



The Boeing Company  
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Via FedEx

February 15, 2019

In reply refer to SHEA-115985

Information Technology Unit  
Los Angeles Regional Water Quality Control Board  
320 West 4th Street, Suite 200  
Los Angeles, California 90013

Subject: Fourth Quarter 2018 NPDES Discharge Monitoring Report  
Compliance File CI-6027 and NPDES No. CA0001309  
Santa Susana Field Laboratory  
Ventura County, California

The Boeing Company (Boeing) hereby submits this Discharge Monitoring Report (DMR) for the Santa Susana Field Laboratory (Santa Susana Site) for the period of October 1 through December 31, 2018 (Fourth Quarter 2018). This DMR was prepared as required by, and in accordance with the National Pollutant Discharge Elimination System Permit No. CA0001309 (NPDES Permit) issued by the Los Angeles California Regional Water Quality Control Board (Regional Board) in 2015. The NPDES Permit covers the entire Santa Susana Site, including the approximately 2,400 acres owned by Boeing, the approximately 450 acres owned by the United States and administered by the National Aeronautics and Space Administration (NASA), and the approximately 290 acres for which the Department of Energy (DOE) has assumed responsibility for soil remediation.

In addition to reporting the sampling results of outfalls that flowed in connection with rain events that occurred in the Fourth Quarter 2018, this DMR discusses the steps taken in the aftermath of the November 2018 Woolsey Wildfire, which caused a substantial loss of vegetation at the Santa Susana Site and the destruction of many previously installed controls identified as best management practices (BMPs). BMPs include, as examples, fiber rolls, sand bags, rip rap, hydromulch, biofilters, bioswales, stormwater conveyance pipelines, and outfall monitoring equipment. Before the fire, naturally occurring vegetation, vegetation established by hydroseed, and BMPs aided in controlling sediment and constituent migration into and within stormwater. While steps were taken as soon as feasible following the fire to control sediment and constituent runoff and redeploy BMPs, the damaged BMPs and vegetation loss in the fire had some impact on controlling sediment flow in the Fourth Quarter 2018, resulting in increased amounts of sediment (e.g., dirt) being captured in stormwater, which is referred to as "turbidity". A fuller discussion of these post-fire restoration efforts is set forth below under the heading "FOURTH QUARTER 2018 SANTA SUSANA SITE SWPPP/BMP ACTIVITIES".

Hard copies of this DMR are available to the public at California State University at Northridge Library, Simi Valley Public Library, and the Platt Branch of the Los Angeles Public Library. An electronic version of this DMR is located at:

<http://www.boeing.com/principles/environment/santa-susana/monitoring-reports.page>

## FOURTH QUARTER 2018 DMR CONTENTS

This DMR includes the following sections and appendices:

- **Discharge and Sample Collection Summary:** This section describes the number of rain events, number of samples collected, sample dates, and sample locations during the Fourth Quarter 2018. Table I summarizes the Fourth Quarter 2018 sampling record by outfall, location, and sample type collected per the requirements of the NPDES Permit.
- **Fourth Quarter 2018 Receiving Water Surveys:** This section summarizes the receiving water surveys required by the NPDES Permit. Table II presents the Fourth Quarter 2018 Arroyo Simi observations. Table III presents the Fourth Quarter 2018 Bell Creek observations. Table IV presents the Fourth Quarter 2018 Dayton Canyon Creek observations.
- **Fourth Quarter 2018 Summary of Exceedances and/or Non-Compliance:** This section summarizes the sample results that exceeded NPDES Permit limits, daily maximum benchmark limits, and receiving water limits in the Fourth Quarter 2018, and the potential causes thereof.
- **Fourth Quarter 2018 Santa Susana Site Stormwater Pollution Prevention Plan (SWPPP)/BMP Activities:** This section presents the Santa Susana Site SWPPP and BMP-related activities associated with Woolsey Wildfire Vegetation Restoration as well as activities associated with NASA, DOE, the Stormwater Expert Panel (Expert Panel), the Northern Drainage, and the Outfall 001/002 BMP Compliance Report implemented in the Fourth Quarter 2018. Table V summarizes typical BMP-related activities that occur at outfalls every quarter. Table VI summarizes specific BMP activities by outfall location that were completed during the Fourth Quarter 2018.
- **Reasonable Potential Analysis:** This section discusses the results of the analysis.
- **Data Validation and Quality Control:** This section discusses data validation results and any laboratory or field corrective actions.
- **Figure 1** shows the stormwater collection conveyance system, the Bell Creek Receiving Water sampling location (RSW-001, Outfall 002), and Santa Susana Site features; **Figure 2** shows the Arroyo Simi Receiving Water (RSW-002, Frontier Park) sampling location and upstream monitoring location.
- **Appendix A** summarizes the rainfall measured during the Fourth Quarter 2018 at the Santa Susana Site.
- **Appendix B** tabulates waste shipment details.
- **Appendix C** presents chemical analytical results from the Fourth Quarter 2018 stormwater and/or receiving water and sediment sample discharge monitoring in tabular form by outfall location, constituents evaluated (analytes), sample dates, and data validation qualifiers.
- **Appendix D** summarizes the NPDES Permit limit exceedances.
- **Appendix E** contains copies of the laboratory analytical reports, chain of custody forms, and data validation reports.
- **Appendix F** tabulates the Reasonable Potential Analysis.



## DISCHARGE AND SAMPLE COLLECTION SUMMARY

The Santa Susana Site measured four qualifying rain events during the Fourth Quarter 2018 that produced greater than 0.1 inch of rainfall within a 24-hour period and were preceded by at least 72 hours of dry weather (Appendix A). Automated flow-weighted composite samplers (autosamplers) were set in preparation for all rain events. One of the four qualifying rain events produced stormwater discharges. During this event, stormwater samples were collected at Outfalls 002, 008, and 009. There were no changes in the discharge as described in the NPDES Permit during the reporting period.

One quarterly offsite receiving water sample was collected at the Arroyo Simi location (RSW-002, Frontier Park; see Figure 2) and one onsite receiving water sample was collected at Outfall 002 (RSW-001). Table I summarizes the Fourth Quarter 2018 sampling record by location, sample frequency, and sample type collected per NPDES Permit requirements.

**TABLE I: Sampling Record during the Fourth Quarter 2018**

Date	Outfall/Location	Sample Frequency	Sample Type
12/06 - 12/07/2018	Outfall 002	Quarterly, Routine; Quarterly (RSW-001)	Grab, Composite
12/06 - 12/07/2018	Outfall 008	Annual, Routine	Grab, Composite
12/06 - 12/07/2018	Outfall 009	Semiannual, Routine	Grab, Composite
12/6/2018	Arroyo Simi Receiving Water (RSW-002, Frontier Park)	Quarterly Surface Water	Grab

**Notes:**

Routine = 1/discharge.

All analyses were conducted at analytical laboratories certified for such analyses by the State Water Resources Control Board ([SWRCB]; i.e., all have current certification from the Environmental Laboratory Accreditation Program [ELAP] established by the California Environmental Laboratory Improvement Act) or are approved by the SWRCB Executive Officer and in accordance with current U.S. Environmental Protection Agency (EPA) guideline procedures or as specified in the NPDES Permit.

## FOURTH QUARTER 2018 RECEIVING WATER SURVEYS

The receiving water monitoring program required by the NPDES Permit includes Bell Creek, Dayton Canyon Creek and Arroyo Simi surveys. Observations are made only during discharge on a monthly basis from Outfalls 002, 008, and 009. During Fourth Quarter 2018, Outfalls 002, 008, and 009 discharged in December. Table II, Table III, and Table IV below present the observations.

**TABLE II: Fourth Quarter 2018 Arroyo Simi Observations**

Arroyo Simi Observations	October 2018	November 2018	December 2018
Date and time of inspection	NA	NA	12/6/2018, 12:25
Weather conditions	NA	NA	Cloudy, windy, no precipitation, 48°F
Color of water	NA	NA	Brown

Arroyo Simi Observations	October 2018	November 2018	December 2018
Appearance of oil films or grease, or floatable materials	NA	NA	None
Extent of visible turbidity or color patches	NA	NA	Uniform, opaque
Description of odor, if any	NA	NA	None
Presence or activity of California Least Tern or California Brown Pelican	NA	NA	No
Upstream Surface Water Temperature*	NA	NA	9.36°C
Upstream Surface Water pH*	NA	NA	7.58 pH Units

**Notes:**

NA = not applicable. Since Outfall 009 did not flow during the months of October and November, no monthly inspection was required at Arroyo Simi.

\* = These data were collected to assist in determining compliance with receiving water limitations. Upstream data were compared to the pH and temperature measured at Arroyo Simi sample location RSW-002 (Appendix C) and were within 0.5 unit and 5°F of the upstream field readings; therefore, compliance was demonstrated.

**TABLE III: Fourth Quarter 2018 Bell Creek Observations**

Bell Creek Observations	October 2018	November 2018	December 2018
Date and time of inspection	NA	NA	12/6/2018, 9:40
Weather conditions	NA	NA	Partly cloudy, between rain, breezy
Color of water	NA	NA	Brown, opaque, uniform
Appearance of oil films or grease, or floatable materials	NA	NA	Few leaves, no films or grease
Extent of visible turbidity or color patches	NA	NA	Uniform, opaque
Description of odor, if any	NA	NA	None
Presence or activity of California Least Tern or California Brown Pelican	NA	NA	No

**Notes:**

NA = not applicable. Since Outfall 002 did not flow during the months of October and November, no monthly inspection was required at Outfall 002.

**TABLE IV: Fourth Quarter 2018 Dayton Canyon Creek Observations**

Dayton Canyon Creek Observations	October 2018	November 2018	December 2018
Date and time of inspection	NA	NA	12/6/2018, 9:10
Weather conditions	NA	NA	Raining moderately hard, breezy
Color of water	NA	NA	Very dark gray
Appearance of oil films or grease, or floatable materials	NA	NA	Wood bits, twigs, no films or grease



Dayton Canyon Creek Observations	October 2018	November 2018	December 2018
Extent of visible turbidity or color patches	NA	NA	Uniform, opaque
Description of odor, if any	NA	NA	None
Presence or activity of California Least Tern or California Brown Pelican	NA	NA	No

**Notes:**

NA = not applicable. Since Outfall 008 did not flow during the months of October and November, no monthly inspection was required at Outfall 008.

**FOURTH QUARTER 2018 SUMMARY OF EXCEEDANCES AND/OR NON-COMPLIANCE**

As summarized in Appendix D, the Fourth Quarter 2018 exceedances of Daily Maximum Benchmark Limits, Daily Maximum Permit Limits, or receiving water limits included:<sup>1</sup>

- Copper, iron, lead, selenium, and zinc at Outfall 002;
- Cyanide, copper, and lead at Outfall 008; and
- Dioxins (TCDD) toxic equivalent (TEQ) at Outfall 009.

Boeing is committed to fulfilling the requirements of the NPDES Permit. Boeing and NASA each took actions during the Fourth Quarter 2018 to control erosion and sediment transport and minimize the occurrence of future permit exceedances on each party’s property and/or area of responsibility. Boeing’s actions are described in Tables V and VI, and sections on BMP Plan-Related Activities, Woolsey Wildfire Restoration Activities, and Outfall 001/002 BMP Compliance Report Related Activities. Any repair and other erosion control measures to BMPs taken by NASA and DOE are also described below. Boeing will continue to work with the Expert Panel to address exceedances at Outfalls.

**Outfall 002**

Metals: Copper, Iron, Lead, Selenium, and Zinc

On December 7, 2018, a stormwater sample was collected from Outfall 002. Iron was detected at 98 milligrams per liter (mg/L), above its the Daily Maximum Benchmark Limit of 0.3 mg/L; copper was detected at 52 micrograms per liter (µg/L), above its Daily Maximum Benchmark Limit of 14 µg/L; lead was detected at 88 µg/L, above its Daily Maximum Benchmark Limit of 5.2 µg/L; selenium was detected at 11 µg/L, above its wet weather Daily Maximum Benchmark Limit of 8.2 µg/L; and zinc was detected at 430 µg/L, above its Daily Maximum Benchmark Limit of 119 µg/L.

These exceedances were preceded by the Woolsey Fire which burned vegetation, deposited ash, and destabilized soils. It is well known that wildfires result in increased runoff flowrates and sediment yield due to the soil repelling water in areas impacted by the fire and decreased vegetative coverage and erosion control, respectively. Another common result of wildfire is an increase in suspended solids comprised of sediment and ash which was confirmed by visual observations of the Bell Creek receiving water (Table III). Lastly, there are no industrial materials, equipment, activity or development-associated sources in this watershed. Most buildings and pavement have been removed, leaving only dirt roads.

<sup>1</sup> Gross alpha results are in a separate section below.

The Expert Panel study, “SSFL Metals Background Report: Sources of Metals in SSFL Watersheds” (Pitt, 2009) noted that heavy metals in stormwater discharges from Outfalls 001, 002, 008, and 009 originate from various sources, including natural soil components, rainfall, and dry atmospheric deposition from local and regional sources. Natural soil components include “very fine soils” that preferentially erode and “have generally been found to have higher metal concentrations compared to larger [soil] particles.” This report also compared wet weather metals concentrations in creeks in regional natural watersheds to concentrations observed at the Santa Susana Site and concluded that “outfall metal concentrations were comparable to the concentrations at these undeveloped watersheds.”

Based on these environmental circumstances, Boeing believes that contact with native soil and sediments and ash contributed to the increased metals concentrations observed in stormwater runoff in the Outfall 002 watershed.

The Stormwater Expert Panel is currently evaluating the data contained in this report and will include the results of their analysis on the likely causes of these exceedances in the 2019 Annual Report.

Exceeding these Daily Maximum Benchmark Limits triggers a BMP Compliance Report, which Boeing will submit to the Regional Board. The actions completed during Fourth Quarter 2018 to control erosion and sediment transport and minimize the occurrence of future permit exceedances in Outfall 002 are described in the Outfall 001/002 BMP Compliance Report Related Activities and in the Woolsey Wildfire Restoration Activities section below. Boeing and the Expert Panel will continue to monitor and evaluate the effectiveness of BMPs within the Outfall 002 watershed.

## **Outfall 008**

### *Metals: Copper and Lead*

On December 7, 2018, a stormwater sample was collected from Outfall 008. Copper was detected at 15 µg/L, above its Daily Maximum Benchmark Limit of 14 µg/L; and lead was detected at 54 µg/L, above its Daily Maximum Benchmark Limit of 5.2 µg/L.

These exceedances were preceded by the Woolsey Wildfire which burned vegetation, deposited ash, and destabilized soils. It is well known that wildfires result in increased runoff flowrates and sediment yield due to the soil repelling water in areas impacted by the fire and decreased vegetative coverage and erosion control, respectively. Another common result of wildfire is an increase in suspended solids comprised of sediment and ash which was confirmed by visual observation of the Dayton Canyon receiving water (Table IV). Lastly, there are no industrial materials, equipment, activity or development-associated sources in this watershed. All buildings and pavement have been removed, leaving only dirt roads.

As discussed above, the Expert Panel study, “SSFL Metals Background Report: Sources of Metals in SSFL Watersheds” (Pitt, 2009) noted that heavy metals in stormwater discharges from Outfalls 001, 002, 008, and 009 originate from various sources, including natural soil components, rainfall, and dry atmospheric deposition from local and regional sources. Natural soil components include “very fine soils” that preferentially erode and “have generally been found to have higher metal concentrations compared to larger [soil] particles.” This report also compared wet weather metals concentrations in creeks in regional natural watersheds to concentrations observed at the Santa Susana Site and concluded that “outfall metal concentrations were comparable to the concentrations at these undeveloped watersheds.”

Based on these environmental circumstances, Boeing believes that contact with native soil and sediments contributed to the increased metals concentrations observed in stormwater runoff in the Outfall 008 watershed.



The Stormwater Expert Panel is currently evaluating the data contained in this report and will include the results of their analysis of the likely causes of these exceedances in the 2019 Annual Report.

The actions completed during Fourth Quarter 2018 to control erosion and sediment transport and minimize the occurrence of future permit exceedances are described in the BMP Activities and Woolsey Wildfire Restoration Activities sections below. Boeing will continue to monitor and evaluate the effectiveness of BMPs within the Outfall 008 watershed.

#### Cyanide

On December 7, 2018, a stormwater sample was collected from Outfall 008. Cyanide was detected at 15 µg/L, above its Daily Maximum Benchmark Limit of 9.5 µg/L. Cyanides can be produced by certain bacteria, fungi, and algae and are found in a number of foods and plants. The potential for species of cyanide to be produced from wildfires has been studied by Los Alamos National Laboratory. These studies also show that cyanides can be produced by the photo-oxidation of fire retardants (Gallaher and Koch, 2004), which were used generally in combating the Woolsey wildfire and even if not directly applied to the Outfall 008 watershed could have been deposited by the wind.

Based on these environmental circumstances, Boeing believes that contact with ash resulting from burned vegetation contributed to the detection of cyanide in stormwater runoff in the Outfall 008 watershed.

The Stormwater Expert Panel is currently evaluating the data contained in this report and will include the results of their analysis on the likely causes of these exceedances in the 2019 Annual Report.

#### **Outfall 009**

##### Dioxins (TCDD) Toxic Equivalent (TEQ)

On December 7, 2018, TCDD TEQ was calculated in a stormwater sample collected from Outfall 009 at 3.7E-08 µg/L, above the Daily Maximum Permit Limit of 2.8E-08 µg/L.

The Department of Toxic Substances Control's (DTSC) Chemical Soil Background Study found TCDD congeners in soil background conditions and concluded that they could have originated from wildfire combustion processes and atmospheric deposition (DTSC, 2012). In addition, the Expert Panel has reported that treated woods (i.e., telephone/utility poles) and pavement runoff may release dioxins that could be captured in stormwater.

Based on these environmental circumstances, Boeing believes that contact with treated wood and pavement, as well as ash resulting from burned vegetation during the recent and prior fires, contributed to the detection of dioxins in stormwater runoff in the Outfall 009 watershed.

The Stormwater Expert Panel is evaluating the data contained in this report, as well as dioxin sources, and will include the results of their analysis on the likely cause of this exceedance in the 2019 Annual Report.

#### **Gross Alpha for Outfalls 002 and 008**

##### Outfall 002

On December 7, 2018, a stormwater sample was collected from Outfall 002. Gross alpha was reported at 22.3 +/- 5.45 picocuries per liter [pCi/L], above the Daily Maximum Benchmark Limit of 15 pCi/L. Per the NPDES Permit, if gross alpha is greater than 15 pCi/L, four things must occur: uranium analysis must be performed, uranium results must be less than 20 pCi/L, gross alpha minus total uranium must be

compared to the Benchmark Limit of 15 pCi/L, and the average of gross alpha results for the calendar year must also be compared to the Daily Maximum Benchmark Limit of 15 pCi/L. Uranium analysis was performed and the result was 1.25 +/- 1.30. Gross alpha minus total uranium was calculated to be 21.05 +/- 5.60 pCi/L which exceeds the Daily Maximum Benchmark Limit of 15 pCi/L. The only other discharge event for Outfall 002 was on March 23, 2018. Averaging the December and March data gives an annual average of 11.70 +/- 2.95 pCi/L, which is below the Daily Maximum Benchmark Limit.

Like metals, levels of gross alpha often increase due to increased turbidity (e.g., sediment captured in stormwater). For example, naturally occurring Uranium-238 and Thorium-232 and their decay products comprise 12 alpha emitting radionuclides, which, under the theory of secular equilibrium, comprise 16 pCi/g or 16,000 pCi/kg of soil. As such, a relatively small amount of soil in water with these naturally occurring materials could result in elevated gross alpha concentrations that exceed 15 pCi/L.

The turbidity measured at Outfall 002 during the December 7, 2018 sampling event was elevated -- 2,500 nephelometric turbidity units (NTUs). As such, Boeing believes that high turbidity (i.e., high suspended solids) resulting from the Woolsey Wildfire caused an increase in gross alpha levels.

#### Outfall 008

On December 7, 2018, a stormwater sample was collected from Outfall 008. Gross alpha was reported at 14.8 +/- 3.81 pCi/L, which was slightly above the Benchmark Limit of 15 pCi/L if you take into account the range provided by the lab. As stated above, if gross alpha is greater than 15 pCi/L, four things must occur: uranium analysis must be performed, uranium results must be less than 20 pCi/L, gross alpha minus total uranium must be compared to the Benchmark Limit of 15 pCi/L, and the average of gross alpha results for the calendar year must also be compared to the Benchmark Limit of 15 pCi/L. Uranium analysis was performed and the results were 1.33 +/- 0.884. Gross alpha minus total uranium was calculated to be 13.47 +/- 3.91 pCi/L which is indeterminate compared to the Daily Maximum Benchmark Limit of 15 pCi/L. As Outfall 008 only flowed during the Fourth Quarter 2018, the annual average was also indeterminate.

Outfall 008 turbidity was 890 NTU. Given the high turbidity (high suspended solids) of this sample and consistent with the discussion above, the elevated but indeterminate levels of gross alpha likely were caused by vegetation loss and BMP damage caused by the Woolsey Wildfire.

The Stormwater Expert Panel is evaluating the data contained in this report and will include the results of their analysis in the 2019 Annual Report.

## **FOURTH QUARTER 2018 SANTA SUSANA SITE SWPPP/BMP ACTIVITIES**

Boeing implemented significant activities related to the Site-Wide SWPPP (Haley & Aldrich, 2018) and BMP-related activities to assist in improving stormwater quality and compliance at the Santa Susana Site. Table V summarizes typical BMP-related activities that occur at outfalls every quarter.



**TABLE V: Routine Quarterly Outfall BMP Activities**

BMP Activities	Outfalls											
	001	002	003	004	005	006	007	008	009	010	011	018
Conducted erosion, sediment control, and drainage stabilization inspections and performed maintenance around the perimeter of the outfall, the drainage/ watershed, and areas of disturbance or sparse vegetation.	X	X	X	X	X	X	X	X	X	X	X	X
Inspected the flume for sediment/debris.	X	X	X	X	N/A	X	N/A	X	X	X	N/A	X
Inspected the weir for sediment/debris.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	N/A
Cleaned the sample box of sediment and debris, checked for the presence of animals, and performed weed abatement as needed.	X	X	X	X	X	X	X	X	N/A	X	X	X
Checked the flow meter control box for the presence of debris and/or animals.	X	X	X	X	N/A	X	N/A	X	X	X	X	X
Cleaned the outfall area of sediment and debris and performed weed abatement as needed.	X	X	X	X	X	X	X	X	X	X	X	X
Reset the flow meter and replaced the tape monthly.	X	X	X	X	N/A	X	N/A	X	X	X	X	X
Conducted maintenance inspections of the stormwater conveyance system.	N/A	N/A	X	X	X	X	X	N/A	N/A	X	X	X
Conducted maintenance inspections of the stormwater retention system.	N/A	N/A	X	X	X	X	X	N/A	N/A	X	X	X
Conducted maintenance inspections of the flow-through structure.	N/A	N/A	X	X	N/A	X	N/A	N/A	N/A	X	X	X

**Notes:**

X = BMP activity is applicable to the outfall and was completed in Fourth Quarter 2018.

N/A = BMP activity is not applicable to the outfall because the outfall does not have a flume, sample box, flow meter, retention system or flow-through structure or is not part of the stormwater conveyance system.

In addition to SWPPP-related activities, specific BMP projects included: Woolsey Wildfire Vegetation Restoration, NASA SWPPP BMPs, DOE BMPs, Expert Panel reports related to BMPs, Northern Drainage BMPs, and Outfall 001/002 BMPs. These are discussed in more detail below.

**OTHER BMP ACTIVITIES**

BMP observations and maintenance inspections were conducted in conformance with the Site-Wide SWPPP (Haley & Aldrich, 2018) at and around the former active test stands Alfa and Bravo and former Advanced Propulsion Test Facility.

**WOOLSEY WILDFIRE VEGETATION RESTORATION ACTIVITIES**

As a result of the Woolsey Wildfire in November 2018, up to 80 percent of the Santa Susana Site property burned, including telephone poles, electrical lines, water conveyance lines, 24-hour composite sampling equipment, and destroyed a substantial amount of vegetation and BMPs. The ground surface of the Santa Susana Site was impacted with ash and/or charred material, which are known to contain naturally occurring constituents such as dioxins and metals (EPA, 2000; Aronsson and Ekelund, 2004). In addition, wildfires have been shown to increase soil pH and to cause an increase in nitrate, ammonia, and other compounds related to plant nutrients (Higgins, et. al., 1989; Earl and Blinn, 2003). To reduce the impact of the ash and charred material on stormwater and to help establish vegetation regrowth, numerous activities were implemented as soon as feasible to help restore the natural, engineered and/or institutional controls that aid in minimizing the erosion of surface materials and sediment migrating in stormwater.

During the Fourth Quarter 2018, Boeing assessed the damage to the BMPs and the Santa Susana Site in general, began repairing/replacing/upgrading the BMPs destroyed, and began installing additional BMPs across the Santa Susana Site to reduce sediment and constituent runoff. Table VI summarizes the additional activities completed during the Fourth Quarter 2018 by outfall or BMP location.

**TABLE VI: Additional Fourth Quarter 2018 BMP Activities**

OUTFALL OR BMP LOCATION	BMP ACTIVITIES DURING FOURTH QUARTER 2018
001	Installed straw and composite wattles around the drainage. Repaired fire damaged sampling tubing and bubbler tubing. Hydromulched around the drainage channel.
002	Removed fire damaged HDPE lines used as irrigation lines from previous fires. Removed and replaced solar panels and wiring, autosampler tubing and sample drums. Repaired fire damaged electrical lines associated with the solar panels. Installed straw and composite wattles around the drainage channel. Hydromulched around the drainage channel. Installed compost socks at the outfall.
006	Installed small sump pump to prevent leak/flume bypass. Removed and replaced autosampler sample tubing, solar panels and wiring.
008	Replaced fire damaged flow meter tubing and bubbler tubing. Repaired fire damaged electrical cables associated with the solar panel. Removed and installed a battery for the flow meter. Installed composite wattles along the drainage channel and straw wattles on the hillside to stabilize the slope. Hydromulched the watershed. Installed fiber rolls in Happy Valley and upstream of Outfall 008. Installed compost socks at the outfall.



OUTFALL OR BMP LOCATION	OUTFALL OR BMP LOCATION
011	<p>Removed fire damaged autosampler enclosure and batteries, conveyance pump, conveyance line, valving, and totalizer. Vacuumed, via Supervac, fine ash and debris in and around the basin. Installed straw wattles and composite wattles around the basin. Repaired cracks in concrete channel; installed polyester felt over the concrete swale and covered with riprap to prevent weed regrowth. Hydromulched the surrounding areas. Installed cover over media bed to improve operation of flow over the weir and through the media bed prior to composite sampling and to prevent ponding water from settling in the sample box. Added additional gravel diversion berm at southern end of burn pit to divert excess water into Outfall 011 weir / media bed. Placed straw wattles at the top of CTL IV, down slope to Perimeter Pond, and in the vicinity of Outfall 011. Fused replacement suction and discharge HDPE piping from Outfall 011 to Perimeter Pond. Installed new aluminum autosampler lean to, installed new solar panels, new autosamplers, associated electrical wiring, sample drums and sample tubing.</p> <p>Removed fire damaged intake pumps and intake and discharge piping at SWTS 011. Replaced fire damaged HDPE discharge line between Perimeter Pond and R1 Pond.</p>
012 and 013	<p>Removed fire damaged HDPE lines and vacuumed, via Supervac, fine ash and debris along the conveyance route. Replaced approximately 2,000 feet conveyance lines to Silvernale. Installed temporary pumps to convey water.</p>
018	<p>Removed debris at the outfall resulting from the fire. Removed fire damaged sampling equipment (shed, drums, autosamplers, tubing, etc.). Removed the fire damaged media bed. Installed new aluminum autosampler lean to, new solar panels, new autosamplers, associated electrical wiring, sample drums and sample tubing. Repaired the fiberglass flume. Rebuilt the stairway to the flume. Installed composite wattles along the slope above the flume. Hydromulched the hill above the flume.</p> <p>Replaced the fire damaged HDPE discharge lines from Silvernale pond down to the discharge point at the Outfall 018 flume. Replaced the fire damaged HDPE lines from R2A pond up to Silvernale pond including the piping and valving for the pressure surge tank and all check valves and pressure relief valves along the pipeline. Replaced and upgraded the fire damaged electrical panel for the R2A pumps. Replaced the fire damaged potable water line to the SWTS and a fire damaged personal protective equipment (PPE) shed.</p>
Roadways; various locations	<p>Began hydromulching effort on December 17<sup>th</sup> which will be completed in early 2019.</p> <p>Removed approximately 1,000 feet of fire damaged HDPE stormwater conveyance pipeline between the Old Conservation Yard Area (which receives stormwater from outfalls Outfall 003, Outfall 004 and Outfall 010) and Silvernale Pond. Installed new pipe, new pressure relief valves, check valves and control valves; salvaged and re-used existing steel pipe supports to secure the pipeline.</p> <p>Replaced approximately 1,200 feet of HDPE pipe between the 5-7 pad and Silvernale Pond.</p>

## **NASA-RELATED ACTIVITIES**

Demolition activities covered by NASA's Construction SWPPP (dated May 16, 2017) for the Alfa and Bravo areas are inspected in accordance with the Construction General Permit (CGP). During the Fourth Quarter 2018, NASA maintained wattles as linear sediment controls, maintained silt fencing, and maintained hydroseeded areas within these sites where construction activities had been completed.

Demolition and stormwater control activities covered by NASA's Construction SWPPP (dated February 21, 2017) for the Delta Area are inspected in accordance with the CGP. During the Fourth Quarter 2018, BMPs and hydroseed were maintained.

Demolition activities covered by NASA's Construction SWPPP (dated December 4, 2017) are inspected in accordance with the CGP. During the Fourth Quarter 2018, NASA completed demolition activities in the Coca Test Stand Area. NASA maintained wattles as linear sediment controls, sandbags, and hydroseed within active demolition areas.

Demolition and stormwater control activities covered by NASA's Construction SWPPP (dated September 20, 2018) for the LOX and Bravo Areas are inspected in accordance with the CGP. During the Fourth Quarter 2018, NASA began demolition activities in these areas and maintained wattles as linear sediment controls and maintained sandbags and silt fencing. NASA maintained hydroseeded areas within these sites where construction activities had been completed and for temporary soil stabilization.

The Woolsey Wildfire consumed approximately 350 acres of NASA-administered property in Area II at the Santa Susana Field Laboratory (approximately 85%). Following the fire, NASA surveyed the burned areas and replaced BMPs where needed. NASA replaced straw wattles, sandbags, silt fencing, and hydroseed in areas of active SWPPPs that were burned in the Woolsey Wildfire. NASA also installed new BMPs (straw wattles and applied hydroseed) in burned areas to reduce the potential for soil/ash movement and to protect onsite drainages. NASA will continue to monitor burned areas and install BMPs as needed.

## **DOE-RELATED ACTIVITIES**

DOE reported no BMP-related activities during the Fourth Quarter 2018.

## **EXPERT PANEL-RELATED ACTIVITIES**

The BMP activities discussed below were performed, commenced, or completed during the Fourth Quarter 2018 in coordination with the Expert Panel.

### *B-1 Area*

The B-1 Area BMPs consists of:

- A sedimentation basin, constructed in 2012;
- A media filter, constructed in 2012; and
- An upper parking lot media filter, constructed in 2017.

The Fourth Quarter 2018 activities included continued BMP inspections and cleaning the areas free of sediment and debris.



### *Culvert Modifications*

Twelve culvert modifications (CMs) were constructed in 2009 at various locations at or along the main road adjacent to the Northern Drainage. The CMs were designed to treat stormwater road runoff and/or stormwater from the surrounding hillside. The Fourth Quarter 2018 activities included BMP inspections, including the culvert inlets and riprap check dams.

### *Road Runoff Diversion to CM-3*

The construction of a new Service Area road runoff diversion to CM-3 was completed during the Second Quarter 2017. This BMP included a new curb installed on the north side of the road meant to convey flow to a new drop inlet and trench under the road, which then directs the collected runoff to CM-3 for treatment before entering the Northern Drainage. The Fourth Quarter 2018 activities included inspections of the BMPs, sediment removal from the drop inlet structure, repairing holes in the sheet metal wall on the northern side of the road near the inlet and securing the fiber rolls upgradient of CM-3 along the road.

### *Road Runoff Diversion to CM-1*

The construction of a new road runoff diversion to CM-1 was completed during Fourth Quarter 2017 and the riprap berm was increased in height to treat the additional road runoff. The Fourth Quarter 2018 activities included BMP inspections and sediment removed from the drop inlet structure.

### *Former Building 1436 Detention Bioswales*

Two detention bioswales were constructed at the former Building 1436 following its removal in Third Quarter 2014. The graded surface was hydroseeded, and more than 2,900 native plantings were installed in December 2014. The bioswales were designed to capture, pretreat, and detain runoff from the adjacent parking lot and from approximately 13.9 acres of drainage area east and upgradient prior to releasing the stormwater to the former Instrument and Equipment Laboratories (IEL) storm drain, where flow is diverted to the lower lot biofilter for treatment. The Fourth Quarter 2018 activities included BMP inspections and invasive plant removal adjacent to the bioswales.

### *Lower Lot Biofilter*

The lower lot biofilter is a stormwater treatment BMP designed and built to capture, convey, and treat stormwater runoff from the lower parking lot and former IEL watershed. The lower lot biofilter consists of a 30,000-gallon cistern, a stormwater conveyance line, a sedimentation basin, and a media biofilter.

The Fourth Quarter 2018 activities included inspections to verify that the sedimentation basin and biofilter were free of sediment and debris, checks of the Cistern area and pump, and inspections of surrounding BMPs. Approximately 377,290 gallons of stormwater was pumped from the cistern to the sedimentation basin during the Fourth Quarter 2018. It is important to note that the cistern was without power for approximately four weeks from mid-November to mid-December.

### *NASA Expendable Launch Vehicle (ELV) Area BMPs*

BMPs and drainage improvements were installed between June and October 2013 at the NASA ELV to improve the quality of stormwater runoff from the ELV area. Stormwater is gravity-driven through the tank system, starting with the settling tanks, then through the filter media tank, before discharging to a tributary that flows to Outfall 009. In the Second Quarter 2016, a sand bag berm was placed across the ELV asphalt swale to divert runoff toward CM-1 for treatment instead of directly discharging to the Northern Drainage. The Fourth Quarter 2018 activities included BMP inspections.

#### *Administration Area Inlet Filters*

Four storm drain inlets were modified with either drop inlet filters or weighted wattles filled with media mixtures during the Second Quarter 2017. At the inlet closest to the lower lot, a storm drain filter sock was also placed upstream of the inlet to increase solid settling. The Fourth Quarter 2018 activities included BMP inspections and sealing the lips of the inlet filters.

#### *Well 13 Road*

The sandbag berms located near the culvert inlet and downgradient of the hydroseeded area were reinforced and increased in height during Fourth Quarter 2017. The Fourth Quarter 2018 activities included BMP inspections.

#### *Upper Parking Lot Media Filter*

The construction of a media filter at the northeast corner of the upper parking lot was completed during the Second Quarter 2017. This BMP included a new media filter, similar in style to the B-1 media filter, designed to treat runoff from parts of the parking lot as well as parts of the adjacent Entrance Road. The Fourth Quarter 2018 activities included BMP inspections.

#### *Creosote Treated Wood Poles*

During Fourth Quarter 2017, creosote-treated wood poles had fiber roll installed around the base of the poles. The Fourth Quarter 2018 activities included BMP inspections.

#### *Former Shooting Range*

Prior to the Second Quarter 2018, existing BMPs at the Former Shooting Range consisted of:

- Slope stabilization measures (i.e., vegetation planting areas);
- Riprap berms along the Northern Drainage;
- A culvert maintenance media filter;
- Fiber rolls;
- Sandbag berm;
- Silt fencing;
- Constructed water bar across the trail;
- Three check structures on the Northern trail;
- Sandbags with fiber rolls;
- A check structure at the dissipater; and
- Hydroseeding.

The Fourth Quarter 2018 activities included BMP inspections.

#### *Non-Industrial Sources Special Studies*

The Expert Panel submitted a "Site-Wide Stormwater Work Plan and 2014/15 Annual Report" (2015 Work Plan) on behalf of Boeing in September of 2015 (Geosyntec and the Expert Panel, 2015) to meet the



requirements of the NPDES Permit (Order No. R4-2015-0033)<sup>2</sup>. The 2015 Work Plan also included recommended non-industrial sources special studies intended to help identify sources of lead and dioxins within the Outfall 009 watershed. The special studies involve vacuum sampling pavement solids, pan sampling atmospheric deposition solids, soil sampling around treated wood poles, lead isotope sampling, and sediment and stormwater sampling at multiple locations along the Northern Drainage. No additional subset sampling pertaining to the various stormwater studies was conducted in the Fourth Quarter 2018. However, composite ash samples resulting from the Woolsey Wildfire were collected and are currently being analyzed and evaluated.

### **NORTHERN DRAINAGE BMPS**

Boeing restored the Northern Drainage following cleanup activities performed under DTSC oversight and in accordance with the requirements of Regional Board's Cleanup and Abatement Order No. R4-2007-0054 (Regional Board, 2007). The restoration and mitigation activities proposed in the Northern Drainage Restoration, Mitigation, and Monitoring Plan (RMMP)<sup>3</sup> were implemented in 2012. In accordance with the RMMP, regular maintenance, monitoring, and reporting were implemented in the Northern Drainage from 2012 through the Third Quarter 2017 for the stream's plant biology and geomorphology. The successful restoration and mitigation of the Northern Drainage per the success criteria of the RMMP were documented in the fifth and final Annual Mitigation Monitoring Report (Haley & Aldrich, 2017). Based on the success of the project, Boeing requested that the Regional Board provide written notice stating that Boeing has complied with all terms of the Cleanup and Abatement Order, and Boeing's obligations under the Order were terminated. Boeing will continue to inspect the Northern Drainage BMPs annually and maintain them on an as-needed basis. No RMMP-related inspections of Northern Drainage BMPs were performed during Fourth Quarter 2018.

### **OUTFALL 001/002 BMP COMPLIANCE REPORT RELATED ACTIVITIES**

Boeing submitted a BMP Compliance Report to the Regional Board on June 16, 2017 discussing activities to reduce or eliminate benchmark exceedances for samples collected on January 21, 2017, from drainage at Outfalls 001 (iron, lead, manganese, and TCDD TEQ) and 002 (chronic toxicity and iron; Boeing, 2017). The BMP activities were completed during the Third Quarter 2017 and currently include sitewide BMP inspections. Boeing will submit a BMP Compliance Report to the Regional Board to discuss activities to reduce or eliminate benchmark exceedances for samples collected on December 7, 2018, for Outfall 002 (copper, iron, lead, selenium, and zinc) drainage.

The sampling frequency for iron and manganese at Outfall 001 was increased in January 2017 from once per year to once per discharge until four consecutive sample results demonstrate compliance per the NPDES Permit. There were no discharges at Outfall 001 during the remainder of 2017 or in 2018; therefore, none of the required four consecutive samples have been collected to date.

The sampling frequency of iron at Outfall 002 was increased in January 2017 from once per year to once per discharge until four consecutive sample results demonstrate compliance per the NPDES Permit and will continue to be sampled once per discharge following the December 2018 exceedance.

Boeing and the Expert Panel will continue to monitor and evaluate the effectiveness of BMPs within the watersheds of Outfall 001 and Outfall 002 as discussed in the 2018 Expert Panel Annual Report (Geosyntec and the Expert Panel, 2018).

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<sup>2</sup> Available at: <http://www.boeing.com/principles/environment/santa-susana/permits.page>

<sup>3</sup> Available at: <http://www.boeing.com/principles/environment/santa-susana/technical-reports.page>

## REASONABLE POTENTIAL ANALYSIS

Stormwater discharges from the Santa Susana Site occurred at Outfalls 002, 008, and 009 during the Fourth Quarter 2018. Analytical results from this quarter were added to the Reasonable Potential Analysis dataset. RPA analysis was performed for *E. coli* for Outfall 008; these analyses are discussed below, and Boeing believes they did not trigger reasonable potential (Appendix F). The analytical results for the Fourth Quarter 2018 did not trigger a reasonable potential for any other constituent not already regulated under the current NPDES Permit.

### Bacteria

On December 6, 2018, *E. coli* was detected in stormwater samples collected from Outfall 008 at 8,500 MPN/100 milliliters. Outfall 008 was also analyzed for human-specific Bacteroides to confirm if the bacteria present in these samples were from human sources. Bacteroides analysis did not identify human-specific markers at Outfall 008. As such, Boeing believes that no reasonable potential has been demonstrated for human-caused *E. coli* at Outfall 008, and that the detected *E. coli* was caused by the animals that live at or cross through the Santa Susana Site.

## DATA VALIDATION AND QUALITY CONTROL

In accordance with current federal and state EPA guidelines and procedures, or as specified in the NPDES Monitoring and Reporting Program, samples were analyzed at a State of California-certified laboratory. Data validation was performed on the analytical results, and quality control elements were found to be within acceptable limits for the analytical methods reported, except as noted on the analytical summary tables. Measures were implemented by the analytical laboratory to monitor and/or evaluate low level detections, analyze for interferences, and ensure that cross-contamination did not occur. Laboratory analytical reports, including validation reports and notes, are included in Appendix E.

Attachment H of the NPDES Permit presents the SWRCB's minimum levels laboratories are expected to achieve for reporting and determining compliance with NPDES Permit limits. The analytical laboratory achieved these minimum levels in the Fourth Quarter 2018 except when reporting limits were above the minimum levels (generally due to matrix). In cases where the NPDES Permit limit was less than the reporting limit and minimum level, the reporting limit was used to determine compliance.

## CONCLUSIONS

Boeing continues to improve water quality at stormwater discharge locations at the Santa Susana Site through methods designed to preserve the natural conditions in the watershed to the maximum extent feasible by implementing distributed, sustainable erosion control/restoration measures. The Woolsey Wildfire damaged the site BMPs and caused significant vegetation loss. In addition, numerous scientific studies and literature have demonstrated that wildfires cause increases in the deposition of naturally occurring metals, dioxins and naturally occurring radionuclides. Despite Boeing's tremendous and ongoing wildfire recovery efforts, the results in this report indicate that increased turbidity of stormwater due to the fire resulted in some increased levels of metals, dioxins and gross alpha during the December 5-7, 2018 rain event. Boeing's ongoing collaboration with the Expert Panel will enable Boeing to utilize the best science as we continue to stabilize soils, and repair and improve the onsite stormwater management system.



## FACILITY CONTACT

If there are any questions regarding this report or its enclosures, you may contact Mr. Jeffrey Wokurka of Boeing at (818) 466-8800.

## CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on the 15th of February 2019 at The Boeing Company, Santa Susana Site.

Sincerely,



David W. Dassler P.E.  
Remediation Program Manager  
Environment, Health & Safety

Enclosures:

References

Figure 1 – Site Map with Stormwater Collection and Conveyance System, RSW-001 Sampling Location, and Site Features

Figure 2 – Arroyo Simi Receiving Water – (RSW-002, Frontier Park) Sampling Location

Appendix A – Fourth Quarter 2018 Rainfall Data Summary

Appendix B – Fourth Quarter 2018 Waste Shipment Summary Tables

Appendix C – Fourth Quarter 2018 Discharge Monitoring Data Summary Tables

Appendix D – Fourth Quarter 2018 NPDES Permit Limit Exceedances

Appendix E – Fourth Quarter 2018 Analytical Laboratory Reports, Chain of Custody Forms, and Validation Reports

Appendix F – Fourth Quarter 2018 Reasonable Potential Analysis Tables

- c: Ms. Cassandra Owens, RWQCB  
Mr. Mark Malinowski, DTSC  
California State University – Northridge, Library  
Simi Valley Public Library  
Los Angeles Public Library, Platt Branch

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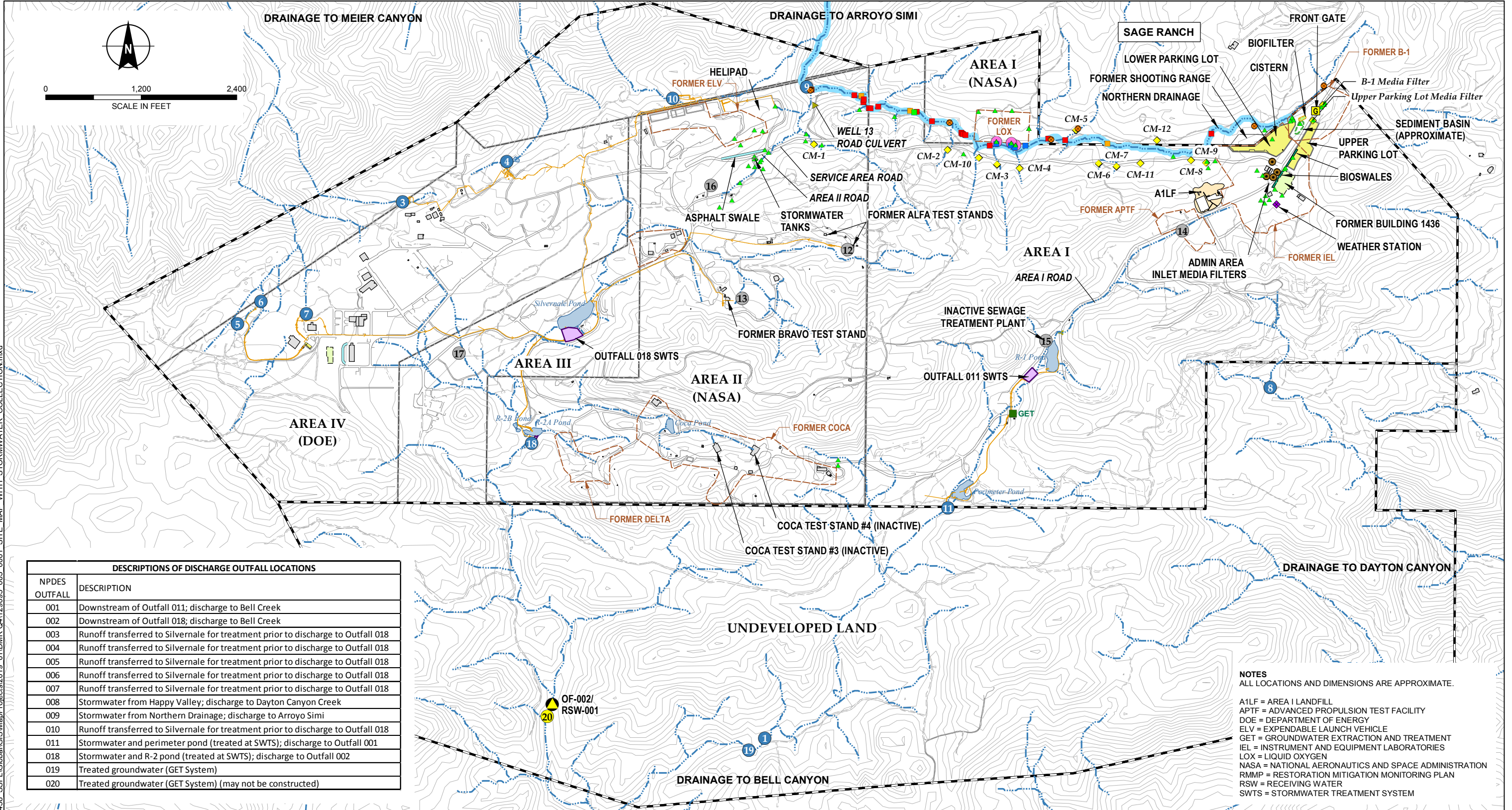


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## FIGURES



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DESCRIPTIONS OF DISCHARGE OUTFALL LOCATIONS	
NPDES OUTFALL	DESCRIPTION
001	Downstream of Outfall 011; discharge to Bell Creek
002	Downstream of Outfall 018; discharge to Bell Creek
003	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
004	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
005	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
006	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
007	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
008	Stormwater from Happy Valley; discharge to Dayton Canyon Creek
009	Stormwater from Northern Drainage; discharge to Arroyo Simi
010	Runoff transferred to Silvernale for treatment prior to discharge to Outfall 018
011	Stormwater and perimeter pond (treated at SWTS); discharge to Outfall 001
018	Stormwater and R-2 pond (treated at SWTS); discharge to Outfall 002
019	Treated groundwater (GET System)
020	Treated groundwater (GET System) (may not be constructed)

- |       |  |   |   |   |   |   |  |   |                           |   |                                     |
|-------|--|---|---|---|---|---|--|---|---------------------------|---|-------------------------------------|
| 19    | ACTIVE NPDES OUTFALL LOCATION  | ● | INLET MEDIA FILTER                        | ■ | STORMWATER TREATMENT SYSTEM   | — | DRAINAGE   | ■ | BIOFILTER                 | □ | CONCRETE SLAB IN PLACE              |
| 17    | FORMER NPDES OUTFALL LOCATION  | ▲ | BMP MONITORING LOCATION                   | □ | FORMER STUDY AREA   | — | ASPHALT SWALE                                      | ■ | BIOSWALE                  | ■ | LANDFILL AREA                       |
| 20    | POSSIBLE FUTURE NPDES OUTFALL LOCATION                                 | ● | SPECIAL STUDIES LOCATION                  | ■ | RMP LOCATION  | — | PAVED ROAD   | ■ | SEDIMENT BASIN            | □ | SANTA SUSANA SITE PROPERTY BOUNDARY |
| ▲     | BELL CREEK RECEIVING WATER (RSW-001) SAMPLING LOCATION AND OUTFALL 002 | ■ | GET SYSTEM                                | ■ | CHECK STRUCTURE - MOSTLY NATURAL SANDSTONE, SOME RIP RAP                                  | — | DIRT ROAD  | ■ | STORMWATER TANK           | □ | ADMINISTRATIVE AREA BOUNDARY        |
| ▲     | SLOPE DRAIN DISCHARGE POINT TO NORTHERN DRAINAGE                       | ■ | CHECK STRUCTURE - RIP RAP                 | ■ | CHECK STRUCTURE - VEGETATED RIP RAP   | — | STORMWATER CONVEYANCE PIPELINE WITH FLOW DIRECTION | ■ | SURFACE WATER POND        | ■ | EXISTING BUILDING/STRUCTURE         |
| CM-12 | CULVERT MODIFICATION   | ■ | CHECK STRUCTURE - SANDSTONE, SOME RIP RAP | ■ | SLOPE DRAIN WITH UNDERLYING CHECK STRUCTURE AND ENERGY DISSIPATING GRAVEL AT INFLUENT END | — | 25' ELEVATION CONTOUR                              | ■ | FORMER BUILDING FOOTPRINT | ■ | VEHICLE PARKING AREA                |

**NOTES**  
 ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.  
 A1LF = AREA I LANDFILL  
 APTF = ADVANCED PROPULSION TEST FACILITY  
 DOE = DEPARTMENT OF ENERGY  
 ELV = EXPENDABLE LAUNCH VEHICLE  
 GET = GROUNDWATER EXTRACTION AND TREATMENT  
 IEL = INSTRUMENT AND EQUIPMENT LABORATORIES  
 LOX = LIQUID OXYGEN  
 NASA = NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 RMMP = RESTORATION MITIGATION MONITORING PLAN  
 RSW = RECEIVING WATER  
 SWTS = STORMWATER TREATMENT SYSTEM

**HALEY ALDRICH**

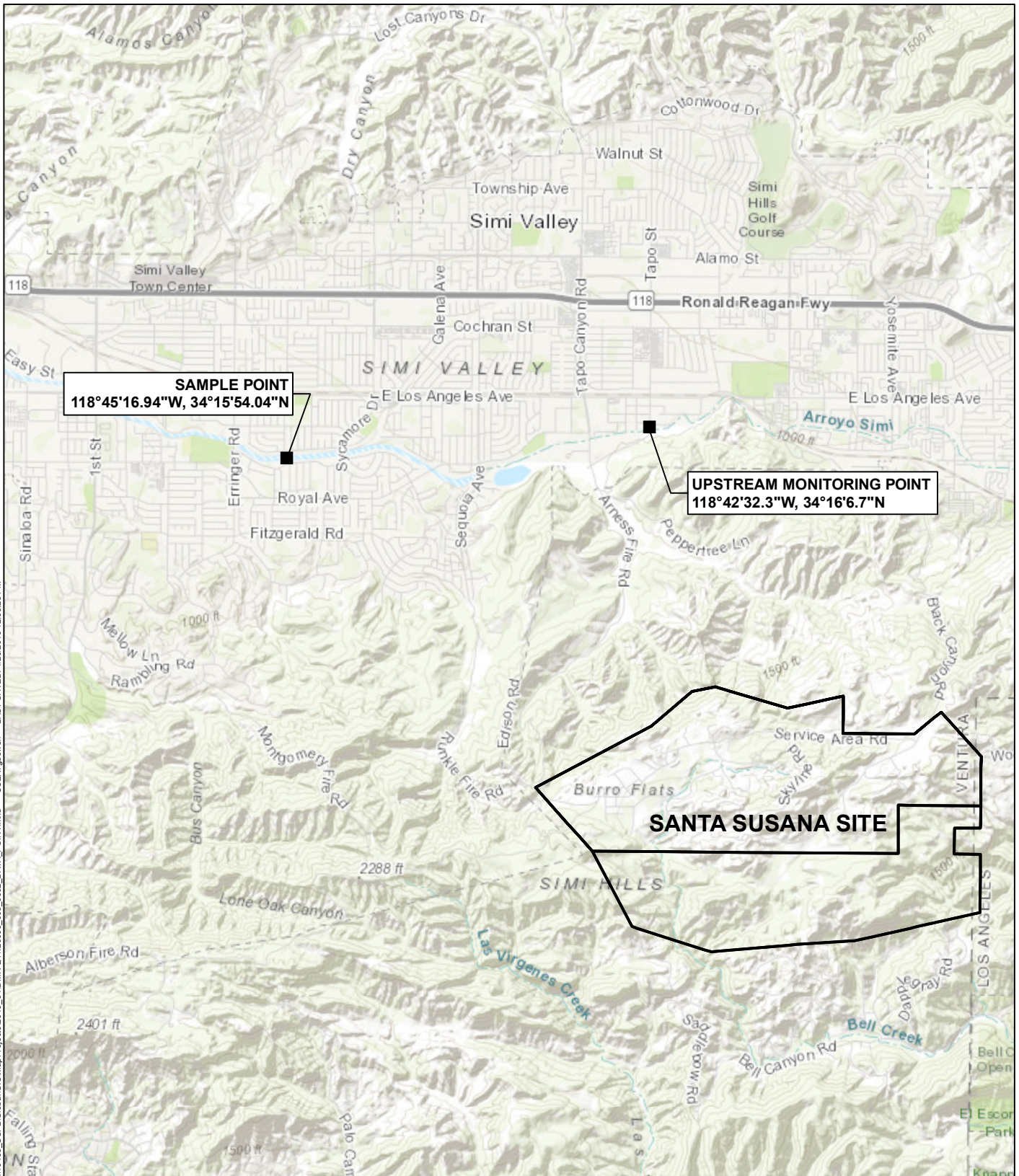
NPDES PERMIT COMPLIANCE FOURTH QUARTER 2018  
 DISCHARGE MONITORING REPORT  
 THE BOEING COMPANY  
 VENTURA COUNTY, CALIFORNIA

**SITE MAP WITH STORMWATER COLLECTION AND CONVEYANCE SYSTEM AND SITE FEATURES**

FEBRUARY 2019 FIGURE 1

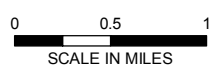


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**NOTES**

1. THE SAMPLE POINT IS FOR QUARTERLY WATER QUALITY AND ANNUAL SEDIMENT SAMPLING.
2. THE UPSTREAM SAMPLE POINT LOCATION WAS CHOSEN BASED ON IT BEING UPSTREAM OF ALL POSSIBLE DISCHARGE FROM THE SANTA SUSANA SITE.



NPDES PERMIT COMPLIANCE FOURTH QUARTER 2018  
DISCHARGE MONITORING REPORT  
THE BOEING COMPANY VENTURA  
COUNTY, CALIFORNIA

**ARROYO SIMI RECEIVING WATER  
(RSW-002, FRONTIER PARK)  
SAMPLING LOCATION**

FEBRUARY 2019

**FIGURE 2**



**APPENDIX A**

**Fourth Quarter 2018 Rainfall Data Summary**

**TABLE A  
DAILY RAINFALL SUMMARY**

**THE BOEING COMPANY  
NPDES PERMIT CA0001309**

Station: AREA 1  
Parameter: Rain  
Month/Year: October 2018

**HOUR OF THE DAY, PACIFIC STANDARD TIME**

	HR-BEG	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	HR-END	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
	DAY																										Total
	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.01	0.02	0.01	0.02	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
T	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	0.00	0.00	0.00	0.00	0.00	0.00	d	d	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Flags: d = Off-line part of hour, invalid hour due to semi-annual audit (October 25). For the off-line event, staff on-site and the rain gauge at Sage Ranch confirmed that no rainfall was recorded on October 25 during hours 06:00-07:00 and 07:00-08:00.



**TABLE A  
DAILY RAINFALL SUMMARY**

**THE BOEING COMPANY  
NPDES PERMIT CA0001309**

Station: AREA 1  
Parameter: Rain  
Month/Year: November 2018

**HOUR OF THE DAY, PACIFIC STANDARD TIME**

	HR-BEG	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	HR-END	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
	DAY																										Total
	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	8	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
A	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Y	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.21
T	22	0.26	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
H	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.04	0.07	0.07
	29	0.11	0.02	0.06	0.01	0.04	0.09	0.30	0.09	0.07	0.00	0.00	0.17	0.00	0.00	0.00	0.04	0.03	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	1.10
	30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**TABLE A  
DAILY RAINFALL SUMMARY**

**THE BOEING COMPANY  
NPDES PERMIT CA0001309**

Station: AREA 1  
Parameter: Rain  
Month/Year: December 2018

**HOOR OF THE DAY, PACIFIC STANDARD TIME**

	HR-BEG	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
	HR-END	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
	<b>DAY</b>																										<b>Total</b>	
	<b>1</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>2</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>3</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>4</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>5</b>	0.00	0.03	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.08	0.07	0.02	0.09	0.22	0.17	0.07	0.03	0.10	1.03		
	<b>6</b>	0.05	0.10	0.05	0.03	0.01	0.12	0.21	0.19	0.44	0.27	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48
	<b>7</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>D</b>	<b>8</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>9</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>A</b>	<b>10</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>11</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>O</b>	<b>12</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>13</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>F</b>	<b>14</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>15</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>T</b>	<b>16</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>17</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>H</b>	<b>18</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>19</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>M</b>	<b>20</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>21</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>N</b>	<b>22</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>23</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>O</b>	<b>24</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>25</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>N</b>	<b>26</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>27</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>T</b>	<b>28</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>29</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>H</b>	<b>30</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>31</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



**APPENDIX B**

**Fourth Quarter 2018 Waste Shipment Summary Tables**

**TABLE B  
LIQUID WASTE SHIPMENTS**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

DATE SHIPPED	MANIFEST OR JOB TRACKING NUMBER	TYPE OF WASTE	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	TRANSPORTER 3	DESTINATION
10/4/2018	019416091JJK	Hazardous Waste, Liquid, N.O.S., (Trichloroethylene)	19,040	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061			US Ecology Vernon Inc. 5375 South Boyle Avenue Los Angeles, CA 90058
	1020180021	Non Hazardous Waste, Liquid, (Decon Water)	4,600	G	American Integrated Services, Inc. 1502 E Opp St Wilmington, CA 90744			Crosby & Overton 1630 W 17th St Long Beach, CA 90813
	1020180022	Non Hazardous Waste, Liquid, (Decon Water)	2,560	G				
11/14/2018	019416456JJK	Waste Permanganates, Inorganic, Aqueous Solution, N.O.S., (Sodium Permanganate)	920	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	n/a	Clean Harbors Aragonite LLC 11600 North Aptus Road Grantsville, Utah 84029
		Waste Permanganates, Inorganic, Aqueous Solution, N.O.S., (Sodium Permanganate)	64	P				
	019416457JJK	Hazardous Waste, Liquid, N.O.S., (Trichloroethylene)	472	P				
		Non-RCRA Hazardous Waste, Liquids, (Oil, Water)	8	P				
		Non-RCRA Hazardous Waste, Liquids, (Oil, Water)	20	P				
	NH1805668458	Non Hazardous, Non D.O.T. Regulated, (Water)	550	P				
12/12/2018	012730401FLE	Hazardous Waste Liquid, (Trichloroethylene, Resin Beads)	155	P		Basin Transportation LLC 130 Express Lane McAlester, OK 74501	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Clean Harbors Deer Park, LLC 2027 Independence Parkway South La Porte, TX 77571
12/14/2018	019183301JJK	Hazardous Waste, Liquid, N.O.S., (Lead)	15	G	American Integrated Services, Inc. 1502 E Opp St Wilmington, CA 90744	n/a	n/a	Crosby & Overton 1630 W 17th St Long Beach, CA 90813
		Hazardous Waste, Liquid, N.O.S., (Lead)	10	G				
	019183345JJK	Non-RCRA Hazardous Waste, Liquid, (Hydraulic Oil)	30	G				

**TABLE B  
LIQUID WASTE SHIPMENTS**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

DATE SHIPPED	MANIFEST OR JOB TRACKING NUMBER	TYPE OF WASTE	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	TRANSPORTER 3	DESTINATION
10/10/2018	19056	Flush Water with Trace Sewage, (Clarifier)	5,000	G	Southwest Processors 4120 Bandini Blvd. Vernon, CA 90058	n/a	n/a	Southwest Processors 4120 Bandini Blvd. Vernon, CA 90058
	19057	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
10/24/2018	19139	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
	19140	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
11/7/2018	19212	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
	19213	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
11/20/2018	19249	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
	19250	Flush Water with Trace Sewage, (Clarifier)	5,000	G				
12/5/2018	19368	Flush Water with Trace Sewage, (Holding Tank)	5,000	G				
	19374	Flush Water with Trace Sewage, (Holding Tank)	5,000	G				
12/19/2018	19474	Flush Water with Trace Sewage, (Holding Tank)	4,900	G				
	19475	Flush Water with Trace Sewage, (Clarifier)	5,000	G				

Notes:  
G = Gallons  
n/a = Not Applicable  
P = Pounds



**TABLE B  
SOLID WASTE SHIPMENTS**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

DATE SHIPPED	MANIFEST OR JOB TRACKING NUMBER	TYPE OF WASTE	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	TRANSPORTER 3	DESTINATION		
10/5/2018	1020180025	Non Hazardous Waste, Solid, (Soil)	54	P	American Integrated Services, Inc. 1502 E Opp St Wilmington, CA 90744			Crosby & Overton 1630 W 17th St Long Beach, CA 90813		
11/14/2018	019416457JJK	Waste Environmentally Hazardous Substances, Solid, N.O.S, (Trichloroethylene, Perchloroethylene)	38	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	n/a	Clean Harbors Wilmington LLC 1737 East Denni Street Wilmington, CA 90744		
	NH1805668425-A	Non Hazardous, Non D.O.T. Regulated Material, (Debris)	315	P						
	NH1805668425-B	Batteries, Dry, Sealed, N.O.S, (Alkaline Batteries), (Universal Waste)	38	P						
		Universal Waste, (Electronic Devices)	95	P						
11/15/2018	NH1805673823	Non Hazardous, Non D.O.T. Regulated, (Ion Exchange Resin)	20	P			Clean Harbors Buttonwillow, LLC 2500 West Lokern Road Buttonwillow, CA 93206			
12/5/2018	018217703JJK	Hazardous Waste, Solid, N.O.S, (Tank Debris)	6	T	D And S Trucking 4822 Avenal St Phelan, CA 92371	n/a	n/a	US Ecology Nevada Highway 95 11 Miles South Beatty, NV 89003		
	018217704JJK	Hazardous Waste, Solid, N.O.S, (Tank Debris)	7	T	Espinosa M Trucking 1127 Meadowside St West Covina, CA 91792					
	018217705JJK	Hazardous Waste, Solid, N.O.S, (Tank Debris)	10	T	S & V Trucking 9243 Camulos Ave Montclair, CA91763					
12/6/2018	018217706JJK	Hazardous Waste, Solid, N.O.S, (Tank Debris)	10	T						
12/12/2018	012730369FLE	Non-RCRA Hazardous Waste, Solids, (Ammonium Dihydrogen, Sand)	201	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Basin Transportation LLC 130 Express Lane McAlester, OK 74501	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Clean Harbors Wilmington LLC 1737 East Denni Street Wilmington, CA 90744		
		Non-RCRA Hazardous Waste, Solids, (Toner Cartridges)	9	P						
	012730401FLE	Hazardous Waste, Solid, N.O.S, (Trichloroethylene)	13,058	P						Clean Harbors Deer Park, LLC 2027 Independence Parkway South La Porte, TX 77571
	NH1806312716	Non Hazardous, Non D.O.T. Regulated Material, (Debris)	48	P				Tristate Motor Transit Co. 8141 East 7th Street Joplin, MO 64801		Clean Harbors Grassy Mountain, LLC 3 Miles East, 7 Miles North of Knolls Grantsville, Utah 84029
12/14/2018	019183301JJK	Hazardous Waste, Solid, N.O.S, (Lead)	100	P	American Integrated Services, Inc. 1502 E Opp St Wilmington, CA 90744	n/a	n/a	Crosby & Overton 1630 W 17th St Long Beach, CA 90813		

Notes:  
n/a = Not Applicable  
P = Pounds  
T = tons

**TABLE B  
FLAMMABLE WASTE SHIPMENTS**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

DATE SHIPPED	MANIFEST OR JOB TRACKING NUMBER	TYPE OF WASTE	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	TRANSPORTER 3	DESTINATION
12/14/2018	019183345JJK	Combustible Liquid, N.O.S., (RP-1 Jet Fuel)	40	G	American Integrated Services, Inc. 1502 E Opp St Wilmington, CA 90744	n/a	n/a	Demunno/Kerdoon 2000 N Alameda St Compton, CA 90222

Notes:  
G = Gallons

**APPENDIX C**

**Fourth Quarter 2018 Discharge Monitoring Data Summary Tables**



**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

**Not all of the following notes, abbreviations, symbols, or acronyms occur on every table:**

1. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalents (TEQs) for the purpose of determining permit compliance are the sum of the products of the detected dioxin congener concentration multiplied by that congener's toxicity equivalency factor (TEF) and bioaccumulation equivalency factor (BEF). The resulting compliance TCDD TEQ does not include those congener concentrations that are reported as detected but not quantified (DNQ), as specified on page 26 of the NPDES permit (Water Board, 2015).
2. Temperature, total residual chlorine (TRC), dissolved oxygen (DO), and pH are measured in the field and are not validated.
3. pH and temperature are identified on the table as daily maximum discharge limits. The NPDES permit limit has an instantaneous minimum (6.5) and maximum (8.5) for pH and an instantaneous maximum of 86°F for temperature.
4. Exceedances are defined on page 6 of the NPDES permit as constituents in excess of daily maximum benchmark limits, daily maximum permit limits, or receiving water limits. Analytical concentrations or calculations to determine compliance to the NPDES permit are reported with the same number of significant figures as the daily maximum benchmark limits, daily maximum permit limits, or receiving water limits.
5. Priority pollutants, sampled once every five years, at Arroyo Simi Receiving Water sampling location (RSW-002, Frontier Park) were analyzed during the First Quarter 2018.
6. Dissolved metals are filtered by the laboratory and reported as "Metal, dissolved". Total metals are not filtered by the laboratory and reported as "Metal".
7. Abbreviations, symbols, and acronyms:

-92.9 +/-200	A negative radiochemical analytical result indicates the count rate of the sample was less than the background condition. Radiological results are presented as activity plus or minus total uncertainty.
%	Percent.
\$	Reported result or other information was incorrectly reported by the laboratory; result was corrected by the data validator.
--	Based on validation of the data, a qualifier was not required.
-/-	No NPDES permit limit established for daily maximum or monthly average.
<(value)	Analyte not detected at a concentration greater than or equal to the detection limit (DL), method detection limit (MDL), or laboratory reporting limit (RL); see laboratory report for specific detail.
>(value)	Greater than most probable number.
*	Result not validated.
**	Flow for each outfall is calculated over the 24-hour period when the outfall autosampler is operating to collect the composite sample. See definition of "Daily Discharge" on page A-2 of attachment A of the NPDES permit.
*1	Improper preservation of sample.

**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

*2	The inductively coupled plasma (ICP)/matrix spike (MS) parts per billion (ppb) check standard was recovered above the control limit; therefore, the constituent detected was qualified as estimated (J).
*3	Initial and or continuing calibration recoveries were outside acceptable control limits.
*5	Blank spike/blank spike duplicate relative percent difference was outside the control limit.
*10	Value was estimated detect or estimated non-detect (J, UJ) due to deficiencies in quantitation of the constituent including constituents reported by the laboratory as estimated maximum possible concentration (EMPC) values.
*11	No calibration was performed for this compound; result is reported as a tentatively identified compound (TIC).
*II *III	Unusual problems found with the data that have been described in Section II, "sample management", or Section III, "method analysis". The number following the asterisk (*) will indicated the validation report section where a description of the problem can be found.
ANR	Analysis not required; e.g., constituent or outfall was not required by the NPDES permit to be sampled and analyzed over the reporting period (annual, semi-annual, etc.).
Avg	Average.
B	Laboratory method blank contamination.
BA	Relative percent difference out of control.
BEF	Bioaccumulation equivalency factor.
BU	Analyzed out of holding time.
BV	Sample received after holding time expired.
C	Calibration percent relative standard deviation (%RSD) or percent difference (%D) were noncompliant.
CaCO3	Calcium carbonate
Comp	Composite sample type.
C5	Calibration verification percent recovery (%R) was outside method control limits.
CEs/100 ml	Cell equivalents per 100 milliliters.
D	The analysis with this flag should not be used because another more technically sound analysis is available.
%D	Percent difference between the initial and continuing calibration relative response factors.
Deg C	Degrees Celsius.
Deg F	Degrees Fahrenheit.
DL	Detection limit.
DNQ	Detected but not quantified (constituent value greater than or equal to the laboratory method detection limit and less than the laboratory reporting limit).
E	E in validation qualifier indicates that duplicates show poor agreement.
EB	Equipment blank.

**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

EMPC	Estimated maximum possible concentration.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
FB	Field blank.
F1	Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits.
ft/sec	Feet per second.
G	Gallons.
gpd	Gallons per day.
H	Holding time was exceeded.
Hardness	Equivalent of calcium carbonate (CaCO <sub>3</sub> ).
Hp	Hepta.
Hx	Hexa.
ICP	Interference check solution results were unsatisfactory.
J	Estimated value.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
J, DX	Estimated value, value < lowest standard method quantitation limit (MQL), but > than method detection limit (MDL).
K	The sample dilution's set-up did not meet the oxygen depletion criteria of at least 2 milligrams per liter (mg/L); therefore, the reported result is an estimated value only.
L	Laboratory control sample percent recovery (%R) was outside control limits.
L1	Laboratory control standard (LCS)/laboratory control standard duplicate (LCSD), relative percent difference (RPD) was outside the control limit.
L2	The laboratory control sample percent recovery (%R) was below the method control limits.
LBS/DAY	Pounds per day.
LCS	Laboratory control standard.
LCSD	Laboratory control standard duplicate.
LQ	Laboratory control standard (LCS)/ laboratory control standard duplicate (LCSD) recovery above method control limits.
M1	Matrix spike (MS) and/or matrix spike duplicate (MSD) were above the acceptance limits due to sample matrix interference.
M2	The matrix spike (MS) and/or matrix spike duplicate (MSD) were below the acceptance limits due to sample matrix interference.
Max	Maximum.
MB	Analyte present in the method blank.
MDA/MDC	Minimum detectable activity/minimum detectable concentration.
MDL	Method detection limit.



**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Meas	Measure sample type.
MFL	Million fibers per liter.
MGD	Million gallons per day.
MHA	Due to high level of analyte in the sample, the matrix spike (MS)/matrix spike duplicate (MSD) calculation does not provide useful spike recovery information.
mg/L	Milligrams per liter.
mg/kg	Milligrams per kilogram.
ml/L/hr	Milliliters per liter per hour.
MPN/100 mL	Most probable number per 100 milliliters.
MQL	Method quantitation limit.
MS	Matrix spike.
MSD	Matrix spike duplicate.
mS/cm	MilliSiemens per centimeter
NA	Not applicable; no NPDES permit limit established for the constituent and/or outfall or analyte not required per receiving water monitoring requirements.
ND	Analyte not detected.
NM	Not measured or determined or minimum detectable activities (MDAs) are not calculated as there is no statistical method for combining MDAs.
NPDES	National Pollutant Discharge Elimination System.
NTU	Nephelometric turbidity unit.
OCDD	Octa CDD.
OCDF	Octa CDF.
P	Pounds.
ppb	Parts per billion.
pCi/L	PicoCuries per liter.
Pe	Penta.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio; the measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
Q	Matrix spike (MS) recovery outside of control limits.
Q1	Matrix spike (MS)/matrix spike duplicate (MSD) relative percent difference (RPD) was outside the control limit.
R	As a validation qualifier, results are rejected; the presence or absence of analyte cannot be verified.
(R)	Percent recovery (%R) for calibration not within control limits.
RL	Laboratory reporting limit.
RL-1	Reporting limit raised due to sample matrix effects.
RPD	Relative percent difference.
%R	Percent recovery.

**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

%RSD	Percent relative standard deviation.
% Normal/Alive	Percent normal and alive.
% Survival	Percent survival.
S	Surrogate recovery was outside control limits.
s.u.	Standard unit.
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin.
TCDF	2,3,7,8-tetrachlorodibenzo-p-furan.
TEQ	Toxic equivalent.
TIC	Tentatively identified compound
TIE	Toxicity identification evaluation
TOC	Total organic carbon
T	Presumed contamination, as indicated by a detect in the trip blank.
U	Result not detected.
µg/L	Micrograms per liter.
µg/g	Micrograms per gram.
µg/kg	Micrograms per kilogram.
µmhos/cm	Micromhos per centimeter.
UJ	Result not detected at the estimated reporting limit.
WHO TEF	World Health Organization toxic equivalency factor.
w/out	Without.
^	Analysis not completed due to hold time exceedance or insufficient sample volume.
#	Per Order No. R4-2015-0033, page 16, Footnote 1. The effluent limitations for total suspended solids and settleable solids are not applicable for discharges during wet weather. During wet weather flow, a discharge event is greater than 0.1 inch of rainfall in a 24-hour period. No more than one sample per week need be obtained during extended periods of rainfall or the discharge of collected stormwater. A storm event must be preceded by at least 72 hours of dry weather.
(1)	Based on the NPDES permit, table E-3a footnote 2, receiving water samples for pH, hardness, and priority pollutants must be collected on the same day as effluent samples.
(2)	Additional sample, not required by the NPDES permit.
(4.0)3.1/-	Represents (dry weather limit) wet weather limit / monthly average limit.
(3)	Secondary maximum contaminant level.
(4)	The drinking water maximum contaminant level of 3.00E-05 µg/L is for the dioxin congener 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). TCDD Toxic Equivalent (TEQ) without detected but not quantified (DNQ) values is the sum of the products of the detected dioxin congener concentration multiplied by that congener's toxic Equivalency factor (TEF) and bioaccumulation equivalency factor (BEF). There are 17 dioxin congeners.

**REPORTING SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

(a)	Based on Order No. R4-2015-0033, page 17, footnote 7, sampling event is a dry discharge and the NPDES Permit Limit is 4.03 ug/L and 3.93 lbs/day at OF001,002,011,018 and 0.24 lbs/day at OF008.
(b)	Based on Order No. R4-2015-0033, page 17, footnote 7, sampling event is a wet discharge and the NPDES Permit Limit is 3.1 ug/L and 4.91 lbs/day at OF001,002,011,018 and 3.05 lbs/day at OF008.
(c)	Based on Order No. R4-2015-0033, page 16, footnote 1, sampled during wet weather flow. The effluent limitations for total suspended solids and settleable solids are not applicable for discharges during wet weather.
(d)	Based on Order No. R4-2015-0033, page 16, footnote 1, sampled during dry weather flow. The effluent limitations for total suspended solids and settleable solids are applicable for discharges during dry weather.
(e)	Based on Order No. R4-2015-0033, page 17, footnote 8, sampling event is a dry discharge and the NPDES Permit Limit is 5 ug/L and 4.91 lbs/day.
(f)	Based on Order No. R4-2015-0033, page 17, footnote 8, sampling event is a wet discharge and the NPDES Permit Limit is 8.2 ug/L and 8.06 lbs/day.
(g)	The frequency of Iron and Manganese at Outfall 001 is increased from once per year to once per discharge until four consecutive sample results demonstrate compliance per the NPDES permit.
(h)	Total Ammonia is reported in wet weight units milligrams per kilogram (mg/kg).
(i)	Total organic carbon (TOC) is reported in dry weight units. Permit asks for TOC units in % dry weight, but data is provided in dry unit milligrams per kilogram (mg/kg).
(j)	Analyte does not have a receiving water limit for Bell Creek Receiving Water (RSW-001, OF002).
(k)	The frequency of Iron at Outfall 002 is increased from once per year to once per discharge until four consecutive sample results demonstrate compliance per the NPDES Permit.



OUTFALL 002 (SOUTH SLOPE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	RECEIVING WATER SAMPLE FREQUENCY	RECEIVING WATER LIMIT	12/06/2018 9:45:00 - 12/07/2018 10:05		
						SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Flow**	MGD	117.83/-	1/Discharge	1/Quarter	-/-	Meas	0.003577	*
<b>CONVENTIONAL POLLUTANTS</b>								
Biochemical Oxygen Demand (BOD)(5-Day @ 20 deg. C)	mg/L	30	1/Discharge	NA	-/-	Composite	3.7	--
Oil & Grease	mg/L	15	1/Discharge	NA	-/-	Grab	ND < 1.5	U
pH (Field)	s.u.	6.5-8.5/-	1/Discharge	1/Quarter	6.5-8.5/-	Grab	7.11	*
Total Suspended Solids <sup>#</sup>	mg/L	45/-	1/Discharge	1/Year	-/-	Composite	340 <sup>(c)</sup>	--
<b>PRIORITY POLLUTANTS</b>								
1,1-Dichloroethene	µg/L	6.0/-	1/Discharge	1/5 Years	-/-	Grab	ND < 0.25	U
1,2-Dichloroethane	µg/L	0.50/-	1/Discharge	1/5 Years	-/-	Grab	ND < 0.25	U
2,4,6-Trichlorophenol	µg/L	13.0/-	1/Discharge	1/5 Years	-/-	Composite	ND < 0.153	U
2,4-Dinitrotoluene	µg/L	18.0/-	1/Discharge	1/5 Years	-/-	Composite	ND < 3.05	U
alpha-BHC	µg/L	0.03/-	1/Discharge	1/5 Years	-/-	Composite	ND < 0.0023	U
Antimony	µg/L	6.0/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Arsenic	µg/L	10.0/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Beryllium	µg/L	4.0/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Bis (2-Ethylhexyl) Phthalate	µg/L	4.0/-	1/Discharge	1/5 Years	-/-	Composite	ND < 3.05	U
Cadmium	µg/L	(4.0) 3.1/- <sup>(a)</sup>	1/Discharge	1/5 Years	-/-	Composite	1.6 <sup>(b)</sup>	--
Chromium VI (Hexavalent)	µg/L	16/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Copper	µg/L	14.0/-	1/Discharge	1/5 Years	-/-	Composite	52	--
Cyanide	µg/L	8.5/-	1/Discharge	1/5 Years	-/-	Composite	ND < 2.5	UJ (H)
Lead	µg/L	5.2/-	1/Discharge	1/5 Years	-/-	Composite	88	--
Mercury	µg/L	0.1/-	1/Discharge	1/5 Years	-/-	Composite	ND < 0.10	U
Nickel	µg/L	94/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
N-Nitrosodimethylamine	µg/L	16.0/-	1/Discharge	1/5 Years	-/-	Composite	ND < 0.458	U
Pentachlorophenol	µg/L	16.5/-	1/Discharge	1/5 Years	-/-	Composite	ND < 1.53	U
Selenium	µg/L	(5) 8.2/-	1/Discharge	1/5 Years	-/-	Composite	11 <sup>(f)</sup>	J- (Q)
Silver	µg/L	4.1/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Thallium	µg/L	2.0/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Trichloroethene	µg/L	5.0/-	1/Discharge	1/5 Years	-/-	Grab	ND < 0.25	U
Zinc	µg/L	119/-	1/Discharge	1/5 Years	-/-	Composite	430	--
<b>NON-CONVENTIONAL POLLUTANTS</b>								
Ammonia - N	mg/L	10.1/-	1/Discharge	NA	-/-	Composite	0.264	--
Barium	mg/L	1.0/-	1/Year	NA	-/-	Composite	ANR	ANR
Chloride	mg/L	150/-	1/Discharge	NA	-/-	Composite	2.7	--
Chlorine, Total Residual	mg/L	0.1/-	1/Year	NA	-/-	Grab	ANR	ANR
Chronic Toxicity	Pass or Fail and % Effect	Pass or % Effect <50	1st & 2nd rain event/Year	NA	-/-	Composite	Pass, -19.66	--
Detergents (as MBAS)	mg/L	0.50/-	1/Discharge	NA	-/-	Composite	ND < 0.050	UJ (Q, Q1)
Fluoride	mg/L	1.6/-	1/Year	NA	-/-	Composite	ANR	ANR
Iron	mg/L	0.30/-	1/Discharge <sup>(k)</sup>	1/Discharge <sup>(k)</sup>	-/-	Composite	98	--
Manganese	µg/L	50/-	1/Year	NA	-/-	Composite	ANR	ANR
Nitrate + Nitrite as Nitrogen (N)	mg/L	8.0/-	1/Discharge	NA	-/-	Composite	1.4	--
Nitrate - N	mg/L	8.0/-	1/Discharge	NA	-/-	Composite	1.4	--
Nitrite - N	mg/L	1.0/-	1/Discharge	NA	-/-	Composite	0.025	J (DNQ)
Perchlorate	µg/L	6.0/-	1/Discharge	NA	-/-	Composite	ND < 0.95	U
Settleable Solids <sup>#</sup>	ml/L/hr	0.3/-	1/Discharge	NA	-/-	Grab	0.10 <sup>(c)</sup>	--
Sulfate	mg/L	300/-	1/Discharge	NA	-/-	Composite	7.7	--
Temperature (Field)	Deg F	86/-	1/Discharge	1/Quarter	-/-	Grab	45.4	*
Total Dissolved Solids	mg/L	950/-	1/Discharge	NA	-/-	Composite	250	--
<b>REMAINING PRIORITY POLLUTANTS</b>								
1,1,1-Trichloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,1,2,2-Tetrachloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,1,2-Trichloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,1-Dichloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,2,4-Trichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
1,2-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,2-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
1,2-Dichloropropane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,2-Diphenylhydrazine/Azobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
1,3-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,3-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
1,4-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
1,4-Dichlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2,4-Dichlorophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2,4-Dimethylphenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2,4-Dinitrophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR

OUTFALL 002 (SOUTH SLOPE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	RECEIVING WATER SAMPLE FREQUENCY	RECEIVING WATER LIMIT	12/06/2018 9:45:00 - 12/07/2018 10:05		
						SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
2,6-Dinitrotoluene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2-Chloroethyl vinyl ether	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
2-Chloronaphthalene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2-Chlorophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2-Methyl-4,6-Dinitrophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
2-Nitrophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
3,3'-Dichlorobenzidine	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
4,4'-DDD	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.0038	U
4,4'-DDE	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.0028	U
4,4'-DDT	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.0038	U
4-Bromophenyl phenyl ether	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
4-Chloro-3-methylphenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
4-Chlorophenyl phenyl ether	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
4-Nitrophenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Acenaphthene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Acenaphthylene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Acrolein	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
Acrylonitrile	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
alpha-Endosulfan	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Anthracene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Aroclor 1016	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1221	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1232	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1242	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1248	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1254	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Aroclor 1260	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.24	UJ (S)
Benzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Benztidine	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Benzo(a)anthracene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Benzo(a)pyrene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Benzo(b)fluoranthene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Benzo(g,h,i)Perylene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Benzo(k)fluoranthene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
beta-Endosulfan	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Bis (2-Chloroethoxy) Methane	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Bis (2-Chloroethyl) Ether	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Bis (2-Chloroisopropyl) Ether	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Bromoform	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.40	U
Bromomethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Butyl benzyphthalate	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Carbon Tetrachloride	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Chlordane	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.075	U
Chlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Chlorodibromomethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
Chloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.40	U
Chloroform	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Chloromethane (Methyl Chloride)	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Chromium	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Chrysene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
cis-1,3-Dichloropropene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Dibenz(a,h)anthracene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Dichlorobromomethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Dieldrin	µg/L	-/-	1/Year	1/Quarter	-/-	Composite	ND < 0.0019	U
Diethyl phthalate	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Dimethyl phthalate	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Di-n-butyl phthalate	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Di-n-octyl phthalate	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Ethylbenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Fluoranthene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Fluorene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Hexachlorobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Hexachlorobutadiene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Hexachlorocyclopentadiene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Hexachloroethane	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Indeno(1,2,3-cd)pyrene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR

OUTFALL 002 (SOUTH SLOPE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	RECEIVING WATER SAMPLE FREQUENCY	RECEIVING WATER LIMIT	12/06/2018 9:45:00 - 12/07/2018 10:05		
						SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Isophorone	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
m,p-Xylenes	ug/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
Methylene chloride	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.88	U
Naphthalene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.40	U
Naphthalene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Nitrobenzene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
N-Nitroso-di-n-propylamine	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
N-Nitrosodiphenylamine	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
o-Xylene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
Phenanthrene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Phenol	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Pyrene	µg/L	-/-	1/Year	1/5 Years	-/-	Composite	ANR	ANR
Tetrachloroethene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Toluene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Toxaphene	µg/L	-/-	1/Year	1/Quarter	0.0003/-	Composite	ND < 0.23	U (\$)
trans-1,2-Dichloroethene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
trans-1,3-Dichloropropene	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Trichlorofluoromethane	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
Vinyl chloride	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ND < 0.25	U
Xylenes (Total)	µg/L	-/-	1/Year	1/5 Years	-/-	Grab	ANR	ANR
<b>EFFLUENT MONITORING (NO LIMITATIONS) POLLUTANTS</b>								
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	-/-	1/Quarter	NA	-/-	Grab	ND < 0.50	U
1,2-Dichloro-1,1,2-trifluoroethane	µg/L	-/-	1/Year	NA	-/-	Grab	ANR	ANR
1,4-Dioxane	µg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
Boron	mg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
cis-1,2-Dichloroethene	µg/L	-/-	1/Year	NA	-/-	Grab	ND < 0.25	U
Cobalt	µg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
Conductivity	µmhos/cm	-/-	1/Discharge	NA	-/-	Grab	140	--
Cyclohexane	µg/L	-/-	1/Year	NA	-/-	Grab	ANR	ANR
Diesel Range Organics (DRO C13-C28)	mg/L	-/-	1/Year	NA	-/-	Grab	ANR	ANR
Dissolved Oxygen	mg/L	-/-	1/Discharge	NA	-/-	Grab	9.05	*
E. Coli	mpn/100mL	-/-	1/Year	1/Year	235/-	Grab	ANR	ANR
Gasoline Range Organics (GRO C4-C12)	mg/L	-/-	1/Year	NA	-/-	Grab	ANR	ANR
Hardness (as CaCO3)	mg/L	-/-	1/Year	1/Quarter	-/-	Composite	300	--
Monomethyl hydrazine	µg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
Total Organic Carbon	mg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
Turbidity	NTU	-/-	1/Discharge	NA	-/-	Composite	2500	--
Vanadium	µg/L	-/-	1/Year	NA	-/-	Composite	ANR	ANR
<b>ADDITIONAL POLLUTANTS<sup>2)</sup></b>								
Antimony, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Arsenic, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Barium, dissolved	mg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Beryllium, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Boron, dissolved	mg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Cadmium, dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	ND < 0.25	U
Chromium, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Cobalt, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Copper, dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	2.6	J+ (B)
Hardness, Dissolved (as CaCO3)	mg/L	-/-	Additional/Year	NA	-/-	Composite	54	--
Human Bacteroides	CEs/100mL	-/-	Additional/Year	NA	-/-	Grab	ANR	ANR
Iron, dissolved	mg/L	-/-	Additional/Discharge <sup>(3)</sup>	NA	-/-	Composite	0.36	J(H)
Lead, dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	ND < 0.50	U
Manganese, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Mercury, dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	ND < 0.10	U
Nickel, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Selenium, dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	ND < 0.50	U
Silver, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Thallium, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Vanadium, dissolved	µg/L	-/-	Additional/Year	NA	-/-	Composite	ANR	ANR
Zinc, Dissolved	µg/L	-/-	Additional/Discharge	NA	-/-	Composite	ND < 12	U



OUTFALL 002 (SOUTH SLOPE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018  
 Sample Date 12/06/2018 9:45

ANALYTE	OUTFALL SAMPLE FREQUENCY	RECEIVING WATER SAMPLE FREQUENCY	LAB MDL (µg/L)	LAB RL (µg/L)	LAB RESULT (µg/L)	LABORATORY/ VALIDATION QUALIFIER	1998 WHO TEF	BEF GREAT LAKES WATER QUALITY INITIATIVE	TCDD EQUIVALENT (w/out DNQ Values) (µg/L)
1,2,3,4,6,7,8-HpCDD	1/Discharge	1/Year	3.0E-07	4.7E-05	6.0E-06	U (B)	0.01	0.05	ND
1,2,3,4,6,7,8-HpCDF	1/Discharge	1/Year	2.2E-07	4.7E-05	1.3E-06	U (B)	0.01	0.01	ND
1,2,3,4,7,8,9-HpCDF	1/Discharge	1/Year	2.7E-07	4.7E-05	ND	U	0.01	0.4	ND
1,2,3,4,7,8-HxCDD	1/Discharge	1/Year	2.1E-07	4.7E-05	1.6E-06	U (B)	0.1	0.3	ND
1,2,3,4,7,8-HxCDF	1/Discharge	1/Year	1.8E-07	4.7E-05	4.8E-07	J (DNQ)	0.1	0.08	ND
1,2,3,6,7,8-HxCDD	1/Discharge	1/Year	1.9E-07	4.7E-05	2.9E-07	U (B)	0.1	0.1	ND
1,2,3,6,7,8-HxCDF	1/Discharge	1/Year	1.6E-07	4.7E-05	2.8E-07	U (B)	0.1	0.2	ND
1,2,3,7,8,9-HxCDD	1/Discharge	1/Year	1.9E-07	4.7E-05	7.4E-07	U (B)	0.1	0.1	ND
1,2,3,7,8,9-HxCDF	1/Discharge	1/Year	1.1E-07	4.7E-05	4.2E-07	U (B)	0.1	0.6	ND
1,2,3,7,8-PeCDD	1/Discharge	1/Year	2.4E-07	4.7E-05	4.3E-07	J (DNQ)	1.0	0.9	ND
1,2,3,7,8-PeCDF	1/Discharge	1/Year	2.3E-07	4.7E-05	ND	U	0.05	0.2	ND
2,3,4,6,7,8-HxCDF	1/Discharge	1/Year	1.1E-07	4.7E-05	2.4E-07	J (DNQ)	0.1	0.7	ND
2,3,4,7,8-PeCDF	1/Discharge	1/Year	2.6E-07	4.7E-05	ND	U	0.5	1.6	ND
2,3,7,8-TCDD	1/Discharge	1/Year	3.0E-07	9.4E-06	3.4E-06	J (DNQ)	1.0	1.0	ND
2,3,7,8-TCDF	1/Discharge	1/Year	7.5E-07	9.4E-06	ND	U	0.1	0.8	ND
OCDD	1/Discharge	1/Year	4.9E-07	9.4E-05	5.1E-05	U (B)	0.0001	0.01	ND
OCDF	1/Discharge	1/Year	3.4E-07	9.4E-05	4.8E-06	U (B)	0.0001	0.02	ND
<b>TCDD TEQ w/out DNQ Values<sup>(4)</sup></b>									<b>ND</b>

TCDD TEQ (PRIORITY POLLUTANTS) PERMIT LIMIT<sup>(4)</sup> = 2.8E-08

OUTFALL 002 (SOUTH SLOPE)

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 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	RECEIVING WATER SAMPLE FREQUENCY	RECEIVING WATER LIMIT	12/07/2018 10:05 (Composite)		
						RESULT	MDA	LABORATORY/ VALIDATION QUALIFIER
<b>NON-CONVENTIONAL POLLUTANTS</b>								
Gross Alpha	pCi/L	15/-	1/Discharge	NA	-/-	22.3 ± 5.45	3.52	J- (*III)
Gross Beta	pCi/L	50/-	1/Discharge	NA	-/-	16.7 ± 2.89	2.15	--
Combined Radium-226 & Radium-228	pCi/L	5.0/-	1/Discharge	NA	-/-	1.36 ± 0.707	NM	U (B)
Strontium-90	pCi/L	8.0/-	1/Discharge	NA	-/-	0.453 ± 0.804	1.36	U
Tritium	pCi/L	20,000/-	1/Discharge	NA	-/-	-53.2 ± 166	302	U
<b>ADDITIONAL POLLUTANTS</b>								
Cesium-137	pCi/L	200/-	1/Discharge	NA	-/-	3.14 ± 7.71	13.3	U
Uranium	pCi/L	20/-	1/Discharge	NA	-/-	1.25 ± 1.30	1.61	U
<b>ADDITIONAL POLLUTANTS WITHOUT LIMITS</b>								
Potassium-40	pCi/L	-/-	1/Discharge	NA	-/-	83.1 ± 91.9	139	U

OUTFALL 002 (SOUTH SLOPE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

				12/06/2018 09:45 - 12/07/2018 10:05 (Grab & Composite)		
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Flow**	MGD	117.83/-	1/Discharge	Meas	0.003577	*
<b>CONVENTIONAL POLLUTANTS</b>						
Biochemical Oxygen Demand (BOD)(5-Day @ 20 deg. C)	LBS/DAY	29,481/-	1/Discharge	Composite	0.11	--
Oil & Grease	LBS/DAY	14,741/-	1/Discharge	Grab	ND	U
Total Suspended Solids <sup>#</sup>	LBS/DAY	44,222/-	1/Discharge	Composite	10 <sup>(c)</sup>	--
<b>PRIORITY POLLUTANTS</b>						
1,1-Dichloroethene	LBS/DAY	5.9/-	1/Discharge	Grab	ND	U
1,2-Dichloroethane	LBS/DAY	0.49/-	1/Discharge	Grab	ND	U
2,4,6-Trichlorophenol	LBS/DAY	12.8/-	1/Discharge	Composite	ND	U
2,4-Dinitrotoluene	LBS/DAY	17.7/-	1/Discharge	Composite	ND	U
alpha-BHC	LBS/DAY	0.03/-	1/Discharge	Composite	ND	U
Antimony	LBS/DAY	5.9/-	1/Year	Composite	ANR	ANR
Arsenic	LBS/DAY	9.83/-	1/Year	Composite	ANR	ANR
Beryllium	LBS/DAY	3.93/-	1/Year	Composite	ANR	ANR
Bis (2-Ethylhexyl) Phthalate	LBS/DAY	3.93/-	1/Discharge	Composite	ND	U
Cadmium	LBS/DAY	(3.93) 3.05/-	1/Discharge	Composite	0.000048 <sup>(b)</sup>	--
Chromium VI	LBS/DAY	15.72/-	1/Year	Composite	ANR	ANR
Copper	LBS/DAY	13.76/-	1/Discharge	Composite	0.0016	--
Cyanide	LBS/DAY	8.35/-	1/Discharge	Composite	ND	UJ (H)
Lead	LBS/DAY	5.11/-	1/Discharge	Composite	0.0026	--
Mercury	LBS/DAY	0.1/-	1/Discharge	Composite	ND	U
Nickel	LBS/DAY	92.4/-	1/Year	Composite	ANR	ANR
N-Nitrosodimethylamine	LBS/DAY	15.72/-	1/Discharge	Composite	ND	U
Pentachlorophenol	LBS/DAY	16.22/-	1/Discharge	Composite	ND	U
Selenium	LBS/DAY	(4.91) 8.06/-	1/Discharge	Composite	0.00033 <sup>(f)</sup>	J- (Q)
Silver	LBS/DAY	4.03/-	1/Year	Composite	ANR	ANR
TCDD TEQ NoDNQ <sup>(4)</sup>	LBS/DAY	2.75E-08	1/Discharge	Composite	ND	--
Thallium	LBS/DAY	1.97/-	1/Year	Composite	ANR	ANR
Trichloroethene	LBS/DAY	4.91/-	1/Discharge	Grab	ND	U
Zinc	LBS/DAY	117/-	1/Discharge	Composite	0.013	--
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Ammonia - N	LBS/DAY	9,925.3/-	1/Discharge	Composite	0.00788	--
Barium	LBS/DAY	983/-	1/Year	Composite	ANR	ANR
Chloride	LBS/DAY	147,405/-	1/Discharge	Composite	0.081	--
Chlorine, Total Residual	LBS/DAY	98.3/-	1/Year	Grab	ANR	ANR
Detergents (as MBAS)	LBS/DAY	491.4/-	1/Discharge	Composite	ND	UJ (Q, Q1)
Fluoride	LBS/DAY	1,572.3/-	1/Year	Composite	ANR	ANR
Iron	LBS/DAY	295/-	1/Discharge <sup>(k)</sup>	Composite	2.9	--
Manganese	LBS/DAY	49.1/-	1/Year	Composite	ANR	ANR
Nitrate - N	LBS/DAY	7,862/-	1/Discharge	Composite	0.042	--
Nitrate + Nitrite as Nitrogen (N)	LBS/DAY	7,862/-	1/Discharge	Composite	0.042	--
Nitrite - N	LBS/DAY	983/-	1/Discharge	Composite	0.00075	J (DNQ)
Perchlorate	LBS/DAY	5.9/-	1/Discharge	Composite	ND	U
Sulfate	LBS/DAY	294,810/-	1/Discharge	Composite	0.23	--
Total Dissolved Solids	LBS/DAY	933,567/-	1/Discharge	Composite	7.5	--



OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	12/06/2018 9:15 - 12/07/2018 11:05		
				SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Flow**	MGD	7.21/-	1/Discharge	Meas	0.011839	*
<b>CONVENTIONAL POLLUTANTS</b>						
Oil & Grease	mg/L	15/-	1/Discharge	Grab	ND < 1.5	U
pH (Field)	s.u.	6.5-8.5/-	1/Discharge	Grab	6.54	*
<b>PRIORITY POLLUTANTS</b>						
Antimony	µg/L	6.0/-	1/Discharge	Composite	0.86	J (DNQ)
Cadmium	µg/L	(4.03)3.1/-	1/Discharge	Composite	0.90 <sup>(b)</sup>	J (DNQ)
Copper	µg/L	14/-	1/Discharge	Composite	15	--
Cyanide	µg/L	9.5/-	1/Discharge	Composite	15	--
Lead	µg/L	5.2/-	1/Discharge	Composite	54	--
Mercury	µg/L	0.13/-	1/Discharge	Composite	ND < 0.10	U
Nickel	µg/L	86/-	1/Discharge	Composite	18	--
Selenium	µg/L	5/-	1/Discharge	Composite	2.1	--
Thallium	µg/L	2.0/-	1/Discharge	Composite	ND < 0.50	U
Zinc	µg/L	120/-	1/Discharge	Composite	120	--
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Ammonia - N	mg/L	10.1/-	1/Discharge	Composite	0.508	--
Boron	mg/L	1.0/-	1/Year	Composite	0.081	--
Chloride	mg/L	150/-	1/Discharge	Composite	2.3	--
Chronic Toxicity	Pass or % Effect<50	Pass or % Effect<50	1st & 2nd rain event/Year	Composite	Pass, -28.28	--
Fluoride	mg/L	1.6/-	1/Year	Composite	0.30	J (DNQ)
Nitrate + Nitrite as Nitrogen (N)	mg/L	8/-	1/Discharge	Composite	1.4	--
Nitrate - N	mg/L	8/-	1/Discharge	Composite	1.4	--
Nitrite - N	mg/L	1/-	1/Discharge	Composite	ND < 0.025	U
Perchlorate	µg/L	6.0/-	1/Discharge	Composite	ND < 0.95	U
Sulfate	mg/L	300/-	1/Discharge	Composite	5.1	--
Temperature (Field)	deg F	86/-	1/Discharge	Grab	45.2	*
Total Dissolved Solids	mg/L	950/-	1/Discharge	Composite	120	--
<b>REMAINING PRIORITY POLLUTANTS</b>						
1,1,1-Trichloroethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,1,2,2-Tetrachloroethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,1,2-Trichloroethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,1-Dichloroethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,1-Dichloroethene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,2,4-Trichlorobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
1,2-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
1,2-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,2-Dichloroethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,2-Dichloropropane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,2-Diphenylhydrazine/Azobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
1,3-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
1,3-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
1,4-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
1,4-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
2,4,6-Trichlorophenol	µg/L	-/-	1/Year	Composite	ND < 0.100	U
2,4-Dichlorophenol	µg/L	-/-	1/Year	Composite	ND < 0.200	U
2,4-Dimethylphenol	µg/L	-/-	1/Year	Composite	ND < 0.500	U
2,4-Dinitrophenol	µg/L	-/-	1/Year	Composite	ND < 1.00	U
2,4-Dinitrotoluene	µg/L	-/-	1/Year	Composite	ND < 2.00	U
2,6-Dinitrotoluene	µg/L	-/-	1/Year	Composite	ND < 2.00	U
2-Chloroethylvinylether	µg/L	-/-	1/Year	Grab	ND < 1.0	UJ (*II)
2-Chloronaphthalene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
2-Chlorophenol	µg/L	-/-	1/Year	Composite	ND < 0.100	U
2-Methyl-4,6-Dinitrophenol	µg/L	-/-	1/Year	Composite	ND < 1.00	U
2-Nitrophenol	µg/L	-/-	1/Year	Composite	ND < 0.200	U

See reporting summary notes for abbreviations, definitions, and other explanations for the data presented.

OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

				12/06/2018 9:15 - 12/07/2018 11:05		
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
3,3'-Dichlorobenzidine	µg/L	-/-	1/Year	Composite	ND < 1.00	U
4,4'-DDD	µg/L	-/-	1/Year	Composite	ND < 0.0037	U
4,4'-DDE	µg/L	-/-	1/Year	Composite	ND < 0.0028	U
4,4'-DDT	µg/L	-/-	1/Year	Composite	ND < 0.0037	U
4-Bromophenylphenylether	µg/L	-/-	1/Year	Composite	ND < 0.100	U
4-Chloro-3-methylphenol	µg/L	-/-	1/Year	Composite	ND < 0.200	U
4-Chlorophenylphenylether	µg/L	-/-	1/Year	Composite	ND < 0.100	U
4-Nitrophenol	µg/L	-/-	1/Year	Composite	ND < 2.00	U
Acenaphthene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Acenaphthylene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Acrolein	µg/L	-/-	1/Year	Grab	ND < 2.5	UJ (*II)
Acrylonitrile	µg/L	-/-	1/Year	Grab	ND < 1.0	UJ (*II)
Aldrin	µg/L	-/-	1/Year	Composite	ND < 0.0014	U
alpha-BHC	µg/L	-/-	1/Year	Composite	ND < 0.0023	U
Anthracene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Aroclor 1016	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1221	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1232	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1242	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1248	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1254	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Aroclor 1260	µg/L	-/-	1/Year	Composite	ND < 0.23	U
Arsenic	µg/L	-/-	1/Year	Composite	13	J+ (B)
Asbestos	MFL	-/-	1/Year	Composite	ND < 5	UJ (H)
Benzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Ben-zidine	µg/L	-/-	1/Year	Composite	ND < 5.00	U
Benzo(a)anthracene	µg/L	-/-	1/Year	Composite	ND < 1.00	U
Benzo(a)pyrene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
Benzo(b)fluoranthene	µg/L	-/-	1/Year	Composite	ND < 0.300	U
Benzo(g,h,i)Perylene	µg/L	-/-	1/Year	Composite	ND < 1.00	U
Benzo(k)fluoranthene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Beryllium	µg/L	-/-	1/Year	Composite	1.2	J (DNQ)
beta-BHC	µg/L	-/-	1/Year	Composite	ND < 0.0037	U
Bis (2-Chloroethoxy) Methane	µg/L	-/-	1/Year	Composite	ND < 0.200	U
Bis (2-Chloroethyl) Ether	µg/L	-/-	1/Year	Composite	ND < 0.0500	U
Bis (2-Chloroisopropyl) Ether	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Bis (2-Ethylhexyl) Phthalate	µg/L	-/-	1/Year	Composite	ND < 2.00	U
Bromodichloromethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Bromoform	µg/L	-/-	1/Year	Grab	ND < 0.40	UJ (*II)
Bromomethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Butylbenzylphthalate	µg/L	-/-	1/Year	Composite	ND < 2.00	U
Carbon Tetrachloride	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Chlordane	µg/L	-/-	1/Year	Composite	ND < 0.075	U
Chlorobenzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Chloroethane	µg/L	-/-	1/Year	Grab	ND < 0.40	UJ (*II)
Chloroform	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Chloromethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Chromium	µg/L	-/-	1/Year	Composite	10	--
Chromium VI	µg/L	-/-	1/Year	Composite	ND < 0.25	U
Chrysene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
cis-1,3-Dichloropropene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
delta-BHC	µg/L	-/-	1/Year	Composite	ND < 0.0033	U
Dibenzo(a,h)anthracene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
Dibromochloromethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Dieldrin	µg/L	-/-	1/Year	Composite	ND < 0.0019	U
Diethylphthalate	µg/L	-/-	1/Year	Composite	ND < 0.200	U

OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	12/06/2018 9:15 - 12/07/2018 11:05		
				SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Dimethylphthalate	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Di-n-butylphthalate	µg/L	-/-	1/Year	Composite	ND < 0.500	U
Di-n-octylphthalate	µg/L	-/-	1/Year	Composite	ND < 1.00	U
Endosulfan I	µg/L	-/-	1/Year	Composite	ND < 0.0028	U
Endosulfan II	µg/L	-/-	1/Year	Composite	ND < 0.0019	U
Endosulfan Sulfate	µg/L	-/-	1/Year	Composite	ND < 0.0028	U
Endrin	µg/L	-/-	1/Year	Composite	ND < 0.0019	U
Endrin Aldehyde	µg/L	-/-	1/Year	Composite	ND < 0.0019	U
Ethylbenzene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Fluoranthene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Fluorene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Heptachlor	µg/L	-/-	1/Year	Composite	ND < 0.0028	U
Heptachlor Epoxide	µg/L	-/-	1/Year	Composite	ND < 0.0023	U
Hexachlorobenzene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Hexachlorobutadiene	µg/L	-/-	1/Year	Composite	ND < 0.500	U
Hexachlorocyclopentadiene	µg/L	-/-	1/Year	Composite	ND < 2.00	U
Hexachloroethane	µg/L	-/-	1/Year	Composite	ND < 0.500	U
Indeno(1,2,3-cd)pyrene	µg/L	-/-	1/Year	Composite	ND < 0.400	U
Isophorone	µg/L	-/-	1/Year	Composite	ND < 0.200	U
Lindane (gamma-BHC)	µg/L	-/-	1/Year	Composite	ND < 0.0028	U
Methylene chloride	µg/L	-/-	1/Year	Grab	ND < 0.88	UJ (*II)
Naphthalene	µg/L	-/-	1/Year	Composite	0.104	J (DNQ)
Naphthalene	µg/L	-/-	1/Year	Grab	ND < 0.40	UJ (*II)
Nitrobenzene	µg/L	-/-	1/Year	Composite	ND < 0.200	U
N-Nitrosodimethylamine	µg/L	-/-	1/Year	Composite	ND < 0.300	U
N-Nitroso-di-n-propylamine	µg/L	-/-	1/Year	Composite	ND < 0.200	U
N-Nitrosodiphenylamine	µg/L	-/-	1/Year	Composite	ND < 0.200	U
Pentachlorophenol	µg/L	-/-	1/Year	Composite	ND < 1.00	U
Phenanthrene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Phenol	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Pyrene	µg/L	-/-	1/Year	Composite	ND < 0.100	U
Tetrachloroethene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Toluene	µg/L	-/-	1/Year	Grab	0.27	J (DNQ, *II)
Toxaphene	µg/L	-/-	1/Year	Composite	ND < 0.23	U
trans-1,2-Dichloroethene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
trans-1,3-Dichloropropene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Trichloroethene	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Trichlorofluoromethane	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Vinyl chloride	µg/L	-/-	1/Year	Grab	ND < 0.25	UJ (*II)
Xylenes (Total)	µg/L	-/-	1/Year	Grab	ND < 0.50	UJ (*II)
<b>EFFLUENT MONITORING (NO LIMITATIONS) POLLUTANTS</b>						
Aluminum	µg/L	-/-	1/Year	Composite	9100	--
Chlorpyrifos	µg/L	-/-	1/Year	Composite	ND < 0.034	UJ (S)
Diazinon	µg/L	-/-	1/Year	Composite	ND < 0.026	R (H)
E. Coli	MPN/100mL	-/-	1/Year	Grab	8500	J (H)
Hardness (as CaCO3)	mg/L	-/-	1/Year	Composite	180	--
Iron	mg/L	-/-	1/Year	Composite	9.5	--
Silver	µg/L	-/-	1/Discharge	Composite	ND < 0.50	U
Total Suspended Solids	mg/L	-/-	1/Year	Composite	750	--
Vanadium	µg/L	-/-	1/Year	Composite	22	--
<b>ADDITIONAL POLLUTANTS<sup>(2)</sup></b>						
Aluminum, dissolved	µg/L	-/-	Additional/Year	Composite	60	J (H,DNQ)
Antimony, dissolved	µg/L	-/-	Additional/Discharge	Composite	0.79	J (H,DNQ)
Arsenic, dissolved	µg/L	-/-	Additional/Year	Composite	ND < 8.9	UJ (H)
Beryllium, dissolved	µg/L	-/-	Additional/Year	Composite	ND < 1.0	UJ (H)
Boron, dissolved	mg/L	-/-	Additional/Year	Composite	0.049	J (H,DNQ)

See reporting summary notes for abbreviations, definitions, and other explanations for the data presented.



OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

							12/06/2018 9:15 - 12/07/2018 11:05
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER	
Cadmium, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.25	UJ (H)	
Chromium, dissolved	µg/L	-/-	Additional/Year	Composite	ND < 2.5	UJ (H)	
cis-1,2-Dichloroethene	µg/L	-/-	Additional/Year	Grab	ND < 0.25	UJ (*II)	
Copper, dissolved	µg/L	-/-	Additional/Discharge	Composite	1.5	J (H, DNQ)	
Hardness, Dissolved (as CaCO3)	mg/L	-/-	Additional/Year	Composite	69	--	
Human Bacteroides	CEs/100mL	-/-	Additional/Year	Grab	ND	U*	
Iron, dissolved	mg/L	-/-	Additional/Year	Composite	0.078	J (H, DNQ)	
Lead, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	UJ (H)	
Mercury, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.10	UJ (H)	
Nickel, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 5.0	UJ (H)	
Selenium, dissolved	µg/L	-/-	Additional/Discharge	Composite	0.87	J (H, DNQ)	
Silver, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	UJ (H)	
Thallium, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	UJ (H)	
Turbidity	NTU	-/-	Additional	Composite	890	*	
Vanadium, dissolved	µg/L	-/-	Additional/Year	Composite	ND < 5.0	UJ (H)	
Zinc, Dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 12	UJ (H)	

**OUTFALL 008 (HAPPY VALLEY DRAINAGE)**  
**FOURTH QUARTER 2018 REPORTING SUMMARY**  
**THE BOEING COMPANY**  
**SANTA SUSANA FIELD LABORATORY**  
**NPDES PERMIT CA0001309**

Sample Type: Composite  
Sample Date: December 07, 2018

ANALYTE	OUTFALL SAMPLE FREQUENCY	LAB MDL (µg/L)	LAB RL (µg/L)	LAB RESULT (µg/L)	LABORATORY/ VALIDATION QUALIFIER	1998 WHO TEF	BEF GREAT LAKES WATER QUALITY INITIATIVE	TCDD EQUIVALENT (w/out DNQ Values) (µg/L)
1,2,3,4,6,7,8-HpCDD	1/Discharge	3.70E-07	4.80E-05	3.00E-05	U (B)	0.01	0.05	ND
1,2,3,4,6,7,8-HpCDF	1/Discharge	3.20E-07	4.80E-05	8.10E-06	U (B)	0.01	0.01	ND
1,2,3,4,7,8,9-HpCDF	1/Discharge	2.90E-07	4.80E-05	3.90E-06	U (B)	0.01	0.4	ND
1,2,3,4,7,8-HxCDD	1/Discharge	2.50E-07	4.80E-05	4.60E-06	U (B)	0.1	0.3	ND
1,2,3,4,7,8-HxCDF	1/Discharge	3.00E-07	4.80E-05	4.00E-06	J (DNQ)	0.1	0.08	ND
1,2,3,6,7,8-HxCDD	1/Discharge	2.30E-07	4.80E-05	3.80E-06	U (B)	0.1	0.1	ND
1,2,3,6,7,8-HxCDF	1/Discharge	2.50E-07	4.80E-05	3.20E-06	U (B)	0.1	0.2	ND
1,2,3,7,8,9-HxCDD	1/Discharge	2.20E-07	4.80E-05	5.30E-06	U (B)	0.1	0.1	ND
1,2,3,7,8,9-HxCDF	1/Discharge	1.70E-07	4.80E-05	3.40E-06	U (B)	0.1	0.6	ND
1,2,3,7,8-PeCDD	1/Discharge	2.60E-07	4.80E-05	2.80E-06	J (DNQ)	1.0	0.9	ND
1,2,3,7,8-PeCDF	1/Discharge	2.10E-07	4.80E-05	2.70E-06	J (DNQ)	0.05	0.2	ND
2,3,4,6,7,8-HxCDF	1/Discharge	1.70E-07	4.80E-05	3.10E-06	J (DNQ)	0.1	0.7	ND
2,3,4,7,8-PeCDF	1/Discharge	2.60E-07	4.80E-05	2.80E-06	J (DNQ)	0.5	1.6	ND
2,3,7,8-TCDD	1/Discharge	2.80E-07	9.50E-05	1.40E-06	UJ (*II)	1.0	1.0	ND
2,3,7,8-TCDF	1/Discharge	6.10E-07	9.50E-06	1.90E-06	U (B)	0.1	0.8	ND
OCDD	1/Discharge	5.80E-07	9.50E-05	2.40E-04	U (B)	0.0001	0.01	ND
OCDF	1/Discharge	3.50E-07	9.50E-05	2.10E-05	U (B)	0.0001	0.02	ND
<b>TCDD TEQ w/out DNQ Values<sup>(4)</sup></b>								<b>ND</b>

TCDD TEQ (PRIORITY POLLUTANTS) PERMIT LIMIT = 2.8E-08

OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	12/07/18 11:05 (Composite)		
				RESULT	MDA	LABORATORY/ VALIDATION QUALIFIER
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Gross Alpha	pCi/L	15/-	1/Discharge	14.8 +/-3.81	3.08	J- (*III)
Gross Beta	pCi/L	50/-	1/Discharge	15.5 +/-2.46	1.71	--
Total Combined Radium-226 & Radium 228	pCi/L	5.0/-	1/Discharge	1.01 +/-0.699	NM	U (B)
Strontium-90	pCi/L	8.0/-	1/Discharge	0.109 +/-0.251	0.434	U
Tritium	pCi/L	20,000/-	1/Discharge	-220 +/-200	389	U
<b>ADDITIONAL POLLUTANTS</b>						
Cesium-137	pCi/L	200/-	1/Discharge	0.483 +/-10.6	18.7	U
Total Uranium	pCi/L	20/-	1/Discharge	1.33 +/-0.884	0.833	U (B)
<b>ADDITIONAL POLLUTANTS WITHOUT LIMITS</b>						
Potassium-40	pCi/L	-/-	1/Discharge	-15.1 +/-139	186	U

See reporting summary notes for abbreviations, definitions, and other explanations for the data presented.

OUTFALL 008 (HAPPY VALLEY DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

					12/06/2018 09:15 - 12/07/2018 11:05 (Grab & Composite)	
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Flow**	MGD	7.21/-	1/Discharge	Meas	0.011839	*
<b>CONVENTIONAL POLLUTANTS</b>						
Oil & Grease	LBS/DAY	902/-	1/Discharge	Grab	ND	U
<b>PRIORITY POLLUTANTS</b>						
Antimony	LBS/DAY	0.36/-	1/Discharge	Composite	0.000085	J (DNQ)
Cadmium	LBS/DAY	(0.24)0.19/-	1/Discharge	Composite	0.000090 <sup>(b)</sup>	J (DNQ)
Copper	LBS/DAY	0.84/-	1/Discharge	Composite	0.0015	--
Cyanide	LBS/DAY	0.57/-	1/Discharge	Composite	0.0015	--
Lead	LBS/DAY	0.31/-	1/Discharge	Composite	0.0053	--
Mercury	LBS/DAY	0.008/-	1/Discharge	Composite	ND	U
Nickel	LBS/DAY	5.2/-	1/Discharge	Composite	0.0018	--
Selenium	LBS/DAY	0.3/-	1/Discharge	Composite	0.00021	--
TCCD TEQ, NoDNQ <sup>(4)</sup>	LBS/DAY	1.7E-09/-	1/Discharge	Composite	ND	--
Thallium	LBS/DAY	0.12/-	1/Discharge	Composite	ND	U
Zinc	LBS/DAY	7.22/-	1/Discharge	Composite	0.012	--
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Ammonia-N	LBS/DAY	607.3/-	1/Discharge	Composite	0.0502	--
Boron	LBS/DAY	60/-	1/Year	Composite	0.0080	--
Chloride	LBS/DAY	9,020/-	1/Discharge	Composite	0.23	--
Fluoride	LBS/DAY	96.2/-	1/Year	Composite	0.030	J (DNQ)
Nitrate-N	LBS/DAY	481/-	1/Discharge	Composite	0.14	--
Nitrite-N	LBS/DAY	60/-	1/Discharge	Composite	ND	U
Nitrate + Nitrite as Nitrogen (N)	LBS/DAY	481/-	1/Discharge	Composite	0.14	--
Perchlorate	LBS/DAY	0.36/-	1/Discharge	Composite	ND	U
Sulfate	LBS/DAY	18,039/-	1/Discharge	Composite	0.50	--
Total Dissolved Solids	LBS/DAY	57,124/-	1/Discharge	Composite	12	--



OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

							12/06/2018 10:00 - 12/07/2018 09:00	
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER		
Flow**	MGD	64.33/-	1/Discharge	Meas	0.158274	*		
<b>CONVENTIONAL POLLUTANTS</b>								
Oil & Grease	mg/L	15/-	1/Discharge	Grab	1.6	J (DNQ)		
pH (Field)	s.u.	6.5-8.5/-	1/Discharge	Grab	7.97	*		
<b>PRIORITY POLLUTANTS</b>								
Antimony	µg/L	6.0/-	1/Discharge	Composite	ND < 0.50	U		
Cadmium	µg/L	4.0/-	1/Discharge	Composite	ND < 0.25	U		
Copper	µg/L	13/-	1/Discharge	Composite	4.5	--		
Cyanide	µg/L	9.5/-	1/Discharge	Composite	ND < 2.5	U		
Lead	µg/L	5.2/-	1/Discharge	Composite	2.5	--		
Mercury	µg/L	0.13/-	1/Discharge	Composite	ND < 0.10	U		
Nickel	µg/L	86/-	1/Discharge	Composite	ND < 5.0	U		
Thallium	µg/L	2.0/-	1/Discharge	Composite	ND < 0.50	U		
Zinc	µg/L	120/-	1/Discharge	Composite	ND < 12	U		
<b>NON-CONVENTIONAL POLLUTANTS</b>								
Boron	mg/L	1.0/-	1/Year	Composite	ANR	ANR		
Chloride	mg/L	150/-	1/Discharge	Composite	2.5	--		
Chronic Toxicity	Pass or Fail and % Effect	Pass or % Effect <50	1st & 2nd rain event/Year	Composite	Pass, 10.02	--		
Fluoride	mg/L	1.6/-	1/Year	Composite	ANR	ANR		
Nitrate + Nitrite as Nitrogen (N)	mg/L	10/-	1/Discharge	Composite	0.96	--		
Perchlorate	µg/L	6.0/-	1/Semiannual	Composite	ND < 0.95	U		
Sulfate	mg/L	250/-	1/Discharge	Composite	2.7	--		
Temperature (Field)	deg F	86/-	1/Discharge	Grab	47.2	*		
Total Dissolved Solids	mg/L	850/-	1/Discharge	Composite	46	--		
<b>REMAINING PRIORITY POLLUTANTS</b>								
1,1,1-Trichloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,1,2,2-Tetrachloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,1,2-Trichloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,1-Dichloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,1-Dichloroethene	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,2,4-Trichlorobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR		
1,2-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,2-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR		
1,2-Dichloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,2-Dichloropropane	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,2-Diphenylhydrazine/Azobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR		
1,3-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,3-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR		
1,4-Dichlorobenzene	µg/L	-/-	1/Year	Grab	ANR	ANR		
1,4-Dichlorobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,4,6-Trichlorophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,4-Dichlorophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,4-Dimethylphenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,4-Dinitrophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,4-Dinitrotoluene	µg/L	-/-	1/Year	Composite	ANR	ANR		
2,6-Dinitrotoluene	µg/L	-/-	1/Year	Composite	ANR	ANR		
2-Chloroethyl vinyl ether	µg/L	-/-	1/Year	Grab	ANR	ANR		
2-Chloronaphthalene	µg/L	-/-	1/Year	Composite	ANR	ANR		
2-Chlorophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2-Methyl-4,6-Dinitrophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
2-Nitrophenol	µg/L	-/-	1/Year	Composite	ANR	ANR		
3,3'-Dichlorobenzidine	µg/L	-/-	1/Year	Composite	ANR	ANR		
4,4'-DDD	µg/L	-/-	1/Year	Composite	ANR	ANR		
4,4'-DDE	µg/L	-/-	1/Year	Composite	ANR	ANR		
4,4'-DDT	µg/L	-/-	1/Year	Composite	ANR	ANR		

OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

12/06/2018 10:00 - 12/07/2018 09:00						
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
4-Bromophenyl phenyl ether	µg/L	-/-	1/Year	Composite	ANR	ANR
4-Chloro-3-methylphenol	µg/L	-/-	1/Year	Composite	ANR	ANR
4-Chlorophenyl phenyl ether	µg/L	-/-	1/Year	Composite	ANR	ANR
4-Nitrophenol	µg/L	-/-	1/Year	Composite	ANR	ANR
Acenaphthene	µg/L	-/-	1/Year	Composite	ANR	ANR
Acenaphthylene	µg/L	-/-	1/Year	Composite	ANR	ANR
Acrolein	µg/L	-/-	1/Year	Grab	ANR	ANR
Acrylonitrile	µg/L	-/-	1/Year	Grab	ANR	ANR
Aldrin	µg/L	-/-	1/Year	Composite	ANR	ANR
alpha-BHC	µg/L	-/-	1/Year	Composite	ANR	ANR
alpha-Endosulfan	µg/L	-/-	1/Year	Composite	ANR	ANR
Anthracene	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1016	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1221	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1232	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1242	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1248	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1254	µg/L	-/-	1/Year	Composite	ANR	ANR
Aroclor 1260	µg/L	-/-	1/Year	Composite	ANR	ANR
Arsenic	µg/L	-/-	1/Year	Composite	ANR	ANR
Asbestos	MFL	-/-	1/Year	Composite	ANR	ANR
Benzene	µg/L	-/-	1/Year	Grab	ANR	ANR
Benzidine	µg/L	-/-	1/Year	Composite	ANR	ANR
Benzo(a)anthracene	µg/L	-/-	1/Year	Composite	ANR	ANR
Benzo(a)pyrene	µg/L	-/-	1/Year	Composite	ANR	ANR
Benzo(b)fluoranthene	µg/L	-/-	1/Year	Composite	ANR	ANR
Benzo(g,h,i)Perylene	µg/L	-/-	1/Year	Composite	ANR	ANR
Benzo(k)fluoranthene	µg/L	-/-	1/Year	Composite	ANR	ANR
Beryllium	µg/L	-/-	1/Year	Composite	ANR	ANR
beta-BHC	µg/L	-/-	1/Year	Composite	ANR	ANR
beta-Endosulfan	µg/L	-/-	1/Year	Composite	ANR	ANR
Bis (2-Chloroethoxy) Methane	µg/L	-/-	1/Year	Composite	ANR	ANR
Bis (2-Chloroethyl) Ether	µg/L	-/-	1/Year	Composite	ANR	ANR
Bis (2-Chloroisopropyl) Ether	µg/L	-/-	1/Year	Composite	ANR	ANR
Bis (2-Ethylhexyl) Phthalate	µg/L	-/-	1/Year	Composite	ANR	ANR
Bromodichloromethane	µg/L	-/-	1/Year	Grab	ANR	ANR
Bromoform	µg/L	-/-	1/Year	Grab	ANR	ANR
Bromomethane	µg/L	-/-	1/Year	Grab	ANR	ANR
Butyl benzylphthalate	µg/L	-/-	1/Year	Composite	ANR	ANR
Carbon Tetrachloride	µg/L	-/-	1/Year	Grab	ANR	ANR
Chlordane	µg/L	-/-	1/Year	Composite	ANR	ANR
Chlorobenzene	µg/L	-/-	1/Year	Grab	ANR	ANR
Chloroethane	µg/L	-/-	1/Year	Grab	ANR	ANR
Chloroform (Trichloromethane)	µg/L	-/-	1/Year	Grab	ANR	ANR
Chloromethane (Methyl Chloride)	µg/L	-/-	1/Year	Grab	ANR	ANR
Chromium	µg/L	-/-	1/Year	Composite	ANR	ANR
Chromium VI (Hexavalent)	µg/L	-/-	1/Year	Composite	ANR	ANR
Chrysene	µg/L	-/-	1/Year	Composite	ANR	ANR
cis-1,3-Dichloropropene	µg/L	-/-	1/Year	Grab	ANR	ANR
delta-BHC	µg/L	-/-	1/Year	Composite	ANR	ANR
Dibenz(a,h)anthracene	µg/L	-/-	1/Year	Composite	ANR	ANR
Dibromochloromethane	µg/L	-/-	1/Year	Grab	ANR	ANR
Dieldrin	µg/L	-/-	1/Year	Composite	ANR	ANR
Diethyl phthalate	µg/L	-/-	1/Year	Composite	ANR	ANR
Dimethyl phthalate	µg/L	-/-	1/Year	Composite	ANR	ANR
Di-n-butyl phthalate	µg/L	-/-	1/Year	Composite	ANR	ANR

OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309

October 1 through December 31, 2018

12/06/2018 10:00 - 12/07/2018 09:00						
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Di-n-octyl phthalate	µg/L	-/-	1/Year	Composite	ANR	ANR
Endosulfan Sulfate	µg/L	-/-	1/Year	Composite	ANR	ANR
Endrin	µg/L	-/-	1/Year	Composite	ANR	ANR
Endrin Aldehyde	µg/L	-/-	1/Year	Composite	ANR	ANR
Ethylbenzene	µg/L	-/-	1/Year	Grab	ANR	ANR
Fluoranthene	µg/L	-/-	1/Year	Composite	ANR	ANR
Fluorene	µg/L	-/-	1/Year	Composite	ANR	ANR
gamma-BHC (Lindane)	µg/L	-/-	1/Year	Composite	ANR	ANR
Heptachlor	µg/L	-/-	1/Year	Composite	ANR	ANR
Heptachlor Epoxide	µg/L	-/-	1/Year	Composite	ANR	ANR
Hexachlorobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR
Hexachlorobutadiene	µg/L	-/-	1/Year	Composite	ANR	ANR
Hexachlorocyclopentadiene	µg/L	-/-	1/Year	Composite	ANR	ANR
Hexachloroethane	µg/L	-/-	1/Year	Composite	ANR	ANR
Indeno(1,2,3-cd)pyrene	µg/L	-/-	1/Year	Composite	ANR	ANR
Isophorone	µg/L	-/-	1/Year	Composite	ANR	ANR
Methylene chloride	µg/L	-/-	1/Year	Grab	ANR	ANR
Naphthalene	µg/L	-/-	1/Year	Grab	ANR	ANR
Naphthalene	µg/L	-/-	1/Year	Composite	ANR	ANR
Nitrobenzene	µg/L	-/-	1/Year	Composite	ANR	ANR
N-Nitrosodimethylamine	µg/L	-/-	1/Year	Composite	ANR	ANR
N-Nitroso-di-n-propylamine	µg/L	-/-	1/Year	Composite	ANR	ANR
N-Nitrosodiphenylamine	µg/L	-/-	1/Year	Composite	ANR	ANR
Pentachlorophenol	µg/L	-/-	1/Year	Composite	ANR	ANR
Phenanthrene	µg/L	-/-	1/Year	Composite	ANR	ANR
Phenol	µg/L	-/-	1/Year	Composite	ANR	ANR
Pyrene	µg/L	-/-	1/Year	Composite	ANR	ANR
Tetrachloroethene	µg/L	-/-	1/Year	Grab	ANR	ANR
Toluene	µg/L	-/-	1/Year	Grab	ANR	ANR
Toxaphene	µg/L	-/-	1/Year	Composite	ANR	ANR
trans-1,2-Dichloroethene	µg/L	-/-	1/Year	Grab	ANR	ANR
trans-1,3-Dichloropropene	µg/L	-/-	1/Year	Grab	ANR	ANR
Trichloroethene	µg/L	-/-	1/Year	Grab	ANR	ANR
Trichlorofluoromethane	µg/L	-/-	1/Year	Grab	ANR	ANR
Vinyl chloride	µg/L	-/-	1/Year	Grab	ANR	ANR
Xylenes (Total)	µg/L	-/-	1/Year	Grab	ANR	ANR
<b>EFFLUENT MONITORING (NO LIMITATIONS) POLLUTANTS</b>						
Aluminum	µg/L	-/-	1/Year	Composite	ANR	ANR
Chlorpyrifos	µg/L	-/-	1/Year	Composite	ANR	ANR
Diazinon	µg/L	-/-	1/Year	Composite	ANR	ANR
E. Coli	MPN/100mL	-/-	1/Year	Grab	ANR	ANR
Hardness (as CaCO3)	mg/L	-/-	1/Year	Composite	ANR	ANR
Iron	mg/L	-/-	1/Year	Composite	ANR	ANR
Selenium	µg/L	-/-	1/Discharge	Composite	0.57	J (DNQ)
Silver	µg/L	-/-	1/Discharge	Composite	ND < 0.50	U
Total Suspended Solids	mg/L	-/-	1/Year	Composite	14	--
Vanadium	µg/L	-/-	1/Year	Composite	ANR	ANR
<b>ADDITIONAL POLLUTANTS<sup>2)</sup></b>						
Aluminum, dissolved	µg/L	-/-	Additional/Year	Composite	ANR	ANR
Antimony, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.69	U (B)
Arsenic, dissolved	µg/L	-/-	Additional/Year	Composite	ANR	ANR
Beryllium, dissolved	µg/L	-/-	Additional/Year	Composite	ANR	ANR
Boron, dissolved	mg/L	-/-	Additional/Year	Composite	ANR	ANR
Cadmium, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.25	U
Chromium, dissolved	µg/L	-/-	Additional/Year	Composite	ANR	ANR
cis-1,2-Dichloroethene	µg/L	-/-	Additional/Year	Grab	ANR	ANR

See reporting summary notes for abbreviations, definitions, and other explanations for the data presented.

OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

12/06/2018 10:00 - 12/07/2018 09:00						
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Copper, dissolved	µg/L	-/-	Additional/Discharge	Composite	4.8	--
Hardness, dissolved (as CaCO3)	mg/L	-/-	Additional/Year	Composite	ANR	ANR
Human Bacteroides	CEs/100mL	-/-	Additional/Year	Grab	ANR	ANR
Iron, dissolved	mg/L	-/-	Additional/Year	Composite	ANR	ANR
Lead, dissolved	µg/L	-/-	Additional/Discharge	Composite	0.62	J (DNQ)
Mercury, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.10	U
Nickel, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 5.0	U
Nitrate - N	mg/L	-/-	Additional/Discharge	Composite	0.96	--
Nitrite - N	mg/L	-/-	Additional/Discharge	Composite	ND < 0.025	U
Selenium, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	U
Silver, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	U
Thallium, dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 0.50	U
Vanadium, dissolved	µg/L	-/-	Additional/Year	Composite	ANR	ANR
Zinc, Dissolved	µg/L	-/-	Additional/Discharge	Composite	ND < 12	U



OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

Sample Type: Composite  
 Sample Date: December 07, 2018

ANALYTE	OUTFALL SAMPLE FREQUENCY	LAB MDL (µg/L)	LAB RL (µg/L)	LAB RESULT (µg/L)	LABORATORY/ VALIDATION QUALIFIER	1998 WHO TEF	BEF GREAT LAKES WATER QUALITY INITIATIVE	TCDD EQUIVALENT (w/out DNQ Values) (µg/L)
1,2,3,4,6,7,8-HpCDD	1/Discharge	7.4E-07	4.8E-05	7.4E-05	--	0.01	0.05	3.7E-08
1,2,3,4,6,7,8-HpCDF	1/Discharge	3.6E-07	4.8E-05	1.2E-05	U (B)	0.01	0.01	ND
1,2,3,4,7,8,9-HpCDF	1/Discharge	4.3E-07	4.8E-05	2.1E-06	U (B)	0.01	0.4	ND
1,2,3,4,7,8-HxCDD	1/Discharge	2.6E-07	4.8E-05	2.8E-06	U (B)	0.1	0.3	ND
1,2,3,4,7,8-HxCDF	1/Discharge	2.4E-07	4.8E-05	1.6E-06	J (DNQ)	0.1	0.08	ND
1,2,3,6,7,8-HxCDD	1/Discharge	2.5E-07	4.8E-05	3.1E-06	U (B)	0.1	0.1	ND
1,2,3,6,7,8-HxCDF	1/Discharge	2.1E-07	4.8E-05	1.4E-06	U (B)	0.1	0.2	ND
1,2,3,7,8,9-HxCDD	1/Discharge	2.4E-07	4.8E-05	3.1E-06	U (B)	0.1	0.1	ND
1,2,3,7,8,9-HxCDF	1/Discharge	1.4E-07	4.8E-05	1.9E-06	U (B)	0.1	0.6	ND
1,2,3,7,8-PeCDD	1/Discharge	2.5E-07	4.8E-05	1.7E-06	J (DNQ)	1.0	0.9	ND
1,2,3,7,8-PeCDF	1/Discharge	2.1E-07	4.8E-05	1.1E-06	UJ (*III)	0.05	0.2	ND
2,3,4,6,7,8-HxCDF	1/Discharge	1.5E-07	4.8E-05	1.3E-06	J (DNQ)	0.1	0.7	ND
2,3,4,7,8-PeCDF	1/Discharge	2.7E-07	4.8E-05	1.1E-06	J (DNQ)	0.5	1.6	ND
2,3,7,8-TCDD	1/Discharge	2.2E-07	9.7E-06	8.1E-07	UJ (*III)	1.0	1.0	ND
2,3,7,8-TCDF	1/Discharge	5.7E-07	9.7E-06	5.7E-07	U	0.1	0.8	ND
OCDD	1/Discharge	1.0E-06	9.7E-05	9.0E-04	U (B)	0.0001	0.01	ND
OCDF	1/Discharge	5.1E-07	9.7E-05	4.6E-05	U (B)	0.0001	0.02	ND

TCDD TEQ w/out DNQ Values <sup>(4)</sup>	3.7E-08
--	---------

TCDD TEQ (PRIORITY POLLUTANTS) PERMIT LIMIT = 2.8E-08

OUTFALL 009 (WS-13 DRAINAGE)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	OUTFALL SAMPLE FREQUENCY	12/07/18 09:00 (Composite)		
				RESULT	MDA	LABORATORY/ VALIDATION QUALIFIER
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Gross Alpha	pCi/L	15/-	1/Discharge	1.10 +/- 0.829	1.22	U
Gross Beta	pCi/L	50/-	1/Discharge	2.28 +/- 0.829	1.09	J (B)
Combined Radium-226 & Radium-228	pCi/L	5.0/-	1/Discharge	0.675 +/- 0.445	NM	U
Strontium-90	pCi/L	8.0/-	1/Discharge	0.0693 +/- 0.367	0.644	U
Tritium	pCi/L	20,000/-	1/Discharge	-198 +/- 193	368	U
<b>ADDITIONAL POLLUTANTS</b>						
Cesium-137	pCi/L	200/-	1/Discharge	3.71 +/- 7.73	13.5	U
Uranium	pCi/L	20/-	1/Discharge	0.490 +/- 0.363	0.339	U (B)
<b>ADDITIONAL POLLUTANTS WITHOUT LIMITS</b>						
Potassium-40	pCi/L	-/-	1/Discharge	-23.2 +/- 87.3	178	U

OUTFALL 009 (WS-13 DRAINAGE)

FIRST QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

					12/06/2018 10:00 - 12/07/2018 09:00 (Grab & Composite)	
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
Flow**	MGD	64.33/-	1/Discharge	Meas	0.158274	*
<b>CONVENTIONAL POLLUTANTS</b>						
Oil & Grease	LBS/DAY	8,048/-	1/Discharge	Grab	2.1	J (DNQ)
<b>PRIORITY POLLUTANTS</b>						
Antimony	LBS/DAY	3.22/-	1/Discharge	Composite	ND	U
Cadmium	LBS/DAY	2.15/-	1/Discharge	Composite	ND	U
Copper	LBS/DAY	7/-	1/Discharge	Composite	0.0059	--
Cyanide	LBS/DAY	5.1/-	1/Discharge	Composite	ND	U
Lead	LBS/DAY	2.8/-	1/Discharge	Composite	0.0033	--
Mercury	LBS/DAY	0.07/-	1/Discharge	Composite	ND	U
Nickel	LBS/DAY	46.14/-	1/Discharge	Composite	ND	U
TCDD TEQ NoDNQ <sup>(4)</sup>	LBS/DAY	1.5E-08/-	1/Discharge	Composite	4.9E-11	--
Thallium	LBS/DAY	1.1/-	1/Discharge	Composite	ND	U
Zinc	LBS/DAY	64.4/-	1/Discharge	Composite	ND	U
<b>NON-CONVENTIONAL POLLUTANTS</b>						
Boron	LBS/DAY	537/-	1/Year	Composite	ANR	ANR
Chloride	LBS/DAY	80,477/-	1/Discharge	Composite	3.3	--
Fluoride	LBS/DAY	858/-	1/Year	Composite	ANR	ANR
Nitrate + Nitrite as Nitrogen (N)	LBS/DAY	5,365/-	1/Discharge	Composite	1.3	--
Perchlorate	LBS/DAY	3.22/-	1/Semiannual	Composite	ND	U
Sulfate	LBS/DAY	134,128/-	1/Discharge	Composite	3.6	--
Total Dissolved Solids	LBS/DAY	456,034/-	1/Discharge	Composite	61	--

## ARROYO SIMI RECEIVING WATER (RSW-002, FRONTIER PARK SAMPLING LOCATION)

FOURTH QUARTER 2018 REPORTING SUMMARY  
 THE BOEING COMPANY  
 SANTA SUSANA FIELD LABORATORY  
 NPDES PERMIT CA0001309

October 1 through December 31, 2018

					12/06/2018 12:35	
ANALYTE	UNITS	PERMIT LIMIT DAILY MAX/MONTHLY AVG	SAMPLE FREQUENCY	SAMPLE TYPE	RESULT	LABORATORY/ VALIDATION QUALIFIER
<b>POLLUTANTS WITH LIMITS</b>						
4,4'-DDD	µg/L	0.0014/-	1/Quarter	Grab	ND < 0.0041	U
4,4'-DDE	µg/L	0.001/-	1/Quarter	Grab	0.0040	J (DNQ)
4,4'-DDT	µg/L	0.001/-	1/Quarter	Grab	ND < 0.0041	U
Aroclor 1016	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1221	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1232	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1242	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1248	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1254	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Aroclor 1260	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.10	U
Chlordane	µg/L	0.001/-	1/Quarter	Grab	ND < 0.082	U
Chlorpyrifos	µg/L	0.02/-	1/Quarter	Grab	ND < 0.034	U
Diazinon	µg/L	0.16/-	1/Quarter	Grab	ND < 0.026	U
Dieldrin	µg/L	0.0002/-	1/Quarter	Grab	ND < 0.0021	U
E. coli	MPN/100mL	235/-	1/Year	Grab	ANR	ANR
pH (Field)	s.u.	6.5-8.5/-	1/Quarter	Grab	7.30	*
Toxaphene	µg/L	0.0003/-	1/Quarter	Grab	ND < 0.26	U
<b>POLLUTANTS WITHOUT LIMITS</b>						
Hardness (as CaCO <sub>3</sub> )	mg/L	-/-	1/Quarter	Grab	73	--
Priority Pollutants	NA	-/-	1/5 Years	Grab	ANR	ANR
Temperature (Field)	Deg F	-/-	1/Quarter	Grab	47.9	*
TCDD - Equivalent	µg/L	-/-	1/Year	Grab	ANR	ANR
Total Suspended Solids	mg/L	-/-	1/Year	Grab	ANR	ANR
Water Velocity	ft/sec	-/-	1/Quarter	Meas	0.6	*

**APPENDIX D**

**Fourth Quarter 2018 Summary of Permit Limit Exceedances and/or Non-Compliance**



**TABLE D**  
**SUMMARY OF PERMIT LIMIT EXCEEDANCES AND/OR NON-COMPLIANCE**

**FOURTH QUARTER 2018 REPORTING SUMMARY**  
**THE BOEING COMPANY**  
**SANTA SUSANA FIELD LABORATORY**  
**NPDES PERMIT CA0001309**

October 1 through December 31, 2018

DAILY MAXIMUM BENCHMARK LIMIT EXCEEDANCES AND/OR NON-COMPLIANCE								
OUTFALL	LOCATIONS	SAMPLE DATE	SAMPLE TYPE	ANALYTE	PERMIT LIMIT DAILY MAX	DAILY MAX RESULT	UNITS	VALIDATION QUALIFIER
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Copper	14/-	52	µg/L	--
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Gross Alpha*	15/-	22.3 +/-5.45	pCi/L	J- (*III)
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Iron	0.3/-	98	mg/L	--
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Lead	5.2/-	88	µg/L	--
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Selenium	(5) 8.2/-	11 <sup>(f)</sup>	µg/L	J- (Q)
Outfall 002	South Slope below R-2 Pond	12/7/2018	Comp	Zinc	119/-	430	µg/L	--

\* = Gross alpha minus total uranium was calculated to be 21.05 +/- 5.60 pCi/L which exceeds the Daily Maximum Benchmark Limit of 15 pCi/L. Compliance is based on the annual average. The only other discharge event for Outfall 002 was on March 23, 2018. Averaging the December and March data gives an annual average of 11.70 +/- 2.95 pCi/L, which is below the Daily Maximum Benchmark Limit.

DAILY MAXIMUM PERMIT LIMIT EXCEEDANCES AND/OR NON-COMPLIANCE								
OUTFALL	LOCATIONS	SAMPLE DATE	SAMPLE TYPE	ANALYTE	PERMIT LIMIT DAILY MAX	DAILY MAX RESULT	UNITS	VALIDATION QUALIFIER
Outfall 008	Happy Valley Drainage	12/7/2018	Comp	Copper	14/-	15	µg/L	--
Outfall 008	Happy Valley Drainage	12/7/2018	Comp	Cyanide	9.5/-	15	µg/L	--
Outfall 008	Happy Valley Drainage	12/7/2018	Comp	Lead	5.2/-	54	µg/L	--
Outfall 009	WS-13 Drainage	12/7/2018	Comp	TCDD TEQ w/out DNQ	2.8E-08/-	3.7E-08	µg/L	--

**APPENDIX E**

**Fourth Quarter 2018 Analytical Laboratory Report,  
Chain of Custody Forms, and Validation Reports**

## APPENDIX E

### TABLE OF CONTENTS

#### **Section No.**

- 1 Outfall 002 - 440-226560-1, December 06, 2018, MECx Data Validation Report
- 2 Outfall 002 - 440-226560-1, December 06, 2018, TestAmerica Analytical Report
  
- 3 Outfall002 - 440-226838-1, December 07, 2018, MECx Data Validation Report
- 4 Outfall002 - 440-226838-1, December 07, 2018, TestAmerica Analytical Report
  
- 5 Outfall002 - 440-226838-2, December 07, 2018, MECx Data Validation Report
- 6 Outfall002 - 440-226838-2, December 07, 2018, TestAmerica Analytical Report
  
- 7 Outfall 002 - 440-226838-3, December 07, 2018, MECx Data Validation Report
- 8 Outfall 002 - 440-226838-3, December 07, 2018, TestAmerica Analytical Report
  
- 9 Outfall008 - 440-226551-1, December 06, 2018, MECx Data Validation Report
- 10 Outfall008 - 440-226551-1, December 06, 2018, TestAmerica Analytical Report
  
- 11 Outfall008 - 440-226830-1, December 07, 2018, MECx Data Validation Report
- 12 Outfall008 - 440-226830-1, December 07, 2018, TestAmerica Analytical Report
  
- 13 Outfall008 - 440-226830-2, December 07, 2018, MECx Data Validation Report
- 14 Outfall008 - 440-226830-2, December 07, 2018, TestAmerica Analytical Report
  
- 15 Outfall008 - 440-226830-3, December 07, 2018, MECx Data Validation Report
- 16 Outfall008 - 440-226830-3, December 07, 2018, TestAmerica Analytical Report
  
- 17 Outfall008 - 440-226830-4, December 07, 2018, TestAmerica Analytical Report
  
- 18 Outfall009 - 440-226546-1, December 06, 2018, MECx Data Validation Report
- 19 Outfall 009 - 440-226546-1, December 06, 2018, TestAmerica Analytical Report
  
- 20 Outfall009 - 440-226822-1, December 07, 2018, MECx Data Validation Report
- 21 Outfall 009 - 440-226822-1, December 07, 2018, TestAmerica Analytical Report
  
- 22 Outfall009 - 440-226822-2, December 07, 2018, MECx Data Validation Report
- 23 Outfall 009 - 440-226822-2, December 07, 2018, TestAmerica Analytical Report

## **APPENDIX E**

### Table of Contents (continued)

#### **Section No.**

- 24 Outfall009 - 440-226822-3, December 07, 2018, MECx Data Validation Report
- 25 Outfall 009 - 440-226822-3, December 07, 2018, TestAmerica Analytical Report
  
- 26 Arroyo Simi - 440-226534-1, December 06, 2018, MECx Data Validation Report
- 27 Arroyo Simi - 440-226534-1, December 06, 2018, TestAmerica Analytical Report

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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226560-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**9 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)







TABLE OF CONTENTS

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. EPA METHOD 624—Volatile Organic Compounds (VOCs)..... 6

    III.1. Holding Times ..... 6

    III.2. GC/MS Tuning and Calibration ..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks ..... 6

        III.3.2. Laboratory Control Samples ..... 6

        III.3.3. Surrogate Recovery..... 6

        III.3.4. Matrix Spike/Matrix Spike Duplicate ..... 6

    III.4. Field QC Samples..... 6

        III.4.1. Trip Blanks..... 6

        III.4.2. Field Blanks and Equipment Blanks ..... 7

        III.4.3. Field Duplicates..... 7

    III.5. Internal Standards Performance..... 7

    III.6. Compound Identification ..... 7

    III.7. Compound Quantification and Reported Detection Limits ..... 7

    III.8. Tentatively Identified Compounds ..... 7

    III.9. System Performance..... 7

IV. VARIOUS METHODS — GENERAL CHEMISTRY..... 7

    IV.1. Holding Times ..... 7

    IV.2. Calibration..... 8

    IV.3. Quality Control Samples ..... 8

        IV.3.1. Method Blanks ..... 8

        IV.3.2. Laboratory Control Samples ..... 8

        IV.3.3. Laboratory Duplicates..... 8



IV.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8

IV.4. Sample Result Verification ..... 8

IV.5. Field QC Samples..... 8

IV.5.1. Field Blanks and Equipment Blanks ..... 8

IV.5.2. Field Duplicates..... 8

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>X</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226560-1

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 2

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall002_20181206 _Grab	440-226560-1	N/A	Water	12/06/2018 9:45 AM	E120.1, E1664, E624, SM2540F
TB_201081206	440-226570-3	N/A	Water	12/06/2018 9:45 AM	E624



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226560-1:

- The laboratory received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius ( $^{\circ}\text{C}$ ) and greater than  $0^{\circ}\text{C}$ .
- The lab indicated that one trip blank vial contained headspace, but did not indicate if that was the vial that was used for analysis. No qualifiers were applied.
- The laboratory received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.





Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. EPA METHOD 624—VOLATILE ORGANIC COMPOUNDS (VOCs)

---

K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 11, 2019

The sample and trip blank listed in Table 1 for this analysis were validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Volatile Organics (DVP-2, Rev. 2)*, EPA Method 624, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2014)*.

#### III.1. HOLDING TIMES

Analytical holding times were met. The preserved water samples were analyzed within 14 days of collection.

#### III.2. GC/MS TUNING AND CALIBRATION

The BFB tunes met the method abundance criteria. The samples was analyzed within 12 hours of the BFB injection time.

Calibration criteria were met. The initial calibration average RRFs and the ICV and continuing calibration RRFs were  $\geq 0.05$  for all applicable target compounds. The initial calibration %RSDs were  $\leq 35\%$ , or  $r^2$  values  $\geq 0.990$ . The second source ICV and all applicable CCV recoveries were within the method control limits.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

Target compounds were not detected in the method blank.

##### III.3.2. LABORATORY CONTROL SAMPLES

Recoveries were within the laboratory control limits.

##### III.3.3. SURROGATE RECOVERY

Recoveries were within the laboratory control limits.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on the site sample from this SDG, Outfall002\_20181206 \_Grab. Recoveries and RPDs were within the laboratory control limits with the exception of the recoveries for cis-1,3-dichloroethene and trans-1,3-dichloroethene. Both recoveries were high at 153% and 139% with upper recovery control limits of 133 and 138, respectively. The RPD for cis-1,3-dichloroethene was 24% with a QC limit of 20%. Neither compound was detected in the samples and no qualifiers were applied.

#### III.4. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

##### III.4.1. TRIP BLANKS

Sample TB\_201081206 was identified as the trip blank associated with the site sample in this SDG. The trip blank had no target compounds detected above the MDL.



#### III.4.2. **FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

#### III.4.3. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

#### III.5. **INTERNAL STANDARDS PERFORMANCE**

The internal standard retention times and area counts were within the control limits established by the continuing calibration standards:  $\pm 30$  seconds for retention times and  $-50\%/+100\%$  for internal standard areas.

#### III.6. **COMPOUND IDENTIFICATION**

Compound identification was verified. The laboratory analyzed for 32 target compounds by Method 624. Review of the sample chromatograms, retention times, and spectra indicated no issues with target compound identification.

#### III.7. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit.

#### III.8. **TENTATIVELY IDENTIFIED COMPOUNDS**

The laboratory did not report TICs for this SDG.

#### III.9. **SYSTEM PERFORMANCE**

Review of the raw data indicated no issues with system performance.

### IV. **VARIOUS METHODS — GENERAL CHEMISTRY**

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 9, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *Standard Methods for the Examination of Water and Wastewater 2540F*, *EPA Methods 1664A and 120.1* and the *National Functional Guidelines for Inorganic Superfund Data Review* (2014).

#### IV.1. **HOLDING TIMES**

The analytical holding times, as noted below, were met.

- 7 days for settleable solids
- 28 days for HEM (oil and grease)
- 28 days for specific conductance



## **IV.2. CALIBRATION**

Batch notes indicated that the analytical balance calibration was verified before and after each HEM sample weighing. No instrument calibration information was provided for specific conductance analysis.

## **IV.3. QUALITY CONTROL SAMPLES**

### **IV.3.1. METHOD BLANKS**

The method blank had no detects for HEM or specific conductance. The method blank is not applicable to settleable solids.

### **IV.3.2. LABORATORY CONTROL SAMPLES**

Recoveries for HEM were within the method control limits of 78-114% and the LCS/LCSD RPD was  $\leq 11\%$ . The LCS recovery for specific conductance met the laboratory control limits of 90-110%.

### **IV.3.3. LABORATORY DUPLICATES**

Laboratory duplicate analyses were not performed on the sample in this SDG.

### **IV.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were not performed on a sample in this SDG.

## **IV.4. SAMPLE RESULT VERIFICATION**

Calculations were verified, and the HEM sample result reported on the sample results summary was verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL. It should be noted that no sample raw data was presented in the SDG for specific conductance or settleable solids analyses; no sample results were qualified.

## **IV.5. FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

### **IV.5.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

### **IV.5.2. FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

---

# Validated Sample Result Forms: 4402265601

---

**Analysis Method:** E120.1

---

**Sample Name** Outfall002\_20181206\_Grab      **Matrix Type:** W    **Result Type:** TRG  
**Lab Sample Name:** 440-226560-1      **Sample Date/Time:** 12/06/2018    09:45      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
Specific Conductance	CONDSPEC	140	1.0	1.0	umhos/c			

---

**Analysis Method:** E1664

---

**Sample Name** Outfall002\_20181206\_Grab      **Matrix Type:** W    **Result Type:** TRG  
**Lab Sample Name:** 440-226560-1      **Sample Date/Time:** 12/06/2018    09:45      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
HEM (Oil & Grease)	HEMOILGREAS E		1.5	5.3	mg/L	U	U	

**Analysis Method:** E624

**Sample Name:** Outfall002\_20181206\_Grab      **Matrix Type:** W      **Result Type:** TRG  
**Lab Sample Name:** 440-226560-1      **Sample Date/Time:** 12/06/2018 09:45      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,1,1-Trichloroethane	71-55-6		0.25	0.50	ug/L	U	U	
1,1,2,2-Tetrachloroethane	79-34-5		0.25	0.50	ug/L	U	U	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	2.0	ug/L	U	U	
1,1,2-Trichloroethane	79-00-5		0.25	0.50	ug/L	U	U	
1,1-Dichloroethane	75-34-3		0.25	0.50	ug/L	U	U	
1,1-Dichloroethene	75-35-4		0.25	0.50	ug/L	U	U	
1,2-Dichlorobenzene	95-50-1		0.25	0.50	ug/L	U	U	
1,2-Dichloroethane	107-06-2		0.25	0.50	ug/L	U	U	
1,2-Dichloropropane	78-87-5		0.25	0.50	ug/L	U	U	
1,3-Dichlorobenzene	541-73-1		0.25	0.50	ug/L	U	U	
1,4-Dichlorobenzene	106-46-7		0.25	0.50	ug/L	U	U	
Benzene	71-43-2		0.25	0.50	ug/L	U	U	
Bromodichloromethane	75-27-4		0.25	0.50	ug/L	U	U	
Bromoform	75-25-2		0.40	1.0	ug/L	U	U	
Bromomethane	74-83-9		0.25	0.50	ug/L	U	U	
Carbon tetrachloride	56-23-5		0.25	0.50	ug/L	U	U	
Chlorobenzene	108-90-7		0.25	0.50	ug/L	U	U	
Chloroethane	75-00-3		0.40	1.0	ug/L	U	U	
Chloroform	67-66-3		0.25	0.50	ug/L	U	U	
Chloromethane	74-87-3		0.25	0.50	ug/L	U	U	
cis-1,2-Dichloroethene	156-59-2		0.25	0.50	ug/L	U	U	
cis-1,3-Dichloropropene	10061-01-5		0.25	0.50	ug/L	U	U	
Dibromochloromethane	124-48-1		0.25	0.50	ug/L	U	U	
Ethylbenzene	100-41-4		0.25	0.50	ug/L	U	U	
Methylene Chloride	75-09-2		0.88	2.0	ug/L	U	U	
Naphthalene	91-20-3		0.40	1.0	ug/L	U	U	
Tetrachloroethene	127-18-4		0.25	0.50	ug/L	U	U	
Toluene	108-88-3		0.25	0.50	ug/L	U	U	
trans-1,2-Dichloroethene	156-60-5		0.25	0.50	ug/L	U	U	
trans-1,3-Dichloropropene	10061-02-6		0.25	0.50	ug/L	U	U	
Trichloroethene	79-01-6		0.25	0.50	ug/L	U	U	
Vinyl chloride	75-01-4		0.25	0.50	ug/L	U	U	



**Analysis Method:** E624

**Sample Name** TB\_201081206 **Matrix Type:** W **Result Type:** TRG  
**Lab Sample Name:** 440-226560-3 **Sample Date/Time:** 12/06/2018 09:45 **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,1,1-Trichloroethane	71-55-6		0.25	0.50	ug/L	U	U	
1,1,2,2-Tetrachloroethane	79-34-5		0.25	0.50	ug/L	U	U	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	2.0	ug/L	U	U	
1,1,2-Trichloroethane	79-00-5		0.25	0.50	ug/L	U	U	
1,1-Dichloroethane	75-34-3		0.25	0.50	ug/L	U	U	
1,1-Dichloroethene	75-35-4		0.25	0.50	ug/L	U	U	
1,2-Dichlorobenzene	95-50-1		0.25	0.50	ug/L	U	U	
1,2-Dichloroethane	107-06-2		0.25	0.50	ug/L	U	U	
1,2-Dichloropropane	78-87-5		0.25	0.50	ug/L	U	U	
1,3-Dichlorobenzene	541-73-1		0.25	0.50	ug/L	U	U	
1,4-Dichlorobenzene	106-46-7		0.25	0.50	ug/L	U	U	
Benzene	71-43-2		0.25	0.50	ug/L	U	U	
Bromodichloromethane	75-27-4		0.25	0.50	ug/L	U	U	
Bromoform	75-25-2		0.40	1.0	ug/L	U	U	
Bromomethane	74-83-9		0.25	0.50	ug/L	U	U	
Carbon tetrachloride	56-23-5		0.25	0.50	ug/L	U	U	
Chlorobenzene	108-90-7		0.25	0.50	ug/L	U	U	
Chloroethane	75-00-3		0.40	1.0	ug/L	U	U	
Chloroform	67-66-3		0.25	0.50	ug/L	U	U	
Chloromethane	74-87-3		0.25	0.50	ug/L	U	U	
cis-1,2-Dichloroethene	156-59-2		0.25	0.50	ug/L	U	U	
cis-1,3-Dichloropropene	10061-01-5		0.25	0.50	ug/L	U	U	
Dibromochloromethane	124-48-1		0.25	0.50	ug/L	U	U	
Ethylbenzene	100-41-4		0.25	0.50	ug/L	U	U	
Methylene Chloride	75-09-2		0.88	2.0	ug/L	U	U	
Naphthalene	91-20-3		0.40	1.0	ug/L	U	U	
Tetrachloroethene	127-18-4		0.25	0.50	ug/L	U	U	
Toluene	108-88-3		0.25	0.50	ug/L	U	U	
trans-1,2-Dichloroethene	156-60-5		0.25	0.50	ug/L	U	U	
trans-1,3-Dichloropropene	10061-02-6		0.25	0.50	ug/L	U	U	
Trichloroethene	79-01-6		0.25	0.50	ug/L	U	U	
Vinyl chloride	75-01-4		0.25	0.50	ug/L	U	U	

**Analysis Method:** SM2540F

---

<b>Sample Name</b>	Outfall002_20181206_Grab	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG				
<b>Lab Sample Name:</b>	440-226560-1	<b>Sample Date/Time:</b>	12/06/2018	09:45	<b>Validation Level:</b>	8			
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>	
Settleable Solids	SETTLEABLESOL IDS	0.10	0.10	0.10	ml/l/hr				

---

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226560-1

Client Project/Site: Quarterly Outfall 002 Grab

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/31/2018 11:51:48 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/31/2018 11:51:48 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
QC Sample Results . . . . .	10
QC Association Summary . . . . .	15
Definitions/Glossary . . . . .	16
Certification Summary . . . . .	17
Chain of Custody . . . . .	18
Receipt Checklists . . . . .	19

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226560-1	Outfall002_20181206_Grab	Water	12/06/18 09:45	12/06/18 18:00
440-226560-3	TB_201081206	Water	12/06/18 09:45	12/06/18 18:00

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

**Job ID: 440-226560-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative**  
**440-226560-1**

### Comments

No additional comments.

### Receipt

The samples were received on 12/6/2018 6:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2° C.

### Receipt Exceptions

The following sample(s) was received with headspace in the sample container. This sample container was received with headspace. TB\_201081206 (440-226560-3). Received one out of two voa vial HCL TB with headspace more than 6 mm. One remains.

### GC/MS VOA

Method(s) 624: The matrix spike / matrix spike duplicate (MS/MSD) precision for analytical batch 440-516365 was outside control limits. Sample matrix interference is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### General Chemistry

Method(s) SM 2540F: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with analytical batch 440-515658.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Organic Prep

Method(s) 1664A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-519877 and analytical batch 440-519983. The Laboratory Control Sample (LCS) was performed in duplicate to provide precision data for this batch

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

**Client Sample ID: Outfall002\_20181206\_Grab**

**Lab Sample ID: 440-226560-1**

**Date Collected: 12/06/18 09:45**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.50	ug/L			12/11/18 20:36	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Benzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Bromoform	ND		1.0	0.40	ug/L			12/11/18 20:36	1
Bromomethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Chloroethane	ND		1.0	0.40	ug/L			12/11/18 20:36	1
Chloroform	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Chloromethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/11/18 20:36	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Toluene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Trichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:36	1
Naphthalene	ND		1.0	0.40	ug/L			12/11/18 20:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		12/11/18 20:36	1
Dibromofluoromethane (Surr)	97		76 - 132		12/11/18 20:36	1
Toluene-d8 (Surr)	102		80 - 128		12/11/18 20:36	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	ND		5.3	1.5	mg/L		12/28/18 13:23	12/29/18 08:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	140		1.0	1.0	umhos/cm			12/07/18 14:16	1
Settleable Solids	0.10		0.10	0.10	mL/L/Hr			12/07/18 13:44	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

**Client Sample ID: TB\_201081206**

**Lab Sample ID: 440-226560-3**

**Date Collected: 12/06/18 09:45**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.50	ug/L			12/11/18 21:55	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Benzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Bromoform	ND		1.0	0.40	ug/L			12/11/18 21:55	1
Bromomethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Chloroethane	ND		1.0	0.40	ug/L			12/11/18 21:55	1
Chloroform	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Chloromethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/11/18 21:55	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Toluene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Trichloroethene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 21:55	1
Naphthalene	ND		1.0	0.40	ug/L			12/11/18 21:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		80 - 120		12/11/18 21:55	1
Dibromofluoromethane (Surr)	122		76 - 132		12/11/18 21:55	1
Toluene-d8 (Surr)	124		80 - 128		12/11/18 21:55	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

Method	Method Description	Protocol	Laboratory
624	Volatile Organic Compounds (GC/MS)	40CFR136A	TAL IRV
120.1	Conductivity, Specific Conductance	MCAWW	TAL IRV
1664A	HEM and SGT-HEM	1664A	TAL IRV
SM 2540F	Solids, Settleable	SM	TAL IRV
1664A	HEM and SGT-HEM (SPE)	1664A	TAL IRV

#### Protocol References:

1664A = EPA-821-98-002

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

#### Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

**Client Sample ID: Outfall002\_20181206\_Grab**

**Lab Sample ID: 440-226560-1**

**Date Collected: 12/06/18 09:45**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	10 mL	10 mL	516365	12/11/18 20:36	GMA	TAL IRV
Total/NA	Analysis	120.1		1			515688	12/07/18 14:16	XL	TAL IRV
Total/NA	Prep	1664A			950 mL	1000 mL	519877	12/28/18 13:23	JC1	TAL IRV
Total/NA	Analysis	1664A		1			519983	12/29/18 08:09	JC1	TAL IRV
Total/NA	Analysis	SM 2540F		1	1000 mL	1000 mL	515658	12/07/18 13:44	ST	TAL IRV

**Client Sample ID: TB\_201081206**

**Lab Sample ID: 440-226560-3**

**Date Collected: 12/06/18 09:45**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	10 mL	10 mL	516365	12/11/18 21:55	GMA	TAL IRV

**Laboratory References:**

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Method: 624 - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 440-516365/21**  
**Matrix: Water**  
**Analysis Batch: 516365**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.50	ug/L			12/11/18 20:09	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Benzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Bromoform	ND		1.0	0.40	ug/L			12/11/18 20:09	1
Bromomethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Chloroethane	ND		1.0	0.40	ug/L			12/11/18 20:09	1
Chloroform	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Chloromethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/11/18 20:09	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Toluene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Trichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 20:09	1
Naphthalene	ND		1.0	0.40	ug/L			12/11/18 20:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		80 - 120		12/11/18 20:09	1
Dibromofluoromethane (Surr)	92		76 - 132		12/11/18 20:09	1
Toluene-d8 (Surr)	89		80 - 128		12/11/18 20:09	1

**Lab Sample ID: LCS 440-516365/5**  
**Matrix: Water**  
**Analysis Batch: 516365**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	25.0	27.9		ug/L		111	70 - 130
1,1,2,2-Tetrachloroethane	25.0	26.1		ug/L		104	63 - 130
1,1,2-Trichloroethane	25.0	25.2		ug/L		101	70 - 130
1,1-Dichloroethane	25.0	23.9		ug/L		95	64 - 130
1,1-Dichloroethene	25.0	23.8		ug/L		95	70 - 130

TestAmerica Irvine



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 440-516365/5**  
**Matrix: Water**  
**Analysis Batch: 516365**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	25.0	26.8		ug/L		107	70 - 130
1,2-Dichloroethane	25.0	26.1		ug/L		104	57 - 138
1,2-Dichloropropane	25.0	27.5		ug/L		110	67 - 130
1,3-Dichlorobenzene	25.0	26.3		ug/L		105	70 - 130
1,4-Dichlorobenzene	25.0	26.3		ug/L		105	70 - 130
Benzene	25.0	24.1		ug/L		97	68 - 130
Bromoform	25.0	27.1		ug/L		108	60 - 148
Bromomethane	25.0	25.5		ug/L		102	64 - 139
Carbon tetrachloride	25.0	27.1		ug/L		108	60 - 150
Chlorobenzene	25.0	25.4		ug/L		102	70 - 130
Dibromochloromethane	25.0	28.4		ug/L		114	69 - 145
Chloroethane	25.0	26.9		ug/L		107	64 - 135
Chloroform	25.0	26.8		ug/L		107	70 - 130
Chloromethane	25.0	19.5		ug/L		78	47 - 140
cis-1,3-Dichloropropene	25.0	28.8		ug/L		115	70 - 133
Bromodichloromethane	25.0	27.9		ug/L		111	70 - 132
Ethylbenzene	25.0	22.7		ug/L		91	70 - 130
Methylene Chloride	25.0	23.8		ug/L		95	52 - 130
Tetrachloroethene	25.0	25.5		ug/L		102	70 - 130
Toluene	25.0	22.4		ug/L		90	70 - 130
trans-1,2-Dichloroethene	25.0	25.5		ug/L		102	70 - 130
trans-1,3-Dichloropropene	25.0	27.9		ug/L		112	70 - 132
Vinyl chloride	25.0	21.6		ug/L		86	59 - 133
Trichloroethene	25.0	26.3		ug/L		105	70 - 130
cis-1,2-Dichloroethene	25.0	25.9		ug/L		104	70 - 133
Naphthalene	25.0	26.2		ug/L		105	60 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	96		80 - 120
Dibromofluoromethane (Surr)	102		76 - 132
Toluene-d8 (Surr)	93		80 - 128

**Lab Sample ID: 440-226560-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516365**

**Client Sample ID: Outfall002\_20181206\_Grab**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	ND		25.0	27.4		ug/L		110	70 - 130
1,1,2,2-Tetrachloroethane	ND		25.0	27.0		ug/L		108	63 - 130
1,1,2-Trichloroethane	ND		25.0	27.0		ug/L		108	70 - 130
1,1-Dichloroethane	ND		25.0	25.8		ug/L		103	65 - 130
1,1-Dichloroethene	ND		25.0	23.1		ug/L		92	70 - 130
1,2-Dichlorobenzene	ND		25.0	26.4		ug/L		106	70 - 130
1,2-Dichloroethane	ND		25.0	27.4		ug/L		110	56 - 146
1,2-Dichloropropane	ND		25.0	26.9		ug/L		108	69 - 130
1,3-Dichlorobenzene	ND		25.0	25.7		ug/L		103	70 - 130
1,4-Dichlorobenzene	ND		25.0	26.1		ug/L		105	70 - 130
Benzene	ND		25.0	25.1		ug/L		100	66 - 130

TestAmerica Irvine



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 440-226560-1 MSD**

**Matrix: Water**

**Analysis Batch: 516365**

**Client Sample ID: Outfall002\_20181206\_Grab**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloroform	ND		25.0	27.7		ug/L		111	70 - 130	3	20
Chloromethane	ND		25.0	16.1		ug/L		65	39 - 144	7	25
cis-1,3-Dichloropropene	ND		25.0	38.3	LM BA	ug/L		153	70 - 133	24	20
Bromodichloromethane	ND		25.0	28.0		ug/L		112	70 - 138	0	20
Ethylbenzene	ND		25.0	24.7		ug/L		99	70 - 130	1	20
Methylene Chloride	ND		25.0	25.0		ug/L		100	52 - 130	2	20
Tetrachloroethene	ND		25.0	27.2		ug/L		109	70 - 137	7	20
Toluene	ND		25.0	27.1		ug/L		108	70 - 130	7	20
trans-1,2-Dichloroethene	ND		25.0	26.5		ug/L		106	70 - 130	1	20
trans-1,3-Dichloropropene	ND		25.0	34.7	LM	ug/L		139	70 - 138	16	25
Vinyl chloride	ND		25.0	17.9		ug/L		72	50 - 137	7	30
Trichloroethene	ND		25.0	26.1		ug/L		104	70 - 130	2	20
cis-1,2-Dichloroethene	ND		25.0	27.6		ug/L		111	70 - 130	4	20
Naphthalene	ND		25.0	26.6		ug/L		106	60 - 140	3	30

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
4-Bromofluorobenzene (Surr)	95		80 - 120
Dibromofluoromethane (Surr)	107		76 - 132
Toluene-d8 (Surr)	118		80 - 128

## Method: 120.1 - Conductivity, Specific Conductance

**Lab Sample ID: MB 440-515688/3**

**Matrix: Water**

**Analysis Batch: 515688**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/07/18 14:16	1

**Lab Sample ID: LCS 440-515688/4**

**Matrix: Water**

**Analysis Batch: 515688**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	953	959		umhos/cm		101	90 - 110

**Lab Sample ID: 440-225729-A-1 DU**

**Matrix: Water**

**Analysis Batch: 515688**

**Client Sample ID: Duplicate**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	260		262		umhos/cm		2	5

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Method: 1664A - HEM and SGT-HEM

**Lab Sample ID: MB 440-519877/1-A**  
**Matrix: Water**  
**Analysis Batch: 519983**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 519877**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	ND		5.0	1.4	mg/L		12/28/18 13:23	12/29/18 08:09	1

**Lab Sample ID: LCS 440-519877/2-A**  
**Matrix: Water**  
**Analysis Batch: 519983**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 519877**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
HEM (Oil & Grease)	40.0	34.1		mg/L		85	78 - 114

**Lab Sample ID: LCSD 440-519877/3-A**  
**Matrix: Water**  
**Analysis Batch: 519983**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 519877**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
HEM (Oil & Grease)	40.0	34.6		mg/L		87	78 - 114	1	11

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## GC/MS VOA

### Analysis Batch: 516365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226560-1	Outfall002_20181206_Grab	Total/NA	Water	624	
440-226560-3	TB_201081206	Total/NA	Water	624	
MB 440-516365/21	Method Blank	Total/NA	Water	624	
LCS 440-516365/5	Lab Control Sample	Total/NA	Water	624	
440-226560-1 MS	Outfall002_20181206_Grab	Total/NA	Water	624	
440-226560-1 MSD	Outfall002_20181206_Grab	Total/NA	Water	624	

## General Chemistry

### Analysis Batch: 515658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226560-1	Outfall002_20181206_Grab	Total/NA	Water	SM 2540F	

### Analysis Batch: 515688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226560-1	Outfall002_20181206_Grab	Total/NA	Water	120.1	
MB 440-515688/3	Method Blank	Total/NA	Water	120.1	
LCS 440-515688/4	Lab Control Sample	Total/NA	Water	120.1	
440-225729-A-1 DU	Duplicate	Total/NA	Water	120.1	

### Prep Batch: 519877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226560-1	Outfall002_20181206_Grab	Total/NA	Water	1664A	
MB 440-519877/1-A	Method Blank	Total/NA	Water	1664A	
LCS 440-519877/2-A	Lab Control Sample	Total/NA	Water	1664A	
LCSD 440-519877/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	

### Analysis Batch: 519983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226560-1	Outfall002_20181206_Grab	Total/NA	Water	1664A	519877
MB 440-519877/1-A	Method Blank	Total/NA	Water	1664A	519877
LCS 440-519877/2-A	Lab Control Sample	Total/NA	Water	1664A	519877
LCSD 440-519877/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	519877

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
BA	Relative percent difference out of control
LM	MS and/or MSD above acceptance limits. See Blank Spike (LCS)

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Grab

TestAmerica Job ID: 440-226560-1

## Laboratory: TestAmerica Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
624		Water	1,1,2-Trichloro-1,2,2-trifluoroethane
624		Water	cis-1,2-Dichloroethene
624		Water	Naphthalene



### CHAIN OF CUSTODY FORM

VLSQUVKT

Client Name/Address Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108  Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055				Project: Boeing-SSFL NPDES Permit 2018 Quarterly Outfall [001, 002, 011, 018] Outfall 002 Grab				R Q/S R R ANALYSIS REQUIRED OIL & GREASE (E1664A-HEM) VOCs + Freon 113 (E624) SETTLABLE SOLIDS (E160.5 (SM2540F)) CONDUCTIVITY (SM2510B / E120 1)				Field Readings Meter serial #					
TestAmerica's services under the CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.				Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)				Field Readings: (include units) Time of Readings: 0945 DO 9.05 mg/L pH 7.11 pH unit Temp 74.7 °F TRC 0.035 mg/L									
Sampler: <del>Don Smith</del> John Parkus				Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)				Field readings QC by: <i>MD</i> Checked Date/Time: 0945-									
Sample Description	Sample I D	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	OIL & GREASE (E1664A-HEM)	VOCs + Freon 113 (E624)	SETTLABLE SOLIDS (E160.5 (SM2540F))	CONDUCTIVITY (SM2510B / E120 1)	ANALYSIS REQUIRED	Field Readings	Meter serial #	Comments	
Outfall 002	Outfall002_20181206_Grab	12/6/2018 0945	WM	1 L Glass Amber	2	HCl	15	No	X								
			WM	40 mL VOA	3	HCl	20	No		X							
			WM	1 L Poly	1	None	70	No				X					
	Outfall002_20181206_Grab_Extra	12/6/2018 0945	WM	1 L Glass Amber	2	HCl	15	No	H								Hold
			WM	40 mL VOA	3	HCl	20	No		H							Hold
			WM	500 mL Poly	1	None	75	No				H					Hold
Trip Blank	TB-20181206	12/6/2018 10945	WQ	40 mL VOA	2	HCl	20	No		X							



440-226560 Chain of Custody

Relinquished By: <i>MD</i> Date/Time: 12.6.18/1430 Company: Haley & Aldrich	Received By: <i>MD</i> Date/Time: 12.6.18 1430	Turn-around time. (Check) 24 Hour: _____ 72 Hour: _____ 10 Day: <input checked="" type="checkbox"/> 48 Hour: _____ 5 Day: _____ Normal: _____
Relinquished By: <i>[Signature]</i> Date/Time: 12.6.18 1800 Company: TH IRV	Received By: <i>[Signature]</i> Date/Time: 12/6/18 1800 Company: TH IRV	Sample Integrity: (Check) Intact: _____ On Ice: <input checked="" type="checkbox"/> Store samples for 6 months Data Requirements (Check) No Level IV: _____ All Level IV: <input checked="" type="checkbox"/>

Page 18 of 19

12/31/2018



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226560-1

**Login Number: 226560**

**List Number: 1**

**Creator: Avila, Stephanie 1**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	False	Headspace larger than 1/4" in one or more vials, one vial with acppt. headspace
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226838-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**8 January 3, 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

I. INTRODUCTION..... 1

II. Sample Management..... 2

IV. Methods 200.7, 200.8, 245.1 and SM2340B — Metals, Mercury and Hardness ..... 6

IV.1. Holding Times ..... 6

IV.2. MS Tuning and Calibration..... 6

IV.3. Quality Control Samples ..... 6

IV.3.1. Method Blanks ..... 6

IV.3.2. Interference Check Samples: ..... 6

IV.3.3. Laboratory Control Samples ..... 6

IV.3.4. Laboratory Duplicates:..... 6

IV.3.5. Matrix Spike/Matrix Spike Duplicate ..... 7

IV.4. Serial Dilution..... 7

IV.5. Internal Standards Performance..... 7

IV.6. Compound Quantification and Reported Detection Limits ..... 7

IV.7. Field QC Samples..... 7

IV.7.1. Field Blanks and Equipment Blanks ..... 7

IV.7.2. Field Duplicates ..... 7

V. EPA Method 608 –Pesticides and PCBs ..... 7

V.1. Holding Times ..... 7

V.2. Calibration..... 8

V.3. Quality Control Samples ..... 8

V.3.1. Method Blanks ..... 8

V.3.2. Laboratory Control Samples ..... 8

V.3.3. Surrogate Recovery..... 8

V.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8

V.4. Field QC Samples..... 8



V.4.1. Field Blanks and Equipment Blanks ..... 8

V.4.2. Field Duplicates..... 8

V.5. Compound Identification ..... 8

V.6. Compound Quantification and Reported Detection Limits ..... 8

VI. EPA METHOD 314.0 — Perchlorate ..... 9

VI.1. Holding Times ..... 9

VI.2. Calibration..... 9

VI.3. Quality Control Samples ..... 9

VI.3.1. Method Blanks ..... 9

VI.3.2. Laboratory Control Samples ..... 9

VI.3.3. Laboratory Duplicates..... 9

VI.3.4. Matrix Spike/Matrix Spike Duplicate ..... 9

VI.4. Sample Result Verification ..... 9

VI.5. Field QC Samples..... 9

VI.5.1. Field Blanks and Equipment Blanks ..... 9

VI.5.2. Field Duplicates..... 10

VII. EPA METHOD 625 — Semivolatile Organic Compounds (SVOCs)..... 10

VII.1. Holding Times ..... 10

VII.2. GC/MS Tuning and Calibration ..... 10

VII.3. Quality Control Samples ..... 10

VII.3.1. Method Blanks ..... 10

VII.3.2. Laboratory Control Samples ..... 10

VII.3.3. Surrogate Recovery..... 10

VII.3.4. Matrix Spike/Matrix Spike Duplicate ..... 10

VII.4. Field QC Samples..... 10

VII.4.1. Field Blanks and Equipment Blanks: ..... 10

VII.4.2. Field Duplicates: ..... 11

VII.5. Internal Standards Performance..... 11

VII.6. Compound Identification ..... 11



VII.7. Compound Quantification and Reported Detection Limits ..... 11

VII.8. Tentatively Identified Compounds (TICs) ..... 11

VII.9. System Performance..... 11

VIII. VARIOUS METHODS — GENERAL CHEMISTRY ..... 11

VIII.1. Holding Times ..... 11

VIII.2. Calibration..... 12

VIII.3. Quality Control Samples ..... 12

VIII.3.1. Method Blanks ..... 12

VIII.3.2. Laboratory Control Samples ..... 12

VIII.3.3. Laboratory Duplicates..... 12

VIII.3.4. Matrix Spike/Matrix Spike Duplicate ..... 12

VIII.4. Sample Result Verification ..... 12

VIII.5. Field QC Samples..... 12

VIII.5.1. Field Blanks and Equipment Blanks ..... 13

VIII.5.2. Field Duplicates..... 13

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference

**I. INTRODUCTION****Task Order Title:** Boeing SSFL NPDES**Contract:** 40458-078 and 40458-083**MEC<sup>X</sup> Project No.:** 1272.003D.01 002**Sample Delivery Group:** 440-226838-1**Project Manager:** Katherine Miller**Matrix:** Water**QC Level:** IV**No. of Samples:** 2**No. of Reanalyses/Dilutions:** 0**Laboratory:** TestAmerica-Irvine**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
<b>Outfall002_20181207_Comp</b>	440-226838-1	N/A	Water	12/07/2018 10:05 AM	E180.1, E200.7, E200.8, E245.1, E300, E314.0, E608, E625, SM2340, SM2540C/D, SM4500-CN-E, SM4500-NH3G, SM5210B, SM5540, EPA-821-R-02-013
<b>Outfall002_20181207_Comp_F</b>	440-226838-2	N/A	Water	12/07/2018 10:05 AM	E200.7, E200.8, E245.1, SM2340





## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chains-of-custody (COC) provided by the laboratories for sample delivery group (SDG) 440-226838-1:

- The laboratories received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius (°C) and greater than 0°C.
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.

The following issues were noted:

- Not all corrections to the original COC were initialed and dated.
- Volume was received for sample Outfall002\_2018107\_Comp\_Extra; however, this sample was crossed out on the COC.
- An email from the client requested analysis for dissolved iron; however, this analysis was not performed for the original SDG. The analysis was performed on sample Outfall002\_20181207\_Comp, and included in revised SDG 440-226838-1 Rev(1). The revised data was reviewed for this report.
- The sample was submitted to Aquatic Bioassay Consulting Laboratories (ABC) for Method EPA-821-R-02-013 – Chronic Toxicity – Selenastrum.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



#### IV. METHODS 200.7, 200.8, 245.1 AND SM2340B — METALS, MERCURY AND HARDNESS

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 8, 2019

The samples listed in Table 1 for these analyses were validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Metals (DVP-5, Rev. 2)*, *EPA Methods 200.7, 200.8 and 245.1, Standard Methods for the Examination of Water and Wastewater 2340B*, and the *National Functional Guidelines for Inorganic Data Review (2014)*.

##### IV.1. HOLDING TIMES

The analytical holding times, 28 days for mercury and six months for the remaining metals, were met. As required on the COC, sample Outfall002\_20181207\_Comp\_F was filtered and preserved within 24 hours of receipt at the laboratory. Sample Outfall002\_201801217\_Comp was filtered and preserved for dissolved iron analysis 13 days after receipt at the laboratory (see Sample Management section). The associated sample result was qualified as estimated (J).

##### IV.2. MS TUNING AND CALIBRATION

Mass calibrations were within 0.1 atomic mass units of the true value and the %RSDs were  $\leq 5\%$ .

QAPP calibration criteria were met. A blank and two standards were used for calibration of ICP-AES, a blank and four standards were used for calibration of ICP-MS, and a blank and five standards were used for calibration of mercury. The initial calibration  $r$  values were  $\geq 0.995$ . CRQL recoveries were within the laboratory control limits of 50-150%. Initial calibration verification recoveries were within QAPP control limits of 95-105% for ICP-AES and mercury, and 90-110% for ICP-MS. Continuing calibration verification recoveries were within QAPP control limits of 90-110% for all methods.

##### IV.3. QUALITY CONTROL SAMPLES

###### IV.3.1. METHOD BLANKS

There were no target analyte detections in the method blanks and calibration blanks with the exception of dissolved copper (0.823  $\mu\text{g/L}$ ). The associated sample result was a detect greater than RL and  $<5\times$  the blank concentration and was qualified as estimated with high bias (J+).

###### IV.3.2. INTERFERENCE CHECK SAMPLES:

ICP-AES and ICP-MS ICSAB recoveries were within the control limits of 80-120% or  $\pm 2\times$  the reporting limit, whichever is greater. No target analytes were present in the ICSAs at  $>\text{MDL}$ , therefore, interference was not evaluated.

###### IV.3.3. LABORATORY CONTROL SAMPLES

Laboratory control samples recoveries were within the QAPP control limits of 85-115%.

###### IV.3.4. LABORATORY DUPLICATES:

Laboratory duplicate analyses were not performed on a sample in this SDG.



#### IV.3.5. **MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were performed on sample Outfall002\_20181207\_Comp for ICP-AES. MS/MSD analyses were performed on samples Outfall002\_20181207\_Comp and Outfall002\_20181207\_Comp\_F for mercury and ICP-MS. Results were not assessed when the parent sample concentration exceeded the spike amount by 4×. Recoveries and RPDs were within the QAPP control limits of 70-130% and ≤20%, respectively, for all target analytes except total selenium recoveries (37%/40%). The associated sample result was qualified as estimated with a potential low bias (J-).

The laboratory did not perform post-digestion spike analyses.

#### IV.4. **SERIAL DILUTION**

No serial dilution analyses were performed on a sample in this SDG.

#### IV.5. **INTERNAL STANDARDS PERFORMANCE**

Sample internal standard recoveries were within 60-125% of the ICP-MS calibration blank.

#### IV.6. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Calculations were verified, and the sample results reported on the sample result summary were verified against the raw data. No transcription errors or calculation errors were noted. Nondetects are valid to the MDL.

#### IV.7. **FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### IV.7.1. **FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### IV.7.2. **FIELD DUPLICATES**

There were no field duplicate samples identified for this SDG.

## V. **EPA METHOD 608 –PESTICIDES AND PCBs**

---

K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 10, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for Organochlorine Pesticides/PCBs by GC (DVP-4, Rev. 1)*, *EPA Method 608*, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2014)*.

#### V.1. **HOLDING TIMES**

Extraction and analytical holding times were met. The sample was extracted within seven days of collection and analyzed within 40 days of extraction.



## V.2. CALIBRATION

The initial calibration had %RSDs of  $\leq 10\%$  or  $r^2$  of  $\geq 0.990$  on both analytical columns. The initial calibration verification (ICV) and continuing calibration verification (CCV) %Ds were within the control limit of  $\leq 15\%$ .

## V.3. QUALITY CONTROL SAMPLES

### V.3.1. METHOD BLANKS

The target compounds were not detected in method blanks.

### V.3.2. LABORATORY CONTROL SAMPLES

The recoveries of target compounds were within the laboratory control limits of 37-134%. Chlordane and toxaphene were not spiked in the LCS. RPDs were within 20%.

### V.3.3. SURROGATE RECOVERY

PCB surrogate decachlorobiphenyl (DCB) was recovered at 27%, slightly below the laboratory control limits of 29-115% in the site sample. The data was qualified as estimated (UJ).

### V.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed due to a lack of sample volume. MEC<sup>x</sup> evaluated method accuracy and precision based on LCS/LCSD results.

## V.4. FIELD QC SAMPLES

MEC<sup>x</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>x</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

### V.4.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

### V.4.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

## V.5. COMPOUND IDENTIFICATION

Compound identification was verified. Review of the sample chromatograms and retention times indicated no problems with target compound identification. The laboratory analyzed for Aroclors, and pesticides alpha-BHC, 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, chlordane, dieldrin and toxaphene by Method 608. Information for the toxaphene was added to the report and EDD from the raw data as toxaphene was not reported on the Level 4 report.

## V.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibrations and the laboratory MDLs. The reported nondetect is valid to the reporting limit.





## VI. EPA METHOD 314.0 — PERCHLORATE

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 10, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *EPA Method 314.0*, and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

### VI.1. HOLDING TIMES

The analytical holding time, 28 days, was met.

### VI.2. CALIBRATION

Calibration criteria were met. The initial calibration  $r^2$  value was  $\geq 0.995$ . The initial calibration recovery was within QAPP control limits of 75-125% and the continuing calibration recoveries were within QAPP control limits of 85-115%. The MRL was recovered within the QAPP control limits of 70-130%. Interference check sample recovery was within the QAPP control limits of 80-120%.

### VI.3. QUALITY CONTROL SAMPLES

#### VI.3.1. METHOD BLANKS

Method blanks and calibration blanks had no detects.

#### VI.3.2. LABORATORY CONTROL SAMPLES

The recovery was within the QAPP control limits of 85-115%.

#### VI.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were not performed on the sample from this SDG.

#### VI.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Matrix spike/matrix spike duplicate analyses were performed on sample Outfall002\_20181207\_Comp. Recoveries and RPDs met QAPP control limits of 80-120% and  $\leq 15\%$ , respectively.

### VI.4. SAMPLE RESULT VERIFICATION

Calculations were verified and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL.

### VI.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

#### VI.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.



### VI.5.2. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

## VII. **EPA METHOD 625 — SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)**

---

K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 10, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Semivolatile Organics (DVP-3, Rev. 1)*, *EPA Method 625*, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2014)*.

### VII.1. **HOLDING TIMES**

Extraction and analytical holding times were met. The water sample was extracted within seven days of collection and analyzed within 30 days of extraction.

### VII.2. **GC/MS TUNING AND CALIBRATION**

The DFTPP tunes met the method abundance criteria. Samples were analyzed within 12 hours of the DFTPP injection time.

Calibration criteria were met. The initial calibration average RRFs were  $\geq 0.05$  and %RSD  $\leq 35\%$  or  $r^2$  of  $\geq 0.990$ . The ICV and CCV RRFs were  $\geq 0.05$  and %Ds were within the method control limit of  $\leq 20\%$ .

### VII.3. **QUALITY CONTROL SAMPLES**

#### VII.3.1. **METHOD BLANKS**

Target compounds were not detected in the method blank.

#### VII.3.2. **LABORATORY CONTROL SAMPLES**

LCS recoveries and RPDs were within the laboratory control limits. Target analyte 2,4-dinitrotoluene was only reported in the raw data.

#### VII.3.3. **SURROGATE RECOVERY**

Recoveries were within the laboratory control limits.

#### VII.3.4. **MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were not performed due to a lack of sample volume. MEC<sup>X</sup> evaluated method accuracy and precision based on LCS/LCSD results.

### VII.4. **FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

#### VII.4.1. **FIELD BLANKS AND EQUIPMENT BLANKS:**

Field blank or equipment blank samples were not identified for this SDG.



#### VII.4.2. **FIELD DUPLICATES:**

Field duplicate samples were not identified in this SDG.

#### VII.5. **INTERNAL STANDARDS PERFORMANCE**

The internal standard retention times and area counts were within the control limits established by the midpoint of the initial calibration standards:  $\pm 30$  seconds for retention times and  $-50\%/+100\%$  for internal standard areas.

#### VII.6. **COMPOUND IDENTIFICATION**

Compound identification was verified. The laboratory analyzed for five semivolatile target compounds by EPA Method 625: 2,4-dinitrotoluene, 2,4,6-trichlorophenol, bis(2-ethylhexyl)phthalate, n-nitrosodimethylamine, and pentachlorophenol. Review of the sample chromatogram, retention times, and spectra indicated no problems with target compound identification.

#### VII.7. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit.

#### VII.8. **TENTATIVELY IDENTIFIED COMPOUNDS (TICs)**

The laboratory did not report TICs for this SDG.

#### VII.9. **SYSTEM PERFORMANCE**

Review of the raw data indicated no problems with system performance.

### VIII. **VARIOUS METHODS — GENERAL CHEMISTRY**

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M. Hilchey of MEC<sup>x</sup> reviewed the SDG on January 8, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, EPA Methods 180.1, 300.0 and EPA-821-R-02-213, *Standard Methods for the Examination of Water and Wastewater 2540C, 2540D, 4500-NH3-G, 4500-CN-E, 5210B and 5540* and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

#### VIII.1. **HOLDING TIMES**

Distillation for total cyanide occurred 11 hours past the required holding time of 14 days after collection. The associated sample result was nondetect and was qualified as estimated (UJ). The analytical hold times for the remaining analyses, as listed below, were met:

- 48 hours from collection for biochemical oxygen demand (BOD), nitrate/nitrite, surfactants as methylene blue active substances (MBAS), and turbidity
- 7 days for total dissolved solids (TDS)
- 7 days for total suspended solids (TSS)
- 28 days for ammonia, chloride, and sulfate
- 36 hours from collection for Chronic Toxicity - *Selenastrum*



## VIII.2. CALIBRATION

Calibration criteria were met. The initial calibration  $r^2$  values, as appropriate, were  $\geq 0.995$  and all initial calibration verification recoveries were within 95-105% for anions and 90-110% for the remaining analyses, as appropriate. All continuing calibration verification recoveries were within 90-110% for all appropriate analyses. The MRL recovery for ammonia was within the laboratory control limits of 50-150%. Analytical balance calibration logs were provided by the laboratory.

For chronic toxicity, instruments were calibrated as per the manufacturer requirements and standard reference toxicant testing was performed to verify culture health and sensitivity. Method Test Acceptability criteria (TAC) were met.

## VIII.3. QUALITY CONTROL SAMPLES

### VIII.3.1. METHOD BLANKS

The method blanks and calibration blanks had no detects. The laboratory negative controls were within the laboratory and method established compliance criteria for chronic toxicity.

### VIII.3.2. LABORATORY CONTROL SAMPLES

Laboratory control sample and laboratory control sample duplicates recoveries were within the laboratory control limits. LCS/LCSD RPD for BOD met the laboratory control limit. Positive controls were within the laboratory and method established compliance criteria for chronic toxicity.

### VIII.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were performed on the sample Outfall002\_20181207\_Comp for turbidity. The RPD was  $\leq 20\%$ . Laboratory duplicate analysis was not performed on a sample from this SDG for the remaining methods.

### VIII.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on the sample Outfall002\_20181207\_Comp for MBAS. Laboratory control limits of 50-125% recovery and  $\leq 20\%$  RPD were not met (31%/41% recoveries, 27% RPD). The nondetect sample result was qualified as estimated (UJ). Matrix spike analysis was not performed on a sample from this SDG for the remaining methods.

## VIII.4. SAMPLE RESULT VERIFICATION

Calculations were verified, and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Results reported below the RL and above the MDL were qualified as estimated (J) and coded with a DNQ to comply with the NPDES permit reporting requirements. Reported nondetects are valid to the MDL.

Turbidity in sample Outfall002\_20181207\_Comp was reported from a 400 $\times$  dilution.

## VIII.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.



**VIII.5.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

**VIII.5.2. FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

# Validated Sample Result Forms: 4402268381

## Analysis Method E180.1

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Turbidity	N	TURBIDITY	2500	40	16	NTU			

## Analysis Method E200.7

Sample Name OUTFALL002\_20181207\_COMP\_F Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Iron (Dissolved Lab)		7439-89-6DL	0.36	0.10	0.050	ug/L		J	H

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Iron	T	7439-89-6	98000	100	50	ug/L			
Zinc	T	7440-66-6	430	20	12	ug/L			

Sample Name OUTFALL002\_20181207\_COMP\_F Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Zinc	D	7440-66-6		20	12	ug/L	U	U	

## Analysis Method E200.8

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cadmium	T	7440-43-9	1.6	1.0	0.25	ug/L			
Copper	T	7440-50-8	52	2.0	0.50	ug/L			
Lead	T	7439-92-1	88	1.0	0.50	ug/L			
Selenium	T	7782-49-2	11	2.0	0.50	ug/L		J-	Q

*Analysis Method E200.8*

Sample Name OUTFALL002\_20181207\_COMP\_F Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cadmium	D	7440-43-9		1.0	0.25	ug/L	U	U	
Copper	D	7440-50-8	2.6	2.0	0.50	ug/L		J+	B
Lead	D	7439-92-1		1.0	0.50	ug/L	U	U	
Selenium	D	7782-49-2		2.0	0.50	ug/L	U	U	

*Analysis Method E245.1*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Mercury	T	7439-97-6		0.20	0.10	ug/L	U	U	

Sample Name OUTFALL002\_20181207\_COMP\_F Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Mercury	D	7439-97-6		0.20	0.10	ug/L	U	U	

*Analysis Method E300*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	N	16887-00-6	2.7	0.50	0.25	mg/L			
Nitrate (as N)	N	14797-55-8	1.4	0.11	0.055	mg/L			
Nitrite (as N)	N	14797-65-0	0.025	0.15	0.025	mg/L	J,DX	J	DNQ
Nitrite/Nitrate	N	NO2NO3	1.4	0.15	0.055	mg/L			
Sulfate	N	14808-79-8	7.7	0.50	0.25	mg/L			



### Analysis Method E314.0

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Perchlorate	N	14797-73-0		4.0	0.95	ug/L	U	U	

### Analysis Method E608

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
4,4'-DDD	N	72-54-8		0.0047	0.0038	ug/L	U	U	
4,4'-DDE	N	72-55-9		0.0047	0.0028	ug/L	U	U	
4,4'-DDT	N	50-29-3		0.0094	0.0038	ug/L	U	U	
alpha-BHC	N	319-84-6		0.0047	0.0023	ug/L	U	U	
Aroclor-1016 (PCB-1016)	N	12674-11-2		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1221 (PCB-1221)	N	11104-28-2		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1232 (PCB-1232)	N	11141-16-5		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1242 (PCB-1242)	N	53469-21-9		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1248 (PCB-1248)	N	12672-29-6		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1254 (PCB-1254)	N	11097-69-1		0.48	0.24	ug/L	UBU	UJ	S
Aroclor-1260 (PCB-1260)	N	11096-82-5		0.48	0.24	ug/L	UBU	UJ	S
Chlordane	N	57-74-9		0.094	0.075	ug/L	U	U	
Dieldrin	N	60-57-1		0.0047	0.0019	ug/L	U	U	
Toxaphene	N			0.47	0.23	ug/L	U	U	S

### Analysis Method E625

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
2,4,6-Trichlorophenol	N	88-06-2		9.16	0.153	ug/L	U	U	
2,4-Dinitrotoluene	N	121-14-2		7.63	3.05	ug/L	U	U	
bis(2-Ethylhexyl)phthalate	N	117-81-7		7.63	3.05	ug/L	U	U	
N-Nitrosodimethylamine	N	62-75-9		7.63	0.458	ug/L	U	U	
Pentachlorophenol	N	87-86-5		7.63	1.53	ug/L	U	U	

*Analysis Method* EPA-821-R-02-013

**Sample Name** OUTFALL002\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 10:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chronic Toxicity, Selenastrum	N	CHRTOXSELEN A	-19.66			% SURV			

*Analysis Method* SM2340

**Sample Name** OUTFALL002\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 10:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	T	HARDNESSCA CO3	300	0.33	0.17	mg/L			

**Sample Name** OUTFALL002\_20181207\_COMP\_F **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 10:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226838-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	D	HARDNESSCA CO3	54	0.33	0.17	mg/L			

*Analysis Method* SM2540C

**Sample Name** OUTFALL002\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 10:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Dissolved Solids (TDS)	N	TDS	250	10	5.0	mg/L			

*Analysis Method* SM2540D

**Sample Name** OUTFALL002\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 10:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Suspended Solids (TSS)	N	TSS	340	67	33	mg/L			

*Analysis Method* SM4500-CN-E

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cyanide	N	57-12-5		5.0	2.5	ug/L	U	UJ	H

*Analysis Method* SM4500-NH3G

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Ammonia (as N)	N	7664-41-7N	0.264	0.200	0.100	mg/L			

*Analysis Method* SM5210B

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Biochemical Oxygen Demand	N	BOD	3.7	2.0	0.50	mg/L			

*Analysis Method* SM5540

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 8

Lab Sample Name: 440-226838-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Surfactants as MBAS	N	SURFASMBAS		0.10	0.050	mg/L	U	UJ	Q, Q1

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226838-1

Client Project/Site: Quarterly Outfall 002 Comp

Revision: 3

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/24/2019 8:06:08 PM

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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16

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- 14
- 15
- 16

I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
1/24/2019 8:06:08 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	7
Method Summary . . . . .	10
Lab Chronicle . . . . .	11
QC Sample Results . . . . .	13
QC Association Summary . . . . .	27
Definitions/Glossary . . . . .	33
Certification Summary . . . . .	34
Subcontract Data . . . . .	35
Chain of Custody . . . . .	51
Receipt Checklists . . . . .	54
Field Data Sheets . . . . .	55
Correspondence . . . . .	56

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226838-1	Outfall002_20181207_Comp	Water	12/07/18 10:05	12/07/18 21:05
440-226838-2	Outfall002_20181207_Comp_F	Water	12/07/18 10:05	12/07/18 21:05

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16



# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

**Job ID: 440-226838-1**

**Laboratory: TestAmerica Irvine**

## Narrative

### Job Narrative 440-226838-1

#### Comments

Revision created to add dissolved Iron.  
Revision created to adjust Pest analyte list per client request (see client email) and to add Toxaphene.  
Revision created to remove one email correspondence from final report per client request.

#### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6° C and 2.9° C.

#### Receipt Exceptions

Outfall002\_20181207\_Comp\_F (440-226838-2)-Received only containers for metals

client had requested dissolved iron via email and method was cancelled at final review since it was not on the COC. client email was attached which was missed.

#### GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### GC Semi VOA

Method(s) 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-518465 and analytical batch 440-518537. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch.(LCS 440-518465/2-A)

Method(s) 608: Surrogate recovery for the following sample was outside control limits: Outfall002\_20181207\_Comp (440-226838-1). Evidence of matrix interference is present, emulsion during extraction process; therefore, re-extraction and re-analysis was not performed.

Method(s) 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-516165 and analytical batch 440-516104. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch: (LCS 440-516165/2-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

Method(s) 200.8: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-517388 and analytical batch 440-517466 were outside control limits for Selenium. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) FILTRATION: The following samples requested dissolved metals and were not filtered in the field:  
Outfall002\_20181207\_Comp\_F (440-226838-2). These samples were filtered and preserved upon receipt to the laboratory.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### General Chemistry

Method(s) SM 5540C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 440-515808 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

---

## Job ID: 440-226838-1 (Continued)

---

### Laboratory: TestAmerica Irvine (Continued)

Method(s) SM 5540C: The matrix spike / matrix spike duplicate (MS/MSD) precision for analytical batch 440-515808 was outside control limits. Sample matrix interference is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Subcontract non-Sister

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Organic Prep

Method(s) 3510C, 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510-8015B preparation batch 440-516165.

Method(s) 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C 8082 PCB preparation batch 440-518465.

Method(s) 3520C, 625: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3520C\_8270C/625-LL preparation batch 440-515842.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

## Method: 625 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,6-Trichlorophenol	ND		9.16	0.153	ug/L		12/09/18 15:53	12/12/18 02:08	1
Bis(2-ethylhexyl) phthalate	ND		7.63	3.05	ug/L		12/09/18 15:53	12/12/18 02:08	1
N-Nitrosodimethylamine	ND		7.63	0.458	ug/L		12/09/18 15:53	12/12/18 02:08	1
Pentachlorophenol	ND		7.63	1.53	ug/L		12/09/18 15:53	12/12/18 02:08	1
2,4-Dinitrotoluene	ND		7.63	3.05	ug/L		12/09/18 15:53	12/12/18 02:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	99		40 - 120	12/09/18 15:53	12/12/18 02:08	1
2-Fluorobiphenyl	84		50 - 120	12/09/18 15:53	12/12/18 02:08	1
2-Fluorophenol	70		30 - 120	12/09/18 15:53	12/12/18 02:08	1
Nitrobenzene-d5	87		45 - 120	12/09/18 15:53	12/12/18 02:08	1
Phenol-d6	84		35 - 120	12/09/18 15:53	12/12/18 02:08	1
Terphenyl-d14	125		37 - 144	12/09/18 15:53	12/12/18 02:08	1

## Method: 608 PCB LL - Polychlorinated Biphenyls (PCBs) Low level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1016	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1221	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1232	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1242	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1248	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1254	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1
Aroclor 1260	ND	BU	0.48	0.24	ug/L		12/20/18 12:07	12/20/18 17:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	27	LG	29 - 115	12/20/18 12:07	12/20/18 17:52	1

## Method: 608 Pesticides - Organochlorine Pesticides Low level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.094	0.075	ug/L		12/11/18 05:36	12/11/18 17:09	1
Dieldrin	ND		0.0047	0.0019	ug/L		12/11/18 05:36	12/11/18 17:09	1
4,4'-DDT	ND		0.0094	0.0038	ug/L		12/11/18 05:36	12/11/18 17:09	1
4,4'-DDD	ND		0.0047	0.0038	ug/L		12/11/18 05:36	12/11/18 17:09	1
4,4'-DDE	ND		0.0047	0.0028	ug/L		12/11/18 05:36	12/11/18 17:09	1
Toxaphene	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	69		10 - 150	12/11/18 05:36	12/11/18 17:09	1
DCB Decachlorobiphenyl (Surr)	78		18 - 134	12/11/18 05:36	12/11/18 17:09	1

## Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.7		0.50	0.25	mg/L			12/08/18 11:46	1
Nitrate as N	1.4		0.11	0.055	mg/L			12/08/18 11:46	1
Nitrite as N	0.025	J,DX	0.15	0.025	mg/L			12/08/18 11:46	1
Sulfate	7.7		0.50	0.25	mg/L			12/08/18 11:46	1

## Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/11/18 11:38	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

Date Collected: 12/07/18 10:05

Matrix: Water

Date Received: 12/07/18 21:05

**Method: NO3NO2 Calc - Nitrogen, Nitrate-Nitrite**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	1.4		0.15	0.055	mg/L			12/18/18 14:54	1

**Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	98000		100	50	ug/L		12/16/18 11:30	12/17/18 10:15	1
Zinc	430		20	12	ug/L		12/16/18 11:30	12/17/18 10:15	1

**Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.36		0.10	0.050	mg/L		12/24/18 13:29	12/26/18 13:59	1

**Method: 200.8 - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	1.6		1.0	0.25	ug/L		12/16/18 11:26	12/16/18 19:34	1
Copper	52		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:34	1
Lead	88		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:34	1
Selenium	11		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:34	1

**Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:26	12/13/18 22:24	1

**Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	300		0.33	0.17	mg/L			12/31/18 14:40	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	2500		40	16	NTU			12/09/18 09:15	400
Total Dissolved Solids	250		10	5.0	mg/L			12/14/18 09:17	1
Total Suspended Solids	340		67	33	mg/L			12/14/18 08:46	1
Cyanide, Total	ND		5.0	2.5	ug/L		12/21/18 19:14	12/21/18 23:47	1
Ammonia (as N)	0.264		0.200	0.100	mg/L			12/19/18 15:11	1
Methylene Blue Active Substances	ND		0.10	0.050	mg/L			12/09/18 07:19	1
Biochemical Oxygen Demand	3.7		2.0	0.50	mg/L			12/08/18 17:30	1

**Client Sample ID: Outfall002\_20181207\_Comp\_F**

**Lab Sample ID: 440-226838-2**

Date Collected: 12/07/18 10:05

Matrix: Water

Date Received: 12/07/18 21:05

**Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	ND		20	12	ug/L		12/12/18 13:14	12/12/18 17:52	1

**Method: 200.8 - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		12/12/18 13:17	12/13/18 13:07	1
Copper	2.6		2.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:07	1
Lead	ND		1.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:07	1
Selenium	ND		2.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:07	1

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# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

**Client Sample ID: Outfall002\_20181207\_Comp\_F**

**Lab Sample ID: 440-226838-2**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 245.1 - Mercury (CVAA) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/11/18 11:36	12/11/18 19:14	1

**Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	54		0.33	0.17	mg/L			12/31/18 14:41	1

- 1
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# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

Method	Method Description	Protocol	Laboratory
625	Semivolatile Organic Compounds (GC/MS)	EPA	TAL IRV
608 PCB LL	Polychlorinated Biphenyls (PCBs) Low level	40CFR136A	TAL IRV
608 Pesticides	Organochlorine Pesticides Low level	40CFR136A	TAL IRV
300.0	Anions, Ion Chromatography	MCAWW	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
NO3NO2 Calc	Nitrogen, Nitrate-Nitrite	EPA	TAL IRV
200.7 Rev 4.4	Metals (ICP)	EPA	TAL IRV
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
180.1	Turbidity, Nephelometric	MCAWW	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
SM 4500 CN E	Cyanide, Total (Low Level)	SM	TAL IRV
SM 4500 NH3 G	Ammonia	SM	TAL IRV
SM 5540C	Methylene Blue Active Substances (MBAS)	SM	TAL IRV
SM5210B	BOD, 5 Day	SM	TAL IRV
EPA	Bioassay	EPA	ABC
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
608	Liquid-Liquid Extraction (Separatory Funnel)	40CFR136A	TAL IRV
625	Liquid-Liquid Extraction	40CFR136A	TAL IRV
Distill/CN	Distillation, Cyanide	None	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

#### Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

#### Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	625			655 mL	2.0 mL	515842	12/09/18 15:53	AJP	TAL IRV
Total/NA	Analysis	625		1			516279	12/12/18 02:08	HN	TAL IRV
Total/NA	Prep	608			1045 mL	2 mL	518465	12/20/18 12:07	HCK	TAL IRV
Total/NA	Analysis	608 PCB LL		1			518537	12/20/18 17:52	JM	TAL IRV
Total/NA	Prep	608			1065 mL	2 mL	516165	12/11/18 05:36	L1H	TAL IRV
Total/NA	Analysis	608 Pesticides		1			516104	12/11/18 17:09	D1D	TAL IRV
Total/NA	Analysis	300.0		1			515764	12/08/18 11:46	OH1	TAL IRV
Total/NA	Analysis	300.0		1			515765	12/08/18 11:46	OH1	TAL IRV
Total/NA	Analysis	314.0		1			516202	12/11/18 11:38	CTH	TAL IRV
Total/NA	Analysis	NO3NO2 Calc		1			517960	12/18/18 14:54	TLN	TAL IRV
Dissolved	Filtration	FILTRATION			150 mL	150 mL	518440	12/20/18 11:12	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	519128	12/24/18 13:29	BV	TAL IRV
Dissolved	Analysis	200.7 Rev 4.4		1			519372	12/26/18 13:59	VS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	517392	12/16/18 11:30	KE	TAL IRV
Total Recoverable	Analysis	200.7 Rev 4.4		1			518714	12/17/18 10:15	VS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	517388	12/16/18 11:26	KE	TAL IRV
Total Recoverable	Analysis	200.8		1			517466	12/16/18 19:34	B1H	TAL IRV
Total/NA	Prep	245.1			20 mL	20 mL	516687	12/13/18 13:26	DB	TAL IRV
Total/NA	Analysis	245.1		1			517219	12/13/18 22:24	DB	TAL IRV
Total Recoverable	Analysis	SM 2340B		1			520206	12/31/18 14:40	A1S	TAL IRV
Total/NA	Analysis	180.1		400			515813	12/09/18 09:15	CMM	TAL IRV
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	517079	12/14/18 09:17	XL	TAL IRV
Total/NA	Analysis	SM 2540D		1	15 mL	1000 mL	517087	12/14/18 08:46	XL	TAL IRV
Total/NA	Prep	Distill/CN			50 mL	50 mL	518834	12/21/18 19:14	QTN	TAL IRV
Total/NA	Analysis	SM 4500 CN E		1			518850	12/21/18 23:47	QTN	TAL IRV
Total/NA	Analysis	SM 4500 NH3 G		1	0.8 mL	8.0 mL	518382	12/19/18 15:11	KMY	TAL IRV
Total/NA	Analysis	SM 5540C		1	100 mL	100 mL	515808	12/09/18 07:19	KMY	TAL IRV
Total/NA	Analysis	SM5210B		1			515805	12/08/18 17:30	KYP	TAL IRV

**Client Sample ID: Outfall002\_20181207\_Comp\_F**

**Lab Sample ID: 440-226838-2**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	516574	12/12/18 13:14	KE	TAL IRV
Dissolved	Analysis	200.7 Rev 4.4		1			516674	12/12/18 17:52	P1R	TAL IRV
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	516575	12/12/18 13:17	KE	TAL IRV
Dissolved	Analysis	200.8		1			516916	12/13/18 13:07	B1H	TAL IRV
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	245.1			20 mL	20 mL	516137	12/11/18 11:36	DB	TAL IRV
Dissolved	Analysis	245.1		1			516542	12/11/18 19:14	DB	TAL IRV

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# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	SM 2340B		1			520207	12/31/18 14:41	A1S	TAL IRV

### Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 440-515842/1-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,6-Trichlorophenol	ND		6.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Bis(2-ethylhexyl) phthalate	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
N-Nitrosodimethylamine	ND		5.00	0.300	ug/L		12/09/18 15:53	12/11/18 13:42	1
Pentachlorophenol	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4-Dinitrotoluene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	81		40 - 120	12/09/18 15:53	12/11/18 13:42	1
2-Fluorobiphenyl	76		50 - 120	12/09/18 15:53	12/11/18 13:42	1
2-Fluorophenol	67		30 - 120	12/09/18 15:53	12/11/18 13:42	1
Nitrobenzene-d5	78		45 - 120	12/09/18 15:53	12/11/18 13:42	1
Phenol-d6	76		35 - 120	12/09/18 15:53	12/11/18 13:42	1
Terphenyl-d14	98		37 - 144	12/09/18 15:53	12/11/18 13:42	1

**Lab Sample ID: LCS 440-515842/2-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
2,4,6-Trichlorophenol	10.0	8.220		ug/L		82	37 - 144
Bis(2-ethylhexyl) phthalate	10.0	9.257		ug/L		93	10 - 150
N-Nitrosodimethylamine	10.0	8.208		ug/L		82	26 - 117
Pentachlorophenol	20.0	16.01		ug/L		80	14 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	90		40 - 120
2-Fluorobiphenyl	77		50 - 120
2-Fluorophenol	61		30 - 120
Nitrobenzene-d5	74		45 - 120
Phenol-d6	73		35 - 120
Terphenyl-d14	93		37 - 144

**Lab Sample ID: LCSD 440-515842/3-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
2,4,6-Trichlorophenol	10.0	7.197		ug/L		72	37 - 144	13	35
Bis(2-ethylhexyl) phthalate	10.0	9.150		ug/L		92	10 - 150	1	35
N-Nitrosodimethylamine	10.0	7.657		ug/L		77	26 - 117	7	35
Pentachlorophenol	20.0	14.87		ug/L		74	14 - 150	7	35

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol	84		40 - 120
2-Fluorobiphenyl	71		50 - 120
2-Fluorophenol	70		30 - 120
Nitrobenzene-d5	74		45 - 120

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 440-515842/3-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
Phenol-d6	72		35 - 120
Terphenyl-d14	95		37 - 144

## Method: 608 PCB LL - Polychlorinated Biphenyls (PCBs) Low level

**Lab Sample ID: MB 440-518465/1-A**  
**Matrix: Water**  
**Analysis Batch: 518537**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 518465**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aroclor 1016	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1221	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1232	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1242	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1248	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1254	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1
Aroclor 1260	ND		0.50	0.25	ug/L		12/20/18 12:07	12/20/18 17:12	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
DCB Decachlorobiphenyl (Surr)	71		29 - 115	12/20/18 12:07	12/20/18 17:12	1

**Lab Sample ID: LCS 440-518465/2-A**  
**Matrix: Water**  
**Analysis Batch: 518537**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 518465**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Aroclor 1016	4.00	2.71		ug/L		68	10 - 127
Aroclor 1260	4.00	2.97		ug/L		74	50 - 115

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl (Surr)	66		29 - 115

**Lab Sample ID: LCSD 440-518465/3-A**  
**Matrix: Water**  
**Analysis Batch: 518537**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 518465**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aroclor 1016	4.00	2.71		ug/L		68	10 - 127	0	30
Aroclor 1260	4.00	3.00		ug/L		75	50 - 115	1	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl (Surr)	66		29 - 115

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 608 Pesticides - Organochlorine Pesticides Low level

**Lab Sample ID: MB 440-516165/1-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.10	0.080	ug/L		12/11/18 05:36	12/11/18 15:54	1
Dieldrin	ND		0.0050	0.0020	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDT	ND		0.010	0.0040	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDD	ND		0.0050	0.0040	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDE	ND		0.0050	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
Toxaphene	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 15:54	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	73		10 - 150	12/11/18 05:36	12/11/18 15:54	1
DCB Decachlorobiphenyl (Surr)	98		18 - 134	12/11/18 05:36	12/11/18 15:54	1

**Lab Sample ID: LCS 440-516165/2-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
alpha-BHC	0.200	0.142		ug/L		71	37 - 134
gamma-BHC (Lindane)	0.200	0.142		ug/L		71	32 - 127
Endrin aldehyde	0.200	0.151		ug/L		76	47 - 115
delta-BHC	0.200	0.145		ug/L		73	19 - 140
Aldrin	0.200	0.149		ug/L		74	42 - 122
Endosulfan sulfate	0.200	0.156		ug/L		78	26 - 144
Endosulfan I	0.200	0.154		ug/L		77	45 - 150
Endrin	0.200	0.160		ug/L		80	30 - 147
Dieldrin	0.200	0.156		ug/L		78	36 - 146
4,4'-DDT	0.200	0.159		ug/L		79	25 - 150
Endosulfan II	0.200	0.155		ug/L		77	10 - 150
beta-BHC	0.200	0.149		ug/L		74	17 - 147
4,4'-DDD	0.200	0.159		ug/L		79	31 - 141
4,4'-DDE	0.200	0.153		ug/L		77	30 - 145
Heptachlor	0.200	0.150		ug/L		75	34 - 115
Heptachlor epoxide	0.200	0.153		ug/L		77	37 - 142

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	66		10 - 150
DCB Decachlorobiphenyl (Surr)	82		18 - 134

**Lab Sample ID: LCSD 440-516165/3-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
alpha-BHC	0.200	0.156		ug/L		78	37 - 134	10	35
gamma-BHC (Lindane)	0.200	0.156		ug/L		78	32 - 127	10	35
Endrin aldehyde	0.200	0.168		ug/L		84	47 - 115	11	35
delta-BHC	0.200	0.160		ug/L		80	19 - 140	10	35
Aldrin	0.200	0.163		ug/L		82	42 - 122	9	35

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 608 Pesticides - Organochlorine Pesticides Low level (Continued)

**Lab Sample ID: LCSD 440-516165/3-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Endosulfan sulfate	0.200	0.173		ug/L		86	26 - 144	10	35
Endosulfan I	0.200	0.169		ug/L		85	45 - 150	9	35
Endrin	0.200	0.175		ug/L		88	30 - 147	9	35
Dieldrin	0.200	0.172		ug/L		86	36 - 146	9	35
4,4'-DDT	0.200	0.178		ug/L		89	25 - 150	11	35
Endosulfan II	0.200	0.170		ug/L		85	10 - 150	10	35
beta-BHC	0.200	0.164		ug/L		82	17 - 147	10	35
4,4'-DDD	0.200	0.174		ug/L		87	31 - 141	9	35
4,4'-DDE	0.200	0.168		ug/L		84	30 - 145	9	35
Heptachlor	0.200	0.166		ug/L		83	34 - 115	10	35
Heptachlor epoxide	0.200	0.168		ug/L		84	37 - 142	10	35

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
Tetrachloro-m-xylene	73		10 - 150
DCB Decachlorobiphenyl (Surr)	91		18 - 134

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 440-515764/6**  
**Matrix: Water**  
**Analysis Batch: 515764**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.11	0.055	mg/L			12/08/18 10:50	1
Nitrite as N	ND		0.15	0.025	mg/L			12/08/18 10:50	1

**Lab Sample ID: LCS 440-515764/5**  
**Matrix: Water**  
**Analysis Batch: 515764**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.13	1.15		mg/L		102	90 - 110
Nitrite as N	1.52	1.50		mg/L		99	90 - 110

**Lab Sample ID: 440-226822-A-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515764**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.96		1.13	2.19		mg/L		108	80 - 120
Nitrite as N	ND		1.52	1.56		mg/L		102	80 - 120

**Lab Sample ID: 440-226822-A-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515764**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.96		1.13	2.21		mg/L		110	80 - 120	1	20

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 300.0 - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 440-226822-A-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515764**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND		1.52	1.58		mg/L		104	80 - 120	1	20

**Lab Sample ID: MB 440-515765/6**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.25	mg/L			12/08/18 10:50	1
Sulfate	ND		0.50	0.25	mg/L			12/08/18 10:50	1

**Lab Sample ID: LCS 440-515765/5**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.96		mg/L		99	90 - 110
Sulfate	5.00	4.77		mg/L		95	90 - 110

**Lab Sample ID: 440-226822-A-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.5		5.00	7.59		mg/L		103	80 - 120
Sulfate	2.7		5.00	7.76		mg/L		101	80 - 120

**Lab Sample ID: 440-226822-A-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.5		5.00	7.66		mg/L		104	80 - 120	1	20
Sulfate	2.7		5.00	7.83		mg/L		102	80 - 120	1	20

## Method: 314.0 - Perchlorate (IC)

**Lab Sample ID: MB 440-516202/6**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/11/18 09:26	1

**Lab Sample ID: LCS 440-516202/5**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	28.1		ug/L		112	85 - 115

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 314.0 - Perchlorate (IC) (Continued)

**Lab Sample ID: MRL 440-516202/4**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	1.00	1.14	J,DX	ug/L		114	75 - 125

**Lab Sample ID: 440-226822-A-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	ND		25.0	28.2		ug/L		113	80 - 120

**Lab Sample ID: 440-226822-A-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	ND		25.0	28.2		ug/L		113	80 - 120	0	15

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 440-517392/1-A**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	ND		20	12	ug/L		12/16/18 11:30	12/17/18 09:33	1
Iron	ND		100	50	ug/L		12/16/18 11:30	12/17/18 09:33	1

**Lab Sample ID: LCS 440-517392/2-A**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	500	496		ug/L		99	85 - 115
Calcium	2500	2500		ug/L		100	85 - 115
Magnesium	2500	2470		ug/L		99	85 - 115
Iron	500	494		ug/L		99	85 - 115

**Lab Sample ID: 440-226838-1 MS**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	430		500	957		ug/L		106	70 - 130
Calcium	60000		2500	65300	BB	ug/L		208	70 - 130
Magnesium	38000		2500	43300	BB	ug/L		232	70 - 130
Iron	98000		500	111000	BB	ug/L		2552	70 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: 440-226838-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
				Result	Qualifier				Limits	RPD		
Zinc	430		500	957		ug/L		106	70 - 130	0	20	
Calcium	60000		2500	67000	BB	ug/L		278	70 - 130	3	20	
Magnesium	38000		2500	43800	BB	ug/L		253	70 - 130	1	20	
Iron	98000		500	109000	BB	ug/L		2232	70 - 130	1	20	

**Lab Sample ID: MB 440-515802/1-F**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Zinc	ND		20	12	ug/L		12/12/18 13:13	12/12/18 17:40	1

**Lab Sample ID: LCS 440-515802/2-F**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec.	
		Result	Qualifier				Limits	RPD
Zinc	500	486		ug/L		97	85 - 115	
Calcium	2.50	2.45		mg/L		98	85 - 115	
Magnesium	2.50	2.44		mg/L		98	85 - 115	

**Lab Sample ID: 440-226822-B-2-J MS**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Matrix Spike**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec.	
				Result	Qualifier				Limits	RPD
Zinc	ND		500	476		ug/L		95	70 - 130	
Calcium	4.5		2.50	6.91		mg/L		96	70 - 130	
Magnesium	1.3		2.50	3.68		mg/L		94	70 - 130	

**Lab Sample ID: 440-226822-B-2-K MSD**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec.		RPD	Limit
				Result	Qualifier				Limits	RPD		
Zinc	ND		500	472		ug/L		94	70 - 130	1	20	
Calcium	4.5		2.50	6.89		mg/L		95	70 - 130	0	20	
Magnesium	1.3		2.50	3.69		mg/L		94	70 - 130	0	20	

**Lab Sample ID: MB 440-518440/1-C**  
**Matrix: Water**  
**Analysis Batch: 519372**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 519128**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Iron	ND		0.10	0.050	mg/L		12/24/18 13:29	12/26/18 13:54	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: LCS 440-518440/2-C**  
**Matrix: Water**  
**Analysis Batch: 519372**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 519128**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Iron	0.500	0.492		mg/L		98	85 - 115

**Lab Sample ID: 440-226838-1 MS**  
**Matrix: Water**  
**Analysis Batch: 519372**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Dissolved**  
**Prep Batch: 519128**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Iron	0.36		0.500	0.912		mg/L		111	70 - 130

**Lab Sample ID: 440-226838-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 519372**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Dissolved**  
**Prep Batch: 519128**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Iron	0.36		0.500	0.950		mg/L		119	70 - 130	4	20

## Method: 200.8 - Metals (ICP/MS)

**Lab Sample ID: MB 440-517388/1-A**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		12/16/18 11:26	12/16/18 19:01	1
Copper	ND		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Lead	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Selenium	ND		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1

**Lab Sample ID: LCS 440-517388/2-A**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cadmium	80.0	77.9		ug/L		97	85 - 115
Copper	80.0	78.8		ug/L		98	85 - 115
Lead	80.0	77.6		ug/L		97	85 - 115
Selenium	80.0	78.4		ug/L		98	85 - 115

**Lab Sample ID: 440-226838-1 MS**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cadmium	1.6		80.0	79.4		ug/L		97	70 - 130
Copper	52		80.0	118		ug/L		82	70 - 130
Lead	88		80.0	166		ug/L		98	70 - 130
Selenium	11		80.0	40.8	LN	ug/L		37	70 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 200.8 - Metals (ICP/MS) (Continued)

**Lab Sample ID: 440-226838-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
Cadmium	1.6		80.0	82.2		ug/L		101	70 - 130	3	20	
Copper	52		80.0	119		ug/L		84	70 - 130	1	20	
Lead	88		80.0	168		ug/L		100	70 - 130	1	20	
Selenium	11		80.0	42.6	LN	ug/L		40	70 - 130	4	20	

**Lab Sample ID: MB 440-515802/1-G**  
**Matrix: Water**  
**Analysis Batch: 516916**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516575**

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Cadmium	ND		1.0	0.25	ug/L		12/12/18 13:17	12/13/18 13:02	1
Copper	ND		2.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:02	1
Lead	ND		1.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:02	1
Selenium	ND		2.0	0.50	ug/L		12/12/18 13:17	12/13/18 13:02	1

**Lab Sample ID: LCS 440-515802/2-G**  
**Matrix: Water**  
**Analysis Batch: 516916**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516575**

Analyte	Spike	LCS		Unit	D	%Rec	%Rec.	
		Result	Qualifier				Limits	RPD
Cadmium	80.0	79.9		ug/L		100	85 - 115	
Copper	80.0	82.8		ug/L		104	85 - 115	
Lead	80.0	85.1		ug/L		106	85 - 115	
Selenium	80.0	77.9		ug/L		97	85 - 115	

**Lab Sample ID: 440-226838-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516916**

**Client Sample ID: Outfall002\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516575**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
Cadmium	ND		80.0	77.6		ug/L		97	70 - 130			
Copper	2.6		80.0	85.8		ug/L		104	70 - 130			
Lead	ND		80.0	79.8		ug/L		100	70 - 130			
Selenium	ND		80.0	74.1		ug/L		93	70 - 130			

**Lab Sample ID: 440-226838-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 516916**

**Client Sample ID: Outfall002\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516575**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
Cadmium	ND		80.0	78.2		ug/L		98	70 - 130	1	20	
Copper	2.6		80.0	83.6		ug/L		101	70 - 130	3	20	
Lead	ND		80.0	79.7		ug/L		100	70 - 130	0	20	
Selenium	ND		80.0	73.7		ug/L		92	70 - 130	1	20	

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 245.1 - Mercury (CVAA)

**Lab Sample ID: MB 440-516687/1-A**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:26	12/13/18 21:50	1

**Lab Sample ID: LCS 440-516687/2-A**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	8.00	8.34		ug/L		104	85 - 115

**Lab Sample ID: 440-226822-D-1-E MS**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		8.00	8.06		ug/L		101	75 - 125

**Lab Sample ID: 440-226822-D-1-F MSD**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		8.00	8.20		ug/L		103	75 - 125	2	20

**Lab Sample ID: MB 440-515802/1-D**  
**Matrix: Water**  
**Analysis Batch: 516542**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516137**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/11/18 11:36	12/11/18 19:10	1

**Lab Sample ID: LCS 440-515802/2-D**  
**Matrix: Water**  
**Analysis Batch: 516542**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516137**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	8.00	7.70		ug/L		96	85 - 115

**Lab Sample ID: 440-226838-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516542**

**Client Sample ID: Outfall002\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516137**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		8.00	7.56		ug/L		95	75 - 125

**Lab Sample ID: 440-226838-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 516542**

**Client Sample ID: Outfall002\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516137**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		8.00	7.65		ug/L		96	75 - 125	1	20

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: 180.1 - Turbidity, Nephelometric

**Lab Sample ID: MB 440-515813/5**  
**Matrix: Water**  
**Analysis Batch: 515813**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	ND		0.10	0.040	NTU			12/09/18 09:15	1

**Lab Sample ID: 440-226838-1 DU**  
**Matrix: Water**  
**Analysis Batch: 515813**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Turbidity	2500		2440		NTU		2	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 440-517079/1**  
**Matrix: Water**  
**Analysis Batch: 517079**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	5.0	mg/L			12/14/18 09:17	1

**Lab Sample ID: LCS 440-517079/2**  
**Matrix: Water**  
**Analysis Batch: 517079**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	990		mg/L		99	90 - 110

**Lab Sample ID: 440-227505-E-31 DU**  
**Matrix: Water**  
**Analysis Batch: 517079**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	24000		23900		mg/L		0.7	5

## Method: SM 2540D - Solids, Total Suspended (TSS)

**Lab Sample ID: MB 440-517087/1**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.50	mg/L			12/14/18 08:46	1

**Lab Sample ID: LCS 440-517087/2**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	1050		mg/L		105	85 - 115

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 440-226735-B-1 DU  
 Matrix: Water  
 Analysis Batch: 517087

Client Sample ID: Duplicate  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Suspended Solids	6.5		6.32		mg/L		3	10

## Method: SM 4500 CN E - Cyanide, Total (Low Level)

Lab Sample ID: MB 440-518834/1-A  
 Matrix: Water  
 Analysis Batch: 518850

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 518834

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		5.0	2.5	ug/L		12/21/18 19:14	12/21/18 23:46	1

Lab Sample ID: LCS 440-518834/2-A  
 Matrix: Water  
 Analysis Batch: 518850

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 518834

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	100	103		ug/L		103	90 - 110

Lab Sample ID: 440-227751-A-4-B MS  
 Matrix: Water  
 Analysis Batch: 518850

Client Sample ID: Matrix Spike  
 Prep Type: Total/NA  
 Prep Batch: 518834

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	ND		100	105		ug/L		105	70 - 115

Lab Sample ID: 440-227751-A-4-C MSD  
 Matrix: Water  
 Analysis Batch: 518850

Client Sample ID: Matrix Spike Duplicate  
 Prep Type: Total/NA  
 Prep Batch: 518834

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cyanide, Total	ND		100	105		ug/L		105	70 - 115	0	15

## Method: SM 4500 NH3 G - Ammonia

Lab Sample ID: MB 440-518382/10  
 Matrix: Water  
 Analysis Batch: 518382

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.200	0.100	mg/L			12/19/18 13:43	1

Lab Sample ID: LCS 440-518382/11  
 Matrix: Water  
 Analysis Batch: 518382

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Ammonia (as N)	5.00	4.890		mg/L		98	90 - 110

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: SM 4500 NH3 G - Ammonia (Continued)

**Lab Sample ID: MRL 440-518382/9**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.200	0.1610	J,DX	mg/L		81	50 - 150

**Lab Sample ID: 440-227448-K-1 MS**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	5.070		mg/L		101	90 - 110

**Lab Sample ID: 440-227448-K-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia (as N)	ND		5.00	5.050		mg/L		101	90 - 110	0	15

## Method: SM 5540C - Methylene Blue Active Substances (MBAS)

**Lab Sample ID: MB 440-515808/3**  
**Matrix: Water**  
**Analysis Batch: 515808**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Blue Active Substances	ND		0.10	0.050	mg/L			12/09/18 07:19	1

**Lab Sample ID: LCS 440-515808/4**  
**Matrix: Water**  
**Analysis Batch: 515808**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methylene Blue Active Substances	0.250	0.236		mg/L		94	90 - 110

**Lab Sample ID: 440-226838-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515808**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Methylene Blue Active Substances	ND		0.250	0.0779	J,DX LN	mg/L		31	50 - 125

**Lab Sample ID: 440-226838-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515808**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methylene Blue Active Substances	ND		0.250	0.102	LN BA	mg/L		41	50 - 125	27	20

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Method: SM5210B - BOD, 5 Day

**Lab Sample ID: USB 440-515805/1**  
**Matrix: Water**  
**Analysis Batch: 515805**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	USB Result	USB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	ND		2.0	0.50	mg/L			12/08/18 17:30	1

**Lab Sample ID: LCS 440-515805/4**  
**Matrix: Water**  
**Analysis Batch: 515805**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biochemical Oxygen Demand	199	208		mg/L		105	85 - 115

**Lab Sample ID: LCSD 440-515805/5**  
**Matrix: Water**  
**Analysis Batch: 515805**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Biochemical Oxygen Demand	199	200		mg/L		101	85 - 115	4	20

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## GC/MS Semi VOA

### Prep Batch: 515842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	625	
MB 440-515842/1-A	Method Blank	Total/NA	Water	625	
LCS 440-515842/2-A	Lab Control Sample	Total/NA	Water	625	
LCSD 440-515842/3-A	Lab Control Sample Dup	Total/NA	Water	625	

### Analysis Batch: 516279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	625	515842
MB 440-515842/1-A	Method Blank	Total/NA	Water	625	515842
LCS 440-515842/2-A	Lab Control Sample	Total/NA	Water	625	515842
LCSD 440-515842/3-A	Lab Control Sample Dup	Total/NA	Water	625	515842

## GC Semi VOA

### Analysis Batch: 516104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	608 Pesticides	516165
MB 440-516165/1-A	Method Blank	Total/NA	Water	608 Pesticides	516165
LCS 440-516165/2-A	Lab Control Sample	Total/NA	Water	608 Pesticides	516165
LCSD 440-516165/3-A	Lab Control Sample Dup	Total/NA	Water	608 Pesticides	516165

### Prep Batch: 516165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	608	
MB 440-516165/1-A	Method Blank	Total/NA	Water	608	
LCS 440-516165/2-A	Lab Control Sample	Total/NA	Water	608	
LCSD 440-516165/3-A	Lab Control Sample Dup	Total/NA	Water	608	

### Prep Batch: 518465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	608	
MB 440-518465/1-A	Method Blank	Total/NA	Water	608	
LCS 440-518465/2-A	Lab Control Sample	Total/NA	Water	608	
LCSD 440-518465/3-A	Lab Control Sample Dup	Total/NA	Water	608	

### Analysis Batch: 518537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	608 PCB LL	518465
MB 440-518465/1-A	Method Blank	Total/NA	Water	608 PCB LL	518465
LCS 440-518465/2-A	Lab Control Sample	Total/NA	Water	608 PCB LL	518465
LCSD 440-518465/3-A	Lab Control Sample Dup	Total/NA	Water	608 PCB LL	518465

## HPLC/IC

### Analysis Batch: 515764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	300.0	
MB 440-515764/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515764/5	Lab Control Sample	Total/NA	Water	300.0	
440-226822-A-1 MS	Matrix Spike	Total/NA	Water	300.0	

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# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## HPLC/IC (Continued)

### Analysis Batch: 515764 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

### Analysis Batch: 515765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	300.0	
MB 440-515765/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515765/5	Lab Control Sample	Total/NA	Water	300.0	
440-226822-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
440-226822-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

### Analysis Batch: 516202

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	314.0	
MB 440-516202/6	Method Blank	Total/NA	Water	314.0	
LCS 440-516202/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-516202/4	Lab Control Sample	Total/NA	Water	314.0	
440-226822-A-1 MS	Matrix Spike	Total/NA	Water	314.0	
440-226822-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

### Analysis Batch: 517960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	NO3NO2 Calc	

## Metals

### Filtration Batch: 515802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	FILTRATION	
MB 440-515802/1-D	Method Blank	Dissolved	Water	FILTRATION	
MB 440-515802/1-F	Method Blank	Dissolved	Water	FILTRATION	
MB 440-515802/1-G	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-515802/2-D	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-515802/2-G	Lab Control Sample	Dissolved	Water	FILTRATION	
440-226822-B-2-J MS	Matrix Spike	Dissolved	Water	FILTRATION	
440-226822-B-2-K MSD	Matrix Spike Duplicate	Dissolved	Water	FILTRATION	
440-226838-2 MS	Outfall002_20181207_Comp_F	Dissolved	Water	FILTRATION	
440-226838-2 MSD	Outfall002_20181207_Comp_F	Dissolved	Water	FILTRATION	

### Prep Batch: 516137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	515802
MB 440-515802/1-D	Method Blank	Dissolved	Water	245.1	515802
LCS 440-515802/2-D	Lab Control Sample	Dissolved	Water	245.1	515802
440-226838-2 MS	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	515802
440-226838-2 MSD	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	515802

### Analysis Batch: 516542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	516137

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Metals (Continued)

### Analysis Batch: 516542 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 440-515802/1-D	Method Blank	Dissolved	Water	245.1	516137
LCS 440-515802/2-D	Lab Control Sample	Dissolved	Water	245.1	516137
440-226838-2 MS	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	516137
440-226838-2 MSD	Outfall002_20181207_Comp_F	Dissolved	Water	245.1	516137

### Prep Batch: 516574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	200.2	515802
MB 440-515802/1-F	Method Blank	Dissolved	Water	200.2	515802
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	200.2	515802
440-226822-B-2-J MS	Matrix Spike	Dissolved	Water	200.2	515802
440-226822-B-2-K MSD	Matrix Spike Duplicate	Dissolved	Water	200.2	515802

### Prep Batch: 516575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	200.2	515802
MB 440-515802/1-G	Method Blank	Dissolved	Water	200.2	515802
LCS 440-515802/2-G	Lab Control Sample	Dissolved	Water	200.2	515802
440-226838-2 MS	Outfall002_20181207_Comp_F	Dissolved	Water	200.2	515802
440-226838-2 MSD	Outfall002_20181207_Comp_F	Dissolved	Water	200.2	515802

### Analysis Batch: 516674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	516574
MB 440-515802/1-F	Method Blank	Dissolved	Water	200.7 Rev 4.4	516574
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	200.7 Rev 4.4	516574
440-226822-B-2-J MS	Matrix Spike	Dissolved	Water	200.7 Rev 4.4	516574
440-226822-B-2-K MSD	Matrix Spike Duplicate	Dissolved	Water	200.7 Rev 4.4	516574

### Prep Batch: 516687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	245.1	
MB 440-516687/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-516687/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-226822-D-1-E MS	Matrix Spike	Total/NA	Water	245.1	
440-226822-D-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	

### Analysis Batch: 516916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	200.8	516575
MB 440-515802/1-G	Method Blank	Dissolved	Water	200.8	516575
LCS 440-515802/2-G	Lab Control Sample	Dissolved	Water	200.8	516575
440-226838-2 MS	Outfall002_20181207_Comp_F	Dissolved	Water	200.8	516575
440-226838-2 MSD	Outfall002_20181207_Comp_F	Dissolved	Water	200.8	516575

### Analysis Batch: 517219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	245.1	516687
MB 440-516687/1-A	Method Blank	Total/NA	Water	245.1	516687
LCS 440-516687/2-A	Lab Control Sample	Total/NA	Water	245.1	516687
440-226822-D-1-E MS	Matrix Spike	Total/NA	Water	245.1	516687

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Metals (Continued)

### Analysis Batch: 517219 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-D-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	516687

### Prep Batch: 517388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-517388/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-517388/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226838-1 MS	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	
440-226838-1 MSD	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	

### Prep Batch: 517392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-517392/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-517392/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226838-1 MS	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	
440-226838-1 MSD	Outfall002_20181207_Comp	Total Recoverable	Water	200.2	

### Analysis Batch: 517466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total Recoverable	Water	200.8	517388
MB 440-517388/1-A	Method Blank	Total Recoverable	Water	200.8	517388
LCS 440-517388/2-A	Lab Control Sample	Total Recoverable	Water	200.8	517388
440-226838-1 MS	Outfall002_20181207_Comp	Total Recoverable	Water	200.8	517388
440-226838-1 MSD	Outfall002_20181207_Comp	Total Recoverable	Water	200.8	517388

### Filtration Batch: 518440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Dissolved	Water	FILTRATION	
MB 440-518440/1-C	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-518440/2-C	Lab Control Sample	Dissolved	Water	FILTRATION	
440-226838-1 MS	Outfall002_20181207_Comp	Dissolved	Water	FILTRATION	
440-226838-1 MSD	Outfall002_20181207_Comp	Dissolved	Water	FILTRATION	

### Analysis Batch: 518714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392
MB 440-517392/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	517392
LCS 440-517392/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	517392
440-226838-1 MS	Outfall002_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392
440-226838-1 MSD	Outfall002_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392

### Prep Batch: 519128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Dissolved	Water	200.2	518440
MB 440-518440/1-C	Method Blank	Dissolved	Water	200.2	518440
LCS 440-518440/2-C	Lab Control Sample	Dissolved	Water	200.2	518440
440-226838-1 MS	Outfall002_20181207_Comp	Dissolved	Water	200.2	518440
440-226838-1 MSD	Outfall002_20181207_Comp	Dissolved	Water	200.2	518440

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Metals (Continued)

### Analysis Batch: 519372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Dissolved	Water	200.7 Rev 4.4	519128
MB 440-518440/1-C	Method Blank	Dissolved	Water	200.7 Rev 4.4	519128
LCS 440-518440/2-C	Lab Control Sample	Dissolved	Water	200.7 Rev 4.4	519128
440-226838-1 MS	Outfall002_20181207_Comp	Dissolved	Water	200.7 Rev 4.4	519128
440-226838-1 MSD	Outfall002_20181207_Comp	Dissolved	Water	200.7 Rev 4.4	519128

### Analysis Batch: 520206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total Recoverable	Water	SM 2340B	

### Analysis Batch: 520207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-2	Outfall002_20181207_Comp_F	Dissolved	Water	SM 2340B	

## General Chemistry

### Analysis Batch: 515805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM5210B	
USB 440-515805/1	Method Blank	Total/NA	Water	SM5210B	
LCS 440-515805/4	Lab Control Sample	Total/NA	Water	SM5210B	
LCSD 440-515805/5	Lab Control Sample Dup	Total/NA	Water	SM5210B	

### Analysis Batch: 515808

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM 5540C	
MB 440-515808/3	Method Blank	Total/NA	Water	SM 5540C	
LCS 440-515808/4	Lab Control Sample	Total/NA	Water	SM 5540C	
440-226838-1 MS	Outfall002_20181207_Comp	Total/NA	Water	SM 5540C	
440-226838-1 MSD	Outfall002_20181207_Comp	Total/NA	Water	SM 5540C	

### Analysis Batch: 515813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	180.1	
MB 440-515813/5	Method Blank	Total/NA	Water	180.1	
440-226838-1 DU	Outfall002_20181207_Comp	Total/NA	Water	180.1	

### Analysis Batch: 517079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM 2540C	
MB 440-517079/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-517079/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-227505-E-31 DU	Duplicate	Total/NA	Water	SM 2540C	

### Analysis Batch: 517087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM 2540D	
MB 440-517087/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-517087/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-226735-B-1 DU	Duplicate	Total/NA	Water	SM 2540D	

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## General Chemistry (Continued)

### Analysis Batch: 518382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM 4500 NH3 G	
MB 440-518382/10	Method Blank	Total/NA	Water	SM 4500 NH3 G	
LCS 440-518382/11	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	
MRL 440-518382/9	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	
440-227448-K-1 MS	Matrix Spike	Total/NA	Water	SM 4500 NH3 G	
440-227448-K-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 NH3 G	

### Prep Batch: 518834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	Distill/CN	
MB 440-518834/1-A	Method Blank	Total/NA	Water	Distill/CN	
LCS 440-518834/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
440-227751-A-4-B MS	Matrix Spike	Total/NA	Water	Distill/CN	
440-227751-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	Distill/CN	

### Analysis Batch: 518850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	SM 4500 CN E	518834
MB 440-518834/1-A	Method Blank	Total/NA	Water	SM 4500 CN E	518834
LCS 440-518834/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	518834
440-227751-A-4-B MS	Matrix Spike	Total/NA	Water	SM 4500 CN E	518834
440-227751-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 CN E	518834



# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Qualifiers

### GC Semi VOA

Qualifier	Qualifier Description
BU	Sample was prepped beyond the specified holding time
LG	LG=Surrogate recovery below the acceptance limits

### HPLC/IC

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

### Metals

Qualifier	Qualifier Description
LN	MS and/or MSD below acceptance limits. See Blank Spike (LCS)
BB	Sample > 4X spike concentration

### General Chemistry

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
LN	MS and/or MSD below acceptance limits. See Blank Spike (LCS)
BA	Relative percent difference out of control

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-1

## Laboratory: TestAmerica Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
-----------------	-------------	--------	---------

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16



December 27, 2018

Ms. Urvashi Patel  
TestAmerica Irvine  
17461 Derian Avenue, Suite 100  
Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013*. Results were as follows:

CLIENT:	TestAmerica Irvine
SAMPLE I.D.:	Outfall002_20181207_Comp (440-226838-1)
DATE RECEIVED:	7 Dec - 18
ABC LAB. NO.:	TAM1218.057


### CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

IWC = 100.00 %

#### TST RESULT

\*GROWTH = PASS      % EFFECT = -19.66 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 26 Dec-18 12:14 (p 1 of 1)  
 Test Code: TAM1218.057 | 05-3185-4790

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

<b>Batch ID:</b> 04-8722-6794	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 07 Dec-18 17:20	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 11 Dec-18 15:20	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 94h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9815-9765	<b>Code:</b> TAM1218.057	<b>Client:</b> Test America Irvine
<b>Sample Date:</b> 07 Dec-18 10:05	<b>Material:</b> Sample Water	<b>Project:</b> Boeing-SSFL NPDES
<b>Receipt Date:</b> 07 Dec-18 16:50	<b>Source:</b> Bioassay Report	
<b>Sample Age:</b> 7h (2.5 °C)	<b>Station:</b> Outfall002_20181207_Comp (440-226838-	

## Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
06-3030-7162	Cell Density	TST-Welch's t Test	<1.0E-37	100% passed cell density

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
06-3030-7162	Cell Density	Control CV	0.06625	<<	0.2	Yes	Passes Criteria
06-3030-7162	Cell Density	Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

## Cell Density Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.044E+6	1.253E+6	2.690E+4	7.608E+4	6.62%	0.00%
100		8	1.374E+6	1.314E+6	1.434E+6	1.243E+6	1.466E+6	2.534E+4	7.167E+4	5.21%	-19.66%

## Cell Density Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6
100		1.466E+6	1.396E+6	1.387E+6	1.449E+6	1.341E+6	1.322E+6	1.243E+6	1.390E+6

**CETIS Analytical Report**

Report Date: 26 Dec-18 12:14 (p 1 of 2)  
 Test Code: TAM1218.057 | 05-3185-4790

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID: 06-3030-7162	Endpoint: Cell Density	CETIS Version: CETISv1.9.2			
Analyzed: 26 Dec-18 12:13	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes			
Batch ID: 04-8722-6794	Test Type: Cell Growth	Analyst:			
Start Date: 07 Dec-18 17:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water			
Ending Date: 11 Dec-18 15:20	Species: Selenastrum capricornutum	Brine: Not Applicable			
Duration: 94h	Source: Aquatic Biosystems, CO	Age:			
Sample ID: 00-9815-9765	Code: TAM1218.057	Client: Test America Irvine			
Sample Date: 07 Dec-18 10:05	Material: Sample Water	Project: Boeing-SSFL NPDES			
Receipt Date: 07 Dec-18 16:50	Source: Bioassay Report				
Sample Age: 7h (2.5 °C)	Station: Outfall002_20181207_Comp (440-226838-				

Data Transform	Alt Hyp	TST_b	Comparison Result
Untransformed	C*b < T	0.75	100% passed cell density

TST-Welch's t Test								
Control	vs	Control II	Test Stat	Critical	DF	P-Type	P-Value	Decision(α:25%)
Negative Control		100*	15.84	0.6938	13	CDF	<1.0E-37	Non-Significant Effect

Test Acceptability Criteria					
Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06625	<<	0.2	Yes	Passes Criteria
Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.039E+11	2.039E+11	1	37.32	2.7E-05	Significant Effect
Error	7.647E+10	5.462E+09	14			
Total	2.803E+11		15			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Levene Equality of Variance Test	0.06409	8.862	0.8038	Equal Variances	
Variances	Mod Levene Equality of Variance Test	0.1395	8.862	0.7144	Equal Variances	
Variances	Variance Ratio F Test	1.127	8.885	0.8786	Equal Variances	
Distribution	Anderson-Darling A2 Normality Test	0.3204	3.878	0.5537	Normal Distribution	
Distribution	D'Agostino Skewness Test	0.2346	2.576	0.8145	Normal Distribution	
Distribution	Kolmogorov-Smirnov D Test	0.1334	0.2471	0.6809	Normal Distribution	
Distribution	Shapiro-Wilk W Normality Test	0.9547	0.8408	0.5669	Normal Distribution	

Cell Density Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.146E+6	1.044E+6	1.253E+6	2.690E+4	6.62%	0.00%
100		8	1.374E+6	1.314E+6	1.434E+6	1.388E+6	1.243E+6	1.466E+6	2.534E+4	5.21%	-19.66%

Cell Density Detail										
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6	
100		1.466E+6	1.396E+6	1.387E+6	1.449E+6	1.341E+6	1.322E+6	1.243E+6	1.390E+6	



**CETIS Measurement Report**

Report Date: 26 Dec-18 12:14 (p 1 of 2)  
 Test Code: TAM1218.057 | 05-3185-4790

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.								
Batch ID:	04-8722-6794	Test Type:	Cell Growth	Analyst:							
Start Date:	07 Dec-18 17:20	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water						
Ending Date:	11 Dec-18 15:20	Species:	Selenastrum capricornutum	Brine:	Not Applicable						
Duration:	94h	Source:	Aquatic Biosystems, CO	Age:							
Sample ID:	00-9815-9765	Code:	TAM1218.057	Client:	Test America Irvine						
Sample Date:	07 Dec-18 10:05	Material:	Sample Water	Project:	Boeing-SSFL NPDES						
Receipt Date:	07 Dec-18 16:50	Source:	Bioassay Report								
Sample Age:	7h (2.5 °C)	Station:	Outfall002_20181207_Comp (440-226838-								
Alkalinity (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
100		1	75			75	75	0	0	0.0%	0
Overall		2	71.5	27.03	116	68	75	3.5	4.95	6.92%	0 (0%)
Conductivity-µmhos											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	447.2	402.7	491.7	420	493	16.01	35.8	8.01%	0
100		5	297.4	182.8	412	227	400	41.29	92.32	31.04%	0
Overall		10	372.3	298.7	445.9	227	493	32.54	102.9	27.64%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
100		1	100			100	100	0	0	0.0%	0
Overall		2	105	41.47	168.5	100	110	5	7.071	6.73%	0 (0%)
pH-Units											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.56	7.393	7.727	7.4	7.7	0.06	0.1342	1.78%	0
100		5	7.9	7.724	8.076	7.7	8	0.06325	0.1414	1.79%	0
Overall		10	7.73	7.572	7.888	7.4	8	0.07	0.2214	2.86%	0 (0%)
Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
100		5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
Overall		10	25.04	24.93	25.15	24.8	25.2	0.04989	0.1578	0.63%	0 (0%)



**CETIS Measurement Report**

**Report Date:** 26 Dec-18 12:14 (p 2 of 2)  
**Test Code:** TAM1218.057 | 05-3185-4790

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.				
<b>Alkalinity (CaCO3)-mg/L</b>						
<b>Conc-%</b>	<b>Code</b>	<b>1</b>				
0	N	68				
100		75				
<b>Conductivity-µmhos</b>						
<b>Conc-%</b>	<b>Code</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
0	N	420	420	424	479	493
100		227	230	233	397	400
<b>Hardness (CaCO3)-mg/L</b>						
<b>Conc-%</b>	<b>Code</b>	<b>1</b>				
0	N	110				
100		100				
<b>pH-Units</b>						
<b>Conc-%</b>	<b>Code</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
0	N	7.4	7.5	7.5	7.7	7.7
100		8	8	8	7.7	7.8
<b>Temperature-°C</b>						
<b>Conc-%</b>	<b>Code</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
0	N	25.2	25	25	24.8	25.2
100		25.2	25	25	24.8	25.2





CHAIN OF CUSTODY FORM

Client Name/Address: Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Quarterly Outfall [001, 002, 011, 018] Outfall 002 Comp		R	R	R	R	QRSW	QRSW	QRSW	ALY	Temp. deg. C = 22.0 C		
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)		Total Dissolved Metals: (E200.7); Zn (E200.6); Cu, Pb, Cd, Se	Cyanide (SM4500-CN-E /E335.2)	Gross Alpha(E900.0), Gross Beta(E900.0), Tritium (H-3) (E906.0), Sr-90 (E903.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0); K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenastrium (EPA-821-R-02-013)	Total Dissolved Metals: Mercury (E245.1)	Priority Pollutants-Pesticides/PCBs (E608) <i>Chlordane, dieldrin, toxaphene</i>	Total Recoverable Metals: (E200.7); Hardness as CaCO3	Total Dissolved Metals: (E200.7); Hardness as CaCO3	Chlorine (mg/L) = 0.1 NH3 (mg/L) = 0.1 Comments = 0.1
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.		Sampler: <i>Don Smith</i>		Sample Description	Sample I.D.	Sampling Date/Time	Sample Matrix	Container Type	# of Cont.	Preservative	Bottle #	MS/MSD	Notes	
	<i>Outfall 002-20181207_Comp</i>	<i>12-7-18</i>	WM	1 L Poly	1	None	190	No					Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018.	
	<i>Outfall 002-20181207_Comp</i>	<i>12-7-18</i>	WM	500 mL Poly	1	HNO <sub>3</sub>	80	No				X	at OF001,002,011, or 018.	
Outfall 002	Outfall002_20181207_Comp_F	<i>12/7/2018</i> <i>11:05</i>	WM	1L Poly	1	None	200	No	X				Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018.	
			WM	1 L Glass Amber	2	None	250	No			X		Chlordane, DDD, DDE, DDT, dieldrin, PCBs, toxaphene at OF001,002,011, or 018.	
			WM	borosilicate vials	1	None	320	No			X		Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.	
	Outfall002_20181207_Comp	<i>12/7/2018</i> <i>11:05</i>	WM	500 mL Poly	1	NaOH	220	No		X				Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MS/MSD.
WM			2.5 Gal Cube	1	None	225	No			X			Only test if first or second rain events of the year.	
WM			1 L Glass Amber	1	None	230	No				X			

Relinquished By: <i>Don Smith</i> Date/Time: <i>12-7-18/14:35</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Janis Vega</i> Date/Time: <i>12-7-18 14:35</i>	Turn-around time: (Check) 24 Hour: _____ 72 Hour: _____ 10 Day: <input checked="" type="checkbox"/> X _____ 48 Hour: _____ 5 Day: _____ Normal: _____
Relinquished By: <i>Janis Vega</i> Date/Time: <i>12-7-18 16:50</i> Company: _____	Received By: <i>Victor May</i> Date/Time: <i>12-7-18 1650</i>	Sample Integrity: (Check) Intact: _____ On Ice: _____
Relinquished By: _____ Date/Time: _____ Company: _____	Received By: _____ Date/Time: _____	Store samples for 6 months. Data Requirements: (Check) No Level IV: _____ All Level IV: <input checked="" type="checkbox"/> X _____

**CHRONIC SELENASTRUM GROWTH BIOASSAY**

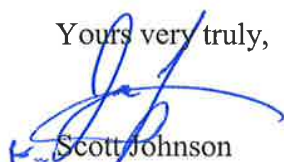
DATE: 6 December - 2018

STANDARD TOXICANT: Cadmium Chloride

NOEC = <10.00 ug/l

IC25 = 67.99 ug/l  
IC50 = >140.00 ug/l

Yours very truly,



Scott Johnson  
Laboratory Director

**CETIS Summary Report**

Report Date: 21 Dec-18 10:17 (p 1 of 1)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Batch ID: 07-4374-8636	Test Type: Cell Growth	Analyst:			
Start Date: 06 Dec-18 13:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water			
Ending Date: 10 Dec-18 12:30	Species: Selenastrum capricornutum	Brine: Not Applicable			
Duration: 95h	Source: Aquatic Biosystems, CO	Age:			
Sample ID: 00-9351-0249	Code: SEL120618	Client: Internal Lab			
Sample Date: 06 Dec-18 13:04	Material: Cadmium chloride	Project:			
Receipt Date:	Source: Reference Toxicant				
Sample Age: n/a	Station: REF TOX				

Multiple Comparison Summary							
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
04-1574-4117	Cell Density	Dunnett Multiple Comparison Test	< 10	10	n/a		8.16%

Point Estimate Summary							
Analysis ID	Endpoint	Point Estimate Method	Level	µg/L	95% LCL	95% UCL	TU ✓
10-0218-2093	Cell Density	Linear Interpolation (ICPIN)	IC5	3.223	1.965	6.094	
			IC10	6.446	3.93	12.18	
			IC15	9.669	5.896	44.85	
			IC20	24.73	0.7599	80.82	
			IC25	67.99	n/a	152.4	
			IC40	>140	n/a	n/a	
			IC50	>140	n/a	n/a	

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-1574-4117	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
10-0218-2093	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
04-1574-4117	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria
10-0218-2093	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

Cell Density Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

Cell Density Detail						
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6	
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6	
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6	
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6	
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5	
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5	



**CETIS Analytical Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID: 04-1574-4117	Endpoint: Cell Density	CETIS Version: CETISv1.9.2			
Analyzed: 21 Dec-18 10:15	Analysis: Parametric-Control vs Treatments	Official Results: Yes			
Batch ID: 07-4374-8636	Test Type: Cell Growth	Analyst:			
Start Date: 06 Dec-18 13:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water			
Ending Date: 10 Dec-18 12:30	Species: Selenastrum capricornutum	Brine: Not Applicable			
Duration: 95h	Source: Aquatic Biosystems, CO	Age:			
Sample ID: 00-9351-0249	Code: SEL120618	Client: Internal Lab			
Sample Date: 06 Dec-18 13:04	Material: Cadmium chloride	Project:			
Receipt Date:	Source: Reference Toxicant				
Sample Age: n/a	Station: REF TOX				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	< 10	10	n/a		8.16%

Dunnett Multiple Comparison Test									
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		10*	4.576	2.407	1E+05	6	CDF	5.5E-04	Significant Effect
		20*	5.785	2.407	1E+05	6	CDF	6.6E-05	Significant Effect
		40*	6.267	2.407	1E+05	6	CDF	4.1E-05	Significant Effect
		80*	7.849	2.407	1E+05	6	CDF	2.8E-05	Significant Effect
		140*	8.856	2.407	1E+05	6	CDF	2.7E-05	Significant Effect

Test Acceptability Criteria					
Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.050E+11	8.101E+10	5	19.41	1.1E-06	Significant Effect
Error	7.511E+10	4.173E+09	18			
Total	4.801E+11		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance Test	8.494	15.09	0.1310	Equal Variances	
Variances	Levene Equality of Variance Test	1.861	4.248	0.1516	Equal Variances	
Variances	Mod Levene Equality of Variance Test	0.8958	4.248	0.5047	Equal Variances	
Distribution	Anderson-Darling A2 Normality Test	0.8885	3.878	0.0231	Normal Distribution	
Distribution	D'Agostino Kurtosis Test	1.662	2.576	0.0964	Normal Distribution	
Distribution	D'Agostino Skewness Test	2.496	2.576	0.0126	Normal Distribution	
Distribution	D'Agostino-Pearson K2 Omnibus Test	8.992	9.21	0.0112	Normal Distribution	
Distribution	Kolmogorov-Smirnov D Test	0.1651	0.2056	0.0895	Normal Distribution	
Distribution	Shapiro-Wilk W Normality Test	0.8988	0.884	0.0203	Normal Distribution	

Cell Density Summary											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.313E+6	1.286E+6	1.477E+6	4.499E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.116E+6	1.109E+6	1.213E+6	2.498E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.046E+6	1.004E+6	1.237E+6	5.363E+4	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.058E+6	1.027E+6	1.102E+6	1.555E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.910E+5	9.510E+5	1.022E+6	1.469E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	9.480E+5	8.980E+5	9.770E+5	1.666E+4	3.53%	30.02%





# CETIS Analytical Report

Report Date: 21 Dec-18 10:17 (p 1 of 2)

Test Code: SEL120618 | 20-7096-1293

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

<b>Analysis ID:</b> 10-0218-2093	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.9.2
<b>Analyzed:</b> 21 Dec-18 10:15	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	3.223	1.965	6.094
IC10	6.446	3.93	12.18
IC15	9.669	5.896	44.85
IC20	24.73	0.7599	80.82
IC25	67.99	n/a	152.4
IC40	>140	n/a	n/a
IC50	>140	n/a	n/a

## Cell Density Summary

Conc-µg/L	Code	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.0%
10		4	1.138E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

## Cell Density Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5

Selenastrum Growth Test

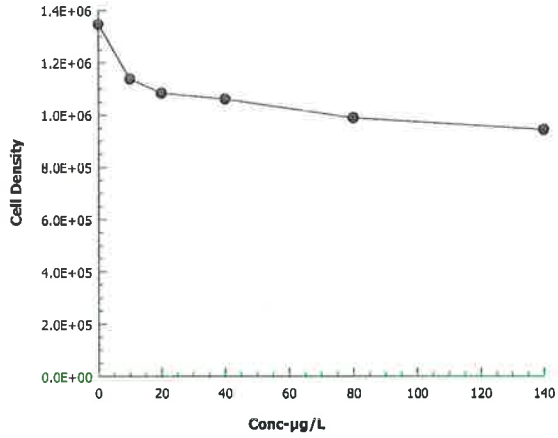
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-0218-2093  
Analyzed: 21 Dec-18 10:15

Endpoint: Cell Density  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2  
Official Results: Yes

Graphics



**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.								
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>									
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water									
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable									
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>									
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab									
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>									
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant										
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX										
Alkalinity (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
10		1	60			60	60	0	0	0.0%	0
20		1	61			61	61	0	0	0.0%	0
40		1	63			63	63	0	0	0.0%	0
80		1	56			56	56	0	0	0.0%	0
140		1	55			55	55	0	0	0.0%	0
Overall		6	60.5	55.5	65.5	55	68	1.945	4.764	7.88%	0 (0%)
Conductivity-µmhos											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	432	399.2	464.8	417	479	11.8	26.39	6.11%	0
10		5	434.4	428.2	440.6	430	443	2.249	5.03	1.16%	0
20		5	424.6	420.2	429	420	428	1.6	3.578	0.84%	0
40		5	410.2	403.7	416.7	405	419	2.354	5.263	1.28%	0
80		5	397	395.5	398.5	395	398	0.5477	1.225	0.31%	0
140		5	378.2	371.2	385.2	373	387	2.518	5.63	1.49%	0
Overall		30	412.7	404.2	421.3	373	479	4.197	22.99	5.57%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
10		1	108			108	108	0	0	0.0%	0
20		1	112			112	112	0	0	0.0%	0
40		1	116			116	116	0	0	0.0%	0
80		1	99			99	99	0	0	0.0%	0
140		1	96			96	96	0	0	0.0%	0
Overall		6	106.8	98.69	115	96	116	3.167	7.757	7.26%	0 (0%)
pH-Units											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.52	7.384	7.656	7.4	7.7	0.04899	0.1095	1.46%	0
10		5	7.6	7.448	7.752	7.5	7.8	0.05477	0.1225	1.61%	0
20		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
40		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
80		5	7.64	7.498	7.782	7.5	7.8	0.05099	0.114	1.49%	0
140		5	7.6	7.476	7.724	7.5	7.7	0.04472	0.1	1.32%	0
Overall		30	7.6	7.562	7.638	7.4	7.8	0.01857	0.1017	1.34%	0 (0%)

**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 2 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test												Aquatic Bioassay & Consulting Labs, Inc.
<b>Temperature-°C</b>												
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count	
0	N	5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
10		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
20		5	24.52	23.87	25.17	24	25.2	0.2332	0.5215	2.13%	0	
40		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
80		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
140		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
Overall		30	24.69	24.52	24.85	24	25.2	0.07947	0.4353	1.76%	0 (0%)	
<b>Alkalinity (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	68										
10		60										
20		61										
40		63										
80		56										
140		55										
<b>Conductivity-µmhos</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	417	420	420	424	479						
10		430	434	432	433	443						
20		420	422	425	428	428						
40		408	409	405	410	419						
80		395	397	398	397	398						
140		373	374	377	380	387						
<b>Hardness (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	110										
10		108										
20		112										
40		116										
80		99										
140		96										
<b>pH-Units</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	7.5	7.4	7.5	7.5	7.7						
10		7.6	7.6	7.5	7.5	7.8						
20		7.7	7.6	7.6	7.5	7.7						
40		7.7	7.6	7.5	7.6	7.7						
80		7.7	7.6	7.5	7.6	7.8						
140		7.7	7.6	7.5	7.5	7.7						
<b>Temperature-°C</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	24.6	25.2	24	25	24.8						
10		24.6	25.2	24	25	24.8						
20		24.6	25.2	24	24	24.8						
40		24.6	25.2	24	25	24.8						
80		24.6	25.2	24	25	24.8						
140		24.6	25.2	24	25	24.8						



## Patel, Urvashi

---

**From:** Miller, Katherine <KMiller@haleyaldrich.com>  
**Sent:** Thursday, December 20, 2018 8:40 AM  
**To:** Patel, Urvashi; Nguyen, Jocelyn  
**Subject:** RE: 440-226838-1

### -External Email-

---

Could you also add dissolved iron? This was not on the COC.

Katherine Miller  
**HALEY & ALDRICH**  
Tel: 520.289.8606

---

**From:** Miller, Katherine  
**Sent:** Wednesday, December 12, 2018 11:05 AM  
**To:** [urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com); Nguyen, Jocelyn <[Jocelyn.Nguyen@testamericainc.com](mailto:Jocelyn.Nguyen@testamericainc.com)>  
**Subject:** 440-226838-1

Urvashi,

440-226838-1 for Outfall002\_20181207\_Comp. COC comment specifies only Fe, not Mn. Please make this change.

Katherine

**Katherine Miller**  
Project Manager

**Haley Aldrich, Inc.**  
600 South Meyer Ave. | Suite 100  
Tucson, AZ 85701

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CHAIN OF CUSTODY FORM

Client Name/Address: Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Quarterly Outfall (001, 002, 011, 018) Outfall 002 Comp		R	R	R	R	QRSW	QRSW	QRSW	ALY	Comments	
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Total Dissolved Metals (E200.7), Zn (E200.8) Cu, Pb, Cd, Se	Cyanide (SM4500-CN-E / E335.2)	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Dissolved Metals Mercury (E245.1)	Priority Pollutants-Pesticides-PCBs (E608) <i>Chlordane, DDE, DDT, Dieldrin, Toxaphene</i>	Total Recoverable Metals (E200.7); Hardness as CaCO3	Total Dissolved Metals (E200.7) Hardness as CaCO3		
Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-19-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)											
Sampler: Dan Smith <i>DS</i>													
Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MSMSD					
	<i>Outfall 002-20181207_Comp_F</i>	<i>12-7-18</i>	WM	1 L Poly	1	None	190	No					Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
	<i>Outfall 002-20181207_Comp</i>	<i>12-7-14</i>	WM	500 mL Poly	1	HNO <sub>3</sub>	80	No					at OF001,002,011, or 018.
Outfall 002	Outfall002_20181207_Comp_F	<i>12/7/2018</i> <i>11:05</i>	WM	1L Poly	1	None	200	No	X				Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
			WM	1 L Glass Amber	2	None	250	No			X		Chlordane, DDE, DDT, Dieldrin, PCBs, toxaphene at OF001,002,011, or 018.
			WM	borosilicate vials	1	None	320	No			X		Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.
	Outfall002_20181207_Comp	<i>12/7/2018</i> <i>11:05</i>	WM	500 mL Poly	1	NaOH	220	No		X			Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MSMSD.
			WM	2.5 Gal Cube	1	None	225	No			X		Only test if first or second rain events of the year
			WM	1 L Glass Amber	1	None	230	No					
			WM	1 Gal Cube	<i>15</i>	None	235	No			X		

Relinquished By: <i>Mark Dominick</i> Date/Time: <i>12-7-18/1435</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12-7-18 14:35</i>	Turn-around time (Check) 24 Hour <input type="checkbox"/> 72 Hour: <input type="checkbox"/> 10 Day <input checked="" type="checkbox"/> 48 Hour <input type="checkbox"/> 5 Day <input type="checkbox"/> Normal <input type="checkbox"/>
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 16:50</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Victor May</i> Date/Time: <i>12-7-18 1650</i>	Sample Integrity (Check) intact <input type="checkbox"/> On Ice <input type="checkbox"/>
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 9:05</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12/7/18 9:05</i>	Store samples for 6 months Data Requirements: (Check) No Level IV <input type="checkbox"/> All Level IV <input checked="" type="checkbox"/>

Page 53 of 60  
12/20/2019 (Rev. 3)





## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226838-1

**Login Number: 226838**

**List Number: 1**

**Creator: Soderblom, Tim**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



THE LEADER IN ENVIRONMENTAL TESTING

Sacramento  
Sample Receiving Notes



Job: 440-226838 Field Sheet

Tracking # 4538 3728 1540

SO (PO) FO / 2-Day / SAT / Ground / UPS / Courier /  
Drop Off / GSO / OnTrac / Goldstreak / USPS / Other

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: \_\_\_\_\_  
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Therm. ID: AK-2 / AK-3 (AK-5) / AK-6 / HACCP / Other \_\_\_\_\_  
(+0.7°C)

Ice  Wet  Gel \_\_\_\_\_ Other \_\_\_\_\_

Cooler Custody Seal: Seal

Sample Custody Seal: \_\_\_\_\_

Cooler ID: \_\_\_\_\_

Temp: Observed 10 Corrected 10

From: Temp Blank  Sample

NCM Filed: Yes  No

	Yes	No	NA
Perchlorate has headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alkalinity has no headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CoC is complete w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample preservatives verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cooler compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample containers have legible labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Containers are not broken or leaking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample date/times are provided.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate containers are used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample bottles are completely filled?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zero headspace?*	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Multiphasic samples are not present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample temp OK?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample out of temp?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Initials: JM Date: 12-11-18

\*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

W22A



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- 1
- 2
- 3
- 4
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- 13
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- 15
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## Patel, Urvashi

---

**From:** Patel, Urvashi  
**Sent:** Wednesday, December 19, 2018 9:42 PM  
**To:** 'Miller, Katherine'; Nguyen, Jocelyn  
**Subject:** RE: TestAmerica Sample Login Confirmation files from 440-226838 Quarterly Outfall 002 Comp

Hi Katherine

I'll try to sum up the issues we discussed over the phone today on this sample. Looks like containers were labeled as Comp instead of Comp\_F so cyanide, pcb Rad and Tox was not logged in for COMP\_F. Containers were received for sample-1 but no NCM was created to note the discrepancy of extra containers received for sample-1. Looking into this further, Beth at ABC confirmed that she already had the samples for outfall 002 COMP as the courier dropped off same day, so we made that analysis within hold time. PCB as been added to sample-1 (past hold) and I'll check on cyanide hold time when I get into work tomorrow. Rad analysis will be added to sample -1 as well. My apologies for not catching the discrepancies after login.

Thanks,  
Urvashi

**URVASHI PATEL**  
Manager of Project Management

**Test America**  
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---

**From:** Miller, Katherine [<mailto:KMiller@haleyaldrich.com>]  
**Sent:** Wednesday, December 19, 2018 1:53 PM  
**To:** Nguyen, Jocelyn; Patel, Urvashi  
**Subject:** RE: TestAmerica Sample Login Confirmation files from 440-226838 Quarterly Outfall 002 Comp  
**Importance:** High

**-External Email-**

---

Where is the cyanide, chronic tox, PCBs, pesticides, and rad for this sample?

Katherine Miller  
**HALEY & ALDRICH**  
Tel: 520.289.8606

**From:** Nguyen, Jocelyn <[jocelyn.nguyen@testamericainc.com](mailto:jocelyn.nguyen@testamericainc.com)>  
**Sent:** Monday, December 10, 2018 12:40 PM  
**To:** Kim Schultz <[kim.schultz@mecx.net](mailto:kim.schultz@mecx.net)>; Miller, Katherine <[KMiller@haleyaldrich.com](mailto:KMiller@haleyaldrich.com)>; Gardiner, Nancy <[NGardiner@haleyaldrich.com](mailto:NGardiner@haleyaldrich.com)>; Urvashi Patel <[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)>  
**Subject:** TestAmerica Sample Login Confirmation files from 440-226838 Quarterly Outfall 002 Comp

Hello,

Attached, please find the Sample Confirmation files for job 440-226838; Quarterly Outfall 002 Comp

The following sample was submitted for analysis; however, it was not listed on the Chain-of-Custody (COC): Outfall002\_20181207\_Comp\_Extra (440-226838-3).

For sample Outfall002\_20181207\_Comp\_F (440-226838-2), only containers for metals were received.

Please feel free to contact me or your PM, Urvashi Patel, if you have any questions.

Thank you.

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: [Project Feedback](#)

**JOCELYN NGUYEN**  
Project Manager Assistant

**TestAmerica Irvine**  
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 949.261,1022

Reference: [487205]  
Attachments: 5

## Patel, Urvashi

---

**From:** Miller, Katherine <KMiller@haleyaldrich.com>  
**Sent:** Thursday, December 20, 2018 8:40 AM  
**To:** Patel, Urvashi; Nguyen, Jocelyn  
**Subject:** RE: 440-226838-1

### -External Email-

---

Could you also add dissolved iron? This was not on the COC.

Katherine Miller  
**HALEY & ALDRICH**  
Tel: 520.289.8606

---

**From:** Miller, Katherine  
**Sent:** Wednesday, December 12, 2018 11:05 AM  
**To:** [urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com); Nguyen, Jocelyn <[Jocelyn.Nguyen@testamericainc.com](mailto:Jocelyn.Nguyen@testamericainc.com)>  
**Subject:** 440-226838-1

Urvashi,

440-226838-1 for Outfall002\_20181207\_Comp. COC comment specifies only Fe, not Mn. Please make this change.

Katherine

**Katherine Miller**  
Project Manager

**Haley Aldrich, Inc.**  
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---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226838-2**

**Prepared for**

Haley & Aldrich, Inc.  
600 South Meyer Avenue, Suite 100  
Tucson, Arizona 85701

**22 January 2019**

MEC<sup>x</sup>, Inc.  
8864 Interchange Drive  
Houston, Texas 77054

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. VARIOUS EPA METHODS —Radionuclides..... 6

    III.1. Holding Times:..... 6

    III.2. Calibration: ..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks..... 6

        III.3.2. Laboratory Control Samples: ..... 6

        III.3.3. Laboratory Duplicates:..... 6

        III.3.4. Matrix Spike/Matrix Spike Duplicate: ..... 6

    III.4. Sample Result Verification:..... 6

    III.5. Field QC Samples: ..... 6

        III.5.1. Field Blanks and Equipment Blanks: ..... 7

        III.5.2. Field Duplicates:..... 7

TABLES

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>x</sup> Project No.:** 1272.003H.01

**Sample Delivery Group:** 440-226838-2

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** III

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall002_20181207 _Comp	440-226838-1	N/A	Water	12/07/2018 10:05	E900, E901.1, E903.0, E904.0, E905.0, E906.0, HASL-300 U Mod



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt forms and the chains-of-custody (COCs) provided by the laboratories for sample delivery group (SDG) 440-226838-2:

- The laboratories received the sample in this SDG on ice and within the temperature limits of  $\leq 6$  degrees Celsius ( $^{\circ}\text{C}$ ) and  $> 0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- Some corrections to the original COCs were not initialed or dated. The corrections did not affect data quality.
- Sample containers were transferred to TestAmerica – St. Louis laboratory for all radionuclide analyses.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.





### III. VARIOUS EPA METHODS — RADIONUCLIDES

---

E. Wessling of MECX reviewed the SDGs on January 22, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the *EPA Methods 900, 901.1, 903.0, 904.0, 905.0, 906.0 and HASL-300 U Mod*, and the *National Functional Guidelines for Inorganic Data Review* (2014).

#### III.1. HOLDING TIMES:

The sample was received unpreserved. The sample was acidified and allowed to equilibrate. The sample was prepared within five days of preservation and analyzed following in-growth.

#### III.2. CALIBRATION:

The detector efficiency for gross alpha was less than 20%; therefore, the detected result for gross alpha was qualified as estimated (J-) with a potential negative bias. All other detector efficiencies were greater than 20% and no further qualifications were required. Carrier/tracer recoveries were within the laboratory control limits. Calibration checks were not verified at a Level III validation.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

Target isotopes were not detected in the method blanks above the MDA. However, a comparison normalized absolute difference of the sample results and the method blank results indicated the method blank and the sample results were not significantly different at the 1% level of confidence for radium-226 and radium-228. The detected sample results for radium-226 and radium-228 were qualified as nondetect (U). No further qualifications were required.

##### III.3.2. LABORATORY CONTROL SAMPLES:

The recoveries and RPDs were within laboratory-established control limits.

##### III.3.3. LABORATORY DUPLICATES:

Laboratory duplicates were performed for cesium-137 and potassium-40 for sample Outfall002\_20181207\_Comp. Both the sample and duplicate results were nondetect.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE:

Matrix spike (MS)/MSD analyses were not performed on the sample in this SDG.

#### III.4. SAMPLE RESULT VERIFICATION:

An EPA Level III review was performed on the sample in this data package. As such, the sample results were not verified. Reported nondetects are valid to the MDC.

#### III.5. FIELD QC SAMPLES:

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. The following are findings associated with field QC samples:



III.5.1. **FIELD BLANKS AND EQUIPMENT BLANKS:**

This SDG had no identified field blank or equipment blank samples.

III.5.2. **FIELD DUPLICATES:**

There were no field duplicate samples identified for this SDG.

# Validated Sample Result Forms: 4402268382

## Analysis Method E900

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Gross Alpha Analytes	GROSSALPHA	22.3	5.45	3.00	3.52	pCi/L	G	J-	*III
Gross Beta Analytes	GROSSBETA	16.7	2.89	4.00	2.15	pCi/L			

## Analysis Method E901.1

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cesium-137	10045-97-3	3.14	7.71	20.0	13.3	pCi/L	U	U	
Potassium-40	13966-00-2	83.1	91.9	139	139	pCi/L	U	U	

## Analysis Method E903.0

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226	13982-63-3	0.262	0.165	1.00	0.212	pCi/L		U	B

## Analysis Method E904.0

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-228	15262-20-1	1.36	0.699	1.00	1.02	pCi/L	G	U	B

*Analysis Method E905.0*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Strontium-90	10098-97-2	0.453	0.804	3.00	1.36	pCi/L	U	U	

*Analysis Method E906.0*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Tritium	10028-17-8	-53.2	166	500	302	pCi/L	U	U	

*Analysis Method HASL-300 U Mod*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Uranium	URANIUM	1.25	1.30	1.00	1.61	pCi/L	U G	U	

*Analysis Method RADIUM*

Sample Name OUTFALL002\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 10:05:00 AM Validation Level: 9

Lab Sample Name: 440-226838-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226 & 228	RADIUM226228	1.36	0.707276					U	B

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226838-2

Client Project/Site: Quarterly Outfall 002 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/16/2019 6:43:59 PM

Urvashi Patel, Manager of Project Management

(949)261-1022

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### LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
1/16/2019 6:43:59 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	7
Method Summary . . . . .	9
Lab Chronicle . . . . .	10
QC Sample Results . . . . .	11
QC Association Summary . . . . .	18
Definitions/Glossary . . . . .	20
Certification Summary . . . . .	21
Chain of Custody . . . . .	22
Receipt Checklists . . . . .	25
Tracer Carrier Summary . . . . .	27
Field Data Sheets . . . . .	29

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226838-1	Outfall002_20181207_Comp	Water	12/07/18 10:05	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

**Job ID: 440-226838-2**

**Laboratory: TestAmerica Irvine**

## Narrative

### Job Narrative 440-226838-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6° C and 2.9° C.

#### Receipt Exceptions

Outfall002\_20181207\_Comp\_F (440-226838-2)-Received only containers for metals

#### RAD

Method(s) 900.0: Gross Alpha/Beta Prep Batch 160-407614

The gross alpha detection goal was not met for the following samples due to a reduction of the sample size attributed to high residual mass: Outfall002\_20181207\_Comp (440-226838-1). Analytical results are reported with the detection limit achieved.

Method(s) 904.0: Ra-228 Prep Batch 160-406940

The following sample did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences (see prep NCM 160-157304). The sample was reduced due to black sediment. The data have been reported with this narrative.

Outfall002\_20181207\_Comp (440-226838-1)

Method(s) A-01-R: Uranium Prep Batch: 160-407549

The uranium detection goals were not met for the following samples due to the reduced aliquot required from the presence of matrix interferences (see prep non-conformance memo: 160-157518): Outfall002\_20181207\_Comp (440-226838-1) and (MB 160-407549/1-A). Analytical results are reported with the detection limit achieved.

Method(s) ExtChrom: Uranium Prep Batch 160-407549:

Sample Outfall002\_20181207\_Comp (440-226838-1) was prepped at a lower aliquot due to dark brown discoloration.

Method(s) ExtChrom: Uranium Prep Batch 160-407549:

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following sample: Outfall002\_20181207\_Comp (440-226838-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep\_0: Radium-228 Prep Batch 406940:

The following samples were prepared at a reduced aliquot due to black sediment: 480-146991-5, 480-146991-6, 440-226838-1.  
The following samples were prepared at a reduced aliquot due to yellow discoloration and sulfurous odor 500-156400-1, 500-155886-19.  
Outfall002\_20181207\_Comp (440-226838-1)

Method(s) PrecSep-21: Radium-226 Prep Batch 406929:

The following samples were prepared at a reduced aliquot due to limited volume and sediment: 480-146991-3, 480-146991-4.  
The following samples were prepared at a reduced aliquot due to black sediment: 480-146991-5, 480-146991-6, 440-226838-1.

## Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

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### Job ID: 440-226838-2 (Continued)

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#### Laboratory: TestAmerica Irvine (Continued)

The following samples were prepared at a reduced aliquot due to yellow discoloration and sulfurous odor 500-156400-1, 500-155886-19.

Method(s) PrecSep-7: Strontium-89 Prep Batch 407602:

The following sample was prepared at a reduced aliquot due to sediment :

Outfall002\_20181207\_Comp (440-226838-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

Date Collected: 12/07/18 10:05

Matrix: Water

Date Received: 12/07/18 21:05

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	22.3	G	4.82	5.45	3.00	3.52	pCi/L	12/27/18 10:23	12/31/18 09:31	1
Gross Beta	16.7		2.35	2.89	4.00	2.15	pCi/L	12/27/18 10:23	12/31/18 09:31	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	3.14	U	7.70	7.71	20.0	13.3	pCi/L	12/20/18 15:43	12/21/18 07:37	1
Potassium-40	83.1	U	91.6	91.9		139	pCi/L	12/20/18 15:43	12/21/18 07:37	1

## Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.262		0.164	0.165	1.00	0.212	pCi/L	12/21/18 08:51	01/14/19 05:33	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	76.1		40 - 110					12/21/18 08:51	01/14/19 05:33	1

## Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.36	G	0.688	0.699	1.00	1.02	pCi/L	12/21/18 09:53	01/03/19 11:27	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	76.1		40 - 110					12/21/18 09:53	01/03/19 11:27	1
Y Carrier	89.3		40 - 110					12/21/18 09:53	01/03/19 11:27	1

## Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.453	U	0.803	0.804	3.00	1.36	pCi/L	12/27/18 08:51	01/08/19 11:41	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Sr Carrier	83.4		40 - 110					12/27/18 08:51	01/08/19 11:41	1
Y Carrier	90.8		40 - 110					12/27/18 08:51	01/08/19 11:41	1

## Method: 906.0 - Tritium, Total (LSC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	-53.2	U	166	166	500	302	pCi/L	01/14/19 14:15	01/15/19 05:55	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Uranium	1.25	U G	1.30	1.30	1.00	1.61	pCi/L	12/26/18 11:53	12/27/18 21:59	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	75.9		30 - 110					12/26/18 11:53	12/27/18 21:59	1



# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Cesium 137 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
905	Strontium-90 (GFPC)	EPA	TAL SL
906.0	Tritium, Total (LSC)	EPA	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Evaporation	Preparation, Evaporation	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-0	Fill Geometry, No In-Growth	None	TAL SL
LSC_Dist_Susp	Distillation and Suspension (LSC)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL
PrecSep-7	Preparation, Precipitate Separation (7-Day In-Growth)	None	TAL SL

#### Protocol References:

DOE = U.S. Department of Energy  
EPA = US Environmental Protection Agency  
None = None

#### Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Evaporation			105 mL	1.0 g	407614	12/27/18 10:23	MRB	TAL SL
Total/NA	Analysis	900.0		1			408319	12/31/18 09:31	KLS	TAL SL
Total/NA	Prep	Fill_Geo-0			1000 mL	1.0 mL	406889	12/20/18 15:43	PK	TAL SL
Total/NA	Analysis	901.1		1			406923	12/21/18 07:37	KLS	TAL SL
Total/NA	Prep	PrecSep-21			500.20 mL	1.0 g	406929	12/21/18 08:51	HET	TAL SL
Total/NA	Analysis	903.0		1	1.0 mL	1.0 mL	410437	01/14/19 05:33	KLS	TAL SL
Total/NA	Prep	PrecSep_0			500.20 mL	1.0 g	406940	12/21/18 09:53	HET	TAL SL
Total/NA	Analysis	904.0		1			408907	01/03/19 11:27	CDR	TAL SL
Total/NA	Prep	PrecSep-7			249.98 mL	1.0 g	407602	12/27/18 08:51	MMO	TAL SL
Total/NA	Analysis	905		1			409328	01/08/19 11:41	CDR	TAL SL
Total/NA	Prep	LSC_Dist_Susp			100.3 mL	1.0 g	410502	01/14/19 14:15	JDL	TAL SL
Total/NA	Analysis	906.0		1			410707	01/15/19 05:55	RTM	TAL SL
Total/NA	Prep	ExtChrom			50.14 mL	1.0 mL	407549	12/26/18 11:53	KNF	TAL SL
Total/NA	Analysis	A-01-R		1			408013	12/27/18 21:59	ALS	TAL SL

**Laboratory References:**

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

**Lab Sample ID: MB 160-407614/1-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	0.6321	U	0.677	0.680	3.00	1.10	pCi/L	12/27/18 10:23	12/31/18 09:20	1
Gross Beta	-0.1631	U	0.514	0.514	4.00	0.930	pCi/L	12/27/18 10:23	12/31/18 09:20	1

**Lab Sample ID: LCS 160-407614/2-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Gross Alpha	50.9	46.07		6.69	3.00	1.74	pCi/L	90	73 - 133

**Lab Sample ID: LCSB 160-407614/3-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCSB Result	LCSB Qual	Total	RL	MDC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Gross Beta	87.1	86.97		9.22	4.00	0.929	pCi/L	100	75 - 125

**Lab Sample ID: 440-226822-J-1-G MS**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total	RL	MDC	Unit	%Rec	%Rec.
						Uncert. (2σ+/-)					Limits
Gross Alpha	1.10	U	50.9	38.18		5.35	3.00	1.02	pCi/L	73	60 - 140

**Lab Sample ID: 440-226822-J-1-H MSD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total	RL	MDC	Unit	%Rec	%Rec.	RER	Limit
						Uncert. (2σ+/-)					Limits	RER	Limit
Gross Alpha	1.10	U	50.9	46.14		6.30	3.00	1.16	pCi/L	88	60 - 140	0.68	1

**Lab Sample ID: 440-226822-J-1-I MSBT**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBT Result	MSBT Qual	Total	RL	MDC	Unit	%Rec	%Rec.
						Uncert. (2σ+/-)					Limits
Gross Beta	2.28		87.1	88.52		9.38	4.00	1.06	pCi/L	99	60 - 140

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity (Continued)

**Lab Sample ID: 440-226822-J-1-J MSBTD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBTD Result	MSBTD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Gross Beta	2.28		87.1	87.44		9.26	4.00	1.04	pCi/L	98	60 - 140	0.06	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

**Lab Sample ID: MB 160-406889/1-A**  
**Matrix: Water**  
**Analysis Batch: 406921**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 406889**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Count Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	2.771	U	6.70	6.70	20.0	11.8	pCi/L	12/20/18 15:43	12/21/18 07:34	1
Potassium-40	-64.27	U	127	127		176	pCi/L	12/20/18 15:43	12/21/18 07:34	1

**Lab Sample ID: LCS 160-406889/2-A**  
**Matrix: Water**  
**Analysis Batch: 406922**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 406889**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	136000	130600		15100		388	pCi/L	96	90 - 111
Cesium-137	45100	42570		4270	20.0	163	pCi/L	94	90 - 111
Cobalt-60	31200	30030		2970		67.2	pCi/L	96	89 - 110

**Lab Sample ID: 440-226838-1 DU**  
**Matrix: Water**  
**Analysis Batch: 406921**

**Client Sample ID: Outfall002\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 406889**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	RER	RER Limit
Cesium-137	3.14	U	-6.196	U	11.1	20.0	18.7	pCi/L		0.50	1
Potassium-40	83.1	U	-79.91	U	214		208	pCi/L		0.53	1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-406929/19-A**  
**Matrix: Water**  
**Analysis Batch: 410438**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 406929**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Count Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01274	U	0.0378	0.0378	1.00	0.0732	pCi/L	12/21/18 08:51	01/14/19 05:38	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110	12/21/18 08:51	01/14/19 05:38	1

TestAmerica Irvine



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 903.0 - Radium-226 (GFPC) (Continued)

**Lab Sample ID: LCS 160-406929/1-A**  
**Matrix: Water**  
**Analysis Batch: 410437**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 406929**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.22		1.04	1.00	0.0809	pCi/L	90	68 - 137
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	103		40 - 110						

**Lab Sample ID: 480-146991-E-2-B MSD**  
**Matrix: Water**  
**Analysis Batch: 410437**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 406929**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	0.528		11.3	9.289		0.966	1.00	0.0803	pCi/L	77	75 - 138	0.10	1
<b>Carrier</b>	<b>MSD %Yield</b>	<b>MSD Qualifier</b>	<b>Limits</b>										
Ba Carrier	101		40 - 110										

**Lab Sample ID: 480-146991-F-2-D MS**  
**Matrix: Water**  
**Analysis Batch: 410437**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 406929**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	0.528		11.4	9.492		0.998	1.00	0.103	pCi/L	79	75 - 138
<b>Carrier</b>	<b>MS %Yield</b>	<b>MS Qualifier</b>	<b>Limits</b>								
Ba Carrier	88.5		40 - 110								

**Lab Sample ID: 500-155886-D-19-B DU**  
**Matrix: Water**  
**Analysis Batch: 410437**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 406929**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.293		0.1566		0.112	1.00	0.153	pCi/L	0.56	1
<b>Carrier</b>	<b>DU %Yield</b>	<b>DU Qualifier</b>	<b>Limits</b>							
Ba Carrier	69.9		40 - 110							

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-406940/19-A**  
**Matrix: Water**  
**Analysis Batch: 408718**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 406940**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2976		0.193	0.195	1.00	0.292	pCi/L	12/21/18 09:53	01/03/19 11:33	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110	12/21/18 09:53	01/03/19 11:33	1
Y Carrier	86.7		40 - 110	12/21/18 09:53	01/03/19 11:33	1

**Lab Sample ID: LCS 160-406940/1-A**  
**Matrix: Water**  
**Analysis Batch: 408907**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 406940**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.07	8.109		0.973	1.00	0.442	pCi/L	89	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	103		40 - 110
Y Carrier	86.4		40 - 110

**Lab Sample ID: 480-146991-E-2-C MSD**  
**Matrix: Water**  
**Analysis Batch: 408907**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 406940**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	0.668		9.06	9.087		1.05	1.00	0.344	pCi/L	93	45 - 150	0.28	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Ba Carrier	101		40 - 110
Y Carrier	89.7		40 - 110

**Lab Sample ID: 480-146991-F-2-F MS**  
**Matrix: Water**  
**Analysis Batch: 408907**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 406940**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	0.668		9.06	9.689		1.14	1.00	0.416	pCi/L	100	45 - 150

Carrier	MS %Yield	MS Qualifier	Limits
Ba Carrier	88.5		40 - 110
Y Carrier	91.2		40 - 110

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: 500-155886-D-19-C DU**  
**Matrix: Water**  
**Analysis Batch: 408718**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 406940**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.635		0.4161	U	0.432	1.00	0.701	pCi/L	0.27	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	69.9		40 - 110
Y Carrier	84.5		40 - 110

## Method: 905 - Strontium-90 (GFPC)

**Lab Sample ID: MB 160-407602/16-A**  
**Matrix: Water**  
**Analysis Batch: 409573**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 407602**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.3319		0.164	0.166	3.00	0.238	pCi/L	12/27/18 08:51	01/08/19 11:51	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Sr Carrier	89.1		40 - 110	12/27/18 08:51	01/08/19 11:51	1
Y Carrier	96.1		40 - 110	12/27/18 08:51	01/08/19 11:51	1

**Lab Sample ID: LCS 160-407602/1-A**  
**Matrix: Water**  
**Analysis Batch: 409328**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407602**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Strontium-90	8.13	9.019		0.933	3.00	0.346	pCi/L	111	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Sr Carrier	90.6		40 - 110
Y Carrier	87.1		40 - 110

**Lab Sample ID: LCSD 160-407602/2-A**  
**Matrix: Water**  
**Analysis Batch: 409328**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 407602**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Strontium-90	8.13	8.318		0.858	3.00	0.280	pCi/L	102	75 - 125	0.39	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Sr Carrier	90.3		40 - 110
Y Carrier	93.5		40 - 110

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 906.0 - Tritium, Total (LSC)

**Lab Sample ID: MB 160-410502/1-A**  
**Matrix: Water**  
**Analysis Batch: 410707**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 410502**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	85.59	U	183	183	500	314	pCi/L	01/14/19 14:15	01/14/19 22:00	1

**Lab Sample ID: LCS 160-410502/2-A**  
**Matrix: Water**  
**Analysis Batch: 410707**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 410502**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	2650	2545		399	500	302	pCi/L	96	74 - 114

**Lab Sample ID: 160-32599-B-11-B MS**  
**Matrix: Water**  
**Analysis Batch: 410707**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 410502**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	121000		2650	127500		11400	500	314	pCi/L	255	67 - 130

**Lab Sample ID: 160-32599-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 410707**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 410502**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Tritium	-38.7	U	-58.11	U	163	500	298	pCi/L	0.06	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

**Lab Sample ID: MB 160-407549/1-A**  
**Matrix: Water**  
**Analysis Batch: 408062**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 407549**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Uranium	1.284	U G	1.53	1.53	1.00	1.81	pCi/L	12/26/18 11:53	12/27/18 21:58	1
Tracer	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	97.4		30 - 110					12/26/18 11:53	12/27/18 21:58	1

**Lab Sample ID: LCS 160-407549/2-A**  
**Matrix: Water**  
**Analysis Batch: 407982**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407549**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Uranium-234	127	125.8		15.9	1.00	1.89	pCi/L	99	75 - 125
Uranium-238	130	146.5		17.7	1.00	1.70	pCi/L	112	75 - 125

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCS 160-407549/2-A  
 Matrix: Water  
 Analysis Batch: 407982

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 407549

Tracer	LCS %Yield	LCS Qualifier	Limits
Uranium-232	76.7		30 - 110

Lab Sample ID: LCSD 160-407549/3-A  
 Matrix: Water  
 Analysis Batch: 407994

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 407549

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Uranium-234	127	125.7		15.4	1.00	1.43	pCi/L	99	75 - 125	0	1
Uranium-238	130	127.4		15.6	1.00	1.54	pCi/L	98	75 - 125	0.57	1

Tracer	LCSD %Yield	LCSD Qualifier	Limits
Uranium-232	71.6		30 - 110

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Rad

### Prep Batch: 406889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	Fill_Geo-0	
MB 160-406889/1-A	Method Blank	Total/NA	Water	Fill_Geo-0	
LCS 160-406889/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-0	
440-226838-1 DU	Outfall002_20181207_Comp	Total/NA	Water	Fill_Geo-0	

### Prep Batch: 406929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	PrecSep-21	
MB 160-406929/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-406929/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
480-146991-E-2-B MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep-21	
480-146991-F-2-D MS	Matrix Spike	Total/NA	Water	PrecSep-21	
500-155886-D-19-B DU	Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 406940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	PrecSep_0	
MB 160-406940/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-406940/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
480-146991-E-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep_0	
480-146991-F-2-F MS	Matrix Spike	Total/NA	Water	PrecSep_0	
500-155886-D-19-C DU	Duplicate	Total/NA	Water	PrecSep_0	

### Prep Batch: 407549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	ExtChrom	
MB 160-407549/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-407549/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
LCSD 160-407549/3-A	Lab Control Sample Dup	Total/NA	Water	ExtChrom	

### Prep Batch: 407602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	PrecSep-7	
MB 160-407602/16-A	Method Blank	Total/NA	Water	PrecSep-7	
LCS 160-407602/1-A	Lab Control Sample	Total/NA	Water	PrecSep-7	
LCSD 160-407602/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-7	

### Prep Batch: 407614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	Evaporation	
MB 160-407614/1-A	Method Blank	Total/NA	Water	Evaporation	
LCS 160-407614/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-407614/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
440-226822-J-1-G MS	Matrix Spike	Total/NA	Water	Evaporation	
440-226822-J-1-H MSD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	
440-226822-J-1-I MSBT	Matrix Spike	Total/NA	Water	Evaporation	
440-226822-J-1-J MSBTD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	

### Prep Batch: 410502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	LSC_Dist_Susp	

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Rad (Continued)

### Prep Batch: 410502 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-410502/1-A	Method Blank	Total/NA	Water	LSC_Dist_Susp	
LCS 160-410502/2-A	Lab Control Sample	Total/NA	Water	LSC_Dist_Susp	
160-32599-B-11-B MS	Matrix Spike	Total/NA	Water	LSC_Dist_Susp	
160-32599-B-1-B DU	Duplicate	Total/NA	Water	LSC_Dist_Susp	

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# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
G	The Sample MDC is greater than the requested RL.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	90125	12-31-18 *
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19 *
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.



CHAIN OF CUSTODY FORM

Client Name/Address: Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Quarterly Outfall (001, 002, 011, 018) Outfall 002 Comp		R	R	R	R	QRSW	QRSW	QRSW	ALY	Comments	
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Total Dissolved Metals (E200.7), Zn (E200.8) Cu, Pb, Cd, Se	Cyanide (SM4500-CN-E / E335.2)	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Dissolved Metals Mercury (E245.1)	Priority Pollutants-Pesticides-PCBs (E608) <i>Chlordane, DDE, DDT, dieldrin, toxaphene</i>	Total Recoverable Metals (E200.7); Hardness as CaCO3	Total Dissolved Metals (E200.7) Hardness as CaCO3		
Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreements 2015-19-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)											
Sampler: Dan Smith <i>DS</i>													
Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MSMSD					
	<i>Outfall 002 - 2018-2019 Comp</i>	<i>12-7-18</i>	WM	1 L Poly	1	None	190	No					Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
	<i>Outfall 002 - 2018-2019 Comp</i>	<i>12-7-14</i>	WM	500 mL Poly	1	HNO <sub>3</sub>	80	No					at OF001,002,011, or 018.
Outfall 002	Outfall002_20181207_Comp_F	<i>12/7/2018 / 11:05</i>	WM	1L Poly	1	None	200	No	X				Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
			WM	1 L Glass Amber	2	None	250	No			X		Chlordane, DDE, DDT, dieldrin, PCBs, toxaphene at OF001,002,011, or 018.
			WM	borosilicate vials	1	None	320	No			X		Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.
	Outfall002_20181207_Comp	<i>12/7/2018 / 11:05</i>	WM	500 mL Poly	1	NaOH	220	No		X			Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MSMSD.
			WM	2.5 Gal Cube	1	None	225	No			X		Only test if first or second rain events of the year
			WM	1 L Glass Amber	1	None	230	No					
			WM	1 Gal Cube	<i>15</i>	None	235	No			X		

Relinquished By: <i>Mark Dominick</i> Date/Time: <i>12-7-18/1435</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12-7-18 14:35</i>	Turn-around time (Check) 24 Hour <input type="checkbox"/> 72 Hour: <input type="checkbox"/> 10 Day <input checked="" type="checkbox"/> 48 Hour <input type="checkbox"/> 5 Day <input type="checkbox"/> Normal <input type="checkbox"/>
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 16:50</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Victor May</i> Date/Time: <i>12-7-18 1650</i>	Sample Integrity (Check) intact <input type="checkbox"/> On Ice <input type="checkbox"/>
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 9:05</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12/7/18 9:05</i>	Store samples for 6 months Data Requirements: (Check) No Level IV <input type="checkbox"/> All Level IV <input checked="" type="checkbox"/>

Page 23 of 29  
12/16/2019







# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226838-2

**Login Number: 226838**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226838-2

**Login Number: 226838**

**List Number: 3**

**Creator: Hellm, Michael**

**List Source: TestAmerica St. Louis**

**List Creation: 12/20/18 12:36 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
440-226838-1	Outfall002_20181207_Comp	76.1	
480-146991-E-2-B MSD	Matrix Spike Duplicate	101	
480-146991-F-2-D MS	Matrix Spike	88.5	
500-155886-D-19-B DU	Duplicate	69.9	
LCS 160-406929/1-A	Lab Control Sample	103	
MB 160-406929/19-A	Method Blank	108	
<b>Tracer/Carrier Legend</b>			
Ba Carrier = Ba Carrier			

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
440-226838-1	Outfall002_20181207_Comp	76.1	89.3
480-146991-E-2-C MSD	Matrix Spike Duplicate	101	89.7
480-146991-F-2-F MS	Matrix Spike	88.5	91.2
500-155886-D-19-C DU	Duplicate	69.9	84.5
LCS 160-406940/1-A	Lab Control Sample	103	86.4
MB 160-406940/19-A	Method Blank	108	86.7
<b>Tracer/Carrier Legend</b>			
Ba Carrier = Ba Carrier			
Y Carrier = Y Carrier			

## Method: 905 - Strontium-90 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Sr Carrier (40-110)	Y Carrier (40-110)
440-226838-1	Outfall002_20181207_Comp	83.4	90.8
LCS 160-407602/1-A	Lab Control Sample	90.6	87.1
LCSD 160-407602/2-A	Lab Control Sample Dup	90.3	93.5
MB 160-407602/16-A	Method Blank	89.1	96.1
<b>Tracer/Carrier Legend</b>			
Sr Carrier = Sr Carrier			
Y Carrier = Y Carrier			

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	uranium-23 (30-110)	
440-226838-1	Outfall002_20181207_Comp	75.9	
LCS 160-407549/2-A	Lab Control Sample	76.7	

TestAmerica Irvine

# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-2

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	uranium-23 (30-110)
LCSD 160-407549/3-A	Lab Control Sample Dup	71.6
MB 160-407549/1-A	Method Blank	97.4

### Tracer/Carrier Legend

Uranium-232 = Uranium-232

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15





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Sacramento  
Sample Receiving Notes



Job: 440-226838 Field Sheet

Tracking # 4538 3728 1540

SO (PO) FO / 2-Day / SAT / Ground / UPS / Courier /  
Drop Off / GSO / OnTrac / Goldstreak / USPS / Other \_\_\_\_\_

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: \_\_\_\_\_

Therm. ID: AK-2 / AK-3 (AK-5) / AK-6 / HACCP / Other \_\_\_\_\_  
(+0.7°C)

Ice  Wet  Gel \_\_\_\_\_ Other \_\_\_\_\_

Cooler Custody Seal: Seal

Sample Custody Seal: \_\_\_\_\_

Cooler ID: \_\_\_\_\_

Temp: Observed 10 Corrected 10

From: Temp Blank  Sample

NCM Filed: Yes  No

	Yes	No	NA
Perchlorate has headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alkalinity has no headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CoC is complete w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample preservatives verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cooler compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample containers have legible labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Containers are not broken or leaking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample date/times are provided.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate containers are used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample bottles are completely filled?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zero headspace?*	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Multiphasic samples are not present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample temp OK?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample out of temp?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Initials: JM Date: 12-11-18

\*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

W22A

---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226838-3**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**14 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





**TABLE OF CONTENTS**

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. EPA METHOD 1613B — Dioxin/Furans..... 6

    III.1. Holding Times ..... 6

    III.2. Instrument Performance ..... 6

        III.2.1. GC Column Performance ..... 6

        III.2.2. Mass Spectrometer Performance..... 6

    III.3. Calibration..... 6

    III.4. Quality Control Samples ..... 6

        III.4.1. Method Blanks ..... 6

        III.4.2. Laboratory Control Samples ..... 7

    III.5. Field QC Samples..... 7

        III.5.1. Field Blanks and Equipment Blanks ..... 7

        III.5.2. Field Duplicates..... 7

    III.6. Internal Standards Performance..... 7

    III.7. Compound Identification..... 7

    III.8. Compound Quantification and Reported Detection Limits ..... 7

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>X</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226838-3

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall002_20181207_ Comp	440-226838-1	N/A	Water	12/07/2018 10:05 AM	E1613B



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226838-3:

- The laboratory received the sample in this SDG on ice and within the temperature limits of <6 degrees Celsius ( $^{\circ}\text{C}$ ) and  $>0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the original and transfer COCs.
- The transfer COC to TA-West Sacramento noted custody seals were present and intact on the cooler.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.





### III. EPA METHOD 1613B — DIOXIN/FURANS

---

L. Calvin of MEC<sup>X</sup> reviewed the SDG on January 14, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Dioxins and Furans* (DVP-19, Rev. 0), *USEPA Method 1613B*, and the *National Functional Guidelines Chlorinated Dioxin/Furan Data Review* (2011).

#### III.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted and analyzed within one year of collection.

#### III.2. INSTRUMENT PERFORMANCE

Instrument performance criteria were met. Following are findings associated with instrument performance:

##### III.2.1. GC COLUMN PERFORMANCE

A Windows Defining Mix (WDM) containing the first and last eluting congeners of each descriptor and isomer specificity compounds was analyzed prior to the initial calibration sequence and at the beginning of each analytical sequence. The GC column performance in the calibrations was acceptable, with the height of the valley between the closely eluting isomers and 2,3,7,8-TCDD reported as <25%.

##### III.2.2. MASS SPECTROMETER PERFORMANCE

The mass spectrometer performance was acceptable with the static resolving power >10,000.

#### III.3. CALIBRATION

Calibration criteria were met. The initial calibration was acceptable with %RSDs  $\leq 20\%$  for the 15 native compounds (calibration by isotope dilution) and  $\leq 35\%$  for the two native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the Method 1613B control limits for all standards.

Continuing Calibration: Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of the analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in Table 6 of EPA Method 1613B. The ion abundance ratios and relative retention times were within the method control limits.

#### III.4. QUALITY CONTROL SAMPLES

##### III.4.1. METHOD BLANKS

The method blank had detects above the EDL and below the reporting limit (RL) for isomers 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,7,8-TCDF, OCDD, and OCDF, and for totals TCDF, HpCDD, HpCDF, HxCDD, and HxCDF. Isomer results for the method blank contaminants detected below the RL were qualified as nondetects (U) at the level of contamination based upon professional judgement and the guidance for blank qualification in the National Functional Guidelines for Dioxin Review. Results for totals



HpCDD, HpCDF, HxCDD, HxCDF, and TCDF were qualified as estimated (J) as they contained one or more peaks not present in the method blank.

#### III.4.2. **LABORATORY CONTROL SAMPLES**

Recoveries were within the acceptance criteria listed in Table 6 of Method 1613B, and RPDs were within the laboratory control limit of  $\leq 50\%$ .

#### III.5. **FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### III.5.1. **FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### III.5.2. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

#### III.6. **INTERNAL STANDARDS PERFORMANCE**

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613B.

#### III.7. **COMPOUND IDENTIFICATION**

Compound identification was verified. Detected compounds met the ion abundance ratio, retention time window and signal-to-noise ratio criteria for identification. The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613B. Isomer 2,3,7,8-TCDF was detected in the initial analysis of the sample; however, the detect was not confirmed by second-column analysis. Both initial and confirmation analyses were reported. As the confirmation column is more specific for the detection of 2,3,7,8-TCDF, the initial result was rejected (R) in favor of the nondetect confirmation result.

#### III.8. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantitation was verified by recalculating a representative number of sample results. The laboratory calculated and reported compound-specific detection limits. Detects between the EDL and the RL were qualified as estimated (J) and coded with DNQ to comply with the NPDES permit. Nondetects are valid to the EDL. Per client request, results below the EDL meeting retention time and signal to noise (S/N) criteria were to be reported; however, this sample had no reported detects below the EDL.

The isomers reported as EMPCs were all previously qualified as nondetects for method blank contamination and were not further qualified as EMPCs. Totals HpcDF, HxCDD, HxCDF, and TCDF contained both EMPC peaks and non-EMPC peaks, and were qualified as estimated (J).

# Validated Sample Result Forms: 4402268383

**Analysis Method:** E1613B

**Sample Name:** Outfall002\_20181207\_Comp      **Matrix Type:** W      **Result Type:** TRG  
**Lab Sample Name:** 440-226838-1      **Sample Date/Time:** 12/07/2018 10:05      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.0000060	0.00000030	0.000047	ug/L	J,DXMB	U	B
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.0000013	0.00000022	0.000047	ug/L	J,DXqMB	U	B
1,2,3,4,7,8,9-HpCDF	55673-89-7		0.00000027	0.000047	ug/L	U	U	
1,2,3,4,7,8-HxCDD	39227-28-6	0.0000016	0.00000021	0.000047	ug/L	J,DXMB	U	B
1,2,3,4,7,8-HxCDF	70648-26-9	0.00000048	0.00000018	0.000047	ug/L	J,DX	J	DNQ
1,2,3,6,7,8-HxCDD	57653-85-7	0.00000029	0.00000019	0.000047	ug/L	J,DXqMB	U	B
1,2,3,6,7,8-HxCDF	57117-44-9	0.00000028	0.00000016	0.000047	ug/L	J,DXMB	U	B
1,2,3,7,8,9-HxCDD	19408-74-3	0.00000074	0.00000019	0.000047	ug/L	J,DXqMB	U	B
1,2,3,7,8,9-HxCDF	72918-21-9	0.00000042	0.00000011	0.000047	ug/L	J,DXMB	U	B
1,2,3,7,8-PeCDD	40321-76-4	0.00000043	0.00000024	0.000047	ug/L	J,DX	J	DNQ
1,2,3,7,8-PeCDF	57117-41-6		0.00000023	0.000047	ug/L	U	U	
2,3,4,6,7,8-HxCDF	60851-34-5	0.00000024	0.00000011	0.000047	ug/L	J,DX	J	DNQ
2,3,4,7,8-PeCDF	57117-31-4		0.00000026	0.000047	ug/L	U	U	
2,3,7,8-TCDD	1746-01-6	0.0000034	0.00000030	0.0000094	ug/L	J,DX	J	DNQ
2,3,7,8-TCDF	51207-31-9		0.00000075	0.0000094	ug/L	U	U	
2,3,7,8-TCDF	51207-31-9	0.00000050	0.00000010	0.0000094	ug/L	J,DXMB	R	D
OCDD	3268-87-9	0.0000051	0.00000049	0.000094	ug/L	J,DXMB	U	B
OCDF	39001-02-0	0.0000048	0.00000034	0.000094	ug/L	J,DXMB	U	B
Total HpCDD	37871-00-4	0.000013	0.00000030	0.000047	ug/L	J,DXMB	J	B, DNQ
Total HpCDF	38998-75-3	0.0000027	0.00000022	0.000047	ug/L	J,DXqMB	J	B, DNQ, *III
Total HxCDD	34465-46-8	0.0000039	0.00000019	0.000047	ug/L	J,DXqMB	J	B, DNQ, *III
Total HxCDF	55684-94-1	0.0000018	0.00000011	0.000047	ug/L	J,DXqMB	J	B, DNQ, *III
Total PeCDD	36088-22-9	0.00000043	0.00000024	0.000047	ug/L	J,DX	J	DNQ
Total PeCDF	30402-15-4		0.00000023	0.000047	ug/L	U	U	
Total TCDD	41903-57-5	0.0000034	0.00000030	0.0000094	ug/L	J,DX	J	DNQ
Total TCDF	55722-27-5	0.00000095	0.00000010	0.0000094	ug/L	J,DXqMB	J	B, DNQ, *III

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226838-3

Client Project/Site: Quarterly Outfall 002 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/9/2019 5:28:53 PM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Case Narrative . . . . .	4
Client Sample Results . . . . .	5
Method Summary . . . . .	7
Lab Chronicle . . . . .	8
QC Sample Results . . . . .	9
QC Association Summary . . . . .	13
Definitions/Glossary . . . . .	14
Certification Summary . . . . .	15
Chain of Custody . . . . .	16
Receipt Checklists . . . . .	18
Isotope Dilution Summary . . . . .	20

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226838-1	Outfall002_20181207_Comp	Water	12/07/18 10:05	12/07/18 21:05

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- 12
- 13
- 14

# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

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**Job ID: 440-226838-3**

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**Laboratory: TestAmerica Irvine**

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## Narrative

**Job Narrative**  
**440-226838-3**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6° C and 2.9° C.

### Receipt Exceptions

Outfall002\_20181207\_Comp\_F (440-226838-2)-Received only containers for metals

### Dioxin

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Dioxin Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 1613B - Dioxins and Furans (HRGC/HRMS)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>2,3,7,8-TCDD</b>	<b>0.0000034</b>	<b>J,DX</b>	0.0000094	0.0000003	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,7,8-PeCDD</b>	<b>0.0000043</b>	<b>J,DX</b>	0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
1,2,3,7,8-PeCDF	ND		0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
2,3,4,7,8-PeCDF	ND		0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,4,7,8-HxCDD</b>	<b>0.0000016</b>	<b>J,DX MB</b>	0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,6,7,8-HxCDD</b>	<b>0.0000029</b>	<b>J,DX q MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,7,8,9-HxCDD</b>	<b>0.0000074</b>	<b>J,DX q MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,4,7,8-HxCDF</b>	<b>0.0000048</b>	<b>J,DX</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,6,7,8-HxCDF</b>	<b>0.0000028</b>	<b>J,DX MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.0000042</b>	<b>J,DX MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>2,3,4,6,7,8-HxCDF</b>	<b>0.0000024</b>	<b>J,DX</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>0.0000060</b>	<b>J,DX MB</b>	0.000047	0.0000003	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.0000013</b>	<b>J,DX q MB</b>	0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
1,2,3,4,7,8,9-HpCDF	ND		0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>OCDD</b>	<b>0.000051</b>	<b>J,DX MB</b>	0.000094	0.0000004	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>OCDF</b>	<b>0.0000048</b>	<b>J,DX MB</b>	0.000094	0.0000003	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total TCDD</b>	<b>0.0000034</b>	<b>J,DX</b>	0.0000094	0.0000003	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total TCDF</b>	<b>0.0000095</b>	<b>J,DX q MB</b>	0.0000094	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total PeCDD</b>	<b>0.0000043</b>	<b>J,DX</b>	0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
Total PeCDF	ND		0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total HxCDD</b>	<b>0.0000039</b>	<b>J,DX q MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total HxCDF</b>	<b>0.0000018</b>	<b>J,DX q MB</b>	0.000047	0.0000001	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total HpCDD</b>	<b>0.000013</b>	<b>J,DX MB</b>	0.000047	0.0000003	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Total HpCDF</b>	<b>0.0000027</b>	<b>J,DX q MB</b>	0.000047	0.0000002	ug/L		12/13/18 08:34	12/19/18 20:22	1
<b>Isotope Dilution</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C-2,3,7,8-TCDD	66		25 - 164				12/13/18 08:34	12/19/18 20:22	1
13C-2,3,7,8-TCDF	70		24 - 169				12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,7,8-PeCDD	65		25 - 181				12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,7,8-PeCDF	63		24 - 185				12/13/18 08:34	12/19/18 20:22	1
13C-2,3,4,7,8-PeCDF	58		21 - 178				12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,4,7,8-HxCDD	56		32 - 141				12/13/18 08:34	12/19/18 20:22	1

TestAmerica Irvine



# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)**

<u>Isotope Dilution</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
13C-1,2,3,6,7,8-HxCDD	61		28 - 130	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,4,7,8-HxCDF	58		26 - 152	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,6,7,8-HxCDF	59		26 - 123	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,7,8,9-HxCDF	71		29 - 147	12/13/18 08:34	12/19/18 20:22	1
13C-2,3,4,6,7,8-HxCDF	65		28 - 136	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,4,6,7,8-HpCDD	69		23 - 140	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,4,6,7,8-HpCDF	63		28 - 143	12/13/18 08:34	12/19/18 20:22	1
13C-1,2,3,4,7,8,9-HpCDF	71		26 - 138	12/13/18 08:34	12/19/18 20:22	1
13C-OCDD	47		17 - 157	12/13/18 08:34	12/19/18 20:22	1

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
37Cl4-2,3,7,8-TCDD	109		35 - 197	12/13/18 08:34	12/19/18 20:22	1

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA**

<u>Analyte</u>	<u>Result</u>	<u>Qualifier</u>	<u>RL</u>	<u>EDL</u>	<u>Unit</u>	<u>D</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
2,3,7,8-TCDF	ND		0.0000094	0.0000007	ug/L		12/13/18 08:34	12/24/18 16:24	1

<u>Isotope Dilution</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
13C-2,3,7,8-TCDF	69		24 - 169	12/13/18 08:34	12/24/18 16:24	1

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
37Cl4-2,3,7,8-TCDD	82		35 - 197	12/13/18 08:34	12/24/18 16:24	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	40CFR136A	TAL SAC
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	40CFR136A	TAL SAC

**Protocol References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

**Client Sample ID: Outfall002\_20181207\_Comp**

**Lab Sample ID: 440-226838-1**

**Date Collected: 12/07/18 10:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			1064.3 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B		1			266436	12/19/18 20:22	AS	TAL SAC
Total/NA	Prep	1613B	RA		1064.3 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B	RA	1			267413	12/24/18 16:24	KSS	TAL SAC

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: MB 320-264993/1-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C-1,2,3,7,8-PeCDF	67		24 - 185	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,7,8-PeCDF	63		21 - 178	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDD	74		32 - 141	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDF	70		26 - 152	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDF	70		26 - 123	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,7,8,9-HxCDF	80		29 - 147	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,6,7,8-HxCDF	75		28 - 136	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDD	84		23 - 140	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDF	83		28 - 143	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8,9-HpCDF	85		26 - 138	12/13/18 08:34	12/19/18 05:04	1
13C-OCDD	53		17 - 157	12/13/18 08:34	12/19/18 05:04	1
Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	105		35 - 197	12/13/18 08:34	12/19/18 05:04	1

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	0.000200	0.000210		ug/L		105	67 - 158
2,3,7,8-TCDF	0.000200	0.000215	MB	ug/L		108	75 - 158
1,2,3,7,8-PeCDD	0.00100	0.00106		ug/L		106	70 - 142
1,2,3,7,8-PeCDF	0.00100	0.00107		ug/L		107	80 - 134
2,3,4,7,8-PeCDF	0.00100	0.00106		ug/L		106	68 - 160
1,2,3,4,7,8-HxCDD	0.00100	0.000974	MB	ug/L		97	70 - 164
1,2,3,6,7,8-HxCDD	0.00100	0.00102	MB	ug/L		102	76 - 134
1,2,3,7,8,9-HxCDD	0.00100	0.00124	MB	ug/L		124	64 - 162
1,2,3,4,7,8-HxCDF	0.00100	0.00101		ug/L		101	72 - 134
1,2,3,6,7,8-HxCDF	0.00100	0.000995	MB	ug/L		100	84 - 130
1,2,3,7,8,9-HxCDF	0.00100	0.00104	MB	ug/L		104	78 - 130
2,3,4,6,7,8-HxCDF	0.00100	0.00101		ug/L		101	70 - 156
1,2,3,4,6,7,8-HpCDD	0.00100	0.000963	MB	ug/L		96	70 - 140
1,2,3,4,6,7,8-HpCDF	0.00100	0.000963	MB	ug/L		96	82 - 122
1,2,3,4,7,8,9-HpCDF	0.00100	0.000965	MB	ug/L		97	78 - 138
OCDD	0.00200	0.00191	MB	ug/L		95	78 - 144
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170
Isotope Dilution	LCS LCS		Limits				
13C-2,3,7,8-TCDD	79		20 - 175				
13C-2,3,7,8-TCDF	81		22 - 152				
13C-1,2,3,7,8-PeCDD	70		21 - 227				
13C-1,2,3,7,8-PeCDF	72		21 - 192				
13C-2,3,4,7,8-PeCDF	60		13 - 328				
13C-1,2,3,4,7,8-HxCDD	67		21 - 193				
13C-1,2,3,6,7,8-HxCDD	67		25 - 163				
13C-1,2,3,4,7,8-HxCDF	64		19 - 202				

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<i>Isotope Dilution</i>	<b>LCS LCS</b>		<b>Limits</b>
	<b>%Recovery</b>	<b>Qualifier</b>	
13C-1,2,3,6,7,8-HxCDF	69		21 - 159
13C-1,2,3,7,8,9-HxCDF	90		17 - 205
13C-2,3,4,6,7,8-HxCDF	78		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	94		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	85		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	98		20 - 186
13C-OCDD	72		13 - 199
<b>Surrogate</b>	<b>LCS LCS</b>		<b>Limits</b>
37Cl4-2,3,7,8-TCDD	109		31 - 191

**Lab Sample ID: LCSD 320-264993/3-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<b>Analyte</b>	<b>Spike Added</b>	<b>LCSD Result</b>	<b>LCSD Qualifier</b>	<b>Unit</b>	<b>D</b>	<b>%Rec</b>	<b>%Rec.</b>		<b>RPD</b>	
							<b>Limits</b>	<b>RPD</b>	<b>Limit</b>	<b>Limit</b>
2,3,7,8-TCDD	0.000200	0.000206		ug/L		103	67 - 158	2	50	
2,3,7,8-TCDF	0.000200	0.000211	MB	ug/L		106	75 - 158	2	50	
1,2,3,7,8-PeCDD	0.00100	0.00104		ug/L		104	70 - 142	2	50	
1,2,3,7,8-PeCDF	0.00100	0.00103		ug/L		103	80 - 134	4	50	
2,3,4,7,8-PeCDF	0.00100	0.00102		ug/L		102	68 - 160	4	50	
1,2,3,4,7,8-HxCDD	0.00100	0.000968	MB	ug/L		97	70 - 164	1	50	
1,2,3,6,7,8-HxCDD	0.00100	0.00100	MB	ug/L		100	76 - 134	2	50	
1,2,3,7,8,9-HxCDD	0.00100	0.00106	MB	ug/L		106	64 - 162	16	50	
1,2,3,4,7,8-HxCDF	0.00100	0.000988		ug/L		99	72 - 134	2	50	
1,2,3,6,7,8-HxCDF	0.00100	0.000987	MB	ug/L		99	84 - 130	1	50	
1,2,3,7,8,9-HxCDF	0.00100	0.00102	MB	ug/L		102	78 - 130	2	50	
2,3,4,6,7,8-HxCDF	0.00100	0.000995		ug/L		99	70 - 156	1	50	
1,2,3,4,6,7,8-HpCDD	0.00100	0.000950	MB	ug/L		95	70 - 140	1	50	
1,2,3,4,6,7,8-HpCDF	0.00100	0.000973	MB	ug/L		97	82 - 122	1	50	
1,2,3,4,7,8,9-HpCDF	0.00100	0.000940	MB	ug/L		94	78 - 138	3	50	
OCDD	0.00200	0.00193	MB	ug/L		97	78 - 144	1	50	
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170	0	50	
<b>Isotope Dilution</b>	<b>LCSD LCSD</b>									
13C-2,3,7,8-TCDD	82									
13C-2,3,7,8-TCDF	82									
13C-1,2,3,7,8-PeCDD	71									
13C-1,2,3,7,8-PeCDF	74									
13C-2,3,4,7,8-PeCDF	68									
13C-1,2,3,4,7,8-HxCDD	77									
13C-1,2,3,6,7,8-HxCDD	76									
13C-1,2,3,4,7,8-HxCDF	73									
13C-1,2,3,6,7,8-HxCDF	73									
13C-1,2,3,7,8,9-HxCDF	88									
13C-2,3,4,6,7,8-HxCDF	79									
13C-1,2,3,4,6,7,8-HpCDD	91									
13C-1,2,3,4,6,7,8-HpCDF	87									

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-264993/3-A

Matrix: Water

Analysis Batch: 266136

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 264993

	<i>LCSD</i>	<i>LCSD</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,7,8,9-HpCDF	94		20 - 186
13C-OCDD	63		13 - 199

	<i>LCSD</i>	<i>LCSD</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	110		31 - 191

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# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Specialty Organics

### Prep Batch: 264993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	1613B	
440-226838-1 - RA	Outfall002_20181207_Comp	Total/NA	Water	1613B	
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	

### Analysis Batch: 266136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	264993
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	264993
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	264993

### Analysis Batch: 266436

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1	Outfall002_20181207_Comp	Total/NA	Water	1613B	264993

### Analysis Batch: 267413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226838-1 - RA	Outfall002_20181207_Comp	Total/NA	Water	1613B	264993



# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Qualifiers

### Dioxin

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
MB	Analyte present in the method blank
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	12-31-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19



CHAIN OF CUSTODY FORM

Client Name/Address: Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Quarterly Outfall (001, 002, 011, 018) Outfall 002 Comp		R	R	R	R	QRSW	QRSW	QRSW	ALY	Comments	
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Total Dissolved Metals (E200.7), Zn (E200.8) Cu, Pb, Cd, Se	Cyanide (SM4500-CN-E / E2335.2)	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Dissolved Metals Mercury (E245.1)	Priority Pollutants-Pesticides-PCBs (E608) <i>add Chloroacetic Acid, Dieldrin, DDT, Endrin, Fenitrothion</i>	Total Recoverable Metals (E200.7); Hardness as CaCO3	Total Dissolved Metals (E200.7) Hardness as CaCO3		
Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreements 2015-19-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)											
Sampler: Dan Smith <i>DS</i>													
Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MSMSD					
	<i>Outfall 002 - 2018-2019 Comp</i>	<i>12-7-18</i>	WM	1 L Poly	1	None	190	No					Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
	<i>Outfall 002 - 2018-2019 Comp</i>	<i>12-7-14</i>	WM	500 mL Poly	1	HNO <sub>3</sub>	80	No					at OF001,002,011, or 018.
Outfall 002	Outfall002_20181207_Comp_F	<i>12/7/2018 / 11:05</i>	WM	1L Poly	1	None	200	No	X				Filter and preserve w/in 24hrs of receipt at lab at OF001,002,011, or 018
			WM	1 L Glass Amber	2	None	250	No			X		Chlordane, DDT, DDE, DDT, dieldrin, PCBs, toxaphene at OF001,002,011, or 018.
			WM	borosilicate vials	1	None	320	No			X		Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.
	Outfall002_20181207_Comp	<i>12/7/2018 / 11:05</i>	WM	500 mL Poly	1	NaOH	220	No		X			Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MSMSD.
			WM	2.5 Gal Cube	1	None	225	No			X		Only test if first or second rain events of the year
			WM	1 L Glass Amber	1	None	230	No					
			WM	1 Gal Cube	<i>15</i>	None	235	No			X		

Relinquished By: <i>Mark Dominick</i> Date/Time: <i>12-7-18/1435</i> Company: <i>Haley &amp; Aldrich</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12-7-18 14:35</i>	Turn-around time (Check) 24 Hour _____ 72 Hour: _____ 10 Day <u>X</u> 48 Hour _____ 5 Day _____ Normal _____
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 16:50</i> Company: _____	Received By: <i>Victor May</i> Date/Time: <i>12-7-18 1650</i>	Sample Integrity (Check) intact _____ On Ice _____
Relinquished By: <i>Javier Vega</i> Date/Time: <i>12-7-18 9:05</i> Company: <i>Javier Vega</i>	Received By: <i>Javier Vega</i> Date/Time: <i>12/7/18 9:05</i>	Store samples for 6 months Data Requirements: (Check) No Level IV _____ All Level IV <u>X</u>

Page 17 of 21

12/9/2019



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226838-3

**Login Number: 226838**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226838-3

**Login Number: 226838**

**List Number: 2**

**Creator: Her, David A**

**List Source: TestAmerica Sacramento**

**List Creation: 12/11/18 05:45 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (25-164)	TCDF (24-169)	PeCDD (25-181)	PeCDF (24-185)	PeCF (21-178)	HxCDD (32-141)	HxDD (28-130)	HxCDF (26-152)
440-226838-1	Outfall002_20181207_Comp	66	70	65	63	58	56	61	58
440-226838-1 - RA	Outfall002_20181207_Comp		69						
MB 320-264993/1-A	Method Blank	77	76	65	67	63	74	74	70

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (26-123)	HxCF (29-147)	13CHxCF (28-136)	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	OCDD (17-157)
440-226838-1	Outfall002_20181207_Comp	59	71	65	69	63	71	47
440-226838-1 - RA	Outfall002_20181207_Comp							
MB 320-264993/1-A	Method Blank	70	80	75	84	83	85	53

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD  
 HxCDF = 13C-1,2,3,4,7,8-HxCDF  
 HxDF = 13C-1,2,3,6,7,8-HxCDF  
 HxCF = 13C-1,2,3,7,8,9-HxCDF  
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
 HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
 OCDD = 13C-OCDD

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (20-175)	TCDF (22-152)	PeCDD (21-227)	PeCDF (21-192)	PeCF (13-328)	HxCDD (21-193)	HxDD (25-163)	HxCDF (19-202)
LCS 320-264993/2-A	Lab Control Sample	79	81	70	72	60	67	67	64
LCSD 320-264993/3-A	Lab Control Sample Dup	82	82	71	74	68	77	76	73

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (21-159)	HxCF (17-205)	13CHxCF (22-176)	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	OCDD (13-199)
LCS 320-264993/2-A	Lab Control Sample	69	90	78	94	85	98	72
LCSD 320-264993/3-A	Lab Control Sample Dup	73	88	79	91	87	94	63

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD

TestAmerica Irvine

# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Outfall 002 Comp

TestAmerica Job ID: 440-226838-3

HxCDF = 13C-1,2,3,4,7,8-HxCDF  
HxDF = 13C-1,2,3,6,7,8-HxCDF  
HxCF = 13C-1,2,3,7,8,9-HxCDF  
13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
OCDD = 13C-OCDD

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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226551-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**9 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

- I. INTRODUCTION..... 1
- II. Sample Management..... 2
- III. EPA METHOD 624—Volatile Organic Compounds (VOCs)..... 6
  - III.1. Holding Times ..... 6
  - III.2. GC/MS Tuning and Calibration ..... 6
  - III.3. Quality Control Samples ..... 6
    - III.3.1. Method Blanks ..... 6
    - III.3.2. Laboratory Control Samples ..... 6
    - III.3.3. Surrogate Recovery..... 6
    - III.3.4. Matrix Spike/Matrix Spike Duplicate ..... 6
  - III.4. Field QC Samples..... 6
    - III.4.1. Trip Blanks..... 6
    - III.4.2. Field Blanks and Equipment Blanks ..... 7
    - III.4.3. Field Duplicates..... 7
  - III.5. Internal Standards Performance..... 7
  - III.6. Compound Identification..... 7
  - III.7. Compound Quantification and Reported Detection Limits ..... 7
  - III.8. Tentatively Identified Compounds ..... 7
  - III.9. System Performance..... 7
- IV. VARIOUS METHODS — GENERAL CHEMISTRY..... 7
  - IV.1. Holding Times ..... 7
  - IV.2. MS Tuning and Calibration..... 8
  - IV.3. Quality Control Samples ..... 8
    - IV.3.1. Method Blanks ..... 8
    - IV.3.2. Laboratory Control Samples ..... 8
    - IV.3.3. Laboratory Duplicates..... 8



IV.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8

IV.4. Sample Result Verification ..... 8

IV.5. Field QC Samples..... 8

IV.5.1. Field Blanks and Equipment Blanks ..... 8

IV.5.2. Field Duplicates..... 8

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>X</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226551-1

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 2

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall008_20181206 _Grab	440-226551-1	N/A	Water	12/06/2018 9:15 AM	E1664, E624, SM9221F
TB_20181206	440-226551-3	N/A	Water	12/06/2018 9:15 AM	E624



## II. SAMPLE MANAGEMENT

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According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226551-1:

- The laboratory received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius ( $^{\circ}\text{C}$ ) and greater than  $0^{\circ}\text{C}$ .
- Both the sample and the trip blank vials contained significant headspace (bubble  $>6$  mm). Nondetect sample results were qualified as estimated (UJ) and detects as estimated (J).
- The laboratory received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.
- A correction to the COC was initialed but not dated.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.





### III. EPA METHOD 624—VOLATILE ORGANIC COMPOUNDS (VOCs)

---

K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 11, 2019

The sample and trip blank listed in Table 1 for this analysis were validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Volatile Organics (DVP-2, Rev. 2)*, EPA Method 624, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2014)*.

#### III.1. HOLDING TIMES

Analytical holding times were met. The preserved water sample and trip blank were analyzed within 14 days of collection.

#### III.2. GC/MS TUNING AND CALIBRATION

The BFB tunes met the method abundance criteria. The sample and trip blank were analyzed within 12 hours of the BFB injection time.

Calibration criteria were met. The initial calibration average RRFs and the ICV and continuing calibration RRFs were  $\geq 0.05$  for all applicable target compounds. The initial calibration %RSDs were  $\leq 35\%$ , or  $r^2$  values  $\geq 0.990$ . The second source ICV and all applicable CCV recoveries were within the method control limits.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

Target compounds were not detected in the method blank above the reporting limit. Chloromethane was reported below the reporting limit but above the MDL, however, this compound was not detected in the samples.

##### III.3.2. LABORATORY CONTROL SAMPLES

Recoveries were within the laboratory control limits.

##### III.3.3. SURROGATE RECOVERY

Recoveries were within the laboratory control limits.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed on the site sample in this SDG. MEC<sup>X</sup> evaluated method accuracy based on LCS results.

#### III.4. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

##### III.4.1. TRIP BLANKS

Sample TB\_20181206 was identified as the trip blank associated with the site sample in this SDG. The trip blank had no target compounds detected above the MDL.



### III.4.2. **FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

### III.4.3. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

### III.5. **INTERNAL STANDARDS PERFORMANCE**

The internal standard retention times and area counts were within the control limits established by the continuing calibration standards:  $\pm 30$  seconds for retention times and  $-50\%/+100\%$  for internal standard areas.

### III.6. **COMPOUND IDENTIFICATION**

Compound identification was verified. The laboratory analyzed for 36 target compounds by Method 624. Review of the sample chromatograms, retention times, and spectra indicated no issues with target compound identification.

### III.7. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit.

### III.8. **TENTATIVELY IDENTIFIED COMPOUNDS**

The laboratory did not report TICs for this SDG.

### III.9. **SYSTEM PERFORMANCE**

Review of the raw data indicated no issues with system performance.

## IV. **VARIOUS METHODS — GENERAL CHEMISTRY**

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 9, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, EPA Method 1664A, *Standard Methods for the Examination of Water and Wastewater 9221F* and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

### IV.1. **HOLDING TIMES**

The analytical holding times as listed below, were met with the exception of *E. coli*.

- 28 days for HEM (oil and grease)
- 8 hours per QAPP for *E. coli*

*E. coli* was analyzed within 90 minutes of receipt at the laboratory and within the 24 hour holding time for the method. The *E. coli* result was qualified by the reviewer as a conservative measure.



#### **IV.2. MS TUNING AND CALIBRATION**

Analytical balance calibration logs were not provided by the laboratory. The HEM batch notes stated that the analytical balance was checked with acceptable results before and after each first and second weighing. Biological controls were acceptable for *E. coli* analysis.

#### **IV.3. QUALITY CONTROL SAMPLES**

##### **IV.3.1. METHOD BLANKS**

The HEM method blank was nondetect. The negative control sample was acceptable for the *E. coli* analysis.

##### **IV.3.2. LABORATORY CONTROL SAMPLES**

Laboratory control sample and laboratory control sample duplicate recoveries and RPD were within the QAPP control limits for HEM. The presumptive test was analyzed with the positive detects for the target bacteria.

##### **IV.3.3. LABORATORY DUPLICATES**

Laboratory duplicate analyses were not performed on the sample in this SDG.

##### **IV.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were not performed on the sample in this SDG.

#### **IV.4. SAMPLE RESULT VERIFICATION**

Calculations were verified, and the sample result reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL.

#### **IV.5. FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

##### **IV.5.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### **IV.5.2. FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

---

# Validated Sample Result Forms: 4402265511

---

**Analysis Method:** E1664

---

**Sample Name** Outfall008\_20181206\_Grab      **Matrix Type:** W    **Result Type:** TRG  
**Lab Sample Name:** 440-226551-1      **Sample Date/Time:** 12/06/2018    09:15      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
HEM (Oil & Grease)	HEMOILGREASE	1.5	5.2	mg/L	U	U		

**Analysis Method:** E624

**Sample Name** Outfall008\_20181206\_Grab      **Matrix Type:** W    **Result Type:** TRG  
**Lab Sample Name:** 440-226551-1      **Sample Date/Time:** 12/06/2018    09:15      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,1,1-Trichloroethane	71-55-6		0.25	0.50	ug/L	U	UJ	*II
1,1,2,2-Tetrachloroethane	79-34-5		0.25	0.50	ug/L	U	UJ	*II
1,1,2-Trichloroethane	79-00-5		0.25	0.50	ug/L	U	UJ	*II
1,1-Dichloroethane	75-34-3		0.25	0.50	ug/L	U	UJ	*II
1,1-Dichloroethene	75-35-4		0.25	0.50	ug/L	U	UJ	*II
1,2-Dichlorobenzene	95-50-1		0.25	0.50	ug/L	U	UJ	*II
1,2-Dichloroethane	107-06-2		0.25	0.50	ug/L	U	UJ	*II
1,2-Dichloropropane	78-87-5		0.25	0.50	ug/L	U	UJ	*II
1,3-Dichlorobenzene	541-73-1		0.25	0.50	ug/L	U	UJ	*II
1,4-Dichlorobenzene	106-46-7		0.25	0.50	ug/L	U	UJ	*II
2-Chloroethyl vinyl ether	110-75-8		1.0	2.0	ug/L	U	UJ	*II
Acrolein	107-02-8		2.5	5.0	ug/L	U	UJ	*II
Acrylonitrile	107-13-1		1.0	2.0	ug/L	U	UJ	*II
Benzene	71-43-2		0.25	0.50	ug/L	U	UJ	*II
Bromodichloromethane	75-27-4		0.25	0.50	ug/L	U	UJ	*II
Bromoform	75-25-2		0.40	1.0	ug/L	U	UJ	*II
Bromomethane	74-83-9		0.25	0.50	ug/L	U	UJ	*II
Carbon tetrachloride	56-23-5		0.25	0.50	ug/L	U	UJ	*II
Chlorobenzene	108-90-7		0.25	0.50	ug/L	U	UJ	*II
Chloroethane	75-00-3		0.40	1.0	ug/L	U	UJ	*II
Chloroform	67-66-3		0.25	0.50	ug/L	U	UJ	*II
Chloromethane	74-87-3		0.25	0.50	ug/L	U	UJ	*II
cis-1,2-Dichloroethene	156-59-2		0.25	0.50	ug/L	U	UJ	*II
cis-1,3-Dichloropropene	10061-01-5		0.25	0.50	ug/L	U	UJ	*II
Dibromochloromethane	124-48-1		0.25	0.50	ug/L	U	UJ	*II
Ethylbenzene	100-41-4		0.25	0.50	ug/L	U	UJ	*II
Methylene Chloride	75-09-2		0.88	2.0	ug/L	U	UJ	*II
Naphthalene	91-20-3		0.40	1.0	ug/L	U	UJ	*II
Tetrachloroethene	127-18-4		0.25	0.50	ug/L	U	UJ	*II
Toluene	108-88-3	0.27	0.25	0.50	ug/L	J,DX	J	DNQ, *II
trans-1,2-Dichloroethene	156-60-5		0.25	0.50	ug/L	U	UJ	*II
trans-1,3-Dichloropropene	10061-02-6		0.25	0.50	ug/L	U	UJ	*II
Trichloroethene	79-01-6		0.25	0.50	ug/L	U	UJ	*II
Trichlorofluoromethane	75-69-4		0.25	0.50	ug/L	U	UJ	*II
Vinyl chloride	75-01-4		0.25	0.50	ug/L	U	UJ	*II
Xylenes, Total	1330-20-7		0.50	1.0	ug/L	U	UJ	*II

**Analysis Method:** E624**Sample Name** TB\_20181206**Matrix Type:** W **Result Type:** TRG**Lab Sample Name:** 440-226551-3**Sample Date/Time:** 12/06/2018 09:15**Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,1,1-Trichloroethane	71-55-6	0.25	0.50	ug/L	U	UJ	*II	
1,1,2,2-Tetrachloroethane	79-34-5	0.25	0.50	ug/L	U	UJ	*II	
1,1,2-Trichloroethane	79-00-5	0.25	0.50	ug/L	U	UJ	*II	
1,1-Dichloroethane	75-34-3	0.25	0.50	ug/L	U	UJ	*II	
1,1-Dichloroethene	75-35-4	0.25	0.50	ug/L	U	UJ	*II	
1,2-Dichlorobenzene	95-50-1	0.25	0.50	ug/L	U	UJ	*II	
1,2-Dichloroethane	107-06-2	0.25	0.50	ug/L	U	UJ	*II	
1,2-Dichloropropane	78-87-5	0.25	0.50	ug/L	U	UJ	*II	
1,3-Dichlorobenzene	541-73-1	0.25	0.50	ug/L	U	UJ	*II	
1,4-Dichlorobenzene	106-46-7	0.25	0.50	ug/L	U	UJ	*II	
2-Chloroethyl vinyl ether	110-75-8	1.0	2.0	ug/L	U	UJ	*II	
Acrolein	107-02-8	2.5	5.0	ug/L	U	UJ	*II	
Acrylonitrile	107-13-1	1.0	2.0	ug/L	U	UJ	*II	
Benzene	71-43-2	0.25	0.50	ug/L	U	UJ	*II	
Bromodichloromethane	75-27-4	0.25	0.50	ug/L	U	UJ	*II	
Bromoform	75-25-2	0.40	1.0	ug/L	U	UJ	*II	
Bromomethane	74-83-9	0.25	0.50	ug/L	U	UJ	*II	
Carbon tetrachloride	56-23-5	0.25	0.50	ug/L	U	UJ	*II	
Chlorobenzene	108-90-7	0.25	0.50	ug/L	U	UJ	*II	
Chloroethane	75-00-3	0.40	1.0	ug/L	U	UJ	*II	
Chloroform	67-66-3	0.25	0.50	ug/L	U	UJ	*II	
Chloromethane	74-87-3	0.25	0.50	ug/L	U	UJ	*II	
cis-1,2-Dichloroethene	156-59-2	0.25	0.50	ug/L	U	UJ	*II	
cis-1,3-Dichloropropene	10061-01-5	0.25	0.50	ug/L	U	UJ	*II	
Dibromochloromethane	124-48-1	0.25	0.50	ug/L	U	UJ	*II	
Ethylbenzene	100-41-4	0.25	0.50	ug/L	U	UJ	*II	
Methylene Chloride	75-09-2	0.88	2.0	ug/L	U	UJ	*II	
Naphthalene	91-20-3	0.40	1.0	ug/L	U	UJ	*II	
Tetrachloroethene	127-18-4	0.25	0.50	ug/L	U	UJ	*II	
Toluene	108-88-3	0.25	0.50	ug/L	U	UJ	*II	
trans-1,2-Dichloroethene	156-60-5	0.25	0.50	ug/L	U	UJ	*II	
trans-1,3-Dichloropropene	10061-02-6	0.25	0.50	ug/L	U	UJ	*II	
Trichloroethene	79-01-6	0.25	0.50	ug/L	U	UJ	*II	
Trichlorofluoromethane	75-69-4	0.25	0.50	ug/L	U	UJ	*II	
Vinyl chloride	75-01-4	0.25	0.50	ug/L	U	UJ	*II	
Xylenes, Total	1330-20-7	0.50	1.0	ug/L	U	UJ	*II	

**Analysis Method:** SM9221F

---

<b>Sample Name</b>	Outfall008_20181206_Grab	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG				
<b>Lab Sample Name:</b>	440-226551-1	<b>Sample Date/Time:</b>	12/06/2018	09:15	<b>Validation Level:</b>	8			
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>	
Escherichia coli	ECOLI	8500	1.8	1.8	mpn/100	BUBV	<b>J</b>	<b>H</b>	

---

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226551-1

Client Project/Site: Annual Outfall 008 Grab

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/24/2018 3:46:00 PM

Urvashi Patel, Manager of Project Management

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/24/2018 3:46:00 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	9
Lab Chronicle . . . . .	10
QC Sample Results . . . . .	11
QC Association Summary . . . . .	21
Definitions/Glossary . . . . .	23
Certification Summary . . . . .	24
Chain of Custody . . . . .	25
Receipt Checklists . . . . .	26

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226551-1	Outfall008_20181206_Grab	Water	12/06/18 09:15	12/06/18 18:00
440-226551-3	TB_20181206	Water	12/06/18 09:15	12/06/18 18:00

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

**Job ID: 440-226551-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226551-1**

### Comments

No additional comments.

### Receipt

The samples were received on 12/6/2018 6:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

### Receipt Exceptions

The following sample(s) was received with headspace in the sample container. This sample container was received with headspace. TB\_20181206 (440-226551-3). Received two vial HCL TB with headspace and one vial unpreserved TB with headspace.

### GC/MS VOA

Method(s) 624: The following volatile sample was received and analyzed with significant headspace in the sample container(s): TB\_20181206 (440-226551-3). Significant headspace is defined as a bubble greater than 6 mm in diameter. All VOA vials had headspace.

Method(s) 624: The method blank for analytical batch 440-516443 contained Chloroform above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Biology

Method(s) SM 9221F: The following sample was received outside of holding time: Outfall008\_20181206 \_Grab (440-226551-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Organic Prep

Method(s) 1664A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-518857 and analytical batch 440-518896. The Laboratory Control Sample (LCS) was performed in duplicate to provide precision data for this batch

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

**Client Sample ID: Outfall008\_20181206\_Grab**

**Lab Sample ID: 440-226551-1**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
2-Chloroethyl vinyl ether	ND		2.0	1.0	ug/L			12/07/18 11:11	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Acrolein	ND		5.0	2.5	ug/L			12/07/18 11:11	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Acrylonitrile	ND		2.0	1.0	ug/L			12/07/18 11:11	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Benzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Bromoform	ND		1.0	0.40	ug/L			12/12/18 09:16	1
Bromomethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Chloroethane	ND		1.0	0.40	ug/L			12/12/18 09:16	1
Chloroform	ND		0.50	0.25	ug/L			12/12/18 09:16	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/12/18 09:16	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
<b>Toluene</b>	<b>0.27</b>	<b>J,DX</b>	0.50	0.25	ug/L			12/12/18 09:16	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Trichloroethene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 09:16	1
Naphthalene	ND		1.0	0.40	ug/L			12/12/18 09:16	1
Xylenes, Total	ND		1.0	0.50	ug/L			12/12/18 09:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		80 - 128		12/07/18 11:11	1
Dibromofluoromethane (Surr)	88		76 - 132		12/07/18 11:11	1
4-Bromofluorobenzene (Surr)	94		80 - 120		12/07/18 11:11	1
4-Bromofluorobenzene (Surr)	96		80 - 120		12/12/18 09:16	1
Dibromofluoromethane (Surr)	91		76 - 132		12/12/18 09:16	1
Toluene-d8 (Surr)	98		80 - 128		12/12/18 09:16	1

**Method: 624 - Volatile Organic Compounds (GC/MS) - RA**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		0.50	0.25	ug/L			12/14/18 01:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		80 - 120		12/14/18 01:30	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

**Client Sample ID: Outfall008\_20181206\_Grab**

**Lab Sample ID: 440-226551-1**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS) - RA (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	108		76 - 132		12/14/18 01:30	1
Toluene-d8 (Surr)	106		80 - 128		12/14/18 01:30	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	ND		5.2	1.5	mg/L		12/22/18 04:59	12/22/18 09:49	1

**Method: SM 9221F - E.Coli (Multiple-Tube Fermentation; EC-MUG)**

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Escherichia coli	8500	BU BV	1.8	1.8	MPN/100mL			12/06/18 19:27	1

**Client Sample ID: TB\_20181206**

**Lab Sample ID: 440-226551-3**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
2-Chloroethyl vinyl ether	ND		2.0	1.0	ug/L			12/07/18 12:49	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Acrolein	ND		5.0	2.5	ug/L			12/07/18 12:49	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Acrylonitrile	ND		2.0	1.0	ug/L			12/07/18 12:49	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Benzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Bromoform	ND		1.0	0.40	ug/L			12/11/18 16:54	1
Bromomethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Chloroethane	ND		1.0	0.40	ug/L			12/11/18 16:54	1
Chloroform	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Chloromethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/11/18 16:54	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Toluene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/11/18 16:54	1

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# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

**Client Sample ID: TB\_20181206**

**Lab Sample ID: 440-226551-3**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 16:54	1
Naphthalene	ND		1.0	0.40	ug/L			12/11/18 16:54	1
Xylenes, Total	ND		1.0	0.50	ug/L			12/11/18 16:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		80 - 128		12/07/18 12:49	1
Dibromofluoromethane (Surr)	88		76 - 132		12/07/18 12:49	1
4-Bromofluorobenzene (Surr)	94		80 - 120		12/07/18 12:49	1
4-Bromofluorobenzene (Surr)	103		80 - 120		12/11/18 16:54	1
Dibromofluoromethane (Surr)	110		76 - 132		12/11/18 16:54	1
Toluene-d8 (Surr)	106		80 - 128		12/11/18 16:54	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

Method	Method Description	Protocol	Laboratory
624	Volatile Organic Compounds (GC/MS)	40CFR136A	TAL IRV
1664A	HEM and SGT-HEM	1664A	TAL IRV
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)	SM	TAL IRV
1664A	HEM and SGT-HEM (SPE)	1664A	TAL IRV

#### Protocol References:

1664A = EPA-821-98-002

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

#### Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

**Client Sample ID: Outfall008\_20181206\_Grab**

**Lab Sample ID: 440-226551-1**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624	RA	1	10 mL	10 mL	516966	12/14/18 01:30	WC	TAL IRV
Total/NA	Analysis	624		1	10 mL	10 mL	515518	12/07/18 11:11	RM	TAL IRV
Total/NA	Analysis	624		1	10 mL	10 mL	516443	12/12/18 09:16	TCN	TAL IRV
Total/NA	Prep	1664A			965 mL	1000 mL	518857	12/22/18 04:59	JC1	TAL IRV
Total/NA	Analysis	1664A		1			518896	12/22/18 09:49	JC1	TAL IRV
Total/NA	Analysis	SM 9221F		1	100 mL	100 mL	516006		CMM	TAL IRV
								(Start) 12/06/18 19:27		
								(End) 12/09/18 15:14		

**Client Sample ID: TB\_20181206**

**Lab Sample ID: 440-226551-3**

**Date Collected: 12/06/18 09:15**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	10 mL	10 mL	516174	12/11/18 16:54	TCN	TAL IRV
Total/NA	Analysis	624		1	10 mL	10 mL	515518	12/07/18 12:49	RM	TAL IRV

**Laboratory References:**

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 440-515518/4**  
**Matrix: Water**  
**Analysis Batch: 515518**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloroethyl vinyl ether	ND		2.0	1.0	ug/L			12/07/18 08:07	1
Acrolein	ND		5.0	2.5	ug/L			12/07/18 08:07	1
Acrylonitrile	ND		2.0	1.0	ug/L			12/07/18 08:07	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		80 - 128		12/07/18 08:07	1
Dibromofluoromethane (Surr)	95		76 - 132		12/07/18 08:07	1
4-Bromofluorobenzene (Surr)	96		80 - 120		12/07/18 08:07	1

**Lab Sample ID: LCS 440-515518/5**  
**Matrix: Water**  
**Analysis Batch: 515518**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Chloroethyl vinyl ether	25.0	25.8		ug/L		103	37 - 150
Acrolein	25.0	20.2		ug/L		81	10 - 145
Acrylonitrile	250	224		ug/L		90	48 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	96		80 - 128
Dibromofluoromethane (Surr)	96		76 - 132
4-Bromofluorobenzene (Surr)	95		80 - 120

**Lab Sample ID: 440-226628-D-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515518**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Chloroethyl vinyl ether	ND		25.0	39.9	LM	ug/L		160	10 - 140
Acrolein	ND		25.0	2.60	J,DX	ug/L		10	10 - 147
Acrylonitrile	ND		250	238		ug/L		95	38 - 144

Surrogate	MS %Recovery	MS Qualifier	Limits
Toluene-d8 (Surr)	97		80 - 128
Dibromofluoromethane (Surr)	89		76 - 132
4-Bromofluorobenzene (Surr)	97		80 - 120

**Lab Sample ID: 440-226628-D-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515518**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Chloroethyl vinyl ether	ND		25.0	40.7	LM	ug/L		163	10 - 140	2	25
Acrolein	ND		25.0	2.56	J,DX	ug/L		10	10 - 147	1	40
Acrylonitrile	ND		250	257		ug/L		103	38 - 144	8	40

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 440-226628-D-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515518**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

<i>Surrogate</i>	<i>MSD %Recovery</i>	<i>MSD Qualifier</i>	<i>Limits</i>
<i>Toluene-d8 (Surr)</i>	93		80 - 128
<i>Dibromofluoromethane (Surr)</i>	87		76 - 132
<i>4-Bromofluorobenzene (Surr)</i>	95		80 - 120

**Lab Sample ID: MB 440-516174/4**  
**Matrix: Water**  
**Analysis Batch: 516174**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

<i>Analyte</i>	<i>MB Result</i>	<i>MB Qualifier</i>	<i>RL</i>	<i>MDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Benzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Bromoform	ND		1.0	0.40	ug/L			12/11/18 08:04	1
Bromomethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Chloroethane	ND		1.0	0.40	ug/L			12/11/18 08:04	1
Chloroform	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Chloromethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/11/18 08:04	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Toluene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Trichloroethene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/11/18 08:04	1
Naphthalene	ND		1.0	0.40	ug/L			12/11/18 08:04	1
Xylenes, Total	ND		1.0	0.50	ug/L			12/11/18 08:04	1

<i>Surrogate</i>	<i>MB %Recovery</i>	<i>MB Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>4-Bromofluorobenzene (Surr)</i>	100		80 - 120		12/11/18 08:04	1
<i>Dibromofluoromethane (Surr)</i>	106		76 - 132		12/11/18 08:04	1
<i>Toluene-d8 (Surr)</i>	109		80 - 128		12/11/18 08:04	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 440-516174/5**

**Matrix: Water**

**Analysis Batch: 516174**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	25.0	28.0		ug/L		112	70 - 130
1,1,2,2-Tetrachloroethane	25.0	27.3		ug/L		109	63 - 130
1,1,2-Trichloroethane	25.0	28.1		ug/L		113	70 - 130
1,1-Dichloroethane	25.0	27.0		ug/L		108	64 - 130
1,1-Dichloroethene	25.0	25.3		ug/L		101	70 - 130
1,2-Dichlorobenzene	25.0	26.9		ug/L		108	70 - 130
1,2-Dichloroethane	25.0	27.5		ug/L		110	57 - 138
1,2-Dichloropropane	25.0	27.3		ug/L		109	67 - 130
1,3-Dichlorobenzene	25.0	26.7		ug/L		107	70 - 130
1,4-Dichlorobenzene	25.0	26.3		ug/L		105	70 - 130
Benzene	25.0	26.2		ug/L		105	68 - 130
Bromoform	25.0	30.3		ug/L		121	60 - 148
Bromomethane	25.0	23.3		ug/L		93	64 - 139
Carbon tetrachloride	25.0	27.5		ug/L		110	60 - 150
Chlorobenzene	25.0	26.5		ug/L		106	70 - 130
Dibromochloromethane	25.0	30.4		ug/L		121	69 - 145
Chloroethane	25.0	23.7		ug/L		95	64 - 135
Chloroform	25.0	27.6		ug/L		110	70 - 130
Chloromethane	25.0	20.7		ug/L		83	47 - 140
cis-1,3-Dichloropropene	25.0	31.5		ug/L		126	70 - 133
Bromodichloromethane	25.0	28.4		ug/L		114	70 - 132
Ethylbenzene	25.0	25.9		ug/L		104	70 - 130
Methylene Chloride	25.0	25.3		ug/L		101	52 - 130
Tetrachloroethene	25.0	26.9		ug/L		107	70 - 130
Toluene	25.0	26.2		ug/L		105	70 - 130
trans-1,2-Dichloroethene	25.0	28.0		ug/L		112	70 - 130
trans-1,3-Dichloropropene	25.0	30.6		ug/L		122	70 - 132
Trichlorofluoromethane	25.0	24.2		ug/L		97	60 - 150
Vinyl chloride	25.0	20.6		ug/L		82	59 - 133
Trichloroethene	25.0	27.0		ug/L		108	70 - 130
cis-1,2-Dichloroethene	25.0	27.8		ug/L		111	70 - 133
Naphthalene	25.0	27.0		ug/L		108	60 - 140
Xylenes, Total	50.0	51.8		ug/L		104	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	100		80 - 120
Dibromofluoromethane (Surr)	104		76 - 132
Toluene-d8 (Surr)	104		80 - 128

**Lab Sample ID: 320-45836-E-19 MS**

**Matrix: Water**

**Analysis Batch: 516174**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	ND		25.0	28.5		ug/L		114	70 - 130
1,1,2,2-Tetrachloroethane	ND		25.0	27.9		ug/L		112	63 - 130
1,1,2-Trichloroethane	ND		25.0	28.1		ug/L		112	70 - 130
1,1-Dichloroethane	ND		25.0	27.0		ug/L		108	65 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 320-45836-E-19 MS**

**Matrix: Water**

**Analysis Batch: 516174**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	ND		25.0	24.6		ug/L		98	70 - 130
1,2-Dichlorobenzene	ND		25.0	27.6		ug/L		111	70 - 130
1,2-Dichloroethane	ND		25.0	28.0		ug/L		112	56 - 146
1,2-Dichloropropane	5.2		25.0	33.4		ug/L		113	69 - 130
1,3-Dichlorobenzene	ND		25.0	26.8		ug/L		107	70 - 130
1,4-Dichlorobenzene	ND		25.0	26.9		ug/L		108	70 - 130
Benzene	ND		25.0	26.2		ug/L		105	66 - 130
Bromoform	ND		25.0	31.2		ug/L		125	59 - 150
Bromomethane	ND		25.0	23.4		ug/L		93	62 - 131
Carbon tetrachloride	ND		25.0	28.0		ug/L		112	60 - 150
Chlorobenzene	ND		25.0	26.1		ug/L		104	70 - 130
Dibromochloromethane	ND		25.0	31.3		ug/L		125	70 - 148
Chloroethane	ND		25.0	23.5		ug/L		94	68 - 130
Chloroform	ND		25.0	27.4		ug/L		110	70 - 130
Chloromethane	ND		25.0	20.4		ug/L		82	39 - 144
cis-1,3-Dichloropropene	ND		25.0	32.1		ug/L		128	70 - 133
Bromodichloromethane	ND		25.0	28.5		ug/L		114	70 - 138
Ethylbenzene	ND		25.0	25.7		ug/L		103	70 - 130
Methylene Chloride	ND		25.0	25.1		ug/L		100	52 - 130
Tetrachloroethene	ND		25.0	27.4		ug/L		110	70 - 137
Toluene	ND		25.0	26.2		ug/L		105	70 - 130
trans-1,2-Dichloroethene	ND		25.0	27.5		ug/L		110	70 - 130
trans-1,3-Dichloropropene	ND		25.0	30.3		ug/L		121	70 - 138
Trichlorofluoromethane	ND		25.0	24.0		ug/L		96	60 - 150
Vinyl chloride	ND		25.0	20.5		ug/L		82	50 - 137
Trichloroethene	ND		25.0	27.2		ug/L		109	70 - 130
cis-1,2-Dichloroethene	ND		25.0	27.2		ug/L		109	70 - 130
Naphthalene	ND		25.0	27.4		ug/L		110	60 - 140
Xylenes, Total	ND		50.0	51.7		ug/L		103	70 - 133

Surrogate	MS %Recovery	MS Qualifier	MS Limits
4-Bromofluorobenzene (Surr)	100		80 - 120
Dibromofluoromethane (Surr)	105		76 - 132
Toluene-d8 (Surr)	103		80 - 128

**Lab Sample ID: 320-45836-E-19 MSD**

**Matrix: Water**

**Analysis Batch: 516174**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		25.0	26.8		ug/L		107	70 - 130	6	20
1,1,1,2-Tetrachloroethane	ND		25.0	26.6		ug/L		106	63 - 130	5	30
1,1,2-Trichloroethane	ND		25.0	26.7		ug/L		107	70 - 130	5	25
1,1-Dichloroethane	ND		25.0	25.0		ug/L		100	65 - 130	8	20
1,1-Dichloroethene	ND		25.0	23.9		ug/L		96	70 - 130	3	20
1,2-Dichlorobenzene	ND		25.0	25.5		ug/L		102	70 - 130	8	20
1,2-Dichloroethane	ND		25.0	26.4		ug/L		106	56 - 146	6	20
1,2-Dichloropropane	5.2		25.0	31.0		ug/L		103	69 - 130	7	20

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 320-45836-E-19 MSD**  
**Matrix: Water**  
**Analysis Batch: 516174**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3-Dichlorobenzene	ND		25.0	24.8		ug/L		99	70 - 130	8	20
1,4-Dichlorobenzene	ND		25.0	25.1		ug/L		100	70 - 130	7	20
Benzene	ND		25.0	24.7		ug/L		99	66 - 130	6	20
Bromoform	ND		25.0	29.5		ug/L		118	59 - 150	5	25
Bromomethane	ND		25.0	22.2		ug/L		89	62 - 131	5	25
Carbon tetrachloride	ND		25.0	26.3		ug/L		105	60 - 150	6	25
Chlorobenzene	ND		25.0	24.6		ug/L		98	70 - 130	6	20
Dibromochloromethane	ND		25.0	29.2		ug/L		117	70 - 148	7	25
Chloroethane	ND		25.0	22.5		ug/L		90	68 - 130	4	25
Chloroform	ND		25.0	26.1		ug/L		105	70 - 130	5	20
Chloromethane	ND		25.0	19.5		ug/L		78	39 - 144	4	25
cis-1,3-Dichloropropene	ND		25.0	29.3		ug/L		117	70 - 133	9	20
Bromodichloromethane	ND		25.0	27.1		ug/L		108	70 - 138	5	20
Ethylbenzene	ND		25.0	24.2		ug/L		97	70 - 130	6	20
Methylene Chloride	ND		25.0	23.6		ug/L		95	52 - 130	6	20
Tetrachloroethene	ND		25.0	25.2		ug/L		101	70 - 137	8	20
Toluene	ND		25.0	24.4		ug/L		98	70 - 130	7	20
trans-1,2-Dichloroethene	ND		25.0	26.1		ug/L		105	70 - 130	5	20
trans-1,3-Dichloropropene	ND		25.0	28.7		ug/L		115	70 - 138	5	25
Trichlorofluoromethane	ND		25.0	23.1		ug/L		93	60 - 150	4	25
Vinyl chloride	ND		25.0	19.9		ug/L		80	50 - 137	3	30
Trichloroethene	ND		25.0	25.4		ug/L		101	70 - 130	7	20
cis-1,2-Dichloroethene	ND		25.0	25.7		ug/L		103	70 - 130	6	20
Naphthalene	ND		25.0	26.0		ug/L		104	60 - 140	5	30
Xylenes, Total	ND		50.0	48.4		ug/L		97	70 - 133	7	20

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
4-Bromofluorobenzene (Surr)	98		80 - 120
Dibromofluoromethane (Surr)	106		76 - 132
Toluene-d8 (Surr)	103		80 - 128

**Lab Sample ID: MB 440-516443/4**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Benzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Bromoform	ND		1.0	0.40	ug/L			12/12/18 08:02	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 440-516443/4**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Chlorobenzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Dibromochloromethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Chloroethane	ND		1.0	0.40	ug/L			12/12/18 08:02	1
Chloroform	0.262	J,DX	0.50	0.25	ug/L			12/12/18 08:02	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Bromodichloromethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Ethylbenzene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Methylene Chloride	ND		2.0	0.88	ug/L			12/12/18 08:02	1
Tetrachloroethene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Toluene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Vinyl chloride	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Trichloroethene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			12/12/18 08:02	1
Naphthalene	ND		1.0	0.40	ug/L			12/12/18 08:02	1
Xylenes, Total	ND		1.0	0.50	ug/L			12/12/18 08:02	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		80 - 120		12/12/18 08:02	1
Dibromofluoromethane (Surr)	93		76 - 132		12/12/18 08:02	1
Toluene-d8 (Surr)	100		80 - 128		12/12/18 08:02	1

**Lab Sample ID: LCS 440-516443/5**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	25.0	24.5		ug/L		98	70 - 130
1,1,2,2-Tetrachloroethane	25.0	26.4		ug/L		106	63 - 130
1,1,2-Trichloroethane	25.0	24.9		ug/L		100	70 - 130
1,1-Dichloroethane	25.0	23.1		ug/L		93	64 - 130
1,1-Dichloroethene	25.0	25.2		ug/L		101	70 - 130
1,2-Dichlorobenzene	25.0	25.9		ug/L		104	70 - 130
1,2-Dichloroethane	25.0	20.2		ug/L		81	57 - 138
1,2-Dichloropropane	25.0	24.8		ug/L		99	67 - 130
1,3-Dichlorobenzene	25.0	24.7		ug/L		99	70 - 130
1,4-Dichlorobenzene	25.0	24.1		ug/L		96	70 - 130
Benzene	25.0	23.6		ug/L		94	68 - 130
Bromoform	25.0	23.8		ug/L		95	60 - 148
Bromomethane	25.0	22.2		ug/L		89	64 - 139
Carbon tetrachloride	25.0	24.2		ug/L		97	60 - 150
Chlorobenzene	25.0	23.6		ug/L		94	70 - 130
Dibromochloromethane	25.0	23.6		ug/L		94	69 - 145
Chloroethane	25.0	23.5		ug/L		94	64 - 135

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 440-516443/5**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroform	25.0	22.8		ug/L		91	70 - 130
cis-1,3-Dichloropropene	25.0	25.3		ug/L		101	70 - 133
Bromodichloromethane	25.0	24.0		ug/L		96	70 - 132
Ethylbenzene	25.0	24.2		ug/L		97	70 - 130
Methylene Chloride	25.0	21.6		ug/L		86	52 - 130
Tetrachloroethene	25.0	24.2		ug/L		97	70 - 130
Toluene	25.0	23.0		ug/L		92	70 - 130
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	70 - 130
trans-1,3-Dichloropropene	25.0	23.6		ug/L		95	70 - 132
Trichlorofluoromethane	25.0	22.4		ug/L		89	60 - 150
Vinyl chloride	25.0	21.6		ug/L		86	59 - 133
Trichloroethene	25.0	24.3		ug/L		97	70 - 130
cis-1,2-Dichloroethene	25.0	23.9		ug/L		96	70 - 133
Naphthalene	25.0	28.0		ug/L		112	60 - 140
Xylenes, Total	50.0	51.4		ug/L		103	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	93		80 - 120
Dibromofluoromethane (Surr)	92		76 - 132
Toluene-d8 (Surr)	94		80 - 128

**Lab Sample ID: 440-226883-A-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	ND		25.0	24.0		ug/L		96	70 - 130
1,1,1,2-Tetrachloroethane	ND		25.0	23.7		ug/L		95	63 - 130
1,1,2-Trichloroethane	ND		25.0	23.3		ug/L		93	70 - 130
1,1-Dichloroethane	ND		25.0	22.0		ug/L		88	65 - 130
1,1-Dichloroethene	ND		25.0	24.0		ug/L		96	70 - 130
1,2-Dichlorobenzene	ND		25.0	24.3		ug/L		97	70 - 130
1,2-Dichloroethane	ND		25.0	19.1		ug/L		77	56 - 146
1,2-Dichloropropane	ND		25.0	23.8		ug/L		95	69 - 130
1,3-Dichlorobenzene	ND		25.0	23.7		ug/L		95	70 - 130
1,4-Dichlorobenzene	ND		25.0	23.1		ug/L		92	70 - 130
Benzene	ND		25.0	22.5		ug/L		90	66 - 130
Bromoform	ND		25.0	21.6		ug/L		86	59 - 150
Bromomethane	ND		25.0	20.5		ug/L		82	62 - 131
Carbon tetrachloride	ND		25.0	23.8		ug/L		95	60 - 150
Chlorobenzene	ND		25.0	22.3		ug/L		89	70 - 130
Dibromochloromethane	ND		25.0	21.9		ug/L		88	70 - 148
Chloroethane	ND		25.0	21.7		ug/L		87	68 - 130
Chloroform	ND		25.0	21.7		ug/L		87	70 - 130
cis-1,3-Dichloropropene	ND		25.0	23.5		ug/L		94	70 - 133
Bromodichloromethane	ND		25.0	23.0		ug/L		92	70 - 138
Ethylbenzene	ND		25.0	23.4		ug/L		93	70 - 130
Methylene Chloride	ND		25.0	19.7		ug/L		79	52 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 440-226883-A-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Tetrachloroethene	ND		25.0	24.2		ug/L		97	70 - 137
Toluene	ND		25.0	22.2		ug/L		89	70 - 130
trans-1,2-Dichloroethene	ND		25.0	23.5		ug/L		94	70 - 130
trans-1,3-Dichloropropene	ND		25.0	22.2		ug/L		89	70 - 138
Trichlorofluoromethane	ND		25.0	22.4		ug/L		89	60 - 150
Vinyl chloride	ND		25.0	20.6		ug/L		82	50 - 137
Trichloroethene	ND		25.0	23.5		ug/L		94	70 - 130
cis-1,2-Dichloroethene	ND		25.0	22.8		ug/L		91	70 - 130
Naphthalene	ND		25.0	24.9		ug/L		100	60 - 140
Xylenes, Total	ND		50.0	48.8		ug/L		98	70 - 133
		<b>MS</b>	<b>MS</b>						
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>						
4-Bromofluorobenzene (Surr)	95		80 - 120						
Dibromofluoromethane (Surr)	91		76 - 132						
Toluene-d8 (Surr)	95		80 - 128						

**Lab Sample ID: 440-226883-A-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 516443**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		25.0	23.2		ug/L		93	70 - 130	4	20
1,1,1,2-Tetrachloroethane	ND		25.0	26.4		ug/L		106	63 - 130	11	30
1,1,1,2-Trichloroethane	ND		25.0	24.7		ug/L		99	70 - 130	6	25
1,1-Dichloroethane	ND		25.0	22.8		ug/L		91	65 - 130	4	20
1,1-Dichloroethene	ND		25.0	24.2		ug/L		97	70 - 130	1	20
1,2-Dichlorobenzene	ND		25.0	26.2		ug/L		105	70 - 130	7	20
1,2-Dichloroethane	ND		25.0	20.1		ug/L		80	56 - 146	5	20
1,2-Dichloropropane	ND		25.0	24.7		ug/L		99	69 - 130	4	20
1,3-Dichlorobenzene	ND		25.0	24.9		ug/L		100	70 - 130	5	20
1,4-Dichlorobenzene	ND		25.0	24.4		ug/L		98	70 - 130	5	20
Benzene	ND		25.0	22.9		ug/L		92	66 - 130	2	20
Bromoform	ND		25.0	23.6		ug/L		95	59 - 150	9	25
Bromomethane	ND		25.0	20.8		ug/L		83	62 - 131	2	25
Carbon tetrachloride	ND		25.0	23.5		ug/L		94	60 - 150	1	25
Chlorobenzene	ND		25.0	23.3		ug/L		93	70 - 130	4	20
Dibromochloromethane	ND		25.0	24.1		ug/L		97	70 - 148	10	25
Chloroethane	ND		25.0	22.5		ug/L		90	68 - 130	4	25
Chloroform	ND		25.0	22.1		ug/L		89	70 - 130	2	20
cis-1,3-Dichloropropene	ND		25.0	24.7		ug/L		99	70 - 133	5	20
Bromodichloromethane	ND		25.0	24.0		ug/L		96	70 - 138	4	20
Ethylbenzene	ND		25.0	24.0		ug/L		96	70 - 130	3	20
Methylene Chloride	ND		25.0	20.9		ug/L		84	52 - 130	6	20
Tetrachloroethene	ND		25.0	24.1		ug/L		96	70 - 137	1	20
Toluene	ND		25.0	22.8		ug/L		91	70 - 130	3	20
trans-1,2-Dichloroethene	ND		25.0	24.1		ug/L		96	70 - 130	3	20
trans-1,3-Dichloropropene	ND		25.0	23.6		ug/L		95	70 - 138	6	25
Trichlorofluoromethane	ND		25.0	21.6		ug/L		86	60 - 150	3	25

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 440-226883-A-1 MSD**

**Matrix: Water**

**Analysis Batch: 516443**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	ND		25.0	20.4		ug/L		82	50 - 137	1	30
Trichloroethene	ND		25.0	23.9		ug/L		96	70 - 130	2	20
cis-1,2-Dichloroethene	ND		25.0	23.6		ug/L		94	70 - 130	3	20
Naphthalene	ND		25.0	27.5		ug/L		110	60 - 140	10	30
Xylenes, Total	ND		50.0	50.8		ug/L		102	70 - 133	4	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		80 - 120
Dibromofluoromethane (Surr)	91		76 - 132
Toluene-d8 (Surr)	94		80 - 128

**Lab Sample ID: MB 440-516966/4**

**Matrix: Water**

**Analysis Batch: 516966**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		0.50	0.25	ug/L			12/13/18 18:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		80 - 120		12/13/18 18:42	1
Dibromofluoromethane (Surr)	107		76 - 132		12/13/18 18:42	1
Toluene-d8 (Surr)	107		80 - 128		12/13/18 18:42	1

**Lab Sample ID: LCS 440-516966/6**

**Matrix: Water**

**Analysis Batch: 516966**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloromethane	25.0	22.2		ug/L		89	47 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	105		80 - 120
Dibromofluoromethane (Surr)	105		76 - 132
Toluene-d8 (Surr)	101		80 - 128

**Lab Sample ID: 440-227268-C-6 MS**

**Matrix: Water**

**Analysis Batch: 516966**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloromethane	ND		25.0	24.2		ug/L		97	39 - 144

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		80 - 120
Dibromofluoromethane (Surr)	106		76 - 132
Toluene-d8 (Surr)	99		80 - 128

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 440-227268-C-6 MSD**

**Matrix: Water**

**Analysis Batch: 516966**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloromethane	ND		25.0	23.9		ug/L		96	39 - 144	1	25
<b>Surrogate</b>	<b>%Recovery</b>	<b>MSD Qualifier</b>	<b>MSD Limits</b>								
4-Bromofluorobenzene (Surr)	103		80 - 120								
Dibromofluoromethane (Surr)	108		76 - 132								
Toluene-d8 (Surr)	97		80 - 128								

## Method: 1664A - HEM and SGT-HEM

**Lab Sample ID: MB 440-518857/1-A**

**Matrix: Water**

**Analysis Batch: 518896**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 518857**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	ND		5.0	1.4	mg/L		12/22/18 04:59	12/22/18 09:49	1

**Lab Sample ID: LCS 440-518857/2-A**

**Matrix: Water**

**Analysis Batch: 518896**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 518857**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HEM (Oil & Grease)	40.0	35.3		mg/L		88	78 - 114

**Lab Sample ID: LCSD 440-518857/3-A**

**Matrix: Water**

**Analysis Batch: 518896**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

**Prep Batch: 518857**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HEM (Oil & Grease)	40.0	36.0		mg/L		90	78 - 114	0	11

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## GC/MS VOA

### Analysis Batch: 515518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1	Outfall008_20181206_Grab	Total/NA	Water	624	
440-226551-3	TB_20181206	Total/NA	Water	624	
MB 440-515518/4	Method Blank	Total/NA	Water	624	
LCS 440-515518/5	Lab Control Sample	Total/NA	Water	624	
440-226628-D-1 MS	Matrix Spike	Total/NA	Water	624	
440-226628-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	624	

### Analysis Batch: 516174

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-3	TB_20181206	Total/NA	Water	624	
MB 440-516174/4	Method Blank	Total/NA	Water	624	
LCS 440-516174/5	Lab Control Sample	Total/NA	Water	624	
320-45836-E-19 MS	Matrix Spike	Total/NA	Water	624	
320-45836-E-19 MSD	Matrix Spike Duplicate	Total/NA	Water	624	

### Analysis Batch: 516443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1	Outfall008_20181206_Grab	Total/NA	Water	624	
MB 440-516443/4	Method Blank	Total/NA	Water	624	
LCS 440-516443/5	Lab Control Sample	Total/NA	Water	624	
440-226883-A-1 MS	Matrix Spike	Total/NA	Water	624	
440-226883-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	624	

### Analysis Batch: 516966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1 - RA	Outfall008_20181206_Grab	Total/NA	Water	624	
MB 440-516966/4	Method Blank	Total/NA	Water	624	
LCS 440-516966/6	Lab Control Sample	Total/NA	Water	624	
440-227268-C-6 MS	Matrix Spike	Total/NA	Water	624	
440-227268-C-6 MSD	Matrix Spike Duplicate	Total/NA	Water	624	

## General Chemistry

### Prep Batch: 518857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1	Outfall008_20181206_Grab	Total/NA	Water	1664A	
MB 440-518857/1-A	Method Blank	Total/NA	Water	1664A	
LCS 440-518857/2-A	Lab Control Sample	Total/NA	Water	1664A	
LCSD 440-518857/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	

### Analysis Batch: 518896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1	Outfall008_20181206_Grab	Total/NA	Water	1664A	518857
MB 440-518857/1-A	Method Blank	Total/NA	Water	1664A	518857
LCS 440-518857/2-A	Lab Control Sample	Total/NA	Water	1664A	518857
LCSD 440-518857/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	518857

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Biology

### Analysis Batch: 516006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226551-1	Outfall008_20181206_Grab	Total/NA	Water	SM 9221F	

1

2

3

4

5

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7

8

9

10

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12

13

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
LM	MS and/or MSD above acceptance limits. See Blank Spike (LCS)

### Biology

Qualifier	Qualifier Description
BU	Analyzed out of holding time
BV	Sample received after holding time expired

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Grab

TestAmerica Job ID: 440-226551-1

## Laboratory: TestAmerica Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
624		Water	cis-1,2-Dichloroethene
624		Water	Naphthalene
624		Water	Xylenes, Total



CHAIN OF CUSTODY FORM



440-226551 Chain of Custody

A A R A A

VLSJOUVKT

Client Name/Address: <b>Haley &amp; Aldrich</b> 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Annual Outfall [008] Outfall 008 Grab		ANALYSIS REQUIRED				Field Readings	Meter serial #
Test America Contact: Urvashi Patel 17461 Denan Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520 289 8606, 520 904.6944 (cell)		MST-Bacteroidales, Human (SAM348-357)	E. coli (SM9221)	Oil & Grease (E1664A-HEM)	VOCs PP + xylenes, Freon 11 (E624)	VOCs - only A+A+2CVE (E624)	Field Readings: (Include units) Time of Readings: <u>0915</u>
Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc		Field Manager: Mark Dominick 978.234 5033, 818 599.0702 (cell)							pH <u>6.54</u> pH unit Temp <u>7.34</u> °F
Sampler: <del>Dan Smith</del> <u>John Parkes</u>								Field readings QC Checked by: <u>Mark Dominick</u> Date/Time: <u>12-6-19/0915</u>	

Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	MST-Bacteroidales, Human (SAM348-357)	E. coli (SM9221)	Oil & Grease (E1664A-HEM)	VOCs PP + xylenes, Freon 11 (E624)	VOCs - only A+A+2CVE (E624)	Comments	
Outfall 008	Outfall008_20181206_Grab	12/6/2018 / 0915	WM	125 mL Sterile Poly	1	None	5	No	X					Send to Jurve Micro lab w/hold Deliver to lab ASAP 8 hr hold time Separate CoC	
			WM	125 mL Sterile Poly	3	Na2S2O3	10	No		X					Deliver to lab ASAP 8 hr hold time, Need 1x, 10x, 100x dilutions
			WM	1 L Glass Amber	2	HCl	15	No			X				
	Outfall008_20181206_Grab_Extra	12/6/2018 / 1045	WM	40 mL VOA	3	HCl	40	No				X			Hold
			WM	40 mL VOA	3	None	55	No					X		Hold
			WM	1 L Glass Amber	2	HCl	15	No			H				Hold
Trip Blanks	TB-20181206	12/6/2018 / 1045	WQ	40 mL VOA	2	HCl	40	No				X			
			WQ	40 mL VOA	2	None	55	No					X		

Legend: R = Routine, A = Annual

Relinquished By: <u>[Signature]</u> Date/Time: <u>12-6-18/1430</u> Company: <u>Haley &amp; Aldrich</u>	Received By: <u>[Signature]</u> Date/Time: <u>12.6.18 1430</u>	Turn-around time (Check) 24 Hour: _____ 72 Hour: _____ 10 Day: <u>X</u> 48 Hour: _____ 5 Day: _____ Normal: _____
Relinquished By: <u>[Signature]</u> Date/Time: <u>12.6.18 1800</u> Company: <u>TA IRV</u>	Received By: <u>[Signature]</u> Date/Time: <u>12/6/18 1800</u>	Sample Integrity: (Check) Intact: _____ On Ice: <u>19/1.4</u>
Relinquished By: _____ Date/Time: _____ Company: _____	Received By: _____ Date/Time: _____	Store samples for 6 months Data Requirements: (Check) No Level IV: _____ All Level IV: <u>X</u>

Page 25 of 26

12/24/2018

12/6/18





## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226551-1

**Login Number: 226551**

**List Number: 1**

**Creator: Avila, Stephanie 1**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	False	Headspace larger than 1/4" in one or more vials, one vial with acct. headspace
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226830-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**11 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

- I. INTRODUCTION..... 1
- II. Sample Management..... 2
- III. Methods 200.7, 200.8, 245.1 and SM2340B — Metals, Mercury and Hardness ..... 6
  - III.1. Holding Times ..... 6
  - III.2. MS Tuning and Calibration..... 6
  - III.3. Quality Control Samples ..... 6
    - III.3.1. Method Blanks ..... 6
    - III.3.2. Interference Check Samples: ..... 6
    - III.3.3. Laboratory Control Samples ..... 6
    - III.3.4. Laboratory Duplicates:..... 6
    - III.3.5. Matrix Spike/Matrix Spike Duplicate ..... 6
  - III.4. Serial Dilution..... 7
  - III.5. Internal Standards Performance..... 7
  - III.6. Compound Quantification and Reported Detection Limits ..... 7
  - III.7. Field QC Samples..... 7
    - III.7.1. Field Blanks and Equipment Blanks ..... 7
    - III.7.2. Field Duplicates ..... 7
- IV. EPA Method 608 –Pesticides and PCBs ..... 7
  - IV.1. Holding Times ..... 7
  - IV.2. Calibration..... 7
  - IV.3. Quality Control Samples ..... 8
    - IV.3.1. Method Blanks ..... 8
    - IV.3.2. Laboratory Control Samples ..... 8
    - IV.3.3. Surrogate Recovery..... 8
    - IV.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8
  - IV.4. Field QC Samples..... 8



IV.4.1. Field Blanks and Equipment Blanks ..... 8

IV.4.2. Field Duplicates..... 8

IV.5. Compound Identification ..... 8

IV.6. Compound Quantification and Reported Detection Limits ..... 8

V. EPA METHOD 314.0 — Perchlorate ..... 9

V.1. Holding Times ..... 9

V.2. Calibration..... 9

V.3. Quality Control Samples ..... 9

V.3.1. Method Blanks ..... 9

V.3.2. Laboratory Control Samples ..... 9

V.3.3. Laboratory Duplicates..... 9

V.3.4. Matrix Spike/Matrix Spike Duplicate ..... 9

V.4. Sample Result Verification ..... 9

V.5. Field QC Samples..... 9

V.5.1. Field Blanks and Equipment Blanks ..... 9

V.5.2. Field Duplicates..... 9

VI. EPA METHOD 525.2— Semivolatile Organic Compounds (SVOCs)..... 10

VI.1. Holding Times ..... 10

VI.2. GC/MS Tuning and Calibration ..... 10

VI.3. Quality Control Samples ..... 10

VI.3.1. Method Blanks ..... 10

VI.3.2. Laboratory Control Samples ..... 10

VI.3.3. Surrogate Recovery..... 10

VI.3.4. Matrix Spike/Matrix Spike Duplicate ..... 10

VI.4. Field QC Samples..... 10

VI.4.1. Field Blanks and Equipment Blanks ..... 10

VI.4.2. Field Duplicates ..... 11

VI.5. Internal Standards Performance..... 11

VI.6. Compound Identification ..... 11



VI.7.	Compound Quantification and Reported Detection Limits .....	11
VI.8.	System Performance.....	11
VII.	EPA METHOD 625 — Semivolatile Organic Compounds (SVOCs).....	11
VII.1.	Holding Times .....	11
VII.2.	GC/MS Tuning and Calibration .....	11
VII.3.	Quality Control Samples .....	11
VII.3.1.	Method Blanks.....	11
VII.3.2.	Laboratory Control Samples .....	12
VII.3.3.	Surrogate Recovery.....	12
VII.3.4.	Matrix Spike/Matrix Spike Duplicate .....	12
VII.4.	Field QC Samples.....	12
VII.4.1.	Field Blanks and Equipment Blanks: .....	12
VII.4.2.	Field Duplicates: .....	12
VII.5.	Internal Standards Performance.....	12
VII.6.	Compound Identification .....	12
VII.7.	Compound Quantification and Reported Detection Limits .....	12
VII.8.	Tentatively Identified Compounds (TICs) .....	12
VII.9.	System Performance.....	12
VIII.	VARIOUS METHODS — GENERAL CHEMISTRY.....	13
VIII.1.	Holding Times .....	13
VIII.2.	Calibration.....	13
VIII.3.	Quality Control Samples .....	13
VIII.3.1.	Method Blanks.....	13
VIII.3.2.	Laboratory Control Samples .....	13
VIII.3.3.	Laboratory Duplicates.....	14
VIII.3.4.	Matrix Spike/Matrix Spike Duplicate .....	14
VIII.4.	Sample Result Verification .....	14
VIII.5.	Field QC Samples.....	14
VIII.5.1.	Field Blanks and Equipment Blanks .....	14



VIII.5.2. Field Duplicates..... 14

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference

**I. INTRODUCTION****Task Order Title:** Boeing SSFL NPDES**Contract:** 40458-078 and 40458-083**MEC<sup>x</sup> Project No.:** 1272.003D.01 002**Sample Delivery Group:** 440-226830-1**Project Manager:** Katherine Miller**Matrix:** Water**QC Level:** IV**No. of Samples:** 2**No. of Reanalyses/Dilutions:** 0**Laboratory:** TestAmerica-Irvine**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall008_20181207_Comp	440-226830-1	N/A	Water	12/07/2018 11:05 AM	E200.7, E200.8, E218.6, E245.1, E100.2 E300, E314.0, 525.2, E608, E625, SM2340, SM2540C/D, SM4500-CN-E, SM4500-NH3G, EPA-821-R-02-013
Outfall008_20181207_Comp_F	440-226830-2	N/A	Water	12/07/2018 11:05 AM	E200.7, E200.8, E245.1, SM2340



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chains-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226830-1:

- The laboratories received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius (°C) and greater than 0°C.
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.
- Sample Outfall008\_20181207\_Comp was submitted to Aquatic Bioassay Consulting Laboratories (ABC) for Method EPA-821-R-02-013 – Chronic Toxicity – Selenastrum
- Sample Outfall008\_20181207\_Comp was submitted to LA Testing for asbestos analysis.
- A correction to the original COC was not initialed and dated.





TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. METHODS 200.7, 200.8, 245.1 AND SM2340B — METALS, MERCURY AND HARDNESS

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M. Hilchey of MEC<sup>x</sup> reviewed the SDG on January 11, 2019.

The samples listed in Table 1 for these analyses were validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for Metals (DVP-5, Rev. 2)*, *EPA Methods 200.7, 200.8 and 245.1*, *Standard Methods for the Examination of Water and Wastewater 2340B*, and the *National Functional Guidelines for Inorganic Data Review (2014)*.

#### III.1. HOLDING TIMES

The analytical holding times, 28 days for mercury and six months for the remaining metals, were met. The COC required sample Outfall008\_20181207\_Comp\_F to be filtered and preserved within 24 hours of receipt at the laboratory; however, the sample was filtered and preserved approximately 4 days after receipt. All results for this sample were qualified as estimated (UJ for nondetects, J for detects).

#### III.2. MS TUNING AND CALIBRATION

Mass calibrations were within 0.1 atomic mass units of the true value and the %RSDs were  $\leq 5\%$ .

QAPP calibration criteria were met. A blank and two or three standards were used for calibration of ICP-AES target analytes, a blank and four standards were used for calibration of ICP-MS, and a blank and five standards were used for calibration of mercury. The initial calibration *r* values were  $\geq 0.995$ . CRQL recoveries were within the laboratory control limits of 50-150%. Initial calibration verification recoveries were within QAPP control limits of 95-105% for ICP-AES and mercury, and 90-110% for ICP-MS. Continuing calibration verification recoveries were within QAPP control limits of 90-110% for all methods.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

There were no target analyte detections in the method blanks and calibration blanks with the exception of total arsenic (9.9  $\mu\text{g/L}$ ). The associated sample result was a detect greater than RL and  $<5\times$  the blank concentration and was qualified as estimated with high bias (J+).

##### III.3.2. INTERFERENCE CHECK SAMPLES:

ICP-AES and ICP-MS ICSAB recoveries were within the control limits of 80-120% or  $\pm 2\times$  the reporting limit, whichever is greater. No interferences were present in the samples at concentrations comparable to those of the ICSs; therefore, interference was not evaluated.

##### III.3.3. LABORATORY CONTROL SAMPLES

Laboratory control samples recoveries were within the QAPP control limits of 85-115%.

##### III.3.4. LABORATORY DUPLICATES:

Laboratory duplicate analyses were not performed on a sample in this SDG.

##### III.3.5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on samples Outfall008\_20181207\_Comp and Outfall008\_20181207\_Comp\_F for all methods. Results were not assessed when the parent sample



concentration exceeded the spike amount by 4×. Recoveries and RPDs were within the QAPP control limits of 70-130% and ≤20%, respectively, for all target analytes

The laboratory did not perform post-digestion spike analyses.

#### **III.4. SERIAL DILUTION**

No serial dilution analyses were performed on a sample in this SDG.

#### **III.5. INTERNAL STANDARDS PERFORMANCE**

Sample internal standard recoveries were within 60-125% of the ICP-MS calibration blank.

#### **III.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Calculations were verified, and the sample results reported on the sample result summary were verified against the raw data. No transcription errors or calculation errors were noted. Results reported below the RL and above the MDL were qualified as estimated (J) and coded with a DNQ to comply with the NPDES permit reporting requirements. Nondetects are valid to the MDL.

#### **III.7. FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### **III.7.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### **III.7.2. FIELD DUPLICATES**

There were no field duplicate samples identified for this SDG.

## **IV. EPA METHOD 608 –PESTICIDES AND PCBs**

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K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 11, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for Organochlorine Pesticides/PCBs by GC (DVP-4, Rev. 1)*, *EPA Method 608*, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2014)*.

#### **IV.1. HOLDING TIMES**

Extraction and analytical holding times were met. The sample was extracted within seven days of collection and analyzed within 40 days of extraction.

#### **IV.2. CALIBRATION**

The initial calibration had %RSDs of ≤10% or  $r^2$  of ≥0.990 on both analytical columns. The initial calibration verification (ICV) and continuing calibration verification (CCV) %Ds were within the control limit of ≤15%.



### **IV.3. QUALITY CONTROL SAMPLES**

#### **IV.3.1. METHOD BLANKS**

The target compounds were not detected in method blanks.

#### **IV.3.2. LABORATORY CONTROL SAMPLES**

LCS/LCSD recoveries and RPD were within the laboratory control limits. Toxaphene and chlordane were not spiked into the LCS samples.

#### **IV.3.3. SURROGATE RECOVERY**

Pesticide surrogate tetrachloro-m-xylene (TCMX) was recovered within the laboratory control limits of 10-150% in the site sample. PCB surrogate decachlorobiphenyl (DCB) was recovered within the laboratory control limit of 29-115%.

#### **IV.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were not performed due to a lack of sample volume. MEC<sup>x</sup> evaluated method accuracy and precision based on LCS/LCSD results.

### **IV.4. FIELD QC SAMPLES**

MEC<sup>x</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>x</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

#### **IV.4.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

#### **IV.4.2. FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

### **IV.5. COMPOUND IDENTIFICATION**

Compound identification was verified. Review of the sample chromatograms and retention times indicated no problems with target compound identification. The laboratory analyzed for seven Aroclors and 18 pesticide target compounds by Method 608.

### **IV.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibrations and the laboratory MDLs. The reported nondetects are valid to the reporting limit.



## V. EPA METHOD 314.0 — PERCHLORATE

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M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 11, 2019.

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *EPA Method 314.0*, and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

### V.1. HOLDING TIMES

The analytical holding time, 28 days, was met.

### V.2. CALIBRATION

Calibration criteria were met. The initial calibration  $r^2$  value was  $\geq 0.995$ . The initial calibration recovery was within QAPP control limits of 75-125% and the continuing calibration recoveries were within QAPP control limits of 85-115%. The MRL was recovered within the QAPP control limits of 70-130%. Interference check sample recovery was within the QAPP control limits of 80-120%.

### V.3. QUALITY CONTROL SAMPLES

#### V.3.1. METHOD BLANKS

Method blanks and calibration blanks had no detects.

#### V.3.2. LABORATORY CONTROL SAMPLES

The LCS recovery was within the QAPP control limits of 85-115%.

#### V.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were not performed on the sample from this SDG.

#### V.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Matrix spike/matrix spike duplicate analyses were not performed on the sample from this SDG.

### V.4. SAMPLE RESULT VERIFICATION

Calculations were verified, and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. The reported nondetect is valid to the MDL.

### V.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

#### V.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

#### V.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.



## VI. EPA METHOD 525.2— SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

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E. Wessling of MEC<sup>X</sup> reviewed the SDG on January 18, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Semivolatile Organics (DVP-3, Rev. 1)*, *EPA Method 525.2*, and the *National Functional Guidelines for Superfund Organic Methods Data Review (2017)*. The sample was validated at Level III.

### VI.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted 4 days past the 24 holding time for diazinon. Diazinon was rejected in the site sample for grossly exceeding the holding time. Chlorpyrifos was extracted within seven days and analyzed within 30 days of extraction.

### VI.2. GC/MS TUNING AND CALIBRATION

As the analyses were acquired in SIM mode, tuning was not applicable.

Calibration criteria were met. The initial calibration average RRFs were  $\geq 0.05$  and %RSDs  $\leq 30\%$  or  $r^2 \geq 0.990$ . The continuing calibration RRFs were  $\geq 0.05$  and recoveries were within the method QC limits of 70-130%.

### VI.3. QUALITY CONTROL SAMPLES

#### VI.3.1. METHOD BLANKS

Target compounds were not detected in the method blank.

#### VI.3.2. LABORATORY CONTROL SAMPLES

The recoveries were within the laboratory control limits of 37-169% for chlorpyrifos and 43-152% for diazinon.

#### VI.3.3. SURROGATE RECOVERY

Surrogates recovery for 1,3-dimethyl-2-nitrobenzene was below the control limits of 76-128%. Surrogate recovery was within the laboratory control limit of 40-163% for triphenyl phosphate. The sample result for chlorpyrifos was qualified as an estimated nondetect (UJ).

#### VI.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed on the sample in this SDG. Method accuracy was evaluated based upon LCS recoveries.

### VI.4. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

#### VI.4.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.





#### VI.4.2. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

#### VI.5. **INTERNAL STANDARDS PERFORMANCE**

The internal standard performance was not evaluated at Level III.

#### VI.6. **COMPOUND IDENTIFICATION**

Compound identification was not verified at Level III. The laboratory analyzed for chlorpyrifos and diazinon by Method 525.2.

#### VI.7. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was not verified at Level III. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit. The sample was analyzed at a 5× dilution prior to analysis due to potential matrix interference. The reporting limits and MDLs were adjusted accordingly.

#### VI.8. **SYSTEM PERFORMANCE**

System performance was not evaluated at Level III.

### VII. **EPA METHOD 625 — SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)**

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K. Zilis of MEC<sup>X</sup> reviewed the SDG on January 11, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Semivolatile Organics* (DVP-3, Rev. 1), *EPA Method 625*, and the *National Functional Guidelines for Superfund Organic Methods Data Review* (2014).

#### VII.1. **HOLDING TIMES**

Extraction and analytical holding times were met. The water sample was extracted within seven days of collection and analyzed within 30 days of extraction.

#### VII.2. **GC/MS TUNING AND CALIBRATION**

The DFTPP tunes met the method abundance criteria. Samples were analyzed within 12 hours of the DFTPP injection time.

Calibration criteria were met, with one exception. Initial calibration average relative response factors (RRFs) were within the method control limits, and the %RSDs were  $\leq 20\%$  or  $r^2$  values  $\geq 0.990$ . ICV and CCV RRFs were within the method control limits. ICV recoveries were within 70-130% of the true value, and CCV %Ds were  $\leq 20\%$ , except for the %D of benzidine with a high response of 20.1% with a limit of 20% for in the CCV associated with the sample analysis. No qualifier was applied.

#### VII.3. **QUALITY CONTROL SAMPLES**

##### VII.3.1. **METHOD BLANKS**

Target compounds were not detected in the method blank.



### VII.3.2. LABORATORY CONTROL SAMPLES

LCS/LCSD recoveries and RPDs were within the laboratory control limits.

### VII.3.3. SURROGATE RECOVERY

Recoveries were within the laboratory control limits.

### VII.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed due to a lack of sample volume. MEC<sup>X</sup> evaluated method accuracy and precision based on LCS/LCSD results.

## VII.4. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

### VII.4.1. FIELD BLANKS AND EQUIPMENT BLANKS:

Field blank or equipment blank samples were not identified for this SDG.

### VII.4.2. FIELD DUPLICATES:

Field duplicate samples were not identified in this SDG.

## VII.5. INTERNAL STANDARDS PERFORMANCE

The internal standard retention times and area counts were within the control limits established by the midpoint of the initial calibration standards:  $\pm 30$  seconds for retention times and  $-50\%/+100\%$  for internal standard areas.

## VII.6. COMPOUND IDENTIFICATION

Compound identification was verified. The laboratory analyzed for 57 semivolatile target compounds by EPA Method 625. Review of the sample chromatogram, retention times, and spectra indicated no problems with target compound identification.

## VII.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit. The result reported below the RL and above the MDL was qualified as estimated (J) and coded with a DNQ to comply with the NPDES permit reporting requirements.

## VII.8. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

The laboratory did not report TICs for this SDG.

## VII.9. SYSTEM PERFORMANCE

Review of the raw data indicated no problems with system performance.



## VIII. VARIOUS METHODS — GENERAL CHEMISTRY

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M. Hilchey of MEC<sup>x</sup> reviewed the SDG on January 13, 2019.

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *EPA Methods 100.2, 218.6, 300.0 and EPA-821-R-02-213*, *Standard Methods for the Examination of Water and Wastewater 2540C, 2540D, 4500-NH3-G and 4500-CN-E* and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

### VIII.1. HOLDING TIMES

The QAPP holding time for asbestos (100.2), 48 hours to filter and UV/ozone treatment, was not met. The sample was received 5 days after collection, at which time it was subjected to UV and ozonation and filtered. The sample was analyzed 9 days after collection. The reviewer qualified the nondetect result as an estimated nondetect (UJ) as a conservative measure based on professional judgment. The analytical hold times for the remaining analyses, as listed below, were met:

- 48 hours from collection for nitrate as N and nitrite as N (300.0)
- 7 days for total dissolved solids (2540C) and total suspended solids (2540D)
- 28 days for ammonia (4500-NH3-G), chloride, fluoride and sulfate (300.0)
- 14 days for total cyanide (4500-CN-E)
- 36 hours from collection for Chronic Toxicity – *Selenastrum* (EPA-821-R-02-213)
- 24 hours from collection for hexavalent chromium (218.6)

### VIII.2. CALIBRATION

Calibration criteria were met. The initial calibration  $r^2$  values, as appropriate, were  $\geq 0.995$  and all initial calibration verification recoveries were within 95-105% for anions and 90-110% for the remaining analyses, as appropriate. All continuing calibration verification recoveries were within 90-110% for all appropriate analyses. The MRL recoveries for ammonia and hexavalent chromium were within the laboratory control limits of 50-150%. Analytical balance calibration logs were provided by the laboratory. Calibration information for asbestos analysis was not provided.

For chronic toxicity, instruments were calibrated as per the manufacturer requirements and standard reference toxicant testing was performed to verify culture health and sensitivity. Method Test Acceptability criteria (TAC) were met.

### VIII.3. QUALITY CONTROL SAMPLES

#### VIII.3.1. METHOD BLANKS

The method blanks and calibration blanks had no detects. Method blank data for asbestos analysis was not provided. The laboratory negative controls were within the laboratory and method established compliance criteria for chronic toxicity.

#### VIII.3.2. LABORATORY CONTROL SAMPLES

Laboratory control sample recoveries were within the laboratory control limits. Positive controls were within the laboratory and method established compliance criteria for chronic toxicity.



### VIII.3.3. *LABORATORY DUPLICATES*

Laboratory duplicate analysis was performed on the sample in this SDG for TDS. The RPD was  $\leq 10\%$ . Laboratory duplicate analysis was not performed on the sample from this SDG for the remaining methods.

### VIII.3.4. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE*

MS/MSD analyses were not performed on the sample in this SDG.

## VIII.4. **SAMPLE RESULT VERIFICATION**

Calculations were verified, and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. It should be noted that raw data was not provided for asbestos analysis; therefore, the sample result could not be verified. Results reported below the RL and above the MDL were qualified as estimated (J) and coded with a DNQ to comply with the NPDES permit reporting requirements. Reported nondetects are valid to the MDL.

The method required 0.2 MFL analytical sensitivity was not reached for asbestos due to aliquot size. The reported analytical sensitivity for asbestos was 5.0 MFL.

## VIII.5. **FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

### VIII.5.1. *FIELD BLANKS AND EQUIPMENT BLANKS*

Field blank or equipment blank samples were not identified for this SDG.

### VIII.5.2. *FIELD DUPLICATES*

Field duplicate samples were not identified in this SDG.

# Validated Sample Result Forms: 4402268301

## Analysis Method E200.7

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 8

Lab Sample Name: 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	9100	100	50	ug/L			
Arsenic	T	7440-38-2	13	10	8.9	ug/L		J+	B
Beryllium	T	7440-41-7	1.2	2.0	1.0	ug/L	J,DX	J	DNQ
Boron	T	7440-42-8	0.081	0.050	0.025	mg/L			
Chromium	T	7440-47-3	10	5.0	2.5	ug/L			
Iron	T	7439-89-6	9.5	0.10	0.050	mg/L			
Nickel	T	7440-02-0	18	10	5.0	ug/L			
Vanadium	T	7440-62-2	22	10	5.0	ug/L			
Zinc	T	7440-66-6	120	20	12	ug/L			

Sample Name OUTFALL008\_20181207\_COMP\_F Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 8

Lab Sample Name: 440-226830-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	D	7429-90-5	60	100	50	ug/L	J,DX	J	H, DNQ
Arsenic	D	7440-38-2		10	8.9	ug/L	U	UJ	H
Beryllium	D	7440-41-7		2.0	1.0	ug/L	U	UJ	H
Boron	D	7440-42-8	0.049	0.050	0.025	mg/L	J,DX	J	H, DNQ
Chromium	D	7440-47-3		5.0	2.5	ug/L	U	UJ	H
Iron (Dissolved Lab)	D	7439-89-6DL	0.078	0.10	0.050	mg/L	J,DX	J	H, DNQ
Nickel	D	7440-02-0		10	5.0	ug/L	U	UJ	H
Vanadium	D	7440-62-2		10	5.0	ug/L	U	UJ	H
Zinc	D	7440-66-6		20	12	ug/L	U	UJ	H

## Analysis Method E200.8

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 8

Lab Sample Name: 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	0.86	2.0	0.50	ug/L	J,DX	J	DNQ
Cadmium	T	7440-43-9	0.90	1.0	0.25	ug/L	J,DX	J	DNQ
Copper	T	7440-50-8	15	2.0	0.50	ug/L			
Lead	T	7439-92-1	54	1.0	0.50	ug/L			

**Analysis Method E200.8**

Selenium	T	7782-49-2	2.1	2.0	0.50	ug/L		
Silver	T	7440-22-4		1.0	0.50	ug/L	U	U
Thallium	T	7440-28-0		1.0	0.50	ug/L	U	U

**Sample Name** OUTFALL008\_20181207\_COMP\_F **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	D	7440-36-0	0.79	2.0	0.50	ug/L	J,DX	J	H, DNQ
Cadmium	D	7440-43-9		1.0	0.25	ug/L	U	UJ	H
Copper	D	7440-50-8	1.5	2.0	0.50	ug/L	J,DX	J	H, DNQ
Lead	D	7439-92-1		1.0	0.50	ug/L	U	UJ	H
Selenium	D	7782-49-2	0.87	2.0	0.50	ug/L	J,DX	J	H, DNQ
Silver	D	7440-22-4		1.0	0.50	ug/L	U	UJ	H
Thallium	D	7440-28-0		1.0	0.50	ug/L	U	UJ	H

**Analysis Method E218.6**

**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chromium VI (Hexavalent)	T	18540-29-9		1.0	0.25	ug/L	U	U	

**Analysis Method E245.1**

**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Mercury	T	7439-97-6		0.20	0.10	ug/L	U	U	

**Sample Name** OUTFALL008\_20181207\_COMP\_F **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Mercury	D	7439-97-6		0.20	0.10	ug/L	U	UJ	H

**Analysis Method E300****Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	N	16887-00-6	2.3	0.50	0.25	mg/L			
Fluoride	N	16984-48-8	0.30	0.50	0.25	mg/L	J,DX	J	DNQ
Nitrate (as N)	N	14797-55-8	1.4	0.11	0.055	mg/L			
Nitrite (as N)	N	14797-65-0		0.15	0.025	mg/L	U	U	
Nitrite/Nitrate	N	NO2NO3	1.4	0.15	0.055	mg/L			
Sulfate	N	14808-79-8	5.1	0.50	0.25	mg/L			

**Analysis Method E314.0****Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Perchlorate	N	14797-73-0		4.0	0.95	ug/L	U	U	

**Analysis Method E525.2M****Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 9**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chlorpyrifos	N	2921-88-2		50	34	ng/L	U, M-02	UJ	S
Diazinon	N	333-41-5		50	26	ng/L	U, M-02	R	H

**Analysis Method E608****Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
4,4'-DDD	N	72-54-8		0.0047	0.0037	ug/L	U	U	
4,4'-DDE	N	72-55-9		0.0047	0.0028	ug/L	U	U	
4,4'-DDT	N	50-29-3		0.0093	0.0037	ug/L	U	U	
Aldrin	N	309-00-2		0.0047	0.0014	ug/L	U	U	
alpha-BHC	N	319-84-6		0.0047	0.0023	ug/L	U	U	
Aroclor-1016 (PCB-1016)	N	12674-11-2		0.47	0.23	ug/L	U	U	
Aroclor-1221 (PCB-1221)	N	11104-28-2		0.47	0.23	ug/L	U	U	

## Analysis Method E608

Aroclor-1232 (PCB-1232)	N	11141-16-5	0.47	0.23	ug/L	U	U
Aroclor-1242 (PCB-1242)	N	53469-21-9	0.47	0.23	ug/L	U	U
Aroclor-1248 (PCB-1248)	N	12672-29-6	0.47	0.23	ug/L	U	U
Aroclor-1254 (PCB-1254)	N	11097-69-1	0.47	0.23	ug/L	U	U
Aroclor-1260 (PCB-1260)	N	11096-82-5	0.47	0.23	ug/L	U	U
beta-BHC	N	319-85-7	0.0093	0.0037	ug/L	U	U
Chlordane	N	57-74-9	0.093	0.075	ug/L	U	U
delta-BHC	N	319-86-8	0.0047	0.0033	ug/L	U	U
Dieldrin	N	60-57-1	0.0047	0.0019	ug/L	U	U
Endosulfan I	N	959-98-8	0.0047	0.0028	ug/L	U	U
Endosulfan II	N	33213-65-9	0.0047	0.0019	ug/L	U	U
Endosulfan sulfate	N	1031-07-8	0.0093	0.0028	ug/L	U	U
Endrin	N	72-20-8	0.0047	0.0019	ug/L	U	U
Endrin aldehyde	N	7421-93-4	0.0093	0.0019	ug/L	U	U
gamma-BHC (Lindane)	N	58-89-9	0.0093	0.0028	ug/L	U	U
Heptachlor	N	76-44-8	0.0093	0.0028	ug/L	U	U
Heptachlor epoxide	N	1024-57-3	0.0047	0.0023	ug/L	U	U
Toxaphene	N	8001-35-2	0.47	0.23	ug/L	U	U

## Analysis Method E625

Sample Name: OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 8

Lab Sample Name: 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
1,2,4-Trichlorobenzene	N	120-82-1	1.00	0.200	ug/L	U	U		
1,2-Dichlorobenzene	N	95-50-1	0.500	0.200	ug/L	U	U		
1,2-Diphenylhydrazine	N	122-66-7	1.00	0.200	ug/L	U	U		
1,3-Dichlorobenzene	N	541-73-1	0.500	0.200	ug/L	U	U		
1,4-Dichlorobenzene	N	106-46-7	0.500	0.200	ug/L	U	U		
2,2'-oxybis(1-Chloropropane)	N	108-60-1	0.500	0.100	ug/L	U	U		
2,4,6-Trichlorophenol	N	88-06-2	1.00	0.100	ug/L	U	U		
2,4-Dichlorophenol	N	120-83-2	2.00	0.200	ug/L	U	U		
2,4-Dimethylphenol	N	105-67-9	2.00	0.500	ug/L	U	U		
2,4-Dinitrophenol	N	51-28-5	5.00	1.00	ug/L	U	U		
2,4-Dinitrotoluene	N	121-14-2	5.00	2.00	ug/L	U	U		
2,6-Dinitrotoluene	N	606-20-2	5.00	2.00	ug/L	U	U		
2-Chloronaphthalene	N	91-58-7	0.500	0.100	ug/L	U	U		
2-Chlorophenol	N	95-57-8	1.00	0.100	ug/L	U	U		
2-Nitrophenol	N	88-75-5	2.00	0.200	ug/L	U	U		
3,3'-Dichlorobenzidine	N	91-94-1	5.00	1.00	ug/L	U	U		
4,6-Dinitro-2-methylphenol	N	534-52-1	5.00	1.00	ug/L	U	U		
4-Bromophenyl phenyl ether	N	101-55-3	1.00	0.100	ug/L	U	U		



## Analysis Method E625

4-Chloro-3-methylphenol	N	59-50-7	2.00	0.200	ug/L	U	U	
4-Chlorophenyl phenyl ether	N	7005-72-3	0.500	0.100	ug/L	U	U	
4-Nitrophenol	N	100-02-7	5.00	2.00	ug/L	U	U	
Acenaphthene	N	83-32-9	0.500	0.100	ug/L	U	U	
Acenaphthylene	N	208-96-8	0.500	0.100	ug/L	U	U	
Anthracene	N	120-12-7	0.500	0.100	ug/L	U	U	
Benzidine	N	92-87-5	10.0	5.00	ug/L	U	U	
Benzo(a)anthracene	N	56-55-3	5.00	1.00	ug/L	U	U	
Benzo(a)pyrene	N	50-32-8	2.00	0.200	ug/L	U	U	
Benzo(b)fluoranthene	N	205-99-2	2.00	0.300	ug/L	U	U	
Benzo(g,h,i)perylene	N	191-24-2	5.00	1.00	ug/L	U	U	
Benzo(k)fluoranthene	N	207-08-9	0.500	0.100	ug/L	U	U	
bis(2-Chloroethoxy)methane	N	111-91-1	0.500	0.200	ug/L	U	U	
bis(2-Chloroethyl)ether	N	111-44-4	0.500	0.0500	ug/L	U	U	
bis(2-Ethylhexyl)phthalate	N	117-81-7	5.00	2.00	ug/L	U	U	
Butyl benzylphthalate	N	85-68-7	5.00	2.00	ug/L	U	U	
Chrysene	N	218-01-9	0.500	0.100	ug/L	U	U	
Dibenz(a,h)anthracene	N	53-70-3	0.500	0.200	ug/L	U	U	
Diethyl phthalate	N	84-66-2	1.00	0.200	ug/L	U	U	
Dimethyl phthalate	N	131-11-3	0.500	0.100	ug/L	U	U	
Di-n-butylphthalate	N	84-74-2	2.00	0.500	ug/L	U	U	
Di-n-octyl phthalate	N	117-84-0	5.00	1.00	ug/L	U	U	
Fluoranthene	N	206-44-0	0.500	0.100	ug/L	U	U	
Fluorene	N	86-73-7	0.500	0.100	ug/L	U	U	
Hexachlorobenzene	N	118-74-1	1.00	0.100	ug/L	U	U	
Hexachlorobutadiene	N	87-68-3	2.00	0.500	ug/L	U	U	
Hexachlorocyclopentadiene	N	77-47-4	5.00	2.00	ug/L	U	U	
Hexachloroethane	N	67-72-1	3.00	0.500	ug/L	U	U	
Indeno(1,2,3-cd)pyrene	N	193-39-5	2.00	0.400	ug/L	U	U	
Isophorone	N	78-59-1	1.00	0.200	ug/L	U	U	
Naphthalene	N	91-20-3	0.104	1.00	0.0500	ug/L	J,DX	J DNQ
Nitrobenzene	N	98-95-3	1.00	0.200	ug/L	U	U	
N-Nitrosodimethylamine	N	62-75-9	2.00	0.300	ug/L	U	U	
N-Nitrosodi-n-propylamine	N	621-64-7	2.00	0.200	ug/L	U	U	
N-Nitrosodiphenylamine	N	86-30-6	1.00	0.200	ug/L	U	U	
Pentachlorophenol	N	87-86-5	2.00	1.00	ug/L	U	U	
Phenanthrene	N	85-01-8	0.500	0.100	ug/L	U	U	
Phenol	N	108-95-2	1.00	0.100	ug/L	U	U	
Pyrene	N	129-00-0	0.500	0.100	ug/L	U	U	

*Analysis Method*    *EPA100.2*

**Sample Name**    OUTFALL008\_20181207\_COMP    **Matrix Type:**    WM    **Result Type:**    TRG

**Sample Date:**    12/7/2018 11:05:00 AM    **Validation Level:**    9

**Lab Sample Name:**    440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Asbestos	N	1332-21-4	5.00	5		MFL	U	UJ	H

*Analysis Method*    *EPA-821-R-02-013*

**Sample Name**    OUTFALL008\_20181207\_COMP    **Matrix Type:**    WM    **Result Type:**    TRG

**Sample Date:**    12/7/2018 11:05:00 AM    **Validation Level:**    8

**Lab Sample Name:**    440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chronic Toxicity, Selenastrum	N	CHRTOXSELEN A	-28.28			% SURV			

*Analysis Method*    *SM2340*

**Sample Name**    OUTFALL008\_20181207\_COMP    **Matrix Type:**    WM    **Result Type:**    TRG

**Sample Date:**    12/7/2018 11:05:00 AM    **Validation Level:**    8

**Lab Sample Name:**    440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	T	HARDNESSCA CO3	180	0.33	0.17	mg/L			

**Sample Name**    OUTFALL008\_20181207\_COMP\_F    **Matrix Type:**    WM    **Result Type:**    TRG

**Sample Date:**    12/7/2018 11:05:00 AM    **Validation Level:**    8

**Lab Sample Name:**    440-226830-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	D	HARDNESSCA CO3	69	0.33	0.17	mg/L			

*Analysis Method*    *SM2540C*

**Sample Name**    OUTFALL008\_20181207\_COMP    **Matrix Type:**    WM    **Result Type:**    TRG

**Sample Date:**    12/7/2018 11:05:00 AM    **Validation Level:**    8

**Lab Sample Name:**    440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Dissolved Solids (TDS)	N	TDS	120	10	5.0	mg/L			

*Analysis Method* SM2540D

**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Suspended Solids (TSS)	N	TSS	750	50	25	mg/L			

*Analysis Method* SM4500-CN-E

**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cyanide	N	57-12-5	15	5.0	2.5	ug/L			

*Analysis Method* SM4500-NH3G

**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG

**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 8

**Lab Sample Name:** 440-226830-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Ammonia (as N)	N	7664-41-7N	0.508	0.200	0.100	mg/L			

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

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Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226830-1

Client Project/Site: Annual Outfall 008 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

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Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/28/2018 4:10:39 PM

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### LINKS

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*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



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Urvashi Patel  
Manager of Project Management  
12/28/2018 4:10:39 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	7
Method Summary . . . . .	11
Lab Chronicle . . . . .	12
QC Sample Results . . . . .	14
QC Association Summary . . . . .	32
Definitions/Glossary . . . . .	37
Certification Summary . . . . .	38
Subcontract Data . . . . .	39
Chain of Custody . . . . .	59
Receipt Checklists . . . . .	61
Field Data Sheets . . . . .	62

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226830-1	Outfall008_20181207_Comp	Water	12/07/18 11:05	12/07/18 21:05
440-226830-2	Outfall008_20181207_Comp_F	Water	12/07/18 11:05	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Job ID: 440-226830-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226830-1**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3° C and 3.5° C.

### Receipt Exceptions

The reference method requires samples to be preserved to a pH <2. The following samples was received with insufficient preservation at a pH of 7: Outfall008\_20181207\_Comp (440-226830-1). The samples were preserved with 10mL of nitric acid reagent #1598157, at 16:00 on 12/11/18, to reach the appropriate pH of 2 in the laboratory for Radiologicals.

### GC/MS Semi VOA

Method(s) 625: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 440-516279: Benzidine. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. The associated samples were non-detect for the affected analyte.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### GC Semi VOA

Method(s) 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-516165 and analytical batch 440-516373. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch: (LCS 440-516165/4-A)

Method(s) 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-516165 and analytical batch 440-516104. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch: (LCS 440-516165/2-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Metals

Method(s) 200.8: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-517388 and analytical batch 440-517466 were outside control limits for Antimony and Selenium. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) FILTRATION: The following sample requested dissolved metals and was not filtered in the field: Outfall008\_20181207\_Comp\_F (440-226830-2). This sample was filtered and preserved upon receipt to the laboratory. However, due to employee oversight this sample was not filtered within the 24hrs from receipt as required per client. The dissolve method was requested 3 days after sample receipt.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

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## Job ID: 440-226830-1 (Continued)

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### Laboratory: TestAmerica Irvine (Continued)

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Subcontract non-Sister

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Organic Prep

Method(s) 3510C, 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510-8015B preparation batch 440-516165.

Method(s) 3520C, 625: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3520C\_8270C/625-LL preparation batch 440-515842.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 625 - Semivolatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Acenaphthylene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Anthracene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzidine	ND		10.0	5.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzo[a]anthracene	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzo[b]fluoranthene	ND		2.00	0.300	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzo[k]fluoranthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzo[a]pyrene	ND		2.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Bis(2-chloroethoxy)methane	ND		0.500	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Bis(2-chloroethyl)ether	ND		0.500	0.0500	ug/L		12/09/18 15:53	12/12/18 01:44	1
Bis(2-ethylhexyl) phthalate	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
4-Bromophenyl phenyl ether	ND		1.00	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Butyl benzyl phthalate	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
4-Chloro-3-methylphenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
2-Chloronaphthalene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
2-Chlorophenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
4-Chlorophenyl phenyl ether	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Chrysene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Dibenz(a,h)anthracene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Di-n-butyl phthalate	ND		2.00	0.500	ug/L		12/09/18 15:53	12/12/18 01:44	1
1,2-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
1,3-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
1,4-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
3,3'-Dichlorobenzidine	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,4-Dichlorophenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Diethyl phthalate	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,4-Dimethylphenol	ND		2.00	0.500	ug/L		12/09/18 15:53	12/12/18 01:44	1
Dimethyl phthalate	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
4,6-Dinitro-2-methylphenol	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,4-Dinitrophenol	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,4-Dinitrotoluene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,6-Dinitrotoluene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
Di-n-octyl phthalate	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
1,2-Diphenylhydrazine(as Azobenzene)	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Fluoranthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Fluorene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Hexachlorobenzene	ND		1.00	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Hexachlorobutadiene	ND		2.00	0.500	ug/L		12/09/18 15:53	12/12/18 01:44	1
Hexachloroethane	ND		3.00	0.500	ug/L		12/09/18 15:53	12/12/18 01:44	1
Hexachlorocyclopentadiene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
Indeno[1,2,3-cd]pyrene	ND		2.00	0.400	ug/L		12/09/18 15:53	12/12/18 01:44	1
Isophorone	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
<b>Naphthalene</b>	<b>0.104</b>	<b>J,DX</b>	1.00	0.0500	ug/L		12/09/18 15:53	12/12/18 01:44	1
Nitrobenzene	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
2-Nitrophenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
4-Nitrophenol	ND		5.00	2.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
N-Nitrosodimethylamine	ND		2.00	0.300	ug/L		12/09/18 15:53	12/12/18 01:44	1
N-Nitrosodiphenylamine	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
Pentachlorophenol	ND		2.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
Phenanthrene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Phenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Pyrene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
1,2,4-Trichlorobenzene	ND		1.00	0.200	ug/L		12/09/18 15:53	12/12/18 01:44	1
2,4,6-Trichlorophenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1
Benzo[g,h,i]perylene	ND		5.00	1.00	ug/L		12/09/18 15:53	12/12/18 01:44	1
bis (2-chloroisopropyl) ether	ND		0.500	0.100	ug/L		12/09/18 15:53	12/12/18 01:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	78		50 - 120	12/09/18 15:53	12/12/18 01:44	1
2-Fluorophenol	71		30 - 120	12/09/18 15:53	12/12/18 01:44	1
2,4,6-Tribromophenol	98		40 - 120	12/09/18 15:53	12/12/18 01:44	1
Nitrobenzene-d5	81		45 - 120	12/09/18 15:53	12/12/18 01:44	1
Terphenyl-d14	120		37 - 144	12/09/18 15:53	12/12/18 01:44	1
Phenol-d6	85		35 - 120	12/09/18 15:53	12/12/18 01:44	1

## Method: 608 PCB LL - Polychlorinated Biphenyls (PCBs) Low level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1016	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1221	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1232	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1242	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1248	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1254	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1
Aroclor 1260	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 17:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	90		29 - 115	12/11/18 05:36	12/11/18 17:47	1

## Method: 608 Pesticides - Organochlorine Pesticides Low level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		0.0047	0.0014	ug/L		12/11/18 05:36	12/11/18 16:39	1
alpha-BHC	ND		0.0047	0.0023	ug/L		12/11/18 05:36	12/11/18 16:39	1
beta-BHC	ND		0.0093	0.0037	ug/L		12/11/18 05:36	12/11/18 16:39	1
Chlordane (technical)	ND		0.093	0.075	ug/L		12/11/18 05:36	12/11/18 16:39	1
delta-BHC	ND		0.0047	0.0033	ug/L		12/11/18 05:36	12/11/18 16:39	1
Dieldrin	ND		0.0047	0.0019	ug/L		12/11/18 05:36	12/11/18 16:39	1
Endosulfan I	ND		0.0047	0.0028	ug/L		12/11/18 05:36	12/11/18 16:39	1
Endosulfan II	ND		0.0047	0.0019	ug/L		12/11/18 05:36	12/11/18 16:39	1
Endosulfan sulfate	ND		0.0093	0.0028	ug/L		12/11/18 05:36	12/11/18 16:39	1
Endrin	ND		0.0047	0.0019	ug/L		12/11/18 05:36	12/11/18 16:39	1
Endrin aldehyde	ND		0.0093	0.0019	ug/L		12/11/18 05:36	12/11/18 16:39	1
gamma-BHC (Lindane)	ND		0.0093	0.0028	ug/L		12/11/18 05:36	12/11/18 16:39	1
Heptachlor	ND		0.0093	0.0028	ug/L		12/11/18 05:36	12/11/18 16:39	1
Heptachlor epoxide	ND		0.0047	0.0023	ug/L		12/11/18 05:36	12/11/18 16:39	1
Toxaphene	ND		0.47	0.23	ug/L		12/11/18 05:36	12/11/18 16:39	1
4,4'-DDD	ND		0.0047	0.0037	ug/L		12/11/18 05:36	12/11/18 16:39	1
4,4'-DDE	ND		0.0047	0.0028	ug/L		12/11/18 05:36	12/11/18 16:39	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

Date Collected: 12/07/18 11:05

Matrix: Water

Date Received: 12/07/18 21:05

### Method: 608 Pesticides - Organochlorine Pesticides Low level (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDT	ND		0.0093	0.0037	ug/L		12/11/18 05:36	12/11/18 16:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	65		10 - 150				12/11/18 05:36	12/11/18 16:39	1

### Method: 218.6 - Chromium, Hexavalent (Ion Chromatography)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	ND		1.0	0.25	ug/L			12/07/18 23:44	1

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.3		0.50	0.25	mg/L			12/07/18 21:48	1
Nitrate as N	1.4		0.11	0.055	mg/L			12/07/18 21:48	1
Fluoride	0.30	J,DX	0.50	0.25	mg/L			12/07/18 21:48	1
Nitrite as N	ND		0.15	0.025	mg/L			12/07/18 21:48	1
Sulfate	5.1		0.50	0.25	mg/L			12/07/18 21:48	1

### Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/10/18 12:58	1

### Method: NO3NO2 Calc - Nitrogen, Nitrate-Nitrite

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	1.4		0.15	0.055	mg/L			12/18/18 14:50	1

### Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	9100		100	50	ug/L		12/16/18 11:30	12/17/18 09:38	1
Arsenic	13		10	8.9	ug/L		12/16/18 11:30	12/17/18 09:38	1
Boron	0.081		0.050	0.025	mg/L		12/16/18 11:30	12/17/18 09:38	1
Beryllium	1.2	J,DX	2.0	1.0	ug/L		12/16/18 11:30	12/17/18 09:38	1
Chromium	10		5.0	2.5	ug/L		12/16/18 11:30	12/17/18 09:38	1
Iron	9.5		0.10	0.050	mg/L		12/16/18 11:30	12/17/18 09:38	1
Nickel	18		10	5.0	ug/L		12/16/18 11:30	12/17/18 09:38	1
Vanadium	22		10	5.0	ug/L		12/16/18 11:30	12/17/18 09:38	1
Zinc	120		20	12	ug/L		12/16/18 11:30	12/17/18 09:38	1

### Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1
Cadmium	0.90	J,DX	1.0	0.25	ug/L		12/16/18 11:26	12/16/18 19:07	1
Copper	15		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1
Lead	54		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1
Antimony	0.86	J,DX	2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1
Selenium	2.1		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1
Thallium	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:07	1

### Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/18/18 11:03	12/18/18 15:38	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

Date Collected: 12/07/18 11:05

Matrix: Water

Date Received: 12/07/18 21:05

**Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	180		0.33	0.17	mg/L			12/19/18 18:42	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	120		10	5.0	mg/L			12/11/18 14:10	1
Total Suspended Solids	750		50	25	mg/L			12/14/18 08:46	1
Cyanide, Total	15		5.0	2.5	ug/L		12/18/18 23:42	12/19/18 23:46	1
Ammonia (as N)	0.508		0.200	0.100	mg/L			12/19/18 15:06	1

**Client Sample ID: Outfall008\_20181207\_Comp\_F**

**Lab Sample ID: 440-226830-2**

Date Collected: 12/07/18 11:05

Matrix: Water

Date Received: 12/07/18 21:05

**Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	60	J,DX	100	50	ug/L		12/17/18 11:56	12/17/18 19:42	1
Arsenic	ND		10	8.9	ug/L		12/17/18 11:56	12/17/18 19:42	1
Boron	0.049	J,DX	0.050	0.025	mg/L		12/17/18 11:56	12/17/18 19:42	1
Beryllium	ND		2.0	1.0	ug/L		12/17/18 11:56	12/17/18 19:42	1
Chromium	ND		5.0	2.5	ug/L		12/17/18 11:56	12/17/18 19:42	1
Iron	0.078	J,DX	0.10	0.050	mg/L		12/17/18 11:56	12/17/18 19:42	1
Nickel	ND		10	5.0	ug/L		12/17/18 11:56	12/17/18 19:42	1
Vanadium	ND		10	5.0	ug/L		12/17/18 11:56	12/17/18 19:42	1
Zinc	ND		20	12	ug/L		12/17/18 11:56	12/17/18 19:42	1

**Method: 200.8 - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1
Cadmium	ND		1.0	0.25	ug/L		12/17/18 11:52	12/17/18 21:14	1
Copper	1.5	J,DX	2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1
Lead	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1
Antimony	0.79	J,DX	2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1
Selenium	0.87	J,DX	2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1
Thallium	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:14	1

**Method: 245.1 - Mercury (CVAA) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/12/18 21:39	12/13/18 21:30	1

**Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	69		0.33	0.17	mg/L			12/19/18 18:49	1

TestAmerica Irvine

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

Method	Method Description	Protocol	Laboratory
625	Semivolatile Organic Compounds (GC/MS)	EPA	TAL IRV
608 PCB LL	Polychlorinated Biphenyls (PCBs) Low level	40CFR136A	TAL IRV
608 Pesticides	Organochlorine Pesticides Low level	40CFR136A	TAL IRV
218.6	Chromium, Hexavalent (Ion Chromatography)	EPA	TAL IRV
300.0	Anions, Ion Chromatography	MCAWW	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
NO3NO2 Calc	Nitrogen, Nitrate-Nitrite	EPA	TAL IRV
200.7 Rev 4.4	Metals (ICP)	EPA	TAL IRV
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
SM 4500 CN E	Cyanide, Total (Low Level)	SM	TAL IRV
SM 4500 NH3 G	Ammonia	SM	TAL IRV
100.2	EPA 100.2 Asbestos in Drinking Water	EPA	LA Testing
EPA	Bioassay	EPA	ABC
Subcontract	Weck- 525.2	None	Weck Lab
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
608	Liquid-Liquid Extraction (Separatory Funnel)	40CFR136A	TAL IRV
625	Liquid-Liquid Extraction	40CFR136A	TAL IRV
Distill/CN	Distillation, Cyanide	None	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

## Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.  
EPA = US Environmental Protection Agency  
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.  
None = None  
SM = "Standard Methods For The Examination Of Water And Wastewater"

## Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001  
LA Testing = LA Testing, 520 Mission Street, South Pasadena, CA 91030  
TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022  
Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	625			1000 mL	2.0 mL	515842	12/09/18 15:53	AJP	TAL IRV
Total/NA	Analysis	625		1			516279	12/12/18 01:44	HN	TAL IRV
Total/NA	Prep	608			1070 mL	2 mL	516165	12/11/18 05:36	L1H	TAL IRV
Total/NA	Analysis	608 PCB LL		1			516373	12/11/18 17:47	D1D	TAL IRV
Total/NA	Prep	608			1070 mL	2 mL	516165	12/11/18 05:36	L1H	TAL IRV
Total/NA	Analysis	608 Pesticides		1			516104	12/11/18 16:39	D1D	TAL IRV
Total/NA	Analysis	218.6		1			515510	12/07/18 23:44	RW	TAL IRV
Total/NA	Analysis	300.0		1			515570	12/07/18 21:48	NN	TAL IRV
Total/NA	Analysis	300.0		1			515571	12/07/18 21:48	NN	TAL IRV
Total/NA	Analysis	314.0		1			515889	12/10/18 12:58	CTH	TAL IRV
Total/NA	Analysis	NO3NO2 Calc		1			517959	12/18/18 14:50	TLN	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	517392	12/16/18 11:30	KE	TAL IRV
Total Recoverable	Analysis	200.7 Rev 4.4		1			518714	12/17/18 09:38	VS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	517388	12/16/18 11:26	KE	TAL IRV
Total Recoverable	Analysis	200.8		1			517466	12/16/18 19:07	B1H	TAL IRV
Total/NA	Prep	245.1			20 mL	20 mL	517745	12/18/18 11:03	DB	TAL IRV
Total/NA	Analysis	245.1		1			518005	12/18/18 15:38	DB	TAL IRV
Total Recoverable	Analysis	SM 2340B		1			517415	12/19/18 18:42	P1R	TAL IRV
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	516331	12/11/18 14:10	XL	TAL IRV
Total/NA	Analysis	SM 2540D		1	20 mL	1000 mL	517087	12/14/18 08:46	XL	TAL IRV
Total/NA	Prep	Distill/CN			50 mL	50 mL	518050	12/18/18 23:42	QTN	TAL IRV
Total/NA	Analysis	SM 4500 CN E		1			518292	12/19/18 23:46	QTN	TAL IRV
Total/NA	Analysis	SM 4500 NH3 G		1	0.8 mL	8.0 mL	518382	12/19/18 15:06	KMY	TAL IRV

**Client Sample ID: Outfall008\_20181207\_Comp\_F**

**Lab Sample ID: 440-226830-2**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			270 mL	270 mL	516386	12/11/18 18:20	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	517587	12/17/18 11:56	KE	TAL IRV
Dissolved	Analysis	200.7 Rev 4.4		1			517759	12/17/18 19:42	P1R	TAL IRV
Dissolved	Filtration	FILTRATION			270 mL	270 mL	516386	12/11/18 18:20	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	517585	12/17/18 11:52	KE	TAL IRV
Dissolved	Analysis	200.8		1			517749	12/17/18 21:14	P1R	TAL IRV
Dissolved	Filtration	FILTRATION			270 mL	270 mL	516386	12/11/18 18:20	KE	TAL IRV
Dissolved	Prep	245.1			20 mL	20 mL	516709	12/12/18 21:39	DB	TAL IRV
Dissolved	Analysis	245.1		1			517219	12/13/18 21:30	DB	TAL IRV
Dissolved	Analysis	SM 2340B		1			517011	12/19/18 18:49	P1R	TAL IRV

TestAmerica Irvine

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

LA Testing = LA Testing, 520 Mission Street, South Pasadena, CA 91030

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 440-515842/1-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Acenaphthylene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Anthracene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzidine	ND		10.0	5.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzo[a]anthracene	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzo[b]fluoranthene	ND		2.00	0.300	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzo[k]fluoranthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzo[a]pyrene	ND		2.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Bis(2-chloroethoxy)methane	ND		0.500	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Bis(2-chloroethyl)ether	ND		0.500	0.0500	ug/L		12/09/18 15:53	12/11/18 13:42	1
Bis(2-ethylhexyl) phthalate	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
4-Bromophenyl phenyl ether	ND		1.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Butyl benzyl phthalate	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
4-Chloro-3-methylphenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
2-Chloronaphthalene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
2-Chlorophenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
4-Chlorophenyl phenyl ether	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Chrysene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Dibenz(a,h)anthracene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Di-n-butyl phthalate	ND		2.00	0.500	ug/L		12/09/18 15:53	12/11/18 13:42	1
1,2-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
1,3-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
1,4-Dichlorobenzene	ND		0.500	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
3,3'-Dichlorobenzidine	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4-Dichlorophenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Diethyl phthalate	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4-Dimethylphenol	ND		2.00	0.500	ug/L		12/09/18 15:53	12/11/18 13:42	1
Dimethyl phthalate	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
4,6-Dinitro-2-methylphenol	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4-Dinitrophenol	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4-Dinitrotoluene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,6-Dinitrotoluene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
Di-n-octyl phthalate	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
1,2-Diphenylhydrazine(as Azobenzene)	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Fluoranthene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Fluorene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Hexachlorobenzene	ND		1.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Hexachlorobutadiene	ND		2.00	0.500	ug/L		12/09/18 15:53	12/11/18 13:42	1
Hexachloroethane	ND		3.00	0.500	ug/L		12/09/18 15:53	12/11/18 13:42	1
Hexachlorocyclopentadiene	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
Indeno[1,2,3-cd]pyrene	ND		2.00	0.400	ug/L		12/09/18 15:53	12/11/18 13:42	1
Isophorone	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Naphthalene	ND		1.00	0.0500	ug/L		12/09/18 15:53	12/11/18 13:42	1
Nitrobenzene	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
2-Nitrophenol	ND		2.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
4-Nitrophenol	ND		5.00	2.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
N-Nitrosodimethylamine	ND		2.00	0.300	ug/L		12/09/18 15:53	12/11/18 13:42	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 440-515842/1-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
N-Nitrosodi-n-propylamine	ND		2.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
Pentachlorophenol	ND		2.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
Phenanthrene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Phenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Pyrene	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
1,2,4-Trichlorobenzene	ND		1.00	0.200	ug/L		12/09/18 15:53	12/11/18 13:42	1
2,4,6-Trichlorophenol	ND		1.00	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1
Benzo[g,h,i]perylene	ND		5.00	1.00	ug/L		12/09/18 15:53	12/11/18 13:42	1
bis (2-chloroisopropyl) ether	ND		0.500	0.100	ug/L		12/09/18 15:53	12/11/18 13:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	76		50 - 120	12/09/18 15:53	12/11/18 13:42	1
2-Fluorophenol	67		30 - 120	12/09/18 15:53	12/11/18 13:42	1
2,4,6-Tribromophenol	81		40 - 120	12/09/18 15:53	12/11/18 13:42	1
Nitrobenzene-d5	78		45 - 120	12/09/18 15:53	12/11/18 13:42	1
Terphenyl-d14	98		37 - 144	12/09/18 15:53	12/11/18 13:42	1
Phenol-d6	76		35 - 120	12/09/18 15:53	12/11/18 13:42	1

**Lab Sample ID: LCS 440-515842/2-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Acenaphthene	10.0	7.889		ug/L		79	47 - 145
Acenaphthylene	10.0	7.910		ug/L		79	33 - 145
Anthracene	10.0	8.757		ug/L		88	27 - 133
Benzidine	10.0	5.247	J,DX	ug/L		52	5 - 66
Benzo[a]anthracene	10.0	8.765		ug/L		88	33 - 143
Benzo[b]fluoranthene	10.0	9.096		ug/L		91	24 - 150
Benzo[k]fluoranthene	10.0	9.188		ug/L		92	11 - 150
Benzo[a]pyrene	10.0	8.937		ug/L		89	17 - 150
Bis(2-chloroethoxy)methane	10.0	7.763		ug/L		78	33 - 150
Bis(2-chloroethyl)ether	10.0	7.341		ug/L		73	12 - 150
Bis(2-ethylhexyl) phthalate	10.0	9.257		ug/L		93	10 - 150
4-Bromophenyl phenyl ether	10.0	8.372		ug/L		84	53 - 127
Butyl benzyl phthalate	10.0	9.039		ug/L		90	10 - 150
4-Chloro-3-methylphenol	10.0	8.907		ug/L		89	22 - 147
2-Chloronaphthalene	10.0	7.297		ug/L		73	60 - 118
2-Chlorophenol	10.0	6.557		ug/L		66	23 - 134
4-Chlorophenyl phenyl ether	10.0	8.167		ug/L		82	25 - 150
Chrysene	10.0	8.691		ug/L		87	17 - 150
Dibenz(a,h)anthracene	10.0	10.09		ug/L		101	10 - 150
Di-n-butyl phthalate	10.0	9.379		ug/L		94	10 - 118
1,2-Dichlorobenzene	10.0	6.049		ug/L		60	32 - 129
1,3-Dichlorobenzene	10.0	5.712		ug/L		57	10 - 150
1,4-Dichlorobenzene	10.0	5.873		ug/L		59	20 - 124
3,3'-Dichlorobenzidine	10.0	8.202		ug/L		82	10 - 150

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 440-515842/2-A**

**Matrix: Water**

**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 515842**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-Dichlorophenol	10.0	7.336		ug/L		73	39 - 135
Diethyl phthalate	10.0	9.086		ug/L		91	10 - 114
2,4-Dimethylphenol	10.0	7.681		ug/L		77	32 - 119
Dimethyl phthalate	10.0	8.625		ug/L		86	10 - 112
4,6-Dinitro-2-methylphenol	20.0	18.97		ug/L		95	10 - 150
2,4-Dinitrophenol	20.0	14.32		ug/L		72	50 - 150
2,4-Dinitrotoluene	10.0	8.465		ug/L		85	39 - 139
2,6-Dinitrotoluene	10.0	8.689		ug/L		87	50 - 150
Di-n-octyl phthalate	10.0	9.302		ug/L		93	10 - 146
1,2-Diphenylhydrazine(as Azobenzene)	10.1	8.927		ug/L		88	47 - 116
Fluoranthene	10.0	9.231		ug/L		92	26 - 137
Fluorene	10.0	8.616		ug/L		86	59 - 121
Hexachlorobenzene	10.0	8.728		ug/L		87	10 - 150
Hexachlorobutadiene	10.0	4.885		ug/L		49	24 - 116
Hexachloroethane	10.0	5.378		ug/L		54	40 - 113
Hexachlorocyclopentadiene	10.0	3.913	J,DX	ug/L		39	10 - 67
Indeno[1,2,3-cd]pyrene	10.0	10.69		ug/L		107	10 - 150
Isophorone	10.0	8.898		ug/L		89	21 - 150
Naphthalene	10.0	6.852		ug/L		69	21 - 133
Nitrobenzene	10.0	7.348		ug/L		73	35 - 150
2-Nitrophenol	10.0	6.910		ug/L		69	29 - 150
4-Nitrophenol	20.0	14.83		ug/L		74	10 - 132
N-Nitrosodimethylamine	10.0	8.208		ug/L		82	26 - 117
N-Nitrosodiphenylamine	10.0	8.702		ug/L		87	54 - 110
N-Nitrosodi-n-propylamine	10.0	9.105		ug/L		91	10 - 150
Pentachlorophenol	20.0	16.01		ug/L		80	14 - 150
Phenanthrene	10.0	8.736		ug/L		87	54 - 120
Phenol	10.0	7.217		ug/L		72	10 - 112
Pyrene	10.0	8.942		ug/L		89	52 - 115
1,2,4-Trichlorobenzene	10.0	6.104		ug/L		61	44 - 142
2,4,6-Trichlorophenol	10.0	8.220		ug/L		82	37 - 144
Benzo[g,h,i]perylene	10.0	11.37		ug/L		114	10 - 150
bis (2-chloroisopropyl) ether	10.0	6.514		ug/L		65	47 - 103

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl	77		50 - 120
2-Fluorophenol	61		30 - 120
2,4,6-Tribromophenol	90		40 - 120
Nitrobenzene-d5	74		45 - 120
Terphenyl-d14	93		37 - 144
Phenol-d6	73		35 - 120

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 440-515842/3-A

Matrix: Water

Analysis Batch: 516279

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 515842

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Acenaphthene	10.0	7.202		ug/L		72	47 - 145	9	35
Acenaphthylene	10.0	7.193		ug/L		72	33 - 145	9	35
Anthracene	10.0	8.363		ug/L		84	27 - 133	5	35
Benzidine	10.0	6.646	J,DX	ug/L		66	5 - 66	24	35
Benzo[a]anthracene	10.0	8.660		ug/L		87	33 - 143	1	35
Benzo[b]fluoranthene	10.0	9.402		ug/L		94	24 - 150	3	35
Benzo[k]fluoranthene	10.0	9.013		ug/L		90	11 - 150	2	35
Benzo[a]pyrene	10.0	9.126		ug/L		91	17 - 150	2	35
Bis(2-chloroethoxy)methane	10.0	7.419		ug/L		74	33 - 150	5	35
Bis(2-chloroethyl)ether	10.0	7.399		ug/L		74	12 - 150	1	35
Bis(2-ethylhexyl) phthalate	10.0	9.150		ug/L		92	10 - 150	1	35
4-Bromophenyl phenyl ether	10.0	7.826		ug/L		78	53 - 127	7	35
Butyl benzyl phthalate	10.0	9.334		ug/L		93	10 - 150	3	35
4-Chloro-3-methylphenol	10.0	7.851		ug/L		79	22 - 147	13	35
2-Chloronaphthalene	10.0	6.738		ug/L		67	60 - 118	8	35
2-Chlorophenol	10.0	6.770		ug/L		68	23 - 134	3	35
4-Chlorophenyl phenyl ether	10.0	7.776		ug/L		78	25 - 150	5	35
Chrysene	10.0	8.916		ug/L		89	17 - 150	3	35
Dibenz(a,h)anthracene	10.0	9.731		ug/L		97	10 - 150	4	35
Di-n-butyl phthalate	10.0	9.233		ug/L		92	10 - 118	2	35
1,2-Dichlorobenzene	10.0	5.773		ug/L		58	32 - 129	5	35
1,3-Dichlorobenzene	10.0	5.149		ug/L		51	10 - 150	10	35
1,4-Dichlorobenzene	10.0	5.540		ug/L		55	20 - 124	6	35
3,3'-Dichlorobenzidine	10.0	8.714		ug/L		87	10 - 150	6	35
2,4-Dichlorophenol	10.0	7.154		ug/L		72	39 - 135	3	35
Diethyl phthalate	10.0	9.152		ug/L		92	10 - 114	1	35
2,4-Dimethylphenol	10.0	6.892		ug/L		69	32 - 119	11	35
Dimethyl phthalate	10.0	8.200		ug/L		82	10 - 112	5	35
4,6-Dinitro-2-methylphenol	20.0	18.09		ug/L		90	10 - 150	5	35
2,4-Dinitrophenol	20.0	13.23		ug/L		66	50 - 150	8	35
2,4-Dinitrotoluene	10.0	8.476		ug/L		85	39 - 139	0	35
2,6-Dinitrotoluene	10.0	8.246		ug/L		82	50 - 150	5	35
Di-n-octyl phthalate	10.0	9.265		ug/L		93	10 - 146	0	35
1,2-Diphenylhydrazine(as Azobenzene)	10.1	8.416		ug/L		83	47 - 116	6	35
Fluoranthene	10.0	9.066		ug/L		91	26 - 137	2	35
Fluorene	10.0	8.000		ug/L		80	59 - 121	7	35
Hexachlorobenzene	10.0	8.385		ug/L		84	10 - 150	4	35
Hexachlorobutadiene	10.0	5.373		ug/L		54	24 - 116	10	35
Hexachloroethane	10.0	5.615		ug/L		56	40 - 113	4	35
Hexachlorocyclopentadiene	10.0	4.328	J,DX	ug/L		43	10 - 67	10	35
Indeno[1,2,3-cd]pyrene	10.0	10.60		ug/L		106	10 - 150	1	35
Isophorone	10.0	7.991		ug/L		80	21 - 150	11	35
Naphthalene	10.0	6.524		ug/L		65	21 - 133	5	35
Nitrobenzene	10.0	7.336		ug/L		73	35 - 150	0	35
2-Nitrophenol	10.0	6.776		ug/L		68	29 - 150	2	35
4-Nitrophenol	20.0	15.63		ug/L		78	10 - 132	5	35
N-Nitrosodimethylamine	10.0	7.657		ug/L		77	26 - 117	7	35

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 440-515842/3-A**  
**Matrix: Water**  
**Analysis Batch: 516279**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 515842**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-Nitrosodiphenylamine	10.0	8.137		ug/L		81	54 - 110	7	35
N-Nitrosodi-n-propylamine	10.0	8.278		ug/L		83	10 - 150	10	35
Pentachlorophenol	20.0	14.87		ug/L		74	14 - 150	7	35
Phenanthrene	10.0	8.403		ug/L		84	54 - 120	4	35
Phenol	10.0	7.700		ug/L		77	10 - 112	6	35
Pyrene	10.0	9.271		ug/L		93	52 - 115	4	35
1,2,4-Trichlorobenzene	10.0	5.938		ug/L		59	44 - 142	3	35
2,4,6-Trichlorophenol	10.0	7.197		ug/L		72	37 - 144	13	35
Benzo[g,h,i]perylene	10.0	11.00		ug/L		110	10 - 150	3	35
bis (2-chloroisopropyl) ether	10.0	6.545		ug/L		65	47 - 103	0	35

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
2-Fluorobiphenyl	71		50 - 120
2-Fluorophenol	70		30 - 120
2,4,6-Tribromophenol	84		40 - 120
Nitrobenzene-d5	74		45 - 120
Terphenyl-d14	95		37 - 144
Phenol-d6	72		35 - 120

## Method: 608 PCB LL - Polychlorinated Biphenyls (PCBs) Low level

**Lab Sample ID: MB 440-516165/1-A**  
**Matrix: Water**  
**Analysis Batch: 516373**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1016	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1221	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1232	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1242	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1248	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1254	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1
Aroclor 1260	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 17:07	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	80		29 - 115	12/11/18 05:36	12/11/18 17:07	1

**Lab Sample ID: LCS 440-516165/4-A**  
**Matrix: Water**  
**Analysis Batch: 516373**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aroclor 1016	4.00	3.33		ug/L		83	10 - 127
Aroclor 1260	4.00	3.51		ug/L		88	50 - 115

Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits
DCB Decachlorobiphenyl (Surr)	89		29 - 115

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

**Lab Sample ID: LCSD 440-516165/5-A**  
**Matrix: Water**  
**Analysis Batch: 516373**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aroclor 1016	4.00	3.47		ug/L		87	10 - 127	4	30
Aroclor 1260	4.00	3.63		ug/L		91	50 - 115	3	30
		<b>LCS</b>	<b>LCS</b>						
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>						
DCB Decachlorobiphenyl (Surr)	91		29 - 115						

## Method: 608 Pesticides - Organochlorine Pesticides Low level

**Lab Sample ID: MB 440-516165/1-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		0.0050	0.0015	ug/L		12/11/18 05:36	12/11/18 15:54	1
alpha-BHC	ND		0.0050	0.0025	ug/L		12/11/18 05:36	12/11/18 15:54	1
beta-BHC	ND		0.010	0.0040	ug/L		12/11/18 05:36	12/11/18 15:54	1
Chlordane (technical)	ND		0.10	0.080	ug/L		12/11/18 05:36	12/11/18 15:54	1
delta-BHC	ND		0.0050	0.0035	ug/L		12/11/18 05:36	12/11/18 15:54	1
Dieldrin	ND		0.0050	0.0020	ug/L		12/11/18 05:36	12/11/18 15:54	1
Endosulfan I	ND		0.0050	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
Endosulfan II	ND		0.0050	0.0020	ug/L		12/11/18 05:36	12/11/18 15:54	1
Endosulfan sulfate	ND		0.010	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
Endrin	ND		0.0050	0.0020	ug/L		12/11/18 05:36	12/11/18 15:54	1
Endrin aldehyde	ND		0.010	0.0020	ug/L		12/11/18 05:36	12/11/18 15:54	1
gamma-BHC (Lindane)	ND		0.010	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
Heptachlor	ND		0.010	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
Heptachlor epoxide	ND		0.0050	0.0025	ug/L		12/11/18 05:36	12/11/18 15:54	1
Toxaphene	ND		0.50	0.25	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDD	ND		0.0050	0.0040	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDE	ND		0.0050	0.0030	ug/L		12/11/18 05:36	12/11/18 15:54	1
4,4'-DDT	ND		0.010	0.0040	ug/L		12/11/18 05:36	12/11/18 15:54	1
		<b>MB</b>	<b>MB</b>						
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>			<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>	
Tetrachloro-m-xylene	73		10 - 150			12/11/18 05:36	12/11/18 15:54	1	

**Lab Sample ID: LCS 440-516165/2-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aldrin	0.200	0.149		ug/L		74	42 - 122
alpha-BHC	0.200	0.142		ug/L		71	37 - 134
beta-BHC	0.200	0.149		ug/L		74	17 - 147
delta-BHC	0.200	0.145		ug/L		73	19 - 140
Dieldrin	0.200	0.156		ug/L		78	36 - 146
Endosulfan I	0.200	0.154		ug/L		77	45 - 150
Endosulfan II	0.200	0.155		ug/L		77	10 - 150
Endosulfan sulfate	0.200	0.156		ug/L		78	26 - 144
Endrin	0.200	0.160		ug/L		80	30 - 147

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 608 Pesticides - Organochlorine Pesticides Low level (Continued)

**Lab Sample ID: LCS 440-516165/2-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Endrin aldehyde	0.200	0.151		ug/L		76	47 - 115
gamma-BHC (Lindane)	0.200	0.142		ug/L		71	32 - 127
Heptachlor	0.200	0.150		ug/L		75	34 - 115
Heptachlor epoxide	0.200	0.153		ug/L		77	37 - 142
4,4'-DDD	0.200	0.159		ug/L		79	31 - 141
4,4'-DDE	0.200	0.153		ug/L		77	30 - 145
4,4'-DDT	0.200	0.159		ug/L		79	25 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	66		10 - 150

**Lab Sample ID: LCSD 440-516165/3-A**  
**Matrix: Water**  
**Analysis Batch: 516104**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 516165**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aldrin	0.200	0.163		ug/L		82	42 - 122	9	35
alpha-BHC	0.200	0.156		ug/L		78	37 - 134	10	35
beta-BHC	0.200	0.164		ug/L		82	17 - 147	10	35
delta-BHC	0.200	0.160		ug/L		80	19 - 140	10	35
Dieldrin	0.200	0.172		ug/L		86	36 - 146	9	35
Endosulfan I	0.200	0.169		ug/L		85	45 - 150	9	35
Endosulfan II	0.200	0.170		ug/L		85	10 - 150	10	35
Endosulfan sulfate	0.200	0.173		ug/L		86	26 - 144	10	35
Endrin	0.200	0.175		ug/L		88	30 - 147	9	35
Endrin aldehyde	0.200	0.168		ug/L		84	47 - 115	11	35
gamma-BHC (Lindane)	0.200	0.156		ug/L		78	32 - 127	10	35
Heptachlor	0.200	0.166		ug/L		83	34 - 115	10	35
Heptachlor epoxide	0.200	0.168		ug/L		84	37 - 142	10	35
4,4'-DDD	0.200	0.174		ug/L		87	31 - 141	9	35
4,4'-DDE	0.200	0.168		ug/L		84	30 - 145	9	35
4,4'-DDT	0.200	0.178		ug/L		89	25 - 150	11	35

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	73		10 - 150

## Method: 218.6 - Chromium, Hexavalent (Ion Chromatography)

**Lab Sample ID: MB 440-515510/6**  
**Matrix: Water**  
**Analysis Batch: 515510**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	ND		1.0	0.25	ug/L			12/07/18 07:06	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 218.6 - Chromium, Hexavalent (Ion Chromatography) (Continued)

**Lab Sample ID: LCS 440-515510/5**  
**Matrix: Water**  
**Analysis Batch: 515510**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	50.0	48.7		ug/L		97	90 - 110

**Lab Sample ID: MRL 440-515510/4**  
**Matrix: Water**  
**Analysis Batch: 515510**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	1.00	0.981	J,DX	ug/L		98	50 - 150

**Lab Sample ID: 440-226746-C-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515510**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	ND		50.0	49.1		ug/L		98	90 - 110

**Lab Sample ID: 440-226746-C-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515510**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium, hexavalent	ND		50.0	48.8		ug/L		98	90 - 110	1	10

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 440-515570/6**  
**Matrix: Water**  
**Analysis Batch: 515570**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.11	0.055	mg/L			12/07/18 13:55	1
Nitrite as N	ND		0.15	0.025	mg/L			12/07/18 13:55	1

**Lab Sample ID: LCS 440-515570/5**  
**Matrix: Water**  
**Analysis Batch: 515570**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.13	1.08		mg/L		95	90 - 110
Nitrite as N	1.52	1.58		mg/L		104	90 - 110

**Lab Sample ID: 440-226786-H-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515570**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	3.5		1.13	4.74		mg/L		107	80 - 120
Nitrite as N	ND		1.52	1.73		mg/L		114	80 - 120

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 300.0 - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 440-226786-H-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515570**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	3.5		1.13	4.74		mg/L		107	80 - 120	0	20
Nitrite as N	ND		1.52	1.73		mg/L		114	80 - 120	0	20

**Lab Sample ID: MB 440-515571/6**  
**Matrix: Water**  
**Analysis Batch: 515571**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.25	mg/L			12/07/18 13:55	1
Fluoride	ND		0.50	0.25	mg/L			12/07/18 13:55	1
Sulfate	ND		0.50	0.25	mg/L			12/07/18 13:55	1

**Lab Sample ID: LCS 440-515571/5**  
**Matrix: Water**  
**Analysis Batch: 515571**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.72		mg/L		94	90 - 110
Fluoride	5.00	4.62		mg/L		92	90 - 110
Sulfate	5.00	4.72		mg/L		94	90 - 110

**Lab Sample ID: 440-226786-H-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515571**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	110	EY	5.00	119	EY BB	mg/L		125	80 - 120
Fluoride	0.42	J,DX	5.00	4.68		mg/L		85	80 - 120
Sulfate	190	EY	5.00	200	EY BB	mg/L		122	80 - 120

**Lab Sample ID: 440-226786-H-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515571**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	110	EY	5.00	119	EY BB	mg/L		123	80 - 120	0	20
Fluoride	0.42	J,DX	5.00	4.67		mg/L		85	80 - 120	0	20
Sulfate	190	EY	5.00	199	EY BB	mg/L		118	80 - 120	0	20

## Method: 314.0 - Perchlorate (IC)

**Lab Sample ID: MB 440-515889/6**  
**Matrix: Water**  
**Analysis Batch: 515889**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/10/18 09:18	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 314.0 - Perchlorate (IC) (Continued)

**Lab Sample ID: LCS 440-515889/5**  
**Matrix: Water**  
**Analysis Batch: 515889**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	25.3		ug/L		101	85 - 115

**Lab Sample ID: MRL 440-515889/4**  
**Matrix: Water**  
**Analysis Batch: 515889**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	1.00	ND		ug/L		92	75 - 125

**Lab Sample ID: 720-90134-E-5 MS**  
**Matrix: Water**  
**Analysis Batch: 515889**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	ND		25.0	26.6		ug/L		106	80 - 120

**Lab Sample ID: 720-90134-E-5 MSD**  
**Matrix: Water**  
**Analysis Batch: 515889**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	ND		25.0	26.0		ug/L		104	80 - 120	2	15

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 440-517392/1-A**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	50	ug/L		12/16/18 11:30	12/17/18 09:33	1
Arsenic	ND		10	8.9	ug/L		12/16/18 11:30	12/17/18 09:33	1
Boron	ND		0.050	0.025	mg/L		12/16/18 11:30	12/17/18 09:33	1
Beryllium	ND		2.0	1.0	ug/L		12/16/18 11:30	12/17/18 09:33	1
Chromium	ND		5.0	2.5	ug/L		12/16/18 11:30	12/17/18 09:33	1
Iron	ND		0.10	0.050	mg/L		12/16/18 11:30	12/17/18 09:33	1
Nickel	ND		10	5.0	ug/L		12/16/18 11:30	12/17/18 09:33	1
Vanadium	ND		10	5.0	ug/L		12/16/18 11:30	12/17/18 09:33	1
Zinc	ND		20	12	ug/L		12/16/18 11:30	12/17/18 09:33	1

**Lab Sample ID: LCS 440-517392/2-A**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	500	491		ug/L		98	85 - 115
Arsenic	500	483		ug/L		97	85 - 115
Boron	0.500	0.488		mg/L		98	85 - 115
Beryllium	500	497		ug/L		99	85 - 115

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: LCS 440-517392/2-A**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	2.50	2.50		mg/L		100	85 - 115
Chromium	500	498		ug/L		100	85 - 115
Iron	0.500	0.494		mg/L		99	85 - 115
Magnesium	2.50	2.47		mg/L		99	85 - 115
Nickel	500	499		ug/L		100	85 - 115
Vanadium	500	495		ug/L		99	85 - 115
Zinc	500	496		ug/L		99	85 - 115

**Lab Sample ID: 440-226830-1 MS**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	9100		500	13600	BB	ug/L		902	70 - 130
Arsenic	13		500	503		ug/L		98	70 - 130
Boron	0.081		0.500	0.593		mg/L		102	70 - 130
Beryllium	1.2	J,DX	500	512		ug/L		102	70 - 130
Calcium	59		2.50	62.2	BB	mg/L		134	70 - 130
Chromium	10		500	510		ug/L		100	70 - 130
Iron	9.5		0.500	9.88	BB	mg/L		82	70 - 130
Magnesium	7.6		2.50	10.2		mg/L		105	70 - 130
Nickel	18		500	512		ug/L		99	70 - 130
Vanadium	22		500	531		ug/L		102	70 - 130
Zinc	120		500	609		ug/L		98	70 - 130

**Lab Sample ID: 440-226830-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 518714**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517392**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Aluminum	9100		500	12700	BB	ug/L		726	70 - 130	7	20
Arsenic	13		500	503		ug/L		98	70 - 130	0	20
Boron	0.081		0.500	0.596		mg/L		103	70 - 130	1	20
Beryllium	1.2	J,DX	500	516		ug/L		103	70 - 130	1	20
Calcium	59		2.50	60.5	BB	mg/L		64	70 - 130	3	20
Chromium	10		500	518		ug/L		101	70 - 130	2	20
Iron	9.5		0.500	9.22	BB	mg/L		-51	70 - 130	7	20
Magnesium	7.6		2.50	9.89		mg/L		93	70 - 130	3	20
Nickel	18		500	516		ug/L		100	70 - 130	1	20
Vanadium	22		500	537		ug/L		103	70 - 130	1	20
Zinc	120		500	609		ug/L		98	70 - 130	0	20

**Lab Sample ID: MB 440-516386/1-D**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	50	ug/L		12/17/18 11:56	12/17/18 19:37	1
Arsenic	ND		10	8.9	ug/L		12/17/18 11:56	12/17/18 19:37	1

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: MB 440-516386/1-D**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.050	0.025	mg/L		12/17/18 11:56	12/17/18 19:37	1
Beryllium	ND		2.0	1.0	ug/L		12/17/18 11:56	12/17/18 19:37	1
Chromium	ND		5.0	2.5	ug/L		12/17/18 11:56	12/17/18 19:37	1
Iron	ND		0.10	0.050	mg/L		12/17/18 11:56	12/17/18 19:37	1
Nickel	ND		10	5.0	ug/L		12/17/18 11:56	12/17/18 19:37	1
Vanadium	ND		10	5.0	ug/L		12/17/18 11:56	12/17/18 19:37	1
Zinc	ND		20	12	ug/L		12/17/18 11:56	12/17/18 19:37	1

**Lab Sample ID: LCS 440-516386/2-D**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Aluminum	500	477		ug/L		95	85 - 115
Arsenic	500	483		ug/L		97	85 - 115
Boron	0.500	0.487		mg/L		97	85 - 115
Beryllium	500	490		ug/L		98	85 - 115
Calcium	2.50	2.46		mg/L		98	85 - 115
Chromium	500	492		ug/L		98	85 - 115
Iron	0.500	0.488		mg/L		98	85 - 115
Magnesium	2.50	2.42		mg/L		97	85 - 115
Nickel	500	489		ug/L		98	85 - 115
Vanadium	500	489		ug/L		98	85 - 115
Zinc	500	487		ug/L		97	85 - 115

**Lab Sample ID: 440-226830-2 MS**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Aluminum	60	J,DX	500	552		ug/L		98	70 - 130
Arsenic	ND		500	485		ug/L		97	70 - 130
Boron	0.049	J,DX	0.500	0.531		mg/L		96	70 - 130
Beryllium	ND		500	486		ug/L		97	70 - 130
Calcium	22		2.50	24.1	BB	mg/L		90	70 - 130
Chromium	ND		500	487		ug/L		97	70 - 130
Iron	0.078	J,DX	0.500	0.556		mg/L		96	70 - 130
Magnesium	3.5		2.50	5.84		mg/L		95	70 - 130
Nickel	ND		500	478		ug/L		96	70 - 130
Vanadium	ND		500	487		ug/L		97	70 - 130
Zinc	ND		500	486		ug/L		97	70 - 130

**Lab Sample ID: 440-226830-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum	60	J,DX	500	552		ug/L		98	70 - 130	0	20
Arsenic	ND		500	485		ug/L		97	70 - 130	0	20

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: 440-226830-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 517759**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517587**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Boron	0.049	J,DX	0.500	0.530		mg/L		96	70 - 130	0	20
Beryllium	ND		500	485		ug/L		97	70 - 130	0	20
Calcium	22		2.50	24.0	BB	mg/L		84	70 - 130	1	20
Chromium	ND		500	484		ug/L		97	70 - 130	1	20
Iron	0.078	J,DX	0.500	0.558		mg/L		96	70 - 130	0	20
Magnesium	3.5		2.50	5.85		mg/L		96	70 - 130	0	20
Nickel	ND		500	479		ug/L		96	70 - 130	0	20
Vanadium	ND		500	485		ug/L		97	70 - 130	0	20
Zinc	ND		500	485		ug/L		97	70 - 130	0	20

## Method: 200.8 - Metals (ICP/MS)

**Lab Sample ID: MB 440-517388/1-A**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Silver	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Cadmium	ND		1.0	0.25	ug/L		12/16/18 11:26	12/16/18 19:01	1
Copper	ND		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Lead	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Antimony	ND		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Selenium	ND		2.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1
Thallium	ND		1.0	0.50	ug/L		12/16/18 11:26	12/16/18 19:01	1

**Lab Sample ID: LCS 440-517388/2-A**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
							Limits
Silver	80.0	77.7		ug/L		97	85 - 115
Cadmium	80.0	77.9		ug/L		97	85 - 115
Copper	80.0	78.8		ug/L		98	85 - 115
Lead	80.0	77.6		ug/L		97	85 - 115
Antimony	80.0	89.4		ug/L		112	85 - 115
Selenium	80.0	78.4		ug/L		98	85 - 115
Thallium	80.0	77.5		ug/L		97	85 - 115

**Lab Sample ID: 440-226830-1 MS**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.
	Result	Qualifier	Added	Result	Qualifier				Limits
Silver	ND		80.0	79.8		ug/L		100	70 - 130
Cadmium	0.90	J,DX	80.0	80.4		ug/L		99	70 - 130
Copper	15		80.0	89.5		ug/L		94	70 - 130
Lead	54		80.0	128		ug/L		93	70 - 130
Antimony	0.86	J,DX	80.0	68.8		ug/L		85	70 - 130
Selenium	2.1		80.0	72.4		ug/L		88	70 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 200.8 - Metals (ICP/MS) (Continued)

**Lab Sample ID: 440-226830-1 MS**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Thallium	ND		80.0	72.0		ug/L		90	70 - 130

**Lab Sample ID: 440-226830-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 517466**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 517388**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		80.0	79.8		ug/L		100	70 - 130	0	20
Cadmium	0.90	J,DX	80.0	80.0		ug/L		99	70 - 130	1	20
Copper	15		80.0	88.8		ug/L		93	70 - 130	1	20
Lead	54		80.0	125		ug/L		89	70 - 130	3	20
Antimony	0.86	J,DX	80.0	74.2		ug/L		92	70 - 130	8	20
Selenium	2.1		80.0	74.1		ug/L		90	70 - 130	2	20
Thallium	ND		80.0	68.5		ug/L		86	70 - 130	5	20

**Lab Sample ID: MB 440-516386/1-C**  
**Matrix: Water**  
**Analysis Batch: 517749**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 517585**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1
Cadmium	ND		1.0	0.25	ug/L		12/17/18 11:52	12/17/18 21:09	1
Copper	ND		2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1
Lead	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1
Antimony	ND		2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1
Selenium	ND		2.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1
Thallium	ND		1.0	0.50	ug/L		12/17/18 11:52	12/17/18 21:09	1

**Lab Sample ID: LCS 440-516386/2-C**  
**Matrix: Water**  
**Analysis Batch: 517749**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 517585**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	80.0	79.3		ug/L		99	85 - 115
Cadmium	80.0	79.4		ug/L		99	85 - 115
Copper	80.0	80.3		ug/L		100	85 - 115
Lead	80.0	80.2		ug/L		100	85 - 115
Antimony	80.0	92.2		ug/L		115	85 - 115
Selenium	80.0	79.4		ug/L		99	85 - 115
Thallium	80.0	79.6		ug/L		99	85 - 115

**Lab Sample ID: 440-226830-2 MS**  
**Matrix: Water**  
**Analysis Batch: 517749**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517585**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Silver	ND		80.0	77.2		ug/L		97	70 - 130
Cadmium	ND		80.0	77.4		ug/L		97	70 - 130
Copper	1.5	J,DX	80.0	80.0		ug/L		98	70 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 200.8 - Metals (ICP/MS) (Continued)

**Lab Sample ID: 440-226830-2 MS**  
**Matrix: Water**  
**Analysis Batch: 517749**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517585**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lead	ND		80.0	82.1		ug/L		103	70 - 130
Antimony	0.79	J,DX	80.0	92.0		ug/L		114	70 - 130
Selenium	0.87	J,DX	80.0	73.0		ug/L		90	70 - 130
Thallium	ND		80.0	81.6		ug/L		102	70 - 130

**Lab Sample ID: 440-226830-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 517749**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 517585**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		80.0	78.6		ug/L		98	70 - 130	2	20
Cadmium	ND		80.0	78.1		ug/L		98	70 - 130	1	20
Copper	1.5	J,DX	80.0	82.3		ug/L		101	70 - 130	3	20
Lead	ND		80.0	82.2		ug/L		103	70 - 130	0	20
Antimony	0.79	J,DX	80.0	93.2		ug/L		116	70 - 130	1	20
Selenium	0.87	J,DX	80.0	73.6		ug/L		91	70 - 130	1	20
Thallium	ND		80.0	81.4		ug/L		102	70 - 130	0	20

## Method: 245.1 - Mercury (CVAA)

**Lab Sample ID: MB 440-517745/1-A**  
**Matrix: Water**  
**Analysis Batch: 518005**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 517745**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/18/18 11:03	12/18/18 15:18	1

**Lab Sample ID: LCS 440-517745/2-A**  
**Matrix: Water**  
**Analysis Batch: 518005**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 517745**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	8.00	7.56		ug/L		95	85 - 115

**Lab Sample ID: 440-227587-A-19-B MS**  
**Matrix: Water**  
**Analysis Batch: 518005**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 517745**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		8.00	7.52		ug/L		94	75 - 125

**Lab Sample ID: 440-227587-A-19-C MSD**  
**Matrix: Water**  
**Analysis Batch: 518005**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 517745**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		8.00	7.40		ug/L		93	75 - 125	2	20

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: 245.1 - Mercury (CVAA) (Continued)

**Lab Sample ID: MB 440-516386/1-B**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516709**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/12/18 21:39	12/13/18 21:26	1

**Lab Sample ID: LCS 440-516386/2-B**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516709**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	8.00	7.89		ug/L		99	85 - 115

**Lab Sample ID: 440-226830-2 MS**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516709**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		8.00	8.02		ug/L		100	75 - 125

**Lab Sample ID: 440-226830-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall008\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516709**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		8.00	7.98		ug/L		100	75 - 125	1	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 440-516331/1**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	5.0	mg/L			12/11/18 14:10	1

**Lab Sample ID: LCS 440-516331/2**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	978		mg/L		98	90 - 110

**Lab Sample ID: 440-226959-Y-1 DU**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	300		289		mg/L		4	5

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: SM 2540D - Solids, Total Suspended (TSS)

**Lab Sample ID: MB 440-517087/1**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.50	mg/L			12/14/18 08:46	1

**Lab Sample ID: LCS 440-517087/2**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	1050		mg/L		105	85 - 115

**Lab Sample ID: 440-226830-1 DU**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Outfall008\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	750		815		mg/L		8	10

## Method: SM 4500 CN E - Cyanide, Total (Low Level)

**Lab Sample ID: MB 440-518050/1-A**  
**Matrix: Water**  
**Analysis Batch: 518292**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 518050**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		5.0	2.5	ug/L		12/18/18 23:42	12/19/18 23:45	1

**Lab Sample ID: LCS 440-518050/2-A**  
**Matrix: Water**  
**Analysis Batch: 518292**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 518050**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	100	103		ug/L		103	90 - 110

**Lab Sample ID: 440-227587-A-38-B MS**  
**Matrix: Water**  
**Analysis Batch: 518292**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 518050**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	ND		100	84.9		ug/L		85	70 - 115

**Lab Sample ID: 440-227587-A-38-C MSD**  
**Matrix: Water**  
**Analysis Batch: 518292**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 518050**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	ND		100	78.8		ug/L		79	70 - 115	8	15

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Method: SM 4500 NH3 G - Ammonia

**Lab Sample ID: MB 440-518382/10**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.200	0.100	mg/L			12/19/18 13:43	1

**Lab Sample ID: LCS 440-518382/11**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	4.890		mg/L		98	90 - 110

**Lab Sample ID: MRL 440-518382/9**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.200	0.1610	J,DX	mg/L		81	50 - 150

**Lab Sample ID: 440-227448-K-1 MS**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	5.070		mg/L		101	90 - 110

**Lab Sample ID: 440-227448-K-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 518382**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia (as N)	ND		5.00	5.050		mg/L		101	90 - 110	0	15

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## GC/MS Semi VOA

### Prep Batch: 515842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	625	
MB 440-515842/1-A	Method Blank	Total/NA	Water	625	
LCS 440-515842/2-A	Lab Control Sample	Total/NA	Water	625	
LCSD 440-515842/3-A	Lab Control Sample Dup	Total/NA	Water	625	

### Analysis Batch: 516279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	625	515842
MB 440-515842/1-A	Method Blank	Total/NA	Water	625	515842
LCS 440-515842/2-A	Lab Control Sample	Total/NA	Water	625	515842
LCSD 440-515842/3-A	Lab Control Sample Dup	Total/NA	Water	625	515842

## GC Semi VOA

### Analysis Batch: 516104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	608 Pesticides	516165
MB 440-516165/1-A	Method Blank	Total/NA	Water	608 Pesticides	516165
LCS 440-516165/2-A	Lab Control Sample	Total/NA	Water	608 Pesticides	516165
LCSD 440-516165/3-A	Lab Control Sample Dup	Total/NA	Water	608 Pesticides	516165

### Prep Batch: 516165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	608	
MB 440-516165/1-A	Method Blank	Total/NA	Water	608	
LCS 440-516165/2-A	Lab Control Sample	Total/NA	Water	608	
LCS 440-516165/4-A	Lab Control Sample	Total/NA	Water	608	
LCSD 440-516165/3-A	Lab Control Sample Dup	Total/NA	Water	608	
LCSD 440-516165/5-A	Lab Control Sample Dup	Total/NA	Water	608	

### Analysis Batch: 516373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	608 PCB LL	516165
MB 440-516165/1-A	Method Blank	Total/NA	Water	608 PCB LL	516165
LCS 440-516165/4-A	Lab Control Sample	Total/NA	Water	608 PCB LL	516165
LCSD 440-516165/5-A	Lab Control Sample Dup	Total/NA	Water	608 PCB LL	516165

## HPLC/IC

### Analysis Batch: 515510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	218.6	
MB 440-515510/6	Method Blank	Total/NA	Water	218.6	
LCS 440-515510/5	Lab Control Sample	Total/NA	Water	218.6	
MRL 440-515510/4	Lab Control Sample	Total/NA	Water	218.6	
440-226746-C-1 MS	Matrix Spike	Total/NA	Water	218.6	
440-226746-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	218.6	

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## HPLC/IC (Continued)

### Analysis Batch: 515570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	300.0	
MB 440-515570/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515570/5	Lab Control Sample	Total/NA	Water	300.0	
440-226786-H-1 MS	Matrix Spike	Total/NA	Water	300.0	
440-226786-H-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

### Analysis Batch: 515571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	300.0	
MB 440-515571/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515571/5	Lab Control Sample	Total/NA	Water	300.0	
440-226786-H-1 MS	Matrix Spike	Total/NA	Water	300.0	
440-226786-H-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

### Analysis Batch: 515889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	314.0	
MB 440-515889/6	Method Blank	Total/NA	Water	314.0	
LCS 440-515889/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-515889/4	Lab Control Sample	Total/NA	Water	314.0	
720-90134-E-5 MS	Matrix Spike	Total/NA	Water	314.0	
720-90134-E-5 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

### Analysis Batch: 517959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	NO3NO2 Calc	

## Metals

### Filtration Batch: 516386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	FILTRATION	
MB 440-516386/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 440-516386/1-C	Method Blank	Dissolved	Water	FILTRATION	
MB 440-516386/1-D	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-516386/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-516386/2-C	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-516386/2-D	Lab Control Sample	Dissolved	Water	FILTRATION	
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	FILTRATION	
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	FILTRATION	

### Prep Batch: 516709

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516386
MB 440-516386/1-B	Method Blank	Dissolved	Water	245.1	516386
LCS 440-516386/2-B	Lab Control Sample	Dissolved	Water	245.1	516386
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516386
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516386

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Metals (Continued)

### Analysis Batch: 517011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	SM 2340B	

### Analysis Batch: 517219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516709
MB 440-516386/1-B	Method Blank	Dissolved	Water	245.1	516709
LCS 440-516386/2-B	Lab Control Sample	Dissolved	Water	245.1	516709
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516709
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	245.1	516709

### Prep Batch: 517388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-517388/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-517388/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226830-1 MS	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	
440-226830-1 MSD	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	

### Prep Batch: 517392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-517392/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-517392/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226830-1 MS	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	
440-226830-1 MSD	Outfall008_20181207_Comp	Total Recoverable	Water	200.2	

### Analysis Batch: 517415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total Recoverable	Water	SM 2340B	

### Analysis Batch: 517466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total Recoverable	Water	200.8	517388
MB 440-517388/1-A	Method Blank	Total Recoverable	Water	200.8	517388
LCS 440-517388/2-A	Lab Control Sample	Total Recoverable	Water	200.8	517388
440-226830-1 MS	Outfall008_20181207_Comp	Total Recoverable	Water	200.8	517388
440-226830-1 MSD	Outfall008_20181207_Comp	Total Recoverable	Water	200.8	517388

### Prep Batch: 517585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386
MB 440-516386/1-C	Method Blank	Dissolved	Water	200.2	516386
LCS 440-516386/2-C	Lab Control Sample	Dissolved	Water	200.2	516386
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386

### Prep Batch: 517587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386
MB 440-516386/1-D	Method Blank	Dissolved	Water	200.2	516386
LCS 440-516386/2-D	Lab Control Sample	Dissolved	Water	200.2	516386

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Metals (Continued)

### Prep Batch: 517587 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	200.2	516386

### Prep Batch: 517745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	245.1	
MB 440-517745/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-517745/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-227587-A-19-B MS	Matrix Spike	Total/NA	Water	245.1	
440-227587-A-19-C MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	

### Analysis Batch: 517749

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	200.8	517585
MB 440-516386/1-C	Method Blank	Dissolved	Water	200.8	517585
LCS 440-516386/2-C	Lab Control Sample	Dissolved	Water	200.8	517585
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	200.8	517585
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	200.8	517585

### Analysis Batch: 517759

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-2	Outfall008_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	517587
MB 440-516386/1-D	Method Blank	Dissolved	Water	200.7 Rev 4.4	517587
LCS 440-516386/2-D	Lab Control Sample	Dissolved	Water	200.7 Rev 4.4	517587
440-226830-2 MS	Outfall008_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	517587
440-226830-2 MSD	Outfall008_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	517587

### Analysis Batch: 518005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	245.1	517745
MB 440-517745/1-A	Method Blank	Total/NA	Water	245.1	517745
LCS 440-517745/2-A	Lab Control Sample	Total/NA	Water	245.1	517745
440-227587-A-19-B MS	Matrix Spike	Total/NA	Water	245.1	517745
440-227587-A-19-C MSD	Matrix Spike Duplicate	Total/NA	Water	245.1	517745

### Analysis Batch: 518714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392
MB 440-517392/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	517392
LCS 440-517392/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	517392
440-226830-1 MS	Outfall008_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392
440-226830-1 MSD	Outfall008_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	517392

## General Chemistry

### Analysis Batch: 516331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	SM 2540C	
MB 440-516331/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-516331/2	Lab Control Sample	Total/NA	Water	SM 2540C	

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## General Chemistry (Continued)

### Analysis Batch: 516331 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226959-Y-1 DU	Duplicate	Total/NA	Water	SM 2540C	

### Analysis Batch: 517087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	SM 2540D	
MB 440-517087/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-517087/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-226830-1 DU	Outfall008_20181207_Comp	Total/NA	Water	SM 2540D	

### Prep Batch: 518050

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	Distill/CN	
MB 440-518050/1-A	Method Blank	Total/NA	Water	Distill/CN	
LCS 440-518050/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
440-227587-A-38-B MS	Matrix Spike	Total/NA	Water	Distill/CN	
440-227587-A-38-C MSD	Matrix Spike Duplicate	Total/NA	Water	Distill/CN	

### Analysis Batch: 518292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	SM 4500 CN E	518050
MB 440-518050/1-A	Method Blank	Total/NA	Water	SM 4500 CN E	518050
LCS 440-518050/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	518050
440-227587-A-38-B MS	Matrix Spike	Total/NA	Water	SM 4500 CN E	518050
440-227587-A-38-C MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 CN E	518050

### Analysis Batch: 518382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	SM 4500 NH3 G	
MB 440-518382/10	Method Blank	Total/NA	Water	SM 4500 NH3 G	
LCS 440-518382/11	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	
MRL 440-518382/9	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	
440-227448-K-1 MS	Matrix Spike	Total/NA	Water	SM 4500 NH3 G	
440-227448-K-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 NH3 G	



# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Qualifiers

### GC/MS Semi VOA

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

### HPLC/IC

Qualifier	Qualifier Description
BB	Sample > 4X spike concentration
EY	Result exceeds normal dynamic range; reported as a min. est.
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

### Metals

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
BB	Sample > 4X spike concentration

### General Chemistry

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-1

## Laboratory: TestAmerica Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
625	625	Water	1,2-Diphenylhydrazine(as Azobenzene)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15



# Certificate of Analysis

FINAL REPORT

**Work Orders:** 8L10022

**Report Date:** 12/26/2018

**Project:** 440-226830-1

**Received Date:** 12/8/2018

**Turnaround Time:** 1 workday

**Phones:** (949) 261-1022

**Fax:** (949) 260-3297

**Attn:** Urvashi Patel

**P.O. #:**

**Client:** TestAmerica - Irvine CA  
17461 Derian Ave, Suite 100  
Irvine, CA 92614

**Billing Code:**

Dear Urvashi Patel,

Enclosed are the results of analyses for samples received 12/08/18 with the Chain-of-Custody document. The samples were received in good condition, at 10.1 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

## Sample Results

Sample: Outfall008\_20181207\_Comp (440-226830-1) 8L10022-01 (Water) Sampled: 12/07/18 11:05 by Client

Analyte	Result	MDL	MRL	Units	Dil	Analyzed	Qualifier
<b>Method:</b> EPA 525.2M	<b>Batch ID:</b> W8L0670	<b>Instr:</b> GCMS13	<b>Prepared:</b> 12/11/18 09:01	<b>Analyst:</b> GCMS13			
Chlorpyrifos	ND	34	50	ng/l	1	12/18/18 20:13	M-02
Diazinon	ND	26	50	ng/l	1	12/18/18 20:13	M-02
<i>Surrogate(s)</i>							
1,3-Dimethyl-2-nitrobenzene	74%		76-128	Conc: 1860		12/18/18 20:13	M-02, S-GC
Triphenyl phosphate	140%		40-163	Conc: 3500		12/18/18 20:13	M-02



WECK LABORATORIES, INC.

# Certificate of Analysis

FINAL REPORT

## Quality Control Results

Semivolatile Organics - Low Level by Tandem GC/MS/MS

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	Limits	RPD	RPD Limit	Qualifier
<b>Blank (W8L0670-BLK1)</b>					<b>Prepared: 12/11/18 Analyzed: 12/18/18</b>						
Chlorpyrifos	ND	6.9	10	ng/l							
Diazinon	ND	5.2	10	ng/l							
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			439	ng/l	500		88	76-128			
Triphenyl phosphate			432	ng/l	500		86	40-163			
<b>LCS (W8L0670-BS1)</b>					<b>Prepared: 12/11/18 Analyzed: 12/18/18</b>						
Chlorpyrifos	52.0	6.9	10	ng/l	50.0		104	37-169			
Diazinon	47.1	5.2	10	ng/l	50.0		94	43-152			
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			469	ng/l	500		94	76-128			
Triphenyl phosphate			516	ng/l	500		103	40-163			
<b>Matrix Spike (W8L0670-MS1)</b>					<b>Source: 8K28075-01</b>		<b>Prepared: 12/11/18 Analyzed: 12/18/18</b>				
Chlorpyrifos	78.4	6.9	10	ng/l	50.0	ND	157	37-168			
Diazinon	67.6	5.2	10	ng/l	50.0	ND	135	36-153			
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			437	ng/l	500		87	76-128			
Triphenyl phosphate			654	ng/l	500		131	40-163			
<b>Matrix Spike Dup (W8L0670-MSD1)</b>					<b>Source: 8K28075-01</b>		<b>Prepared: 12/11/18 Analyzed: 12/18/18</b>				
Chlorpyrifos	60.7	6.9	10	ng/l	50.0	ND	121	37-168	26	30	
Diazinon	57.9	5.2	10	ng/l	50.0	ND	116	36-153	15	30	
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			468	ng/l	500		94	76-128			
Triphenyl phosphate			493	ng/l	500		99	40-163			

## Notes and Definitions

Item	Definition
M-02	Due to the nature of matrix interferences, sample was diluted prior to preparation. The MDL and MRL were raised due to the dilution.
S-GC	Surrogate recovery outside of control limits due to a possible matrix effect. The data was accepted based on valid recovery of the remaining surrogate.
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
MDL	Method Detection Limit
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ) and Detection Limit for Reporting (DLR)
MDA	Minimum Detectable Activity
NR	Not Reportable
TIC	Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.  
 An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB)  
 All results are expressed on wet weight basis unless otherwise specified.  
 All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS 002.

**Reviewed by:**

Regina Giancola  
Project Manager



ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO 17025 #L2457.01 • LACSD #10143 •  
 NELAP-CA #04229CA • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

*This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.*



# LA Testing

520 Mission Street South Pasadena, CA 91030  
Phone/Fax: (323) 254-9960 / (323) 254-9982  
<http://www.LATesting.com> / [pasadenalab@latesting.com](mailto:pasadenalab@latesting.com)

LA Testing Order ID: 321828614  
Customer ID: TEST72  
Customer PO:  
Project ID:

**Attn:** Urvashi Patel Phone: (949) 261-1022  
TestAmerica - Irvine, CA Fax: (949) 260-3297  
17461 Derian Avenue Received: 12/11/2018  
Suite 100 Analyzed: 12/16/2018  
Irvine, CA 92614  
**Proj:** Annual Outfall 008 Comp | Project #44009879 | Job #440-226830-1

## Test Report: Determination of Asbestos Structures $\geq 0.5 \mu\text{m}$ & $> 10\mu\text{m}$ in Water Performed by the 100.2 Method (EPA 600/R-94/134)

Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered (ml)	Effective Filter Area (mm <sup>2</sup> )	Area Analyzed (mm <sup>2</sup> )	ASBESTOS					
					Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits	
Outfall008_2018120 7_Comp (440-226830-1) 321828614-0001	12/12/2018 12:25 PM	1	1288	0.2580	$\geq 0.5 \mu\text{m}$	None Detected	ND	5.00	<5.00	0.00 - 18.00
Collection Date/Time:	12/07/2018 11:05				> 10 $\mu\text{m}$ only	None Detected	ND	5.00	<5.00	0.00 - 18.00

MFL (million fibers per liter)

Sample ozonated prior to analysis due to lab receipt time exceeding 48hr method hold time.

Analyst(s)  
Sherrie Ahmad (1)

Jerry Drapala Ph.D, Laboratory Manager  
or Other Approved Signatory

Any questions please contact Jerry Drapala.

Initial report from: 12/16/2018 15:28:34

Sample collection and containers provided by the client, acceptable bottle blank level is defined as  $\leq 0.01\text{MFL} > 10\mu\text{m}$ . ND=None Detected. This report relates only to those items tested. This report may not be reproduced, except in full, without written permission by LA Testing. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing South Pasadena, CA CA ELAP 2283



December 27, 2018

Ms. Urvashi Patel  
TestAmerica Irvine  
17461 Derian Avenue, Suite 100  
Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013*. Results were as follows:

CLIENT:	TestAmerica Irvine
SAMPLE I.D.:	Outfall008_20181207_Comp (440-226830-1)
DATE RECEIVED:	7 Dec - 18
ABC LAB. NO.:	TAM1218.058

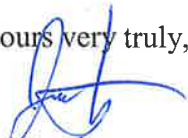
### CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

IWC = 100.00 %

#### TST RESULT

\*GROWTH = PASS      % EFFECT = -28.28 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

**CETIS Summary Report**

Report Date: 26 Dec-18 12:20 (p 1 of 1)  
 Test Code: TAM1218.058 | 12-5125-6487

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Batch ID: 09-7827-3967	Test Type: Cell Growth	Analyst:			
Start Date: 07 Dec-18 17:21	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water			
Ending Date: 11 Dec-18 15:35	Species: Selenastrum capricornutum	Brine: Not Applicable			
Duration: 94h	Source: Aquatic Biosystems, CO	Age:			
Sample ID: 04-8949-4250	Code: TAM1218.058	Client: Test America Irvine			
Sample Date: 07 Dec-18 11:05	Material: Sample Water	Project: Boeing-SSFL NPDES			
Receipt Date: 07 Dec-18 16:50	Source: Bioassay Report				
Sample Age: 6h (2 °C)	Station: Outfall008_20181207_Comp (440-226830-				

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
19-8177-2277	Cell Density	TST-Welch's t Test	2.1E-07	100% passed cell density

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
19-8177-2277	Cell Density	Control CV	0.06625	<<	0.2	Yes	Passes Criteria
19-8177-2277	Cell Density	Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

Cell Density Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.044E+6	1.253E+6	2.690E+4	7.608E+4	6.62%	0.00%
100		8	1.473E+6	1.371E+6	1.575E+6	1.271E+6	1.626E+6	4.304E+4	1.217E+5	8.26%	-28.28%

Cell Density Detail										
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6	
100		1.436E+6	1.371E+6	1.626E+6	1.606E+6	1.271E+6	1.438E+6	1.567E+6	1.471E+6	

**CETIS Analytical Report**

Report Date: 26 Dec-18 12:20 (p 1 of 2)  
 Test Code: TAM1218.058 | 12-5125-6487

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 19-8177-2277	Endpoint: Cell Density	CETIS Version: CETISv1.9.2	
Analyzed: 26 Dec-18 12:19	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes	
Batch ID: 09-7827-3967	Test Type: Cell Growth	Analyst:	
Start Date: 07 Dec-18 17:21	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 11 Dec-18 15:35	Species: Selenastrum capricornutum	Brine: Not Applicable	
Duration: 94h	Source: Aquatic Biosystems, CO	Age:	
Sample ID: 04-8949-4250	Code: TAM1218.058	Client: Test America Irvine	
Sample Date: 07 Dec-18 11:05	Material: Sample Water	Project: Boeing-SSFL NPDES	
Receipt Date: 07 Dec-18 16:50	Source: Bioassay Report		
Sample Age: 6h (2 °C)	Station: Outfall008_20181207_Comp (440-226830-		

Data Transform	Alt Hyp	TST_b	Comparison Result
Untransformed	C*b < T	0.75	100% passed cell density

**TST-Welch's t Test**

Control	vs	Control II	Test Stat	Critical	DF	P-Type	P-Value	Decision(α:25%)
Negative Control		100*	12.87	0.7027	9	CDF	2.1E-07	Non-Significant Effect

**Test Acceptability Criteria**

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06625	<<	0.2	Yes	Passes Criteria
Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.219E+11	4.219E+11	1	40.94	1.7E-05	Significant Effect
Error	1.443E+11	1.030E+10	14			
Total	5.661E+11		15			

**Distributional Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	1.586	8.862	0.2285	Equal Variances
Variances	Mod Levene Equality of Variance Test	1.417	8.862	0.2537	Equal Variances
Variances	Variance Ratio F Test	2.56	8.885	0.2381	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.3345	3.878	0.5157	Normal Distribution
Distribution	D'Agostino Skewness Test	0.3139	2.576	0.7536	Normal Distribution
Distribution	Kolmogorov-Smirnov D Test	0.143	0.2471	0.5440	Normal Distribution
Distribution	Shapiro-Wilk W Normality Test	0.9607	0.8408	0.6754	Normal Distribution

**Cell Density Summary**

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.146E+6	1.044E+6	1.253E+6	2.690E+4	6.62%	0.00%
100		8	1.473E+6	1.371E+6	1.575E+6	1.454E+6	1.271E+6	1.626E+6	4.304E+4	8.26%	-28.28%

**Cell Density Detail**

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6
100		1.436E+6	1.371E+6	1.626E+6	1.606E+6	1.271E+6	1.438E+6	1.567E+6	1.471E+6



Selenastrum Growth Test

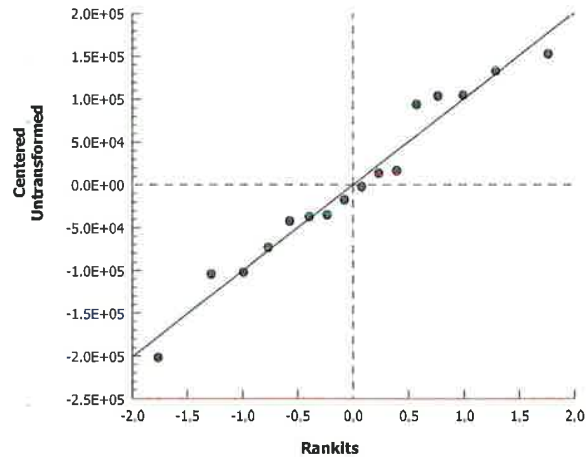
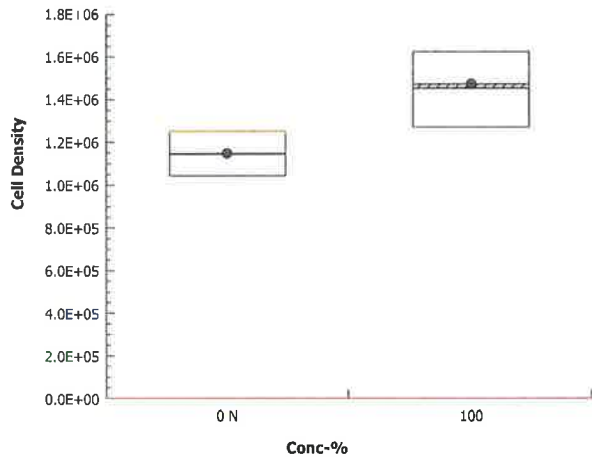
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-8177-2277  
Analyzed: 26 Dec-18 12:19

Endpoint: Cell Density  
Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.9.2  
Official Results: Yes

Graphics



**CETIS Measurement Report**

Report Date: 26 Dec-18 12:20 (p 1 of 2)  
 Test Code: TAM1218.058 | 12-5125-6487

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.								
<b>Batch ID:</b> 09-7827-3967	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>									
<b>Start Date:</b> 07 Dec-18 17:21	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water									
<b>Ending Date:</b> 11 Dec-18 15:35	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable									
<b>Duration:</b> 94h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>									
<b>Sample ID:</b> 04-8949-4250	<b>Code:</b> TAM1218.058	<b>Client:</b> Test America Irvine									
<b>Sample Date:</b> 07 Dec-18 11:05	<b>Material:</b> Sample Water	<b>Project:</b> Boeing-SSFL NPDES									
<b>Receipt Date:</b> 07 Dec-18 16:50	<b>Source:</b> Bioassay Report										
<b>Sample Age:</b> 6h (2 °C)	<b>Station:</b> Outfall008_20181207_Comp (440-226830-										
Alkalinity (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
100		1	78			78	78	0	0	0.0%	0
Overall		2	73	9.469	136.5	68	78	5	7.071	9.69%	0 (0%)
Conductivity-µmhos											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	447.2	402.7	491.7	420	493	16.01	35.8	8.01%	0
100		5	260.2	136.9	383.5	187	370	44.42	99.32	38.17%	0
Overall		10	353.7	267.1	440.3	187	493	38.3	121.1	34.24%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
100		1	103			103	103	0	0	0.0%	0
Overall		2	106.5	62.03	151	103	110	3.5	4.95	4.65%	0 (0%)
pH-Units											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.56	7.393	7.727	7.4	7.7	0.06	0.1342	1.78%	0
100		5	7.8	7.624	7.976	7.6	7.9	0.06324	0.1414	1.81%	0
Overall		10	7.68	7.55	7.81	7.4	7.9	0.05735	0.1814	2.36%	0 (0%)
Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
100		5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
Overall		10	25.04	24.93	25.15	24.8	25.2	0.04989	0.1578	0.63%	0 (0%)

**CETIS Measurement Report**

Report Date: 26 Dec-18 12:20 (p 2 of 2)  
 Test Code: TAM1218.058 | 12-5125-6487

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.				
<b>Alkalinity (CaCO3)-mg/L</b>						
Conc-%	Code	1				
0	N	68				
100		78				
<b>Conductivity-µmhos</b>						
Conc-%	Code	1	2	3	4	5
0	N	420	420	424	479	493
100		188	187	188	370	368
<b>Hardness (CaCO3)-mg/L</b>						
Conc-%	Code	1				
0	N	110				
100		103				
<b>pH-Units</b>						
Conc-%	Code	1	2	3	4	5
0	N	7.4	7.5	7.5	7.7	7.7
100		7.9	7.9	7.9	7.6	7.7
<b>Temperature-°C</b>						
Conc-%	Code	1	2	3	4	5
0	N	25.2	25	25	24.8	25.2
100		25.2	25	25	24.8	25.2





CHAIN OF CUSTODY FORM

Temp. deg. C = 20.2

12/28/2018

Client Name/Address: Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108 Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055	Project: Boeing-SSFL NPDES Permit 2018 Annual Outfall [008] Outfall 008 Comp	ANALYSIS REQUIRED															
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.	Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)	Total Recoverable Metals: (E200.7): Al, As, B, Be, Cr, Fe, Ni, V, Zn, Hardness as CaCO3 (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Tl	TCDD (and all congeners) (E1613B)	Ch, F-, SO4, Nitrate-N, Nitrite-N, NO3+NO2-N, Perchlorate (300)	TDS (SM2540C/E160.1)	TSS (160.2 (SM2540D))	Total Dissolved Metals: (E200.7): Al, As, B, Be, Cr, Fe, Ni, V, Zn, Hardness as CaCO3 (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Tl	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenastrium (EPA-821-R-02-013)	Ammonia-N (350.2)	Cyanide (SM4500-CN/E / E335.2)	Priority Pollutants-Pesticides+PCBs (E60B)	Total Recoverable Metals: Mercury (E245.1)	Total Dissolved Metals: Mercury (E245.1)	Chlorine (mg/L) =	NH4 (mg/L)	Comments
Sampler: Dan Smith	Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)																

Sample Description	Sample I.D.	Sampling Date/Time	Sample Matrix	Container Type	# of Cont.	Preservative	Bottle #	MS/MSD	Total Recoverable Metals: (E200.7): Al, As, B, Be, Cr, Fe, Ni, V, Zn, Hardness as CaCO3 (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Tl	TCDD (and all congeners) (E1613B)	Ch, F-, SO4, Nitrate-N, Nitrite-N, NO3+NO2-N, Perchlorate (300)	TDS (SM2540C/E160.1)	TSS (160.2 (SM2540D))	Total Dissolved Metals: (E200.7): Al, As, B, Be, Cr, Fe, Ni, V, Zn, Hardness as CaCO3 (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Tl	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Chronic Toxicity - Selenastrium (EPA-821-R-02-013)	Ammonia-N (350.2)	Cyanide (SM4500-CN/E / E335.2)	Priority Pollutants-Pesticides+PCBs (E60B)	Total Recoverable Metals: Mercury (E245.1)	Total Dissolved Metals: Mercury (E245.1)	Chlorine (mg/L)	NH4 (mg/L)	Comments					
Outfall 008	Outfall008_20181207_Comp	12/7/2018 1105	WM	500 mL Poly	1	HNO3	85	No	X																				
			WM	1 L Glass Amber	2	None	110	No		X																			
			WM	500 mL Poly	2	None	125	No			X																	48 hours Holding Time NO3 & NO2	
			WM	500 mL Poly	1	None	155	No				X																	
			WM	500 mL Poly	1	H2SO4	160	No											X										
			WM	1L Poly	1	None	185	No						X															
			WM	500 mL Poly	1	NaOH	220	No													X								
			WM	2.5 Gal Cube	1	None	225	No																					
			WM	1 L Glass Amber	1	None	230	No										X											Unfiltered and unpreserved analysis, Separate RAD onto another workorder. Analyze duplicate, not MS/MSD.
			WM	1 Gal Cube	1	None	235	No											X										Only test if first or second rain events of the year
Outfall 008	Outfall008_20181207_Comp_F	12/7/2018 1105	WM	1 L Glass Amber	2	None	250	No											X								Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.		
			WM	borosilicate vials	1	HNO3	315	No														X					Filter and preserve w/in 24hrs of receipt at lab		
Outfall 008	Outfall008_20181207_Comp_Extra	12/7/2018 1105	WM	1L Poly	1	None	195	No						X													Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.		
			WM	1 L Glass Amber	2	None	110	No																				Hold	
			WM	500 mL Poly	2	None	125	No																					Hold
WM	1 L Glass Amber	2	None	250	No																						Hold		

Legend: R = Routine, A = Annual

Relinquished By: <i>[Signature]</i> Date/Time: 12-7-18/1435 Company: Haley Aldrich	Received By: <i>[Signature]</i> Date/Time: 12-7-18 14:35	Turn-around time: (Check) 24 Hour: _____ 72 Hour: _____ 10 Day: <input checked="" type="checkbox"/> _____ 48 Hour: _____ 5 Day: _____ Normal: _____  Sample Integrity: (Check) Intact: _____ On Ice: _____  Store samples for 6 months. Data Requirements: (Check) No Level IV: _____ All Level IV: <input checked="" type="checkbox"/> _____
Relinquished By: <i>[Signature]</i> Date/Time: 12-7-18 16:50 Company: Haley Aldrich	Received By: <i>[Signature]</i> Date/Time: 12-7-18 1650	
Relinquished By: _____ Date/Time: _____ Company: _____	Received By: _____ Date/Time: _____	

**CHRONIC SELENASTRUM GROWTH BIOASSAY**

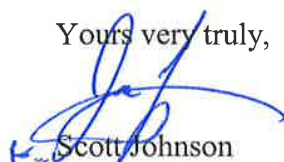
DATE: 6 December - 2018

STANDARD TOXICANT: Cadmium Chloride

NOEC = <10.00 ug/l

IC25 = 67.99 ug/l  
IC50 = >140.00 ug/l

Yours very truly,



Scott Johnson  
Laboratory Director



# CETIS Summary Report

Report Date: 21 Dec-18 10:17 (p 1 of 1)  
 Test Code: SEL120618 | 20-7096-1293

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-4374-8636	Test Type: Cell Growth	Analyst:
Start Date: 06 Dec-18 13:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 10 Dec-18 12:30	Species: Selenastrum capricornutum	Brine: Not Applicable
Duration: 95h	Source: Aquatic Biosystems, CO	Age:
Sample ID: 00-9351-0249	Code: SEL120618	Client: Internal Lab
Sample Date: 06 Dec-18 13:04	Material: Cadmium chloride	Project:
Receipt Date:	Source: Reference Toxicant	
Sample Age: n/a	Station: REF TOX	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
04-1574-4117	Cell Density	Dunnett Multiple Comparison Test	< 10	10	n/a		8.16%

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	µg/L	95% LCL	95% UCL	TU	✓
10-0218-2093	Cell Density	Linear Interpolation (ICPIN)	IC5	3.223	1.965	6.094		
			IC10	6.446	3.93	12.18		
			IC15	9.669	5.896	44.85		
			IC20	24.73	0.7599	80.82		
			IC25	67.99	n/a	152.4		
			IC40	>140	n/a	n/a		
			IC50	>140	n/a	n/a		

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-1574-4117	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
10-0218-2093	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
04-1574-4117	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria
10-0218-2093	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

## Cell Density Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

## Cell Density Detail

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5

**CETIS Analytical Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

**Selenastrum Growth Test** Aquatic Bioassay & Consulting Labs, Inc.

<b>Analysis ID:</b> 04-1574-4117	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.9.2
<b>Analyzed:</b> 21 Dec-18 10:15	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	< 10	10	n/a		8.16%

**Dunnnett Multiple Comparison Test**

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		10*	4.576	2.407	1E+05	6	CDF	5.5E-04	Significant Effect
		20*	5.785	2.407	1E+05	6	CDF	6.6E-05	Significant Effect
		40*	6.267	2.407	1E+05	6	CDF	4.1E-05	Significant Effect
		80*	7.849	2.407	1E+05	6	CDF	2.8E-05	Significant Effect
		140*	8.856	2.407	1E+05	6	CDF	2.7E-05	Significant Effect

**Test Acceptability Criteria**

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.050E+11	8.101E+10	5	19.41	1.1E-06	Significant Effect
Error	7.511E+10	4.173E+09	18			
Total	4.801E+11		23			

**Distributional Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	8.494	15.09	0.1310	Equal Variances
Variances	Levene Equality of Variance Test	1.861	4.248	0.1516	Equal Variances
Variances	Mod Levene Equality of Variance Test	0.8958	4.248	0.5047	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.8885	3.878	0.0231	Normal Distribution
Distribution	D'Agostino Kurtosis Test	1.662	2.576	0.0964	Normal Distribution
Distribution	D'Agostino Skewness Test	2.496	2.576	0.0126	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus Test	8.992	9.21	0.0112	Normal Distribution
Distribution	Kolmogorov-Smirnov D Test	0.1651	0.2056	0.0895	Normal Distribution
Distribution	Shapiro-Wilk W Normality Test	0.8988	0.884	0.0203	Normal Distribution

**Cell Density Summary**

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.313E+6	1.286E+6	1.477E+6	4.499E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.116E+6	1.109E+6	1.213E+6	2.498E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.046E+6	1.004E+6	1.237E+6	5.363E+4	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.058E+6	1.027E+6	1.102E+6	1.555E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.910E+5	9.510E+5	1.022E+6	1.469E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	9.480E+5	8.980E+5	9.770E+5	1.666E+4	3.53%	30.02%





**CETIS Analytical Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

**Selenastrum Growth Test**

Aquatic Bioassay & Consulting Labs, Inc.

<b>Analysis ID:</b> 10-0218-2093	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.9.2
<b>Analyzed:</b> 21 Dec-18 10:15	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

**Test Acceptability Criteria**

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

**Point Estimates**

Level	µg/L	95% LCL	95% UCL
IC5	3.223	1.965	6.094
IC10	6.446	3.93	12.18
IC15	9.669	5.896	44.85
IC20	24.73	0.7599	80.82
IC25	67.99	n/a	152.4
IC40	>140	n/a	n/a
IC50	>140	n/a	n/a

**Cell Density Summary**

Conc-µg/L	Code	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.0%
10		4	1.138E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

**Cell Density Detail**

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5



**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test				Aquatic Bioassay & Consulting Labs, Inc.							
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth			<b>Analyst:</b>							
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)			<b>Diluent:</b> Laboratory Water							
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum			<b>Brine:</b> Not Applicable							
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO			<b>Age:</b>							
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618			<b>Client:</b> Internal Lab							
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride			<b>Project:</b>							
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant										
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX										
Alkalinity (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
10		1	60			60	60	0	0	0.0%	0
20		1	61			61	61	0	0	0.0%	0
40		1	63			63	63	0	0	0.0%	0
80		1	56			56	56	0	0	0.0%	0
140		1	55			55	55	0	0	0.0%	0
Overall		6	60.5	55.5	65.5	55	68	1.945	4.764	7.88%	0 (0%)
Conductivity-µmhos											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	432	399.2	464.8	417	479	11.8	26.39	6.11%	0
10		5	434.4	428.2	440.6	430	443	2.249	5.03	1.16%	0
20		5	424.6	420.2	429	420	428	1.6	3.578	0.84%	0
40		5	410.2	403.7	416.7	405	419	2.354	5.263	1.28%	0
80		5	397	395.5	398.5	395	398	0.5477	1.225	0.31%	0
140		5	378.2	371.2	385.2	373	387	2.518	5.63	1.49%	0
Overall		30	412.7	404.2	421.3	373	479	4.197	22.99	5.57%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
10		1	108			108	108	0	0	0.0%	0
20		1	112			112	112	0	0	0.0%	0
40		1	116			116	116	0	0	0.0%	0
80		1	99			99	99	0	0	0.0%	0
140		1	96			96	96	0	0	0.0%	0
Overall		6	106.8	98.69	115	96	116	3.167	7.757	7.26%	0 (0%)
pH-Units											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.52	7.384	7.656	7.4	7.7	0.04899	0.1095	1.46%	0
10		5	7.6	7.448	7.752	7.5	7.8	0.05477	0.1225	1.61%	0
20		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
40		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
80		5	7.64	7.498	7.782	7.5	7.8	0.05099	0.114	1.49%	0
140		5	7.6	7.476	7.724	7.5	7.7	0.04472	0.1	1.32%	0
Overall		30	7.6	7.562	7.638	7.4	7.8	0.01857	0.1017	1.34%	0 (0%)



**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 2 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test												Aquatic Bioassay & Consulting Labs, Inc.
<b>Temperature-°C</b>												
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count	
0	N	5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
10		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
20		5	24.52	23.87	25.17	24	25.2	0.2332	0.5215	2.13%	0	
40		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
80		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
140		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
Overall		30	24.69	24.52	24.85	24	25.2	0.07947	0.4353	1.76%	0 (0%)	
<b>Alkalinity (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	68										
10		60										
20		61										
40		63										
80		56										
140		55										
<b>Conductivity-µmhos</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	417	420	420	424	479						
10		430	434	432	433	443						
20		420	422	425	428	428						
40		408	409	405	410	419						
80		395	397	398	397	398						
140		373	374	377	380	387						
<b>Hardness (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	110										
10		108										
20		112										
40		116										
80		99										
140		96										
<b>pH-Units</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	7.5	7.4	7.5	7.5	7.7						
10		7.6	7.6	7.5	7.5	7.8						
20		7.7	7.6	7.6	7.5	7.7						
40		7.7	7.6	7.5	7.6	7.7						
80		7.7	7.6	7.5	7.6	7.8						
140		7.7	7.6	7.5	7.5	7.7						
<b>Temperature-°C</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	24.6	25.2	24	25	24.8						
10		24.6	25.2	24	25	24.8						
20		24.6	25.2	24	24	24.8						
40		24.6	25.2	24	25	24.8						
80		24.6	25.2	24	25	24.8						
140		24.6	25.2	24	25	24.8						







## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-1

**Login Number: 226830**

**List Number: 1**

**Creator: Soderblom, Tim**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226830-2**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**14 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





**TABLE OF CONTENTS**

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. EPA METHOD 1613B — Dioxin/Furans..... 6

    III.1. Holding Times ..... 6

    III.1. Instrument Performance ..... 6

        III.1.1. GC Column Performance ..... 6

        III.1.2. Mass Spectrometer Performance..... 6

    III.2. Calibration..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks ..... 6

        III.3.2. Laboratory Control Samples ..... 7

    III.4. Field QC Samples..... 7

        III.4.1. Field Blanks and Equipment Blanks ..... 7

        III.4.2. Field Duplicates..... 7

    III.5. Internal Standards Performance..... 7

    III.6. Compound Identification..... 7

    III.7. Compound Quantification and Reported Detection Limits ..... 7

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>x</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226830-2

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall008_20181207_ Comp	440-226830-1	N/A	Water	12/07/2018 11:05 AM	E1613B



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226830-2:

- The laboratory received the sample in this SDG on ice and within the temperature limits of <6 degrees Celsius ( $^{\circ}\text{C}$ ) and  $>0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the original and transfer COCs.
- The transfer COC to TA-West Sacramento noted custody seals were present and intact on the cooler.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.





### III. EPA METHOD 1613B — DIOXIN/FURANS

---

L. Calvin of MEC<sup>X</sup> reviewed the SDG on January 14, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Dioxins and Furans* (DVP-19, Rev. 0), *USEPA Method 1613B*, and the *National Functional Guidelines Chlorinated Dioxin/Furan Data Review* (2011).

#### III.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted and analyzed within one year of collection.

#### III.1. INSTRUMENT PERFORMANCE

Instrument performance criteria were met. Following are findings associated with instrument performance:

##### III.1.1. GC COLUMN PERFORMANCE

A Windows Defining Mix (WDM) containing the first and last eluting congeners of each descriptor and isomer specificity compounds was analyzed prior to the initial calibration sequence and at the beginning of each analytical sequence. The GC column performance in the calibrations was acceptable, with the height of the valley between the closely eluting isomers and 2,3,7,8-TCDD reported as <25%.

##### III.1.2. MASS SPECTROMETER PERFORMANCE

The mass spectrometer performance was acceptable with the static resolving power >10,000.

#### III.2. CALIBRATION

Calibration criteria were met. The initial calibration was acceptable with %RSDs  $\leq 20\%$  for the 15 native compounds (calibration by isotope dilution) and  $\leq 35\%$  for the two native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the Method 1613B control limits for all standards.

Continuing Calibration: Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of the analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in Table 6 of EPA Method 1613B. The ion abundance ratios and relative retention times were within the method control limits.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

The method blank had detects above the EDL and below the reporting limit (RL) for isomers 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,7,8-TCDF, OCDD, and OCDF, and for totals TCDF, HpCDD, HpCDF, HxCDD, and HxCDF. Isomer results for the method blank contaminants detected below the RL were qualified as nondetects (U) at the level of contamination based upon professional judgement and the guidance for blank qualification in the National Functional Guidelines for Dioxin Review. The result above the RL for OCDD was <10 $\times$  the method blank concentration, and was therefore qualified as a nondetect (U)



at the level of contamination. The reviewer verified that peaks comprising total HpCDF in the method blank were the same peaks comprising total HpCDF in sample Outfall008\_20181207\_Comp at similar concentrations. The result for total HpCDF was qualified as a nondetect (U) at the level of contamination. Results for totals HpCDD, HxCDD, HxCDF, and TCDF were qualified as estimated (J) as they contained one or more peaks not present in the method blank.

### III.3.2. LABORATORY CONTROL SAMPLES

Recoveries were within the acceptance criteria listed in Table 6 of Method 1613B, and RPDs were within the laboratory control limit of  $\leq 50\%$ .

### III.4. FIELD QC SAMPLES

MEC<sup>x</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>x</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

#### III.4.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

#### III.4.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

### III.5. INTERNAL STANDARDS PERFORMANCE

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613B.

### III.6. COMPOUND IDENTIFICATION

Compound identification was verified. With the exception of estimated maximum possible concentrations (EMPCs), detected compounds met the ion abundance ratio, retention time window and signal-to-noise ratio criteria for identification. The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613B. Isomer 2,3,7,8-TCDF was detected in the initial analysis of the sample, and the detect was confirmed by second-column analysis. Both initial and confirmation analyses were reported. As the confirmation column is more specific for the detection of 2,3,7,8-TCDF, the initial result was rejected (R) in favor of the confirmation result. The confirmation result was subsequently qualified as a nondetect for method blank contamination.

### III.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified by recalculating a representative number of sample results. The laboratory calculated and reported compound-specific detection limits. Detects between the EDL and the RL were qualified as estimated (J) and coded with DNQ to comply with the NPDES permit. Nondetects are valid to the EDL. Per client request, results below the EDL meeting retention time and signal to noise (S/N) criteria were to be reported; however, this sample had no reported detects below the EDL.

Isomer 2,3,7,8-TCDD reported as an EMPC was qualified as an estimated nondetect (UJ) at the level of contamination. Totals HxCDD, PeCDD, PeCDF, TCDD, and TCDF contained both EMPC peaks and non-EMPC peaks, and were qualified as estimated (J).

# Validated Sample Result Forms: 4402268302

**Analysis Method:** E1613B

**Sample Name:** Outfall008\_20181207\_Comp      **Matrix Type:** W      **Result Type:** TRG  
**Lab Sample Name:** 440-226830-1      **Sample Date/Time:** 12/07/2018 11:05      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.000030	0.00000037	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.0000081	0.00000032	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.0000039	0.00000029	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8-HxCDD	39227-28-6	0.0000046	0.00000025	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8-HxCDF	70648-26-9	0.0000040	0.00000030	0.000048	ug/L	J,DX	J	DNQ
1,2,3,6,7,8-HxCDD	57653-85-7	0.0000038	0.00000023	0.000048	ug/L	J,DXMB	U	B
1,2,3,6,7,8-HxCDF	57117-44-9	0.0000032	0.00000025	0.000048	ug/L	J,DXMB	U	B
1,2,3,7,8,9-HxCDD	19408-74-3	0.0000053	0.00000022	0.000048	ug/L	J,DXMB	U	B
1,2,3,7,8,9-HxCDF	72918-21-9	0.0000034	0.00000017	0.000048	ug/L	J,DXMB	U	B
1,2,3,7,8-PeCDD	40321-76-4	0.0000028	0.00000026	0.000048	ug/L	J,DX	J	DNQ
1,2,3,7,8-PeCDF	57117-41-6	0.0000027	0.00000021	0.000048	ug/L	J,DX	J	DNQ
2,3,4,6,7,8-HxCDF	60851-34-5	0.0000031	0.00000017	0.000048	ug/L	J,DX	J	DNQ
2,3,4,7,8-PeCDF	57117-31-4	0.0000028	0.00000026	0.000048	ug/L	J,DX	J	DNQ
2,3,7,8-TCDD	1746-01-6	0.0000014	0.00000028	0.0000095	ug/L	J,DXq	UJ	*III
2,3,7,8-TCDF	51207-31-9	0.0000019	0.00000061	0.0000095	ug/L	J,DXMB	U	B
2,3,7,8-TCDF	51207-31-9	0.0000021	0.00000014	0.0000095	ug/L	J,DXMB	R	D
OCDD	3268-87-9	0.00024	0.00000058	0.000095	ug/L	MB	U	B
OCDF	39001-02-0	0.000021	0.00000035	0.000095	ug/L	J,DXMB	U	B
Total HpCDD	37871-00-4	0.000069	0.00000037	0.000048	ug/L	MB	J	B
Total HpCDF	38998-75-3	0.000018	0.00000029	0.000048	ug/L	J,DXMB	U	B
Total HxCDD	34465-46-8	0.000024	0.00000022	0.000048	ug/L	J,DXqMB	J	B, DNQ, *III
Total HxCDF	55684-94-1	0.000015	0.00000017	0.000048	ug/L	J,DXMB	J	B, DNQ
Total PeCDD	36088-22-9	0.0000041	0.00000026	0.000048	ug/L	J,DXq	J	DNQ, *III
Total PeCDF	30402-15-4	0.0000068	0.00000021	0.000048	ug/L	J,DXq	J	DNQ, *III
Total TCDD	41903-57-5	0.0000023	0.00000028	0.0000095	ug/L	J,DXq	J	DNQ, *III
Total TCDF	55722-27-5	0.0000041	0.00000014	0.0000095	ug/L	J,DXqMB	J	B, DNQ, *III

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226830-2

Client Project/Site: Annual Outfall 008 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/28/2018 11:37:14 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

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[www.testamericainc.com](http://www.testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/28/2018 11:37:14 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
QC Sample Results . . . . .	10
QC Association Summary . . . . .	14
Definitions/Glossary . . . . .	15
Certification Summary . . . . .	16
Chain of Custody . . . . .	17
Receipt Checklists . . . . .	20
Isotope Dilution Summary . . . . .	22
Field Data Sheets . . . . .	24

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226830-1	Outfall008_20181207_Comp	Water	12/07/18 11:05	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

**Job ID: 440-226830-2**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226830-2**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3° C and 3.5° C.

### Dioxin

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: (CCV 320-266136/54), (LCS 320-264993/2-A), (LCSD 320-264993/3-A) and (MB 320-264993/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: Outfall008\_20181207\_Comp (440-226830-1), (CCV 320-266136/54), (LCS 320-264993/2-A), (LCSD 320-264993/3-A) and (MB 320-264993/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: Outfall008\_20181207\_Comp (440-226830-1) and (CCV 320-267413/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Dioxin Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

Date Collected: 12/07/18 11:05

Matrix: Water

Date Received: 12/07/18 21:05

**Method: 1613B - Dioxins and Furans (HRGC/HRMS)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.0000014	J,DX q	0.0000095	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,7,8-PeCDD	0.0000028	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,7,8-PeCDF	0.0000027	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
2,3,4,7,8-PeCDF	0.0000028	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,4,7,8-HxCDD	0.0000046	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,6,7,8-HxCDD	0.0000038	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,7,8,9-HxCDD	0.0000053	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,4,7,8-HxCDF	0.0000040	J,DX	0.000048	0.0000003	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,6,7,8-HxCDF	0.0000032	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,7,8,9-HxCDF	0.0000034	J,DX MB	0.000048	0.0000001	ug/L		12/13/18 08:34	12/19/18 13:30	1
2,3,4,6,7,8-HxCDF	0.0000031	J,DX	0.000048	0.0000001	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,4,6,7,8-HpCDD	0.000030	J,DX MB	0.000048	0.0000003	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,4,6,7,8-HpCDF	0.0000081	J,DX MB	0.000048	0.0000003	ug/L		12/13/18 08:34	12/19/18 13:30	1
1,2,3,4,7,8,9-HpCDF	0.0000039	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
OCDD	0.00024	MB	0.000095	0.0000005	ug/L		12/13/18 08:34	12/19/18 13:30	1
OCDF	0.000021	J,DX MB	0.000095	0.0000003	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total TCDD	0.0000023	J,DX q	0.0000095	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total TCDF	0.0000041	J,DX q MB	0.0000095	0.0000001	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total PeCDD	0.0000041	J,DX q	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total PeCDF	0.0000068	J,DX q	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total HxCDD	0.000024	J,DX q MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total HxCDF	0.000015	J,DX MB	0.000048	0.0000001	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total HpCDD	0.000069	MB	0.000048	0.0000003	ug/L		12/13/18 08:34	12/19/18 13:30	1
Total HpCDF	0.000018	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 13:30	1
<b>Isotope Dilution</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C-2,3,7,8-TCDD	68		25 - 164				12/13/18 08:34	12/19/18 13:30	1
13C-2,3,7,8-TCDF	66		24 - 169				12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,7,8-PeCDD	62		25 - 181				12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,7,8-PeCDF	63		24 - 185				12/13/18 08:34	12/19/18 13:30	1
13C-2,3,4,7,8-PeCDD	54		21 - 178				12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,4,7,8-HxCDD	63		32 - 141				12/13/18 08:34	12/19/18 13:30	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)**

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-1,2,3,6,7,8-HxCDD	63		28 - 130	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,4,7,8-HxCDF	61		26 - 152	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,6,7,8-HxCDF	63		26 - 123	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,7,8,9-HxCDF	77		29 - 147	12/13/18 08:34	12/19/18 13:30	1
13C-2,3,4,6,7,8-HxCDF	71		28 - 136	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,4,6,7,8-HpCDD	85		23 - 140	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,4,6,7,8-HpCDF	63		28 - 143	12/13/18 08:34	12/19/18 13:30	1
13C-1,2,3,4,7,8,9-HpCDF	85		26 - 138	12/13/18 08:34	12/19/18 13:30	1
13C-OCDD	59		17 - 157	12/13/18 08:34	12/19/18 13:30	1

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
37Cl4-2,3,7,8-TCDD	104		35 - 197	12/13/18 08:34	12/19/18 13:30	1

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA**

<i>Analyte</i>	<i>Result</i>	<i>Qualifier</i>	<i>RL</i>	<i>EDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
2,3,7,8-TCDF	0.0000019	J,DX MB	0.0000095	0.0000006	ug/L		12/13/18 08:34	12/24/18 15:46	1

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-2,3,7,8-TCDF	70		24 - 169	12/13/18 08:34	12/24/18 15:46	1

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
37Cl4-2,3,7,8-TCDD	80		35 - 197	12/13/18 08:34	12/24/18 15:46	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	40CFR136A	TAL SAC
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	40CFR136A	TAL SAC

**Protocol References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			1047.8 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B		1			266136	12/19/18 13:30	AS	TAL SAC
Total/NA	Prep	1613B	RA		1047.8 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B	RA	1			267413	12/24/18 15:46	KSS	TAL SAC

#### Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: MB 320-264993/1-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C-1,2,3,7,8-PeCDF	67		24 - 185	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,7,8-PeCDF	63		21 - 178	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDD	74		32 - 141	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDF	70		26 - 152	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDF	70		26 - 123	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,7,8,9-HxCDF	80		29 - 147	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,6,7,8-HxCDF	75		28 - 136	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDD	84		23 - 140	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDF	83		28 - 143	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8,9-HpCDF	85		26 - 138	12/13/18 08:34	12/19/18 05:04	1
13C-OCDD	53		17 - 157	12/13/18 08:34	12/19/18 05:04	1
Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
37Cl4-2,3,7,8-TCDD	105		35 - 197	12/13/18 08:34	12/19/18 05:04	1

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
2,3,7,8-TCDD	0.000200	0.000210		ug/L		105	67 - 158
2,3,7,8-TCDF	0.000200	0.000215	MB	ug/L		108	75 - 158
1,2,3,7,8-PeCDD	0.00100	0.00106		ug/L		106	70 - 142
1,2,3,7,8-PeCDF	0.00100	0.00107		ug/L		107	80 - 134
2,3,4,7,8-PeCDF	0.00100	0.00106		ug/L		106	68 - 160
1,2,3,4,7,8-HxCDD	0.00100	0.000974	MB	ug/L		97	70 - 164
1,2,3,6,7,8-HxCDD	0.00100	0.00102	MB	ug/L		102	76 - 134
1,2,3,7,8,9-HxCDD	0.00100	0.00124	MB	ug/L		124	64 - 162
1,2,3,4,7,8-HxCDF	0.00100	0.00101		ug/L		101	72 - 134
1,2,3,6,7,8-HxCDF	0.00100	0.000995	MB	ug/L		100	84 - 130
1,2,3,7,8,9-HxCDF	0.00100	0.00104	MB	ug/L		104	78 - 130
2,3,4,6,7,8-HxCDF	0.00100	0.00101		ug/L		101	70 - 156
1,2,3,4,6,7,8-HpCDD	0.00100	0.000963	MB	ug/L		96	70 - 140
1,2,3,4,6,7,8-HpCDF	0.00100	0.000963	MB	ug/L		96	82 - 122
1,2,3,4,7,8,9-HpCDF	0.00100	0.000965	MB	ug/L		97	78 - 138
OCDD	0.00200	0.00191	MB	ug/L		95	78 - 144
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170
Isotope Dilution	LCS LCS		Limits				
	%Recovery	Qualifier					
13C-2,3,7,8-TCDD	79		20 - 175				
13C-2,3,7,8-TCDF	81		22 - 152				
13C-1,2,3,7,8-PeCDD	70		21 - 227				
13C-1,2,3,7,8-PeCDF	72		21 - 192				
13C-2,3,4,7,8-PeCDF	60		13 - 328				
13C-1,2,3,4,7,8-HxCDD	67		21 - 193				
13C-1,2,3,6,7,8-HxCDD	67		25 - 163				
13C-1,2,3,4,7,8-HxCDF	64		19 - 202				

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<i>Isotope Dilution</i>	LCS LCS		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C-1,2,3,6,7,8-HxCDF	69		21 - 159
13C-1,2,3,7,8,9-HxCDF	90		17 - 205
13C-2,3,4,6,7,8-HxCDF	78		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	94		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	85		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	98		20 - 186
13C-OCDD	72		13 - 199
<b>Surrogate</b>			
	LCS	LCS	
	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	109		31 - 191

**Lab Sample ID: LCSD 320-264993/3-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	%Rec.		RPD		
							<i>Limits</i>	<i>RPD</i>	<i>Limit</i>	<i>Limit</i>	
2,3,7,8-TCDD	0.000200	0.000206		ug/L		103	67 - 158	2	50		
2,3,7,8-TCDF	0.000200	0.000211	MB	ug/L		106	75 - 158	2	50		
1,2,3,7,8-PeCDD	0.00100	0.00104		ug/L		104	70 - 142	2	50		
1,2,3,7,8-PeCDF	0.00100	0.00103		ug/L		103	80 - 134	4	50		
2,3,4,7,8-PeCDF	0.00100	0.00102		ug/L		102	68 - 160	4	50		
1,2,3,4,7,8-HxCDD	0.00100	0.000968	MB	ug/L		97	70 - 164	1	50		
1,2,3,6,7,8-HxCDD	0.00100	0.00100	MB	ug/L		100	76 - 134	2	50		
1,2,3,7,8,9-HxCDD	0.00100	0.00106	MB	ug/L		106	64 - 162	16	50		
1,2,3,4,7,8-HxCDF	0.00100	0.000988		ug/L		99	72 - 134	2	50		
1,2,3,6,7,8-HxCDF	0.00100	0.000987	MB	ug/L		99	84 - 130	1	50		
1,2,3,7,8,9-HxCDF	0.00100	0.00102	MB	ug/L		102	78 - 130	2	50		
2,3,4,6,7,8-HxCDF	0.00100	0.000995		ug/L		99	70 - 156	1	50		
1,2,3,4,6,7,8-HpCDD	0.00100	0.000950	MB	ug/L		95	70 - 140	1	50		
1,2,3,4,6,7,8-HpCDF	0.00100	0.000973	MB	ug/L		97	82 - 122	1	50		
1,2,3,4,7,8,9-HpCDF	0.00100	0.000940	MB	ug/L		94	78 - 138	3	50		
OCDD	0.00200	0.00193	MB	ug/L		97	78 - 144	1	50		
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170	0	50		
<b>Isotope Dilution</b>											
	LCS	LCS									
	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>								
13C-2,3,7,8-TCDD	82		20 - 175								
13C-2,3,7,8-TCDF	82		22 - 152								
13C-1,2,3,7,8-PeCDD	71		21 - 227								
13C-1,2,3,7,8-PeCDF	74		21 - 192								
13C-2,3,4,7,8-PeCDF	68		13 - 328								
13C-1,2,3,4,7,8-HxCDD	77		21 - 193								
13C-1,2,3,6,7,8-HxCDD	76		25 - 163								
13C-1,2,3,4,7,8-HxCDF	73		19 - 202								
13C-1,2,3,6,7,8-HxCDF	73		21 - 159								
13C-1,2,3,7,8,9-HxCDF	88		17 - 205								
13C-2,3,4,6,7,8-HxCDF	79		22 - 176								
13C-1,2,3,4,6,7,8-HpCDD	91		26 - 166								
13C-1,2,3,4,6,7,8-HpCDF	87		21 - 158								

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-264993/3-A

Matrix: Water

Analysis Batch: 266136

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 264993

	<i>LCSD</i>	<i>LCSD</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,7,8,9-HpCDF	94		20 - 186
13C-OCDD	63		13 - 199

	<i>LCSD</i>	<i>LCSD</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	110		31 - 191

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# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Specialty Organics

### Prep Batch: 264993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	1613B	
440-226830-1 - RA	Outfall008_20181207_Comp	Total/NA	Water	1613B	
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	

### Analysis Batch: 266136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	1613B	264993
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	264993
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	264993
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	264993

### Analysis Batch: 267413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1 - RA	Outfall008_20181207_Comp	Total/NA	Water	1613B	264993

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Qualifiers

### Dioxin

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
MB	Analyte present in the method blank
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19









## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-2

**Login Number: 226830**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-2

**Login Number: 226830**

**List Number: 3**

**Creator: Her, David A**

**List Source: TestAmerica Sacramento**

**List Creation: 12/11/18 05:45 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (25-164)	TCDF (24-169)	PeCDD (25-181)	PeCDF (24-185)	PeCF (21-178)	HxCDD (32-141)	HxDD (28-130)	HxCDF (26-152)
440-226830-1	Outfall008_20181207_Comp	68	66	62	63	54	63	63	61
440-226830-1 - RA	Outfall008_20181207_Comp		70						
MB 320-264993/1-A	Method Blank	77	76	65	67	63	74	74	70

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (26-123)	HxCF (29-147)	13CHxCF (28-136)	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	OCDD (17-157)
440-226830-1	Outfall008_20181207_Comp	63	77	71	85	63	85	59
440-226830-1 - RA	Outfall008_20181207_Comp							
MB 320-264993/1-A	Method Blank	70	80	75	84	83	85	53

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD  
 HxCDF = 13C-1,2,3,4,7,8-HxCDF  
 HxDF = 13C-1,2,3,6,7,8-HxCDF  
 HxCF = 13C-1,2,3,7,8,9-HxCDF  
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
 HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
 OCDD = 13C-OCDD

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (20-175)	TCDF (22-152)	PeCDD (21-227)	PeCDF (21-192)	PeCF (13-328)	HxCDD (21-193)	HxDD (25-163)	HxCDF (19-202)
LCS 320-264993/2-A	Lab Control Sample	79	81	70	72	60	67	67	64
LCSD 320-264993/3-A	Lab Control Sample Dup	82	82	71	74	68	77	76	73

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (21-159)	HxCF (17-205)	13CHxCF (22-176)	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	OCDD (13-199)
LCS 320-264993/2-A	Lab Control Sample	69	90	78	94	85	98	72
LCSD 320-264993/3-A	Lab Control Sample Dup	73	88	79	91	87	94	63

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD

TestAmerica Irvine

# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-2

HxCDF = 13C-1,2,3,4,7,8-HxCDF  
HxDF = 13C-1,2,3,6,7,8-HxCDF  
HxCF = 13C-1,2,3,7,8,9-HxCDF  
13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
OCDD = 13C-OCDD

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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226830-3**

**Prepared for**

Haley & Aldrich, Inc.  
600 South Meyer Avenue, Suite 100  
Tucson, Arizona 85701

**22 January 2019**

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TABLE OF CONTENTS

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. VARIOUS EPA METHODS —Radionuclides..... 6

    III.1. Holding Times:..... 6

    III.2. Calibration: ..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks..... 6

        III.3.2. Laboratory Control Samples: ..... 6

        III.3.3. Laboratory Duplicates:..... 6

        III.3.4. Matrix Spike/Matrix Spike Duplicate: ..... 6

    III.4. Sample Result Verification:..... 6

    III.5. Field QC Samples: ..... 6

        III.5.1. Field Blanks and Equipment Blanks: ..... 7

        III.5.2. Field Duplicates:..... 7

TABLES

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

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**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>x</sup> Project No.:** 1272.003H.01

**Sample Delivery Group:** 440-226830-3

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** III

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall008_20181207 _Comp	440-226830-1	N/A	Water	12/07/2018 11:05	E900, E901.1, E903.0, E904.0, E905.0, E906.0, HASL-300 U Mod



## II. SAMPLE MANAGEMENT

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According to the case narrative, sample condition upon receipt forms and the chains-of-custody (COCs) provided by the laboratories for sample delivery group (SDG) 440-226830-3:

- The laboratories received the sample in this SDG on ice and within the temperature limits of  $\leq 6$  degrees Celsius ( $^{\circ}\text{C}$ ) and  $> 0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact.
- Field and laboratory personnel signed and dated the COCs.
- Some corrections to the original COCs were not initialed or dated. The cross-outs did not affect data quality.
- Sample containers were transferred to TestAmerica – St. Louis laboratory for all radionuclide analyses.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.





TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. VARIOUS EPA METHODS — RADIONUCLIDES

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E. Wessling of MEC<sup>x</sup> reviewed the SDGs on January 22, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the *EPA Methods 900, 901.1, 903.0, 904.0, 905.0, 906.0 and HASL-300 U Mod*, and the *National Functional Guidelines for Inorganic Data Review* (2014).

#### III.1. HOLDING TIMES:

The sample was received unpreserved. The sample was acidified and allowed to equilibrate. The sample was prepared within five days of preservation and analyzed following in-growth.

#### III.2. CALIBRATION:

The detector efficiency for gross alpha was less than 20%; therefore, the detected result for gross alpha was qualified as estimated (J-) with a potential negative bias. All other detector efficiencies were greater than 20% and no further qualifications were required. Carrier/tracer recoveries were within the laboratory control limits. Calibration checks were not verified at a Level III validation.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

Target isotopes were not detected in the method blanks above the MDA. However, a comparison normalized absolute difference of the sample results and the method blank results indicated the method blank and the sample results were not significantly different at the 1% level of confidence for total uranium and radium-226. The detected sample results for total uranium and radium-226 were qualified as nondetect (U). No further qualifications were required.

##### III.3.2. LABORATORY CONTROL SAMPLES:

The recoveries and RPDs were within laboratory-established control limits.

##### III.3.3. LABORATORY DUPLICATES:

Laboratory duplicates were not performed on the sample from this SDG.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE:

Matrix spike (MS)/MSD analyses were not performed on the sample from this SDG.

#### III.4. SAMPLE RESULT VERIFICATION:

An EPA Level III review was performed on the sample in this data package. As such, the sample results were not verified. Reported nondetects are valid to the MDC.

#### III.5. FIELD QC SAMPLES:

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. The following are findings associated with field QC samples:



III.5.1. **FIELD BLANKS AND EQUIPMENT BLANKS:**

This SDG had no identified field blank or equipment blank samples.

III.5.2. **FIELD DUPLICATES:**

There were no field duplicate samples identified for this SDG.

# Validated Sample Result Forms: 4402268303

## Analysis Method E900

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 9

Lab Sample Name: 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Gross Alpha Analytes	GROSSALPHA	14.8	3.81	3.00	3.08	pCi/L	G	J-	*III
Gross Beta Analytes	GROSSBETA	15.5	2.46	4.00	1.71	pCi/L			

## Analysis Method E901.1

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 9

Lab Sample Name: 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cesium-137	10045-97-3	0.483	10.6	20.0	18.7	pCi/L	U	U	
Potassium-40	13966-00-2	-15.1	139	186	186	pCi/L	U	U	

## Analysis Method E903.0

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 9

Lab Sample Name: 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226	13982-63-3	0.642	0.309	1.00	0.326	pCi/L		U	B

## Analysis Method E904.0

Sample Name OUTFALL008\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 11:05:00 AM Validation Level: 9

Lab Sample Name: 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-228	15262-20-1	0.673	0.632	1.00	1.01	pCi/L	UG	U	

**Analysis Method** E905.0**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 9**Lab Sample Name:** 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Strontium-90	10098-97-2	0.109	0.251	3.00	0.434	pCi/L	U	U	

**Analysis Method** E906.0**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 9**Lab Sample Name:** 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Tritium	10028-17-8	-220	200	500	389	pCi/L	U	U	

**Analysis Method** HASL-300 U Mod**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 9**Lab Sample Name:** 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Uranium	URANIUM	1.33	0.884	1.00	0.833	pCi/L		U	B

**Analysis Method** RADIUM**Sample Name** OUTFALL008\_20181207\_COMP **Matrix Type:** WM **Result Type:** TRG**Sample Date:** 12/7/2018 11:05:00 AM **Validation Level:** 9**Lab Sample Name:** 440-226830-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226 & 228	RADIUM226228	1.01	0.698611					U	B

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226830-3

Client Project/Site: Annual Outfall 008 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/10/2019 10:25:52 PM

Urvashi Patel, Manager of Project Management

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



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Urvashi Patel  
Manager of Project Management  
1/10/2019 10:25:52 PM





# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	7
Method Summary . . . . .	9
Lab Chronicle . . . . .	10
QC Sample Results . . . . .	11
QC Association Summary . . . . .	18
Definitions/Glossary . . . . .	20
Certification Summary . . . . .	21
Chain of Custody . . . . .	22
Receipt Checklists . . . . .	25
Tracer Carrier Summary . . . . .	27
Field Data Sheets . . . . .	29

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226830-1	Outfall008_20181207_Comp	Water	12/07/18 11:05	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

**Job ID: 440-226830-3**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226830-3**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3° C and 3.5° C.

### Receipt Exceptions

The reference method requires samples to be preserved to a pH <2. The following samples was received with insufficient preservation at a pH of 7: Outfall008\_20181207\_Comp (440-226830-1). The samples were preserved with 10mL of nitric acid reagent #1598157, at 16:00 on 12/11/18, to reach the appropriate pH of 2 in the laboratory.

### RAD

Method(s) 900.0: Gross Alpha/Beta Prep Batch 160-407614

The gross alpha detection goal was not met for the following samples due to a reduction of the sample size attributed to high residual mass: Outfall008\_20181207\_Comp (440-226830-1). Analytical results are reported with the detection limit achieved.

Method(s) 904.0: Radium-228 Prep Batch 160-405521:

The detection goal was not met for the following samples due to the reduced sample volume attributed to the presence of matrix interferences (see prep NCM156513): Outfall008\_20181207\_Comp (440-226830-1). Samples 440-226869-1 and 440-226869-2 both had low(er) barium carrier recoveries that can contribute to an elevated MDC. Analytical results are reported with the detection limit achieved.

Method(s) ExtChrom: Uranium Prep Batch 160-405494:

Samples Outfall008\_20181207\_Comp (440-226830-1) were prepared at a reduced aliquot due to gray and yellow discoloration and cloudiness.

Method(s) PrecSep\_0: Radium-228 Prep Batch 405521:

The following samples were prepared at a reduced aliquot due to sediment and discoloration: Outfall008\_20181207\_Comp (440-226830-1).

Method(s) PrecSep-21: Radium-226 Prep Batch 160-405504:

The following samples were prepared at a reduced aliquot due to sediment and discoloration: Outfall008\_20181207\_Comp (440-226830-1).

Method(s) PrecSep-21: Radium-226 Prep Batch 160-405504:

The following samples have a different barium carrier recovery than the accompanying Ra-228 analysis method. This is due to the planchets getting re-tared and re-weighed after the separation step.

Outfall008\_20181207\_Comp (440-226830-1)

Method(s) PrecSep-7: Strontium-90 Prep Batch 405485:

The following sample was prepared at a reduced aliquot.

Outfall008\_20181207\_Comp (440-226830-1)

Job number 440-226822, 440-226863, 440-226867, and 440-226869 contained samples with a yellow, cloudy matrix.

Sample 440-226830-I-1 contained black sediment.

The samples in job 280-117873 contained red sediment.

# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

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## Job ID: 440-226830-3 (Continued)

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### Laboratory: TestAmerica Irvine (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

Date Collected: 12/07/18 11:05

Matrix: Water

Date Received: 12/07/18 21:05

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	14.8	G	3.41	3.81	3.00	3.08	pCi/L	12/27/18 10:23	12/31/18 09:30	1
Gross Beta	15.5		1.91	2.46	4.00	1.71	pCi/L	12/27/18 10:23	12/31/18 09:30	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	0.483	U	10.6	10.6	20.0	18.7	pCi/L	12/12/18 02:07	12/17/18 17:57	1
Potassium-40	-15.1	U	139	139		186	pCi/L	12/12/18 02:07	12/17/18 17:57	1

## Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.642		0.304	0.309	1.00	0.326	pCi/L	12/13/18 11:03	01/04/19 08:39	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	63.4		40 - 110					12/13/18 11:03	01/04/19 08:39	1

## Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.673	U G	0.629	0.632	1.00	1.01	pCi/L	12/13/18 13:19	12/21/18 14:11	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	75.2		40 - 110					12/13/18 13:19	12/21/18 14:11	1
Y Carrier	78.9		40 - 110					12/13/18 13:19	12/21/18 14:11	1

## Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.109	U	0.251	0.251	3.00	0.434	pCi/L	12/13/18 08:52	12/31/18 12:20	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Sr Carrier	84.4		40 - 110					12/13/18 08:52	12/31/18 12:20	1
Y Carrier	95.7		40 - 110					12/13/18 08:52	12/31/18 12:20	1

## Method: 906.0 - Tritium, Total (LSC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	-220	U	199	200	500	389	pCi/L	01/07/19 11:23	01/07/19 19:39	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Total Uranium</b>	<b>1.33</b>		0.881	0.884	1.00	0.833	pCi/L	12/13/18 09:58	12/14/18 17:42	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	71.9		30 - 110					12/13/18 09:58	12/14/18 17:42	1



# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Cesium 137 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
905	Strontium-90 (GFPC)	EPA	TAL SL
906.0	Tritium, Total (LSC)	EPA	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Evaporation	Preparation, Evaporation	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-0	Fill Geometry, No In-Growth	None	TAL SL
LSC_Dist_Susp	Distillation and Suspension (LSC)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL
PrecSep-7	Preparation, Precipitate Separation (7-Day In-Growth)	None	TAL SL

#### Protocol References:

DOE = U.S. Department of Energy  
EPA = US Environmental Protection Agency  
None = None

#### Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Evaporation			137 mL	1.0 g	407614	12/27/18 10:23	MRB	TAL SL
Total/NA	Analysis	900.0		1			408344	12/31/18 09:30	CDR	TAL SL
Total/NA	Prep	Fill_Geo-0			1000 mL	1.0 mL	405196	12/12/18 02:07	MPT	TAL SL
Total/NA	Analysis	901.1		1			406064	12/17/18 17:57	JLW	TAL SL
Total/NA	Prep	PrecSep-21			499.98 mL	1.0 g	405504	12/13/18 11:03	MMO	TAL SL
Total/NA	Analysis	903.0		1			408962	01/04/19 08:39	CDR	TAL SL
Total/NA	Prep	PrecSep_0			499.98 mL	1.0 g	405521	12/13/18 13:19	MMO	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	406931	12/21/18 14:11	CDR	TAL SL
Total/NA	Prep	PrecSep-7			500.05 mL	1.0 g	405485	12/13/18 08:52	HET	TAL SL
Total/NA	Analysis	905		1			408308	12/31/18 12:20	KLS	TAL SL
Total/NA	Prep	LSC_Dist_Susp			100.3 mL	1.0 g	409225	01/07/19 11:23	JDL	TAL SL
Total/NA	Analysis	906.0		1			409354	01/07/19 19:39	RTM	TAL SL
Total/NA	Prep	ExtChrom			100.05 mL	1.0 mL	405494	12/13/18 09:58	KNF	TAL SL
Total/NA	Analysis	A-01-R		1			405843	12/14/18 17:42	ALS	TAL SL

**Laboratory References:**

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

**Lab Sample ID: MB 160-407614/1-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	0.6321	U	0.677	0.680	3.00	1.10	pCi/L	12/27/18 10:23	12/31/18 09:20	1
Gross Beta	-0.1631	U	0.514	0.514	4.00	0.930	pCi/L	12/27/18 10:23	12/31/18 09:20	1

**Lab Sample ID: LCS 160-407614/2-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Gross Alpha	50.9	46.07		6.69	3.00	1.74	pCi/L	90	73 - 133

**Lab Sample ID: LCSB 160-407614/3-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCSB Result	LCSB Qual	Total	RL	MDC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Gross Beta	87.1	86.97		9.22	4.00	0.929	pCi/L	100	75 - 125

**Lab Sample ID: 440-226822-J-1-G MS**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total	RL	MDC	Unit	%Rec	%Rec.
						Uncert. (2σ+/-)					Limits
Gross Alpha	1.10	U	50.9	38.18		5.35	3.00	1.02	pCi/L	73	60 - 140

**Lab Sample ID: 440-226822-J-1-H MSD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total	RL	MDC	Unit	%Rec	%Rec.	RER	Limit
						Uncert. (2σ+/-)					Limits	RER	Limit
Gross Alpha	1.10	U	50.9	46.14		6.30	3.00	1.16	pCi/L	88	60 - 140	0.68	1

**Lab Sample ID: 440-226822-J-1-I MSBT**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBT Result	MSBT Qual	Total	RL	MDC	Unit	%Rec	%Rec.
						Uncert. (2σ+/-)					Limits
Gross Beta	2.28		87.1	88.52		9.38	4.00	1.06	pCi/L	99	60 - 140

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity (Continued)

**Lab Sample ID: 440-226822-J-1-J MSBTD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBTD Result	MSBTD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Gross Beta	2.28		87.1	87.44		9.26	4.00	1.04	pCi/L	98	60 - 140	0.06	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

**Lab Sample ID: MB 160-405196/1-A**  
**Matrix: Water**  
**Analysis Batch: 405206**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	2.771	U	6.28	6.28	20.0	11.0	pCi/L	12/12/18 02:07	12/12/18 06:12	1
Potassium-40	-48.63	U	190	190		236	pCi/L	12/12/18 02:07	12/12/18 06:12	1

**Lab Sample ID: LCS 160-405196/2-A**  
**Matrix: Water**  
**Analysis Batch: 405207**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	136000	124900		14400		350	pCi/L	92	90 - 111
Cesium-137	45100	42160		4230	20.0	168	pCi/L	94	90 - 111
Cobalt-60	31300	30340		3000		66.0	pCi/L	97	89 - 110

**Lab Sample ID: 280-117873-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 405207**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Cesium-137	-3.30	U	5.059	U	8.98	20.0	15.1	pCi/L	0.45	1
Potassium-40	1.18	U	25.26	U	141		185	pCi/L	0.08	1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-405504/20-A**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.09638	U	0.181	0.182	1.00	0.323	pCi/L	12/13/18 11:03	01/04/19 08:39	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	51.3		40 - 110					12/13/18 11:03	01/04/19 08:39	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 903.0 - Radium-226 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405504/1-A**  
**Matrix: Water**  
**Analysis Batch: 408961**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	13.80		1.60	1.00	0.236	pCi/L	91	68 - 137
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	63.4		40 - 110						

**Lab Sample ID: 440-226822-F-1-F MS**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	0.117	U	15.1	14.50		1.77	1.00	0.317	pCi/L	95	75 - 138
<b>Carrier</b>	<b>MS %Yield</b>	<b>MS Qualifier</b>	<b>Limits</b>								
Ba Carrier	45.4		40 - 110								

**Lab Sample ID: 440-226822-F-1-G MSD**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	0.117	U	15.1	15.06		1.84	1.00	0.365	pCi/L	99	75 - 138	0.15	1
<b>Carrier</b>	<b>MSD %Yield</b>	<b>MSD Qualifier</b>	<b>Limits</b>										
Ba Carrier	43.1		40 - 110										

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-405521/20-A**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.01266	U	0.314	0.314	1.00	0.566	pCi/L	12/13/18 13:19	12/21/18 14:11	1
<b>Carrier</b>	<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>		<b>Prepared</b>		<b>Analyzed</b>		<b>Dil Fac</b>	
Ba Carrier	90.0		40 - 110		12/13/18 13:19		12/21/18 14:11		1	
Y Carrier	81.9		40 - 110		12/13/18 13:19		12/21/18 14:11		1	

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405521/1-A**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	12.1	13.92		1.64	1.00	0.603	pCi/L	115	56 - 140
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Ba Carrier	90.6		40 - 110						
Y Carrier	76.3		40 - 110						

**Lab Sample ID: 440-226822-F-1-H MS**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	0.407	U	12.1	17.84		2.13	1.00	0.816	pCi/L	144	45 - 150
<b>MS MS</b>											
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Ba Carrier	70.2		40 - 110								
Y Carrier	71.4		40 - 110								

**Lab Sample ID: 440-226822-F-1-I MSD**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	0.407	U	12.1	13.69		1.68	1.00	0.666	pCi/L	109	45 - 150	1.09	1
<b>MSD MSD</b>													
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Ba Carrier	72.0		40 - 110										
Y Carrier	80.7		40 - 110										

## Method: 905 - Strontium-90 (GFPC)

**Lab Sample ID: MB 160-405485/17-A**  
**Matrix: Water**  
**Analysis Batch: 408308**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac			
Strontium-90	1.005		0.356	0.365	3.00	0.482	pCi/L	12/13/18 08:52	12/31/18 12:21	1			
<b>MB MB</b>													
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Sr Carrier	87.5		40 - 110								12/13/18 08:52	12/31/18 12:21	1
Y Carrier	93.1		40 - 110								12/13/18 08:52	12/31/18 12:21	1

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 905 - Strontium-90 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405485/1-A**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Strontium-90	16.3	16.09		1.66	3.00	0.590	pCi/L	99	75 - 125
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Sr Carrier	86.5		40 - 110						
Y Carrier	91.6		40 - 110						

**Lab Sample ID: 440-226822-F-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Strontium-90	0.0693	U	16.2	16.08		1.68	3.00	0.616	pCi/L	99	19 - 150
<b>MS MS</b>											
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Sr Carrier	79.7		40 - 110								
Y Carrier	93.1		40 - 110								

**Lab Sample ID: 440-226822-F-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Strontium-90	0.0693	U	16.2	14.35		1.55	3.00	0.596	pCi/L	88	19 - 150	0.54	1
<b>MSD MSD</b>													
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Sr Carrier	72.0		40 - 110										
Y Carrier	93.8		40 - 110										

## Method: 906.0 - Tritium, Total (LSC)

**Lab Sample ID: MB 160-409225/1-A**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	-243.2	U	191	192	500	374	pCi/L	01/07/19 11:23	01/07/19 17:46	1

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 906.0 - Tritium, Total (LSC) (Continued)

**Lab Sample ID: LCS 160-409225/2-A**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	2650	2230		404	500	380	pCi/L	84	74 - 114

**Lab Sample ID: 440-226822-E-1-D MS**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	-198	U	2650	2644		443	500	384	pCi/L	100	67 - 130

**Lab Sample ID: 440-226822-E-1-E MSD**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Tritium	-198	U	2660	2568		440	500	392	pCi/L	97	67 - 130	0.09	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

**Lab Sample ID: MB 160-405494/1-A**  
**Matrix: Water**  
**Analysis Batch: 405954**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Uranium	0.1880	U	0.175	0.175	1.00	0.191	pCi/L	12/13/18 09:58	12/14/18 17:43	1
<b>Tracer</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Uranium-232	87.7		30 - 110					12/13/18 09:58	12/14/18 17:43	1

**Lab Sample ID: LCS 160-405494/2-A**  
**Matrix: Water**  
**Analysis Batch: 405955**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Uranium-234	12.7	12.06		1.52	1.00	0.201	pCi/L	95	75 - 125
Uranium-238	13.0	12.91		1.59	1.00	0.136	pCi/L	99	75 - 125
<b>Tracer</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Uranium-232	84.0		30 - 110						

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

**Lab Sample ID: 440-226822-F-1-D MS**  
**Matrix: Water**  
**Analysis Batch: 405841**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Sample	Sample	Spike Added	MS	MS	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
	Result	Qual		Result	Qual						
Uranium-234	0.347		25.4	23.35		3.51	1.00	0.550	pCi/L	90	65 - 146
Uranium-238	0.157	U	26.0	25.55		3.72	1.00	0.549	pCi/L	98	68 - 143
<b>MS MS</b>											
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Uranium-232	40.8		30 - 110								

**Lab Sample ID: 440-226822-F-1-E MSD**  
**Matrix: Water**  
**Analysis Batch: 405842**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Sample	Sample	Spike Added	MSD	MSD	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
	Result	Qual		Result	Qual								
Uranium-234	0.347		25.5	24.00		3.98	1.00	0.747	pCi/L	93	65 - 146	0.09	1
Uranium-238	0.157	U	26.0	25.07		4.09	1.00	0.694	pCi/L	96	68 - 143	0.06	1
<b>MSD MSD</b>													
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Uranium-232	30.3		30 - 110										

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Rad

### Prep Batch: 405196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	Fill_Geo-0	
MB 160-405196/1-A	Method Blank	Total/NA	Water	Fill_Geo-0	
LCS 160-405196/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-0	
280-117873-B-1-B DU	Duplicate	Total/NA	Water	Fill_Geo-0	

### Prep Batch: 405485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	PrecSep-7	
MB 160-405485/17-A	Method Blank	Total/NA	Water	PrecSep-7	
LCS 160-405485/1-A	Lab Control Sample	Total/NA	Water	PrecSep-7	
440-226822-F-1-B MS	Matrix Spike	Total/NA	Water	PrecSep-7	
440-226822-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep-7	

### Prep Batch: 405494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	ExtChrom	
MB 160-405494/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-405494/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
440-226822-F-1-D MS	Matrix Spike	Total/NA	Water	ExtChrom	
440-226822-F-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	ExtChrom	

### Prep Batch: 405504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	PrecSep-21	
MB 160-405504/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-405504/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
440-226822-F-1-F MS	Matrix Spike	Total/NA	Water	PrecSep-21	
440-226822-F-1-G MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep-21	

### Prep Batch: 405521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	PrecSep_0	
MB 160-405521/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-405521/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
440-226822-F-1-H MS	Matrix Spike	Total/NA	Water	PrecSep_0	
440-226822-F-1-I MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep_0	

### Prep Batch: 407614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	Evaporation	
MB 160-407614/1-A	Method Blank	Total/NA	Water	Evaporation	
LCS 160-407614/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-407614/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
440-226822-J-1-G MS	Matrix Spike	Total/NA	Water	Evaporation	
440-226822-J-1-H MSD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	
440-226822-J-1-I MSBT	Matrix Spike	Total/NA	Water	Evaporation	
440-226822-J-1-J MSBTD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	

### Prep Batch: 409225

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	LSC_Dist_Susp	

TestAmerica Irvine



# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Rad (Continued)

### Prep Batch: 409225 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-409225/1-A	Method Blank	Total/NA	Water	LSC_Dist_Susp	
LCS 160-409225/2-A	Lab Control Sample	Total/NA	Water	LSC_Dist_Susp	
440-226822-E-1-D MS	Matrix Spike	Total/NA	Water	LSC_Dist_Susp	
440-226822-E-1-E MSD	Matrix Spike Duplicate	Total/NA	Water	LSC_Dist_Susp	

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# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
G	The Sample MDC is greater than the requested RL.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	90125	12-31-18 *
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19 *
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.









## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-3

**Login Number: 226830**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-3

**Login Number: 226830**

**List Number: 2**

**Creator: Dupart, Lacey S**

**List Source: TestAmerica St. Louis**

**List Creation: 12/11/18 03:46 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)			
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)				
440-226822-F-1-F MS	Matrix Spike	45.4				
440-226822-F-1-G MSD	Matrix Spike Duplicate	43.1				
440-226830-1	Outfall008_20181207_Comp	63.4				
LCS 160-405504/1-A	Lab Control Sample	63.4				
MB 160-405504/20-A	Method Blank	51.3				
<b>Tracer/Carrier Legend</b>						
Ba Carrier = Ba Carrier						

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)			
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)			
440-226822-F-1-H MS	Matrix Spike	70.2	71.4			
440-226822-F-1-I MSD	Matrix Spike Duplicate	72.0	80.7			
440-226830-1	Outfall008_20181207_Comp	75.2	78.9			
LCS 160-405521/1-A	Lab Control Sample	90.6	76.3			
MB 160-405521/20-A	Method Blank	90.0	81.9			
<b>Tracer/Carrier Legend</b>						
Ba Carrier = Ba Carrier						
Y Carrier = Y Carrier						

## Method: 905 - Strontium-90 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)			
Lab Sample ID	Client Sample ID	Sr Carrier (40-110)	Y Carrier (40-110)			
440-226822-F-1-B MS	Matrix Spike	79.7	93.1			
440-226822-F-1-C MSD	Matrix Spike Duplicate	72.0	93.8			
440-226830-1	Outfall008_20181207_Comp	84.4	95.7			
LCS 160-405485/1-A	Lab Control Sample	86.5	91.6			
MB 160-405485/17-A	Method Blank	87.5	93.1			
<b>Tracer/Carrier Legend</b>						
Sr Carrier = Sr Carrier						
Y Carrier = Y Carrier						

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)			
Lab Sample ID	Client Sample ID	uranium-23 (30-110)				
440-226822-F-1-D MS	Matrix Spike	40.8				
440-226822-F-1-E MSD	Matrix Spike Duplicate	30.3				
440-226830-1	Outfall008_20181207_Comp	71.9				

TestAmerica Irvine

# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-3

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	uranium-23 (30-110)
LCS 160-405494/2-A	Lab Control Sample	84.0
MB 160-405494/1-A	Method Blank	87.7

### Tracer/Carrier Legend

Uranium-232 = Uranium-232

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226830-4

Client Project/Site: Annual Outfall 008 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/25/2019 11:19:44 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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- 12
- 13
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- 15

I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
1/25/2019 11:19:44 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	7
Lab Chronicle . . . . .	8
QC Sample Results . . . . .	9
QC Association Summary . . . . .	10
Definitions/Glossary . . . . .	11
Certification Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	16
Field Data Sheets . . . . .	17
Correspondence . . . . .	18

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226830-1	Outfall008_20181207_Comp	Water	12/07/18 11:05	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

---

**Job ID: 440-226830-4**

---

**Laboratory: TestAmerica Irvine**

---

## Narrative

**Job Narrative  
440-226830-4**

### Comments

Analysis added past hold per client request.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3° C and 3.5° C.

### Receipt Exceptions

The reference method requires samples to be preserved to a pH <2. The following samples was received with insufficient preservation at a pH of 7: Outfall008\_20181207\_Comp (440-226830-1). The samples were preserved with 10mL of nitric acid reagent #1598157, at 16:00 on 12/11/18, to reach the appropriate pH of 2 in the laboratory.

### General Chemistry

Method(s) 180.1, SM 2130B: The following sample was received outside of holding time: Outfall008\_20181207\_Comp (440-226830-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	890	BU	10	4.0	NTU			01/24/19 19:09	100

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# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

---

Method	Method Description	Protocol	Laboratory
180.1	Turbidity, Nephelometric	MCAWW	TAL IRV

---

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

**Laboratory References:**

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

**Client Sample ID: Outfall008\_20181207\_Comp**

**Lab Sample ID: 440-226830-1**

**Date Collected: 12/07/18 11:05**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	180.1		100			524797	01/24/19 19:09	CMM	TAL IRV

**Laboratory References:**

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

## Method: 180.1 - Turbidity, Nephelometric

Lab Sample ID: MB 440-524797/5  
 Matrix: Water  
 Analysis Batch: 524797

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	ND		0.10	0.040	NTU			01/24/19 19:09	1

Lab Sample ID: 440-231269-A-3 DU  
 Matrix: Water  
 Analysis Batch: 524797

Client Sample ID: Duplicate  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Turbidity	3.7		3.89		NTU		5	20

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

## General Chemistry

### Analysis Batch: 524797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226830-1	Outfall008_20181207_Comp	Total/NA	Water	180.1	
MB 440-524797/5	Method Blank	Total/NA	Water	180.1	
440-231269-A-3 DU	Duplicate	Total/NA	Water	180.1	

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# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

## Qualifiers

### General Chemistry

Qualifier	Qualifier Description
BU	Analyzed out of holding time

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Annual Outfall 008 Comp

TestAmerica Job ID: 440-226830-4

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

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**TestAmerica Irvine**

17461 Derian Ave Suite 100  
Irvine, CA 92614-5817  
Phone (949) 261-1022 Fax (949) 260-3297

**Chain of Custody Record**



**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM: Patel, Urvashi		Carrier Tracking No(s):		COC No: 440-130570.1			
Client Contact: Shipping/Receiving		Phone:		E-Mail: urvashi.patel@testamericainc.com		State of Origin: California		Page: Page 1 of 1			
Company: TestAmerica Laboratories, Inc.				Accreditations Required (See note): State Program - California				Job #: 440-226830-2			
Address: 880 Riverside Parkway,		Due Date Requested: 12/26/2018		<b>Analysis Requested</b>						<b>Preservation Codes:</b> A - HCL                      M - Hexane B - NaOH                    N - None C - Zn Acetate            O - AsNaO2 D - Nitric Acid            P - Na2O4S E - NaHSO4                O - Na2SO3 F - MeOH                    R - Na2S2O3 G - Amchlor                S - H2SO4 H - Ascorbic Acid        T - TSP Dodecahydrate I - Ice                        U - Acetone J - DI Water                V - MCAA K - EDTA                    W - pH 4-5 L - EDA                      Z - other (specify)	
City: West Sacramento		TAT Requested (days):									
State, Zip: CA, 95605		PO #:		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		1613B/1613B_Sox_Sep_P Standard List w/ Totals		Total Number of containers	
Phone: 916-373-5600(Tel) 916-372-1059(Fax)		WO #:									
Email:		Project #: 44009879		Sample		Type		Matrix		Preservation Code:	
Project Name: Annual Outfall 008 Comp		SSOW#:									
Site:		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=TISSUE, A=Air)		Special Instructions/Note:	
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=TISSUE, A=Air)		Special Instructions/Note:	
Outfall008_20181207_Comp (440-226830-1)		12/7/18		11:05 Pacific		Water		X		2 See QAS, Boeing_w/u to zero; Use Boeing glassware.	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.											
<b>Possible Hazard Identification</b>						<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>					
Unconfirmed						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)				Primary Deliverable Rank: 2		Special Instructions/QC Requirements:					
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:							
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				1-0							

Page 15 of 19

1/25/2019



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226830-4

**Login Number: 226830**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





## Patel, Urvashi

---

**From:** Miller, Katherine <KMiller@haleyaldrich.com>  
**Sent:** Thursday, January 24, 2019 1:05 PM  
**To:** Patel, Urvashi  
**Subject:** RE: turbidity request

### -External Email-

---

Whichever sample is the comp sample for OF008

Katherine Miller  
**HALEY & ALDRICH**  
Tel: 520.289.8606

---

**From:** Patel, Urvashi <[Urvashi.Patel@testamericainc.com](mailto:Urvashi.Patel@testamericainc.com)>  
**Sent:** Thursday, January 24, 2019 1:55 PM  
**To:** Miller, Katherine <[KMiller@haleyaldrich.com](mailto:KMiller@haleyaldrich.com)>  
**Subject:** RE: turbidity request

Hi  
I think there is one extra digit in the job listed below. I'm assuming you meant 440-226830 sample-3?

Thanks,  
Urvashi

**URVASHI PATEL**  
Manager of Project Management

### Test America

THE LEADER IN ENVIRONMENTAL TESTING

17461 Derian Ave, Suite #100  
Irvine, CA 92614  
TEL 949-261-1022 | FAX 949-260-3297  
DIRECT 949-260-3269  
CELL 949-333-9055

[www.testamericainc.com](http://www.testamericainc.com)

---

**From:** Miller, Katherine [<mailto:KMiller@haleyaldrich.com>]  
**Sent:** Thursday, January 24, 2019 10:43 AM  
**To:** Patel, Urvashi  
**Subject:** turbidity request  
**Importance:** High

### -External Email-

---

Urvashi,  
Please analyze turbidity on 24hr TAT for Outfall008 440-226-8303.  
Katherine

**Katherine Miller**  
Project Manager

**Haley Aldrich, Inc.**  
600 South Meyer Ave. | Suite 100  
Tucson, AZ 85701

T: (520) 289.8606  
C: (520) 904.6944

[www.haleyaldrich.com](http://www.haleyaldrich.com)

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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226546-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**9 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





**TABLE OF CONTENTS**

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. EPA Method 1664A — HEM (oil and grease)..... 6

    III.1. Holding Times ..... 6

    III.2. Calibration..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks ..... 6

        III.3.2. Laboratory Control Samples ..... 6

        III.3.3. Laboratory Duplicates..... 6

        III.3.4. Matrix Spike/Matrix Spike Duplicate ..... 6

    III.4. Sample Result Verification..... 6

    III.5. Field QC Samples..... 6

        III.5.1. Field Blanks and Equipment Blanks ..... 6

        III.5.2. Field Duplicates..... 6

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference





## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>X</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226546-1

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall009_20181206 _Grab	440-226546-1	N/A	Water	12/06/2018 10:00 AM	E1664



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226546-1:

- The laboratory received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius ( $^{\circ}\text{C}$ ) and greater than  $0^{\circ}\text{C}$ .
- The laboratory received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COC.
- According to the Login Sample Receipt Checklist, custody seals were absent on the cooler; however, no evidence of tampering was noted.

The following issue was noted:

- The COC did not list collection times; therefore, the samples were logged per the bottle labels.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. EPA METHOD 1664A — HEM (OIL AND GREASE)

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 9, 2019.

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *EPA Method 1664A* and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

#### III.1. HOLDING TIMES

The analytical holding time, 28 days, was met.

#### III.2. CALIBRATION

Analytical balance calibration logs were not provided by the laboratory. The batch notes stated that the analytical balance was checked with acceptable results before and after each first and second weighing.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

The method blank was nondetect.

##### III.3.2. LABORATORY CONTROL SAMPLES

Laboratory control sample and laboratory control sample duplicate recoveries and RPD were within the QAPP control limits.

##### III.3.3. LABORATORY DUPLICATES

Laboratory duplicate analysis was not performed on the sample in this SDG.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed on the sample in this SDG.

#### III.4. SAMPLE RESULT VERIFICATION

Calculations were verified, and the sample result reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL.

#### III.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

##### III.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

##### III.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

---

# Validated Sample Result Forms: 4402265461

---

**Analysis Method:** E1664

---

**Sample Name** Outfall009\_20181206\_Grab      **Matrix Type:** W    **Result Type:** TRG  
**Lab Sample Name:** 440-226546-1      **Sample Date/Time:** 12/06/2018    10:00      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
HEM (Oil & Grease)	HEMOILGREASE	1.6	1.5	5.2	mg/L	J,DX	J	DNQ

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226546-1

Client Project/Site: Semiannual Outfall 009 Grab

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/31/2018 11:44:50 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

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results through

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/31/2018 11:44:50 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	7
Lab Chronicle . . . . .	8
QC Sample Results . . . . .	9
QC Association Summary . . . . .	10
Definitions/Glossary . . . . .	11
Certification Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	14

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226546-1	Outfall009_20181206_Grab	Water	12/06/18 10:00	12/06/18 18:00

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

**Job ID: 440-226546-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226546-1**

## Comments

No additional comments.

## Receipt

The samples were received on 12/6/2018 6:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

## Receipt Exceptions

The following samples were received at the laboratory without a sample collection time documented on the chain of custody: Outfall009\_20181206\_Grab (440-226546-1) and Outfall009\_20181206\_Grab\_Extra (440-226546-2). The time not listed on the COC and was taken from the container -10:00

## Organic Prep

Method(s) 1664A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-519877 and analytical batch 440-519983. The Laboratory Control Sample (LCS) was performed in duplicate to provide precision data for this batch

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

**Client Sample ID: Outfall009\_20181206\_Grab**

**Lab Sample ID: 440-226546-1**

**Date Collected: 12/06/18 10:00**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	1.6	J,DX	5.2	1.5	mg/L		12/28/18 13:23	12/29/18 08:09	1

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# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

Method	Method Description	Protocol	Laboratory
1664A	HEM and SGT-HEM	1664A	TAL IRV
1664A	HEM and SGT-HEM (SPE)	1664A	TAL IRV

**Protocol References:**

1664A = EPA-821-98-002

**Laboratory References:**

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

**Client Sample ID: Outfall009\_20181206\_Grab**

**Lab Sample ID: 440-226546-1**

**Date Collected: 12/06/18 10:00**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1664A			955 mL	1000 mL	519877	12/28/18 13:23	JC1	TAL IRV
Total/NA	Analysis	1664A		1			519983	12/29/18 08:09	JC1	TAL IRV

## Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

## Method: 1664A - HEM and SGT-HEM

Lab Sample ID: MB 440-519877/1-A  
 Matrix: Water  
 Analysis Batch: 519983

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 519877

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	ND		5.0	1.4	mg/L		12/28/18 13:23	12/29/18 08:09	1

Lab Sample ID: LCS 440-519877/2-A  
 Matrix: Water  
 Analysis Batch: 519983

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 519877

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
HEM (Oil & Grease)	40.0	34.1		mg/L		85	78 - 114

Lab Sample ID: LCSD 440-519877/3-A  
 Matrix: Water  
 Analysis Batch: 519983

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 519877

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
HEM (Oil & Grease)	40.0	34.6		mg/L		87	78 - 114	1	11



# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

## General Chemistry

### Prep Batch: 519877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226546-1	Outfall009_20181206_Grab	Total/NA	Water	1664A	
MB 440-519877/1-A	Method Blank	Total/NA	Water	1664A	
LCS 440-519877/2-A	Lab Control Sample	Total/NA	Water	1664A	
LCSD 440-519877/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	

### Analysis Batch: 519983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226546-1	Outfall009_20181206_Grab	Total/NA	Water	1664A	519877
MB 440-519877/1-A	Method Blank	Total/NA	Water	1664A	519877
LCS 440-519877/2-A	Lab Control Sample	Total/NA	Water	1664A	519877
LCSD 440-519877/3-A	Lab Control Sample Dup	Total/NA	Water	1664A	519877

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

## Qualifiers

### General Chemistry

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Grab

TestAmerica Job ID: 440-226546-1

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

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# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226546-1

**Login Number: 226546**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Avila, Stephanie 1**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	No sample date and/or time on COC, logged in per container labels.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226822-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**10 January 2019**

**MEC<sup>x</sup>, Inc.**  
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TABLE OF CONTENTS

- I. INTRODUCTION..... 1
- II. Sample Management..... 2
- III. Methods 200.7, 200.8 and 245.1 — Metals and Mercury..... 6
  - III.1. Holding Times ..... 6
  - III.2. MS Tuning and Calibration..... 6
  - III.3. Quality Control Samples ..... 6
    - III.3.1. Method Blanks ..... 6
    - III.3.2. Interference Check Samples: ..... 6
    - III.3.3. Laboratory Control Samples ..... 6
    - III.3.4. Laboratory Duplicates:..... 6
    - III.3.5. Matrix Spike/Matrix Spike Duplicate ..... 6
  - III.4. Serial Dilution..... 7
  - III.5. Internal Standards Performance..... 7
  - III.6. Compound Quantification and Reported Detection Limits ..... 7
  - III.7. Field QC Samples..... 7
    - III.7.1. Field Blanks and Equipment Blanks ..... 7
    - III.7.2. Field Duplicates ..... 7
- IV. EPA METHOD 314.0 — Perchlorate ..... 7
  - IV.1. Holding Times ..... 7
  - IV.2. Calibration..... 7
  - IV.3. Quality Control Samples ..... 8
    - IV.3.1. Method Blanks ..... 8
    - IV.3.2. Laboratory Control Samples ..... 8
    - IV.3.3. Laboratory Duplicates..... 8
    - IV.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8
  - IV.4. Sample Result Verification ..... 8



IV.5. Field QC Samples..... 8

    IV.5.1. Field Blanks and Equipment Blanks ..... 8

    IV.5.2. Field Duplicates..... 8

V. VARIOUS METHODS — GENERAL CHEMISTRY..... 8

    V.1. Holding Times ..... 8

    V.2. Calibration..... 9

    V.3. Quality Control Samples ..... 9

        V.3.1. Method Blanks ..... 9

        V.3.2. Laboratory Control Samples ..... 9

        V.3.3. Laboratory Duplicates..... 9

        V.3.4. Matrix Spike/Matrix Spike Duplicate ..... 9

    V.4. Sample Result Verification..... 9

    V.5. Field QC Samples..... 9

        V.5.1. Field Blanks and Equipment Blanks ..... 9

        V.5.2. Field Duplicates..... 10

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



**I. INTRODUCTION****Task Order Title:** Boeing SSFL NPDES**Contract:** 40458-078 and 40458-083**MEC<sup>x</sup> Project No.:** 1272.003D.01 002**Sample Delivery Group:** 440-226822-1**Project Manager:** Katherine Miller**Matrix:** Water**QC Level:** IV**No. of Samples:** 2**No. of Reanalyses/Dilutions:** 0**Laboratory:** TestAmerica-Irvine**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall009_20181207_Comp	440-226822-1	N/A	Water	12/07/2018 09:00 AM	E200.7, E200.8, E245.1, E300, E314.0, SM2540C/D, SM4500-CN-E, EPA- 821-R-02-013
Outfall009_20181207_Comp_F	440-226822-2	N/A	Water	12/07/2018 9:00 AM	E200.7, E200.8, E245.1



## II. SAMPLE MANAGEMENT

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According to the case narrative, sample condition upon receipt form and the chains-of-custody (COC) provided by the laboratories for sample delivery group (SDG) 440-226822-1:

- The laboratories received the samples in this SDG on ice and within the temperature limits of less than 6 degrees Celsius (°C) and greater than 0°C.
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the COCs.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.
- Sample Outfall009\_20181207\_Comp was submitted to Aquatic Bioassay Consulting Laboratories (ABC) for Method EPA-821-R-02-013 – Chronic Toxicity – Selenastrum.
- A correction to the original COC was not initialed and dated.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. METHODS 200.7, 200.8 AND 245.1 — METALS AND MERCURY

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M. Hilchey of MEC<sup>x</sup> reviewed the SDG on January 10, 2019.

The samples listed in Table 1 for these analyses were validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for Metals (DVP-5, Rev. 2)*, *EPA Methods 200.7, 200.8 and 245.1*, and the *National Functional Guidelines for Inorganic Data Review (2014)*.

#### III.1. HOLDING TIMES

The analytical holding times, 28 days for mercury and six months for the remaining metals, were met. As required on the COC, sample Outfall009\_20181207\_Comp\_F was filtered and preserved within 24 hours of receipt at the laboratory.

#### III.2. MS TUNING AND CALIBRATION

Mass calibrations were within 0.1 atomic mass units of the true value and the %RSDs were ≤5%.

QAPP calibration criteria were met. A blank and two standards were used for calibration of ICP-AES, a blank and four standards were used for calibration of ICP-MS, and a blank and five standards were used for calibration of mercury. The initial calibration *r* values were ≥0.995. CRQL recoveries were within the laboratory control limits of 50-150%. Initial calibration verification recoveries were within QAPP control limits of 95-105% for ICP-AES and mercury, and 90-110% for ICP-MS. Continuing calibration verification recoveries were within QAPP control limits of 90-110% for all methods.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

There were no detections in the method blanks and calibration blanks for any target analytes except dissolved antimony (0.690 µg/L, CCB). The associated sample result was a detect below the RL and was qualified as nondetect (U).

##### III.3.2. INTERFERENCE CHECK SAMPLES:

ICP-AES and ICP-MS ICSAB recoveries were within the control limits of 80-120% or ±2× the reporting limit, whichever is greater. No interferences were present in the samples at concentrations comparable to those of the ICSs; therefore, interference was not evaluated.

##### III.3.3. LABORATORY CONTROL SAMPLES

Laboratory control samples recoveries were within the QAPP control limits of 85-115%.

##### III.3.4. LABORATORY DUPLICATES:

Laboratory duplicate analyses were not performed on a sample in this SDG.

##### III.3.5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on samples Outfall009\_20181207\_Comp and Outfall009\_20181207\_Comp\_F for all methods. Results were not assessed when the parent sample concentration exceeded the spike amount by 4×. Recoveries and RPDs were within the QAPP control limits of 70-130% and ≤20%, respectively, for all target analytes.



The laboratory did not perform post-digestion spike analyses.

#### **III.4. SERIAL DILUTION**

No serial dilution analyses were performed on a sample in this SDG.

#### **III.5. INTERNAL STANDARDS PERFORMANCE**

Sample internal standard recoveries were within 60-125% of the ICP-MS calibration blank.

#### **III.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Calculations were verified, and the sample results reported on the sample result summary were verified against the raw data. No transcription errors or calculation errors were noted. Results reported below the RL and above the MDL were qualified as estimated (J) and coded with a DNQ to comply with the NPDES permit reporting requirements. Nondetects are valid to the MDL.

#### **III.7. FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### **III.7.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### **III.7.2. FIELD DUPLICATES**

There were no field duplicate samples identified for this SDG.

## **IV. EPA METHOD 314.0 — PERCHLORATE**

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M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 10, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, *EPA Method 314.0*, and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

#### **IV.1. HOLDING TIMES**

The analytical holding time, 28 days, was met.

#### **IV.2. CALIBRATION**

Calibration criteria were met. The initial calibration  $r^2$  value was  $\geq 0.995$ . The initial calibration recovery was within QAPP control limits of 75-125% and the continuing calibration recoveries were within QAPP control limits of 85-115%. The MRL was recovered within the QAPP control limits of 70-130%. Interference check sample recovery was within the QAPP control limits of 80-120%.



### IV.3. QUALITY CONTROL SAMPLES

#### IV.3.1. METHOD BLANKS

Method blanks and calibration blanks had no detects.

#### IV.3.2. LABORATORY CONTROL SAMPLES

The LCS recovery was within the QAPP control limits of 85-115%.

#### IV.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were not performed on the sample from this SDG.

#### IV.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Matrix spike/matrix spike duplicate analyses were performed on sample Outfall009\_20181207\_Comp. Recoveries and the RPD met QAPP control limits of 80-120% and  $\leq 15\%$ , respectively.

### IV.4. SAMPLE RESULT VERIFICATION

Calculations were verified, and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL.

### IV.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

#### IV.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

#### IV.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

## V. VARIOUS METHODS — GENERAL CHEMISTRY

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M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 10, 2019.

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for General Minerals (DVP-6, Rev. 1)*, EPA Methods 300.0 and EPA-821-R-02-213, *Standard Methods for the Examination of Water and Wastewater 2540C, 2540D and 4500-CN-E*, and the *National Functional Guidelines for Inorganic Superfund Data Review (2014)*.

### V.1. HOLDING TIMES

The analytical hold times, as listed below, were met:

- 48 hours from collection for nitrate as N and nitrite as N
- 7 days for total dissolved solids (TDS)
- 7 days for total suspended solids (TSS)





- 28 days for chloride and sulfate
- 14 days for total cyanide
- 36 hours from collection for Chronic Toxicity - *Selenastrum*

## V.2. CALIBRATION

Calibration criteria were met. The initial calibration  $r^2$  values, as appropriate, were  $\geq 0.995$  and all initial calibration verification recoveries were within 95-105% for anions and 90-110% for total cyanide. All continuing calibration verification recoveries were within 90-110% for all appropriate analyses. Analytical balance calibration logs were provided by the laboratory.

For chronic toxicity, instruments were calibrated as per the manufacturer requirements and standard reference toxicant testing was performed to verify culture health and sensitivity. Method Test Acceptability criteria (TAC) were met.

## V.3. QUALITY CONTROL SAMPLES

### V.3.1. METHOD BLANKS

The method blanks and calibration blanks had no detects. The laboratory negative controls were within the laboratory and method established compliance criteria for chronic toxicity.

### V.3.2. LABORATORY CONTROL SAMPLES

Laboratory control sample and laboratory control sample duplicates recoveries and RPDs, as applicable, were within the laboratory control limits. Positive controls were within the laboratory and method established compliance criteria for chronic toxicity.

### V.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were not performed on the sample in this SDG.

### V.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on the sample Outfall009\_20181207\_Comp for anions and total cyanide. Laboratory control limits of 50-125% recovery and  $\leq 20\%$  RPD were met for all target analytes. Matrix spike analysis was not performed on a sample from this SDG for the remaining methods.

## V.4. SAMPLE RESULT VERIFICATION

Calculations were verified, and the sample results reported on the sample results summary were verified against the raw data. No transcription errors or calculation errors were noted. Reported nondetects are valid to the MDL.

## V.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

### V.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.



**V.5.2. FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

# Validated Sample Result Forms: 4402268221

## *Analysis Method:* E200.7

<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
Nickel	7440-02-0	5.0	10	10	ug/L	U	U	
Zinc	7440-66-6	12	20	20	ug/L	U	U	

<b>Sample Name</b>	Outfall009_20181207_Comp_F	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-2	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
Nickel	7440-02-0	5.0	10	10	ug/L	U	U	
Zinc	7440-66-6	12	20	20	ug/L	U	U	

## *Analysis Method:* E200.8

<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
Antimony	7440-36-0		0.50	2.0	ug/L	U	U	
Cadmium	7440-43-9		0.25	1.0	ug/L	U	U	
Copper	7440-50-8	4.5	0.50	2.0	ug/L			
Lead	7439-92-1	2.5	0.50	1.0	ug/L			
Selenium	7782-49-2	0.57	0.50	2.0	ug/L	J,DX	J	DNQ
Silver	7440-22-4		0.50	1.0	ug/L	U	U	
Thallium	7440-28-0		0.50	1.0	ug/L	U	U	

<b>Sample Name</b>	Outfall009_20181207_Comp_F	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-2	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
Antimony	7440-36-0	0.69	0.50	2.0	ug/L	J,DX	U	B
Cadmium	7440-43-9		0.25	1.0	ug/L	U	U	
Copper	7440-50-8	4.8	0.50	2.0	ug/L			
Lead	7439-92-1	0.62	0.50	1.0	ug/L	J,DX	J	DNQ
Selenium	7782-49-2		0.50	2.0	ug/L	U	U	
Silver	7440-22-4		0.50	1.0	ug/L	U	U	
Thallium	7440-28-0		0.50	1.0	ug/L	U	U	

**Analysis Method:** E245.1

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<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Mercury	7439-97-6		0.10	0.20	ug/L	U	U	

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<b>Sample Name</b>	Outfall009_20181207_Comp_F	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-2	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Mercury	7439-97-6		0.10	0.20	ug/L	U	U	

---

**Analysis Method:** E300

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<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Chloride	16887-00-6	2.5	0.25	0.50	mg/L			
Nitrate as N	14797-55-8	0.96	0.055	0.11	mg/L			
Nitrate Nitrite as N	NO2NO3	0.96	0.055	0.15	mg/L			
Nitrite as N	14797-65-0		0.025	0.15	mg/L	U	U	
Sulfate	14808-79-8	2.7	0.25	0.50	mg/L			

---

**Analysis Method:** E314.0

---

<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Perchlorate	14797-73-0		0.95	4.0	ug/L	U	U	

---

**Analysis Method:** EPA-821-R-02-013

---

<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>		<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Chronic Toxicity, Selenastrum	CHRTOXSELEN A	10.02			% SURV			

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**Analysis Method:** SM2540C

---

<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Total Dissolved Solids	TDS	46	5.0	10	mg/L			

---

**Analysis Method:** SM2540D

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<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Total Suspended Solids	TSS	14	2.5	5.0	mg/L			

---

**Analysis Method:** SM4500-CN-E

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<b>Sample Name</b>	Outfall009_20181207_Comp	<b>Matrix Type:</b>	W	<b>Result Type:</b>	TRG			
<b>Lab Sample Name:</b>	440-226822-1	<b>Sample Date/Time:</b>	12/07/2018	09:00	<b>Validation Level:</b>	8		
<b>Analyte</b>	<b>CAS No</b>	<b>Result Value</b>	<b>DL</b>	<b>LOQ</b>	<b>Result Units</b>	<b>Lab Qualifier</b>	<b>Validation Qualifier</b>	<b>Validation Reason Code</b>
Cyanide, Total	57-12-5		2.5	5.0	ug/L	U	U	

---

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226822-1

Client Project/Site: Semiannual Outfall 009 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/28/2018 5:12:58 PM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/28/2018 5:12:58 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
QC Sample Results . . . . .	10
QC Association Summary . . . . .	19
Definitions/Glossary . . . . .	23
Certification Summary . . . . .	24
Subcontract Data . . . . .	25
Chain of Custody . . . . .	41
Receipt Checklists . . . . .	44
Field Data Sheets . . . . .	45



# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226822-1	Outfall009_20181207_Comp	Water	12/07/18 09:00	12/07/18 21:05
440-226822-2	Outfall009_20181207_Comp_F	Water	12/07/18 09:00	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

**Job ID: 440-226822-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226822-1**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.6° C and 4.1° C.

### Receipt Exceptions

The reference method requires samples to be preserved to a pH <2. The following samples were received with insufficient preservation at a pH of 7: Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MS]) and Outfall009\_20181207\_Comp (440-226822-1[MSD]). The samples were preserved with 10mL of nitric acid reagent #1598157, at 16:00 to reach the appropriate pH of 2 in the laboratory for Radiologicals.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Metals

Method(s) FILTRATION: The following samples requested dissolved metals and were not filtered in the field:

Outfall009\_20181207\_Comp\_F (440-226822-2), Outfall009\_20181207\_Comp\_F (440-226822-2[MS]) and Outfall009\_20181207\_Comp\_F (440-226822-2[MSD]). These samples were filtered and preserved upon receipt to the laboratory.

Method(s) 200.8: The matrix spike (MS) recoveries of Thallium for preparation batch 440-516211 and analytical batch 440-516401 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Subcontract non-Sister

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

Date Collected: 12/07/18 09:00

Matrix: Water

Date Received: 12/07/18 21:05

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.5		0.50	0.25	mg/L			12/08/18 11:04	1
Nitrate as N	0.96		0.11	0.055	mg/L			12/08/18 11:04	1
Nitrite as N	ND		0.15	0.025	mg/L			12/08/18 11:04	1
Sulfate	2.7		0.50	0.25	mg/L			12/08/18 11:04	1

### Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/11/18 10:06	1

### Method: NO3NO2 Calc - Nitrogen, Nitrate-Nitrite

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	0.96		0.15	0.055	mg/L			12/18/18 14:50	1

### Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		12/11/18 07:57	12/11/18 16:02	1
Zinc	ND		20	12	ug/L		12/11/18 07:57	12/11/18 16:02	1

### Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1
Cadmium	ND		1.0	0.25	ug/L		12/11/18 07:54	12/11/18 19:02	1
Copper	4.5		2.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1
Lead	2.5		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1
Antimony	ND		2.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1
Selenium	0.57	J,DX	2.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1
Thallium	ND		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 19:02	1

### Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:26	12/13/18 21:54	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	46		10	5.0	mg/L			12/11/18 14:10	1
Total Suspended Solids	14		5.0	2.5	mg/L			12/14/18 08:46	1
Cyanide, Total	ND		5.0	2.5	ug/L		12/13/18 19:24	12/13/18 21:19	1

**Client Sample ID: Outfall009\_20181207\_Comp\_F**

**Lab Sample ID: 440-226822-2**

Date Collected: 12/07/18 09:00

Matrix: Water

Date Received: 12/07/18 21:05

### Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		12/12/18 13:13	12/12/18 17:45	1
Zinc	ND		20	12	ug/L		12/12/18 13:13	12/12/18 17:45	1

### Method: 200.8 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1
Cadmium	ND		1.0	0.25	ug/L		12/12/18 09:45	12/12/18 14:49	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

**Client Sample ID: Outfall009\_20181207\_Comp\_F**

**Lab Sample ID: 440-226822-2**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 200.8 - Metals (ICP/MS) - Dissolved (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	4.8		2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1
Lead	0.62	J,DX	1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1
Antimony	0.69	J,DX	2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1
Selenium	ND		2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1
Thallium	ND		1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:49	1

**Method: 245.1 - Mercury (CVAA) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:30	12/13/18 21:40	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
NO3NO2 Calc	Nitrogen, Nitrate-Nitrite	EPA	TAL IRV
200.7 Rev 4.4	Metals (ICP)	EPA	TAL IRV
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
SM 4500 CN E	Cyanide, Total (Low Level)	SM	TAL IRV
EPA	Bioassay	EPA	ABC
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
Distill/CN	Distillation, Cyanide	None	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

#### Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

#### Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			515764	12/08/18 11:04	OH1	TAL IRV
Total/NA	Analysis	300.0		1			515765	12/08/18 11:04	OH1	TAL IRV
Total/NA	Analysis	314.0		1			516202	12/11/18 10:06	CTH	TAL IRV
Total/NA	Analysis	NO3NO2 Calc		1			517959	12/18/18 14:50	TLN	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	516212	12/11/18 07:57	KE	TAL IRV
Total Recoverable	Analysis	200.7 Rev 4.4		1			516364	12/11/18 16:02	P1R	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	516211	12/11/18 07:54	KE	TAL IRV
Total Recoverable	Analysis	200.8		1			516401	12/11/18 19:02	P1R	TAL IRV
Total/NA	Prep	245.1			20 mL	20 mL	516687	12/13/18 13:26	DB	TAL IRV
Total/NA	Analysis	245.1		1			517219	12/13/18 21:54	DB	TAL IRV
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	516331	12/11/18 14:10	XL	TAL IRV
Total/NA	Analysis	SM 2540D		1	200 mL	1000 mL	517087	12/14/18 08:46	XL	TAL IRV
Total/NA	Prep	Distill/CN			50 mL	50 mL	516993	12/13/18 19:24	QTN	TAL IRV
Total/NA	Analysis	SM 4500 CN E		1			517015	12/13/18 21:19	QTN	TAL IRV

**Client Sample ID: Outfall009\_20181207\_Comp\_F**

**Lab Sample ID: 440-226822-2**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	516574	12/12/18 13:13	KE	TAL IRV
Dissolved	Analysis	200.7 Rev 4.4		1			516674	12/12/18 17:45	P1R	TAL IRV
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	516493	12/12/18 09:45	KE	TAL IRV
Dissolved	Analysis	200.8		1			516625	12/12/18 14:49	B1H	TAL IRV
Dissolved	Filtration	FILTRATION			150 mL	150 mL	515802	12/08/18 16:39	KE	TAL IRV
Dissolved	Prep	245.1			20 mL	20 mL	516702	12/13/18 13:30	DB	TAL IRV
Dissolved	Analysis	245.1		1			517219	12/13/18 21:40	DB	TAL IRV

**Laboratory References:**

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 440-515764/6**

**Matrix: Water**

**Analysis Batch: 515764**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.11	0.055	mg/L			12/08/18 10:50	1
Nitrite as N	ND		0.15	0.025	mg/L			12/08/18 10:50	1

**Lab Sample ID: LCS 440-515764/5**

**Matrix: Water**

**Analysis Batch: 515764**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.13	1.15		mg/L		102	90 - 110
Nitrite as N	1.52	1.50		mg/L		99	90 - 110

**Lab Sample ID: 440-226822-1 MS**

**Matrix: Water**

**Analysis Batch: 515764**

**Client Sample ID: Outfall009\_20181207\_Comp**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.96		1.13	2.19		mg/L		108	80 - 120
Nitrite as N	ND		1.52	1.56		mg/L		102	80 - 120

**Lab Sample ID: 440-226822-1 MSD**

**Matrix: Water**

**Analysis Batch: 515764**

**Client Sample ID: Outfall009\_20181207\_Comp**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.96		1.13	2.21		mg/L		110	80 - 120	1	20
Nitrite as N	ND		1.52	1.58		mg/L		104	80 - 120	1	20

**Lab Sample ID: MB 440-515765/6**

**Matrix: Water**

**Analysis Batch: 515765**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.25	mg/L			12/08/18 10:50	1
Sulfate	ND		0.50	0.25	mg/L			12/08/18 10:50	1

**Lab Sample ID: LCS 440-515765/5**

**Matrix: Water**

**Analysis Batch: 515765**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.96		mg/L		99	90 - 110
Sulfate	5.00	4.77		mg/L		95	90 - 110

**Lab Sample ID: 440-226822-1 MS**

**Matrix: Water**

**Analysis Batch: 515765**

**Client Sample ID: Outfall009\_20181207\_Comp**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.5		5.00	7.59		mg/L		103	80 - 120

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 300.0 - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	2.7		5.00	7.76		mg/L		101	80 - 120

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515765**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.5		5.00	7.66		mg/L		104	80 - 120	1	20
Sulfate	2.7		5.00	7.83		mg/L		102	80 - 120	1	20

## Method: 314.0 - Perchlorate (IC)

**Lab Sample ID: MB 440-516202/6**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			12/11/18 09:26	1

**Lab Sample ID: LCS 440-516202/5**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	28.1		ug/L		112	85 - 115

**Lab Sample ID: MRL 440-516202/4**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	1.00	1.14	J,DX	ug/L		114	75 - 125

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	ND		25.0	28.2		ug/L		113	80 - 120

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 516202**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	ND		25.0	28.2		ug/L		113	80 - 120	0	15

TestAmerica Irvine



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 440-516212/1-A**  
**Matrix: Water**  
**Analysis Batch: 516364**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516212**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		12/11/18 07:57	12/11/18 15:25	1
Zinc	ND		20	12	ug/L		12/11/18 07:57	12/11/18 15:25	1

**Lab Sample ID: LCS 440-516212/2-A**  
**Matrix: Water**  
**Analysis Batch: 516364**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516212**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	500	498		ug/L		100	85 - 115
Zinc	500	501		ug/L		100	85 - 115

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516364**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516212**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	ND		500	504		ug/L		101	70 - 130
Zinc	ND		500	513		ug/L		103	70 - 130

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 516364**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516212**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Nickel	ND		500	501		ug/L		100	70 - 130	1	20
Zinc	ND		500	512		ug/L		102	70 - 130	0	20

**Lab Sample ID: MB 440-515802/1-F**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		12/12/18 13:13	12/12/18 17:40	1
Zinc	ND		20	12	ug/L		12/12/18 13:13	12/12/18 17:40	1

**Lab Sample ID: LCS 440-515802/2-F**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	500	489		ug/L		98	85 - 115
Zinc	500	486		ug/L		97	85 - 115

**Lab Sample ID: 440-226822-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	ND		500	477		ug/L		95	70 - 130

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: 440-226822-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Zinc	ND		500	476		ug/L		95	70 - 130

**Lab Sample ID: 440-226822-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 516674**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nickel	ND		500	470		ug/L		94	70 - 130	1	20
Zinc	ND		500	472		ug/L		94	70 - 130	1	20

## Method: 200.8 - Metals (ICP/MS)

**Lab Sample ID: MB 440-516211/1-A**  
**Matrix: Water**  
**Analysis Batch: 516401**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516211**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1
Cadmium	ND		1.0	0.25	ug/L		12/11/18 07:54	12/11/18 17:51	1
Copper	ND		2.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1
Lead	ND		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1
Antimony	ND		2.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1
Selenium	ND		2.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1
Thallium	ND		1.0	0.50	ug/L		12/11/18 07:54	12/11/18 17:51	1

**Lab Sample ID: LCS 440-516211/2-A**  
**Matrix: Water**  
**Analysis Batch: 516401**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516211**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	80.0	75.7		ug/L		95	85 - 115
Cadmium	80.0	75.7		ug/L		95	85 - 115
Copper	80.0	77.8		ug/L		97	85 - 115
Lead	80.0	76.6		ug/L		96	85 - 115
Antimony	80.0	87.8		ug/L		110	85 - 115
Selenium	80.0	85.2		ug/L		106	85 - 115
Thallium	80.0	71.2		ug/L		89	85 - 115

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516401**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516211**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Silver	ND		80.0	71.5		ug/L		89	70 - 130
Cadmium	ND		80.0	74.3		ug/L		93	70 - 130
Copper	4.5		80.0	79.7		ug/L		94	70 - 130
Lead	2.5		80.0	77.3		ug/L		94	70 - 130
Antimony	ND		80.0	83.2		ug/L		104	70 - 130
Selenium	0.57	J,DX	80.0	78.6		ug/L		98	70 - 130

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 200.8 - Metals (ICP/MS) (Continued)

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 516401**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516211**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Thallium	ND		80.0	51.7	LN	ug/L		65	70 - 130

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 516401**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total Recoverable**  
**Prep Batch: 516211**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		80.0	76.6		ug/L		96	70 - 130	7	20
Cadmium	ND		80.0	78.0		ug/L		98	70 - 130	5	20
Copper	4.5		80.0	84.7		ug/L		100	70 - 130	6	20
Lead	2.5		80.0	83.1		ug/L		101	70 - 130	7	20
Antimony	ND		80.0	87.6		ug/L		109	70 - 130	5	20
Selenium	0.57	J,DX	80.0	83.4		ug/L		104	70 - 130	6	20
Thallium	ND		80.0	58.4		ug/L		73	70 - 130	12	20

**Lab Sample ID: MB 440-515802/1-E**  
**Matrix: Water**  
**Analysis Batch: 516625**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516493**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1
Cadmium	ND		1.0	0.25	ug/L		12/12/18 09:45	12/12/18 14:44	1
Copper	ND		2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1
Lead	ND		1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1
Antimony	ND		2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1
Selenium	ND		2.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1
Thallium	ND		1.0	0.50	ug/L		12/12/18 09:45	12/12/18 14:44	1

**Lab Sample ID: LCS 440-515802/2-E**  
**Matrix: Water**  
**Analysis Batch: 516625**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516493**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	80.0	77.0		ug/L		96	85 - 115
Cadmium	80.0	77.8		ug/L		97	85 - 115
Copper	80.0	78.5		ug/L		98	85 - 115
Lead	80.0	79.4		ug/L		99	85 - 115
Antimony	80.0	85.3		ug/L		107	85 - 115
Selenium	80.0	76.6		ug/L		96	85 - 115
Thallium	80.0	77.9		ug/L		97	85 - 115

**Lab Sample ID: 440-226822-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516625**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516493**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Silver	ND		80.0	84.2		ug/L		105	70 - 130
Cadmium	ND		80.0	83.7		ug/L		105	70 - 130
Copper	4.8		80.0	89.5		ug/L		106	70 - 130

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 200.8 - Metals (ICP/MS) (Continued)

**Lab Sample ID: 440-226822-2 MS**  
**Matrix: Water**  
**Analysis Batch: 516625**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516493**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	0.62	J,DX	80.0	89.5		ug/L		111	70 - 130
Antimony	0.69	J,DX	80.0	95.2		ug/L		118	70 - 130
Selenium	ND		80.0	77.2		ug/L		97	70 - 130
Thallium	ND		80.0	86.7		ug/L		108	70 - 130

**Lab Sample ID: 440-226822-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 516625**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516493**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Silver	ND		80.0	81.2		ug/L		101	70 - 130	4	20
Cadmium	ND		80.0	80.0		ug/L		100	70 - 130	5	20
Copper	4.8		80.0	86.6		ug/L		102	70 - 130	3	20
Lead	0.62	J,DX	80.0	86.6		ug/L		107	70 - 130	3	20
Antimony	0.69	J,DX	80.0	92.2		ug/L		114	70 - 130	3	20
Selenium	ND		80.0	75.2		ug/L		94	70 - 130	3	20
Thallium	ND		80.0	84.6		ug/L		106	70 - 130	2	20

## Method: 245.1 - Mercury (CVAA)

**Lab Sample ID: MB 440-516687/1-A**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:26	12/13/18 21:50	1

**Lab Sample ID: LCS 440-516687/2-A**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	8.00	8.34		ug/L		104	85 - 115

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		8.00	8.06		ug/L		101	75 - 125

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 516687**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	ND		8.00	8.20		ug/L		103	75 - 125	2	20

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: 245.1 - Mercury (CVAA) (Continued)

**Lab Sample ID: MB 440-515802/1-I**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 516702**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/13/18 13:30	12/13/18 21:36	1

**Lab Sample ID: LCS 440-515802/2-I**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 516702**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	8.00	7.96		ug/L		100	85 - 115

**Lab Sample ID: 440-226822-2 MS**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516702**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		8.00	7.94		ug/L		99	75 - 125

**Lab Sample ID: 440-226822-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 517219**

**Client Sample ID: Outfall009\_20181207\_Comp\_F**  
**Prep Type: Dissolved**  
**Prep Batch: 516702**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		8.00	7.81		ug/L		98	75 - 125	2	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 440-516331/1**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	5.0	mg/L			12/11/18 14:10	1

**Lab Sample ID: LCS 440-516331/2**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	978		mg/L		98	90 - 110

**Lab Sample ID: 440-226959-Y-1 DU**  
**Matrix: Water**  
**Analysis Batch: 516331**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	300		289		mg/L		4	5

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: SM 2540D - Solids, Total Suspended (TSS)

**Lab Sample ID: MB 440-517087/1**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.50	mg/L			12/14/18 08:46	1

**Lab Sample ID: LCS 440-517087/2**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	1050		mg/L		105	85 - 115

**Lab Sample ID: 440-226830-V-1 DU**  
**Matrix: Water**  
**Analysis Batch: 517087**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	750		815		mg/L		8	10

## Method: SM 4500 CN E - Cyanide, Total (Low Level)

**Lab Sample ID: MB 440-516993/1-A**  
**Matrix: Water**  
**Analysis Batch: 517015**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 516993**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		5.0	2.5	ug/L		12/13/18 19:24	12/13/18 21:18	1

**Lab Sample ID: LCS 440-516993/2-A**  
**Matrix: Water**  
**Analysis Batch: 517015**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 516993**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	100	102		ug/L		102	90 - 110

**Lab Sample ID: LCSD 440-516993/3-A**  
**Matrix: Water**  
**Analysis Batch: 517015**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 516993**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	100	104		ug/L		104	90 - 110	2	10

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 517015**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 516993**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	ND		100	108		ug/L		108	70 - 115

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Method: SM 4500 CN E - Cyanide, Total (Low Level) (Continued)

Lab Sample ID: 440-226822-1 MSD  
 Matrix: Water  
 Analysis Batch: 517015

Client Sample ID: Outfall009\_20181207\_Comp  
 Prep Type: Total/NA  
 Prep Batch: 516993

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cyanide, Total	ND		100	107		ug/L		107	70 - 115	1	15

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## HPLC/IC

### Analysis Batch: 515764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	300.0	
MB 440-515764/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515764/5	Lab Control Sample	Total/NA	Water	300.0	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	300.0	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	300.0	

### Analysis Batch: 515765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	300.0	
MB 440-515765/6	Method Blank	Total/NA	Water	300.0	
LCS 440-515765/5	Lab Control Sample	Total/NA	Water	300.0	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	300.0	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	300.0	

### Analysis Batch: 516202

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	314.0	
MB 440-516202/6	Method Blank	Total/NA	Water	314.0	
LCS 440-516202/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-516202/4	Lab Control Sample	Total/NA	Water	314.0	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	314.0	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	314.0	

### Analysis Batch: 517959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	NO3NO2 Calc	

## Metals

### Filtration Batch: 515802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	FILTRATION	
MB 440-515802/1-E	Method Blank	Dissolved	Water	FILTRATION	
MB 440-515802/1-F	Method Blank	Dissolved	Water	FILTRATION	
MB 440-515802/1-I	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-515802/2-E	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-515802/2-I	Lab Control Sample	Dissolved	Water	FILTRATION	
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	FILTRATION	
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	FILTRATION	

### Prep Batch: 516211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-516211/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-516211/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226822-1 MS	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	
440-226822-1 MSD	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	

TestAmerica Irvine



# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Metals (Continued)

### Prep Batch: 516212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	
MB 440-516212/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-516212/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-226822-1 MS	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	
440-226822-1 MSD	Outfall009_20181207_Comp	Total Recoverable	Water	200.2	

### Analysis Batch: 516364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	516212
MB 440-516212/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	516212
LCS 440-516212/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	516212
440-226822-1 MS	Outfall009_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	516212
440-226822-1 MSD	Outfall009_20181207_Comp	Total Recoverable	Water	200.7 Rev 4.4	516212

### Analysis Batch: 516401

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total Recoverable	Water	200.8	516211
MB 440-516211/1-A	Method Blank	Total Recoverable	Water	200.8	516211
LCS 440-516211/2-A	Lab Control Sample	Total Recoverable	Water	200.8	516211
440-226822-1 MS	Outfall009_20181207_Comp	Total Recoverable	Water	200.8	516211
440-226822-1 MSD	Outfall009_20181207_Comp	Total Recoverable	Water	200.8	516211

### Prep Batch: 516493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802
MB 440-515802/1-E	Method Blank	Dissolved	Water	200.2	515802
LCS 440-515802/2-E	Lab Control Sample	Dissolved	Water	200.2	515802
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802

### Prep Batch: 516574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802
MB 440-515802/1-F	Method Blank	Dissolved	Water	200.2	515802
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	200.2	515802
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	200.2	515802

### Analysis Batch: 516625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	200.8	516493
MB 440-515802/1-E	Method Blank	Dissolved	Water	200.8	516493
LCS 440-515802/2-E	Lab Control Sample	Dissolved	Water	200.8	516493
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	200.8	516493
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	200.8	516493

### Analysis Batch: 516674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	516574
MB 440-515802/1-F	Method Blank	Dissolved	Water	200.7 Rev 4.4	516574
LCS 440-515802/2-F	Lab Control Sample	Dissolved	Water	200.7 Rev 4.4	516574

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Metals (Continued)

### Analysis Batch: 516674 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	516574
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	200.7 Rev 4.4	516574

### Prep Batch: 516687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	245.1	
MB 440-516687/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-516687/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	245.1	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	245.1	

### Prep Batch: 516702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	515802
MB 440-515802/1-I	Method Blank	Dissolved	Water	245.1	515802
LCS 440-515802/2-I	Lab Control Sample	Dissolved	Water	245.1	515802
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	515802
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	515802

### Analysis Batch: 517219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	245.1	516687
440-226822-2	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	516702
MB 440-515802/1-I	Method Blank	Dissolved	Water	245.1	516702
MB 440-516687/1-A	Method Blank	Total/NA	Water	245.1	516687
LCS 440-515802/2-I	Lab Control Sample	Dissolved	Water	245.1	516702
LCS 440-516687/2-A	Lab Control Sample	Total/NA	Water	245.1	516687
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	245.1	516687
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	245.1	516687
440-226822-2 MS	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	516702
440-226822-2 MSD	Outfall009_20181207_Comp_F	Dissolved	Water	245.1	516702

## General Chemistry

### Analysis Batch: 516331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	SM 2540C	
MB 440-516331/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-516331/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-226959-Y-1 DU	Duplicate	Total/NA	Water	SM 2540C	

### Prep Batch: 516993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	Distill/CN	
MB 440-516993/1-A	Method Blank	Total/NA	Water	Distill/CN	
LCS 440-516993/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
LCSD 440-516993/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/CN	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	Distill/CN	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	Distill/CN	

TestAmerica Irvine

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## General Chemistry (Continued)

### Analysis Batch: 517015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	SM 4500 CN E	516993
MB 440-516993/1-A	Method Blank	Total/NA	Water	SM 4500 CN E	516993
LCS 440-516993/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	516993
LCSD 440-516993/3-A	Lab Control Sample Dup	Total/NA	Water	SM 4500 CN E	516993
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	SM 4500 CN E	516993
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	SM 4500 CN E	516993

### Analysis Batch: 517087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	SM 2540D	
MB 440-517087/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-517087/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-226830-V-1 DU	Duplicate	Total/NA	Water	SM 2540D	

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

### Metals

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
LN	MS and/or MSD below acceptance limits. See Blank Spike (LCS)

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-1

## Laboratory: TestAmerica Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
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December 27, 2018

Ms. Urvashi Patel  
TestAmerica Irvine  
17461 Derian Avenue, Suite 100  
Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013*. Results were as follows:

CLIENT:	TestAmerica Irvine
SAMPLE I.D.:	Outfall009_20181207_Comp (440-226822-1)
DATE RECEIVED:	7 Dec - 18
ABC LAB. NO.:	TAM1218.059

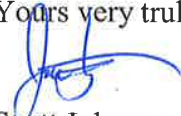
**CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY**

IWC = 100.00 %

**TST RESULT**

\*GROWTH = PASS    % EFFECT = 10.02 %

Yours very truly,

  
Scott Johnson  
Laboratory Director

# CETIS Summary Report

Report Date: 26 Dec-18 12:24 (p 1 of 1)  
 Test Code: TAM1218.059sel | 21-2844-6945

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Batch ID:	14-7319-5540	Test Type:	Cell Growth	Analyst:	
Start Date:	07 Dec-18 17:22	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	11 Dec-18 15:45	Species:	Selenastrum capricornutum	Brine:	Not Applicable
Duration:	94h	Source:	Aquatic Biosystems, CO	Age:	
Sample ID:	01-5982-6897	Code:	TAM1218.059sel	Client:	Test America Irvine
Sample Date:	07 Dec-18 09:00	Material:	Sample Water	Project:	Boeing NPDES SSFL Outfall 009 Com
Receipt Date:	07 Dec-18 16:50	Source:	Bioassay Report		
Sample Age:	8h (2 °C)	Station:	Outfall009_20181207_Comp (440-226822-		

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
13-3496-2865	Cell Density	TST-Welch's t Test	2.3E-04	100% passed cell density

Test Acceptability		TAC Limits					
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
13-3496-2865	Cell Density	Control CV	0.06625	<<	0.2	Yes	Passes Criteria
13-3496-2865	Cell Density	Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

Cell Density Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.044E+6	1.253E+6	2.690E+4	7.608E+4	6.62%	0.00%
100		8	1.033E+6	9.625E+5	1.104E+6	9.170E+5	1.174E+6	2.995E+4	8.472E+4	8.20%	10.02%

Cell Density Detail										
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6	
100		9.440E+5	9.170E+5	1.174E+6	1.071E+6	1.018E+6	9.870E+5	1.102E+6	1.054E+6	

**CETIS Analytical Report**

Report Date: 26 Dec-18 12:24 (p 1 of 2)  
 Test Code: TAM1218.059sel | 21-2844-6945

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.		
Analysis ID:	13-3496-2865	Endpoint:	Cell Density	CETIS Version:	CETISv1.9.2
Analyzed:	12 Dec-18 9:07	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes
Batch ID:	14-7319-5540	Test Type:	Cell Growth	Analyst:	
Start Date:	07 Dec-18 17:22	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	11 Dec-18 15:45	Species:	Selenastrum capricornutum	Brine:	Not Applicable
Duration:	94h	Source:	Aquatic Biosystems, CO	Age:	
Sample ID:	01-5982-6897	Code:	TAM1218.059sel	Client:	Test America Irvine
Sample Date:	07 Dec-18 09:00	Material:	Sample Water	Project:	Boeing NPDES SSFL Outfall 009 Com
Receipt Date:	07 Dec-18 16:50	Source:	Bioassay Report		
Sample Age:	8h (2 °C)	Station:	Outfall009_20181207_Comp (440-226822-		

Data Transform	Alt Hyp	TST_b	Comparison Result
Untransformed	C*b < T	0.75	100% passed cell density

TST-Welch's t Test								
Control	vs	Control II	Test Stat	Critical	DF	P-Type	P-Value	Decision(α:25%)
Negative Control		100*	4.763	0.6955	12	CDF	2.3E-04	Non-Significant Effect

Test Acceptability Criteria		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control CV	0.06625	<<	0.2	Yes	Passes Criteria
Control Resp	1.15E+6	1000000	>>	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.302E+10	5.302E+10	1	8.177	0.0126	Significant Effect
Error	9.077E+10	6.483E+09	14			
Total	1.438E+11		15			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Levene Equality of Variance Test	0.1142	8.862	0.7404	Equal Variances	
Variances	Mod Levene Equality of Variance Test	0.1139	8.862	0.7408	Equal Variances	
Variances	Variance Ratio F Test	1.24	8.885	0.7839	Equal Variances	
Distribution	Anderson-Darling A2 Normality Test	0.2232	3.878	0.8591	Normal Distribution	
Distribution	D'Agostino Skewness Test	0.4268	2.576	0.6695	Normal Distribution	
Distribution	Kolmogorov-Smirnov D Test	0.09583	0.2471	1.0000	Normal Distribution	
Distribution	Shapiro-Wilk W Normality Test	0.965	0.8408	0.7524	Normal Distribution	

Cell Density Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	8	1.148E+6	1.085E+6	1.212E+6	1.146E+6	1.044E+6	1.253E+6	2.690E+4	6.62%	0.00%
100		8	1.033E+6	9.625E+5	1.104E+6	1.036E+6	9.170E+5	1.174E+6	2.995E+4	8.20%	10.02%

Cell Density Detail										
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
0	N	1.162E+6	1.252E+6	1.165E+6	1.253E+6	1.044E+6	1.075E+6	1.106E+6	1.131E+6	
100		9.440E+5	9.170E+5	1.174E+6	1.071E+6	1.018E+6	9.870E+5	1.102E+6	1.054E+6	





**CETIS Measurement Report**

Report Date: 26 Dec-18 12:24 (p 1 of 2)  
 Test Code: TAM1218.059sel | 21-2844-6945

Selenastrum Growth Test				Aquatic Bioassay & Consulting Labs, Inc.							
Batch ID:	14-7319-5540	Test Type:	Cell Growth	Analyst:							
Start Date:	07 Dec-18 17:22	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water						
Ending Date:	11 Dec-18 15:45	Species:	Selenastrum capricornutum	Brine:	Not Applicable						
Duration:	94h	Source:	Aquatic Biosystems, CO	Age:							
Sample ID:	01-5982-6897	Code:	TAM1218.059sel	Client:	Test America Irvine						
Sample Date:	07 Dec-18 09:00	Material:	Sample Water	Project:	Boeing NPDES SSFL Outfall 009 Com						
Receipt Date:	07 Dec-18 16:50	Source:	Bioassay Report								
Sample Age:	8h (2 °C)	Station:	Outfall009_20181207_Comp (440-226822-								
Alkalinity (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
100		1	30			30	30	0	0	0.0%	0
Overall		2	49	-192.4	290.4	30	68	19	26.87	54.84%	0 (0%)
Conductivity-µmhos											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	447.2	402.7	491.7	420	493	16.01	35.8	8.01%	0
100		5	103.8	45.15	162.5	68	158	21.12	47.24	45.51%	0
Overall		10	275.5	143	408	68	493	58.58	185.3	67.24%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
100		1	50			50	50	0	0	0.0%	0
Overall		2	80	-301.2	461.2	50	110	30	42.43	53.03%	0 (0%)
pH-Units											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.56	7.393	7.727	7.4	7.7	0.06	0.1342	1.78%	0
100		5	7.46	7.318	7.602	7.3	7.6	0.05099	0.114	1.53%	0
Overall		10	7.51	7.418	7.602	7.3	7.7	0.04069	0.1287	1.71%	0 (0%)
Temperature-°C											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
100		5	25.04	24.83	25.25	24.8	25.2	0.07484	0.1673	0.67%	0
Overall		10	25.04	24.93	25.15	24.8	25.2	0.04989	0.1578	0.63%	0 (0%)

**CETIS Measurement Report**

Report Date: 26 Dec-18 12:24 (p 2 of 2)  
 Test Code: TAM1218.059sel | 21-2844-6945

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.				
<b>Alkalinity (CaCO3)-mg/L</b>						
Conc-%	Code	1				
0	N	68				
100		30				
<b>Conductivity-µmhos</b>						
Conc-%	Code	1	2	3	4	5
0	N	420	420	424	479	493
100		68	70	70	153	158
<b>Hardness (CaCO3)-mg/L</b>						
Conc-%	Code	1				
0	N	110				
100		50				
<b>pH-Units</b>						
Conc-%	Code	1	2	3	4	5
0	N	7.4	7.5	7.5	7.7	7.7
100		7.3	7.4	7.5	7.5	7.6
<b>Temperature-°C</b>						
Conc-%	Code	1	2	3	4	5
0	N	25.2	25	25	24.8	25.2
100		25.2	25	25	24.8	25.2

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CHAIN OF CUSTODY FORM

Temp. deg. C = 20°C Page 1 of 1

Chlorine (mg/L) = 0.0

NH3 (mg/L) = 0.0

Client Name/Address: Haley & Aldrich, Inc. 5333 Mission Center Rd Suite 300 San Diego, CA 92108 Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project: Boeing-SSFL NPDES Permit 2018 Semiannual Outfall [003-007, 009, 010] Outfall 009 Comp		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)		ANALYSIS REQUIRED											
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc.		Comments																	
Sampler: Dan Smith <i>Dan Smith</i>																			

Sample Description	Sample I.D.	Sampling Date/Time	Sample Matrix	Container Type	# of Cont.	Preservative	Bottle #	MS/MSD	Total Recoverable Metals: (E200.7): Ni, Zn (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Ti	TCDD (and all congeners) (E1613B)	Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300)	TDS (SM2540C/E160.1)	Total Dissolved Metals: (E200.7): Ni, Zn (E200.8): Ag, Cd, Cu, Pb, Sb, Se, Ti	Gross Alpha(E900.0), Gross Beta(E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Cyanide (SM4500-CN-E / E335.2)	Chronic Toxicity - Selenastrium (EPA-821-R-02-013)	Total Recoverable Metals: Mercury (E245.1)	Total Dissolved Metals: Mercury (E245.1)	TSS (160.2 (SM2540D))					
Outfall 009	Outfall009_20181207_Comp	12/7/2018 10:00	WM	500 mL Poly	3	HNO <sub>3</sub>	95	Yes	X															
			WM	1 L Glass Amber	2	None	110	No		X														
			WM	500 mL Poly	6	None	140	Yes			X											48 hours Holding Time NO3 & NO2		
			WM	500 mL Poly	1	None	155	No				X												
			WM	500 mL Poly	3	NaOH	220	Yes								X								
			WM	2.5 Gal Cube	3	None	225	Yes															Unfiltered and unpreserved analysis, Separate RAD onto another workorder. Analyze duplicate, not MS/MSD.	
			WM	1 L Glass Amber	3	None	230	Yes																
			WM	1 Gal Cube	6	None	235	No																Only test if first or second rain events of the year
			WM	borosilicate vials	3	HNO <sub>3</sub>	315	Yes												X				Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.
			WM	1 L Poly	1	None	185	No														X		
Outfall009_20181207_Comp_F	12/7/2018 16:00	WM	1 L Poly	3	None	205	Yes						X								Filter and preserve w/in 24hrs of receipt at lab			
		WM	borosilicate vials	3	None	320	Yes												X			Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures.		
Outfall009_20181207_Comp_Extra	12/7/2018 1:00	WM	1 L Glass Amber	2	None	110	No															Hold		
		WM	500 mL Poly	2	None	145	No																Hold	

Relinquished By: <i>Mark Dominick</i> Date/Time: 12-7-18/14:35 Company: Haley & Aldrich	Received By: <i>Janice Vega</i> Date/Time: 12-7-18 14:35	Turn-around time: (Check) 24 Hour: _____ 72 Hour: _____ 10 Day: <input checked="" type="checkbox"/> _____ 48 Hour: _____ 5 Day: _____ Normal: _____
Relinquished By: <i>Janice Vega</i> Date/Time: 12-7-18 16:50 Company:	Received By: <i>Victor May</i> Date/Time: 12-7-18 1650	Sample Integrity: (Check) Intact: _____ On Ice: _____
Relinquished By: _____ Date/Time: _____ Company: _____	Received By: _____ Date/Time: _____	Store samples for 6 months. Data Requirements: (Check) No Level IV: _____ All Level IV: <input checked="" type="checkbox"/> _____

**CHRONIC SELENASTRUM GROWTH BIOASSAY**

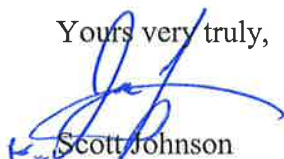
DATE: 6 December - 2018

STANDARD TOXICANT: Cadmium Chloride

NOEC = <10.00 ug/l

IC25 = 67.99 ug/l  
IC50 = >140.00 ug/l

Yours very truly,



Scott Johnson  
Laboratory Director



**CETIS Summary Report**

Report Date: 21 Dec-18 10:17 (p 1 of 1)  
 Test Code: SEL120618 | 20-7096-1293

**Selenastrum Growth Test**

Aquatic Bioassay & Consulting Labs, Inc.

<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX	

**Multiple Comparison Summary**

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
04-1574-4117	Cell Density	Dunnett Multiple Comparison Test	< 10	10	n/a		8.16%

**Point Estimate Summary**

Analysis ID	Endpoint	Point Estimate Method	Level	µg/L	95% LCL	95% UCL	TU	✓
10-0218-2093	Cell Density	Linear Interpolation (ICPIN)	IC5	3.223	1.965	6.094		
			IC10	6.446	3.93	12.18		
			IC15	9.669	5.896	44.85		
			IC20	24.73	0.7599	80.82		
			IC25	67.99	n/a	152.4		
			IC40	>140	n/a	n/a		
			IC50	>140	n/a	n/a		

**Test Acceptability**

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-1574-4117	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
10-0218-2093	Cell Density	Control CV	0.06678	<<	0.2	Yes	Passes Criteria
04-1574-4117	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria
10-0218-2093	Cell Density	Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

**Cell Density Summary**

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

**Cell Density Detail**

Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5

# CETIS Analytical Report

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

## Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

<b>Analysis ID:</b> 04-1574-4117	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.9.2
<b>Analyzed:</b> 21 Dec-18 10:15	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant	
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	< 10	10	n/a		8.16%

## Dunnett Multiple Comparison Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		10*	4.576	2.407	1E+05	6	CDF	5.5E-04	Significant Effect
		20*	5.785	2.407	1E+05	6	CDF	6.6E-05	Significant Effect
		40*	6.267	2.407	1E+05	6	CDF	4.1E-05	Significant Effect
		80*	7.849	2.407	1E+05	6	CDF	2.8E-05	Significant Effect
		140*	8.856	2.407	1E+05	6	CDF	2.7E-05	Significant Effect

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.050E+11	8.101E+10	5	19.41	1.1E-06	Significant Effect
Error	7.511E+10	4.173E+09	18			
Total	4.801E+11		23			

## Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	8.494	15.09	0.1310	Equal Variances
Variances	Levene Equality of Variance Test	1.861	4.248	0.1516	Equal Variances
Variances	Mod Levene Equality of Variance Test	0.8958	4.248	0.5047	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.8885	3.878	0.0231	Normal Distribution
Distribution	D'Agostino Kurtosis Test	1.662	2.576	0.0964	Normal Distribution
Distribution	D'Agostino Skewness Test	2.496	2.576	0.0126	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus Test	8.992	9.21	0.0112	Normal Distribution
Distribution	Kolmogorov-Smirnov D Test	0.1651	0.2056	0.0895	Normal Distribution
Distribution	Shapiro-Wilk W Normality Test	0.8988	0.884	0.0203	Normal Distribution

## Cell Density Summary

Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.347E+6	1.204E+6	1.490E+6	1.313E+6	1.286E+6	1.477E+6	4.499E+4	6.68%	0.00%
10		4	1.138E+6	1.059E+6	1.218E+6	1.116E+6	1.109E+6	1.213E+6	2.498E+4	4.39%	15.51%
20		4	1.083E+6	9.123E+5	1.254E+6	1.046E+6	1.004E+6	1.237E+6	5.363E+4	9.90%	19.61%
40		4	1.061E+6	1.012E+6	1.110E+6	1.058E+6	1.027E+6	1.102E+6	1.555E+4	2.93%	21.25%
80		4	9.888E+5	9.420E+5	1.036E+6	9.910E+5	9.510E+5	1.022E+6	1.469E+4	2.97%	26.61%
140		4	9.428E+5	8.897E+5	9.958E+5	9.480E+5	8.980E+5	9.770E+5	1.666E+4	3.53%	30.02%





**CETIS Analytical Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test		Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID: 10-0218-2093	Endpoint: Cell Density	CETIS Version: CETISv1.9.2	Official Results: Yes
Analyzed: 21 Dec-18 10:15	Analysis: Linear Interpolation (ICPIN)		
Batch ID: 07-4374-8636	Test Type: Cell Growth	Analyst:	
Start Date: 06 Dec-18 13:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water	
Ending Date: 10 Dec-18 12:30	Species: Selenastrum capricornutum	Brine: Not Applicable	
Duration: 95h	Source: Aquatic Biosystems, CO	Age:	
Sample ID: 00-9351-0249	Code: SEL120618	Client: Internal Lab	
Sample Date: 06 Dec-18 13:04	Material: Cadmium chloride	Project:	
Receipt Date:	Source: Reference Toxicant		
Sample Age: n/a	Station: REF TOX		

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Test Acceptability Criteria					
Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control CV	0.06678	<<	0.2	Yes	Passes Criteria
Control Resp	1.35E+6	1000000	>>	Yes	Passes Criteria

Point Estimates			
Level	µg/L	95% LCL	95% UCL
IC5	3.223	1.965	6.094
IC10	6.446	3.93	12.18
IC15	9.669	5.896	44.85
IC20	24.73	0.7599	80.82
IC25	67.99	n/a	152.4
IC40	>140	n/a	n/a
IC50	>140	n/a	n/a

Cell Density Summary			Calculated Variate						
Conc-µg/L	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.347E+6	1.286E+6	1.477E+6	4.499E+4	8.997E+4	6.68%	0.0%
10		4	1.138E+6	1.109E+6	1.213E+6	2.498E+4	4.997E+4	4.39%	15.51%
20		4	1.083E+6	1.004E+6	1.237E+6	5.363E+4	1.073E+5	9.90%	19.61%
40		4	1.061E+6	1.027E+6	1.102E+6	1.555E+4	3.110E+4	2.93%	21.25%
80		4	9.888E+5	9.510E+5	1.022E+6	1.469E+4	2.939E+4	2.97%	26.61%
140		4	9.428E+5	8.980E+5	9.770E+5	1.666E+4	3.331E+4	3.53%	30.02%

Cell Density Detail					
Conc-µg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.287E+6	1.339E+6	1.477E+6	1.286E+6
10		1.213E+6	1.109E+6	1.113E+6	1.118E+6
20		1.004E+6	1.016E+6	1.075E+6	1.237E+6
40		1.102E+6	1.053E+6	1.062E+6	1.027E+6
80		1.022E+6	9.960E+5	9.510E+5	9.860E+5
140		9.770E+5	9.410E+5	8.980E+5	9.550E+5

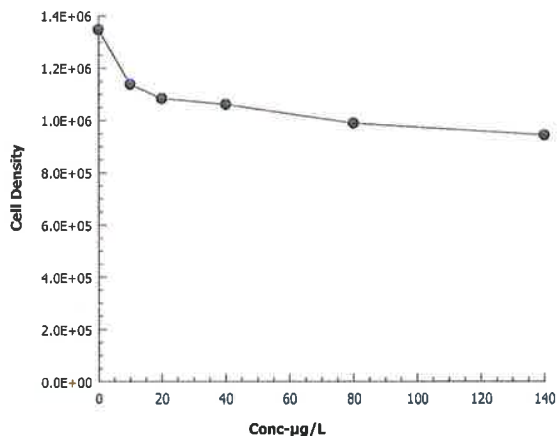
Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-0218-2093      Endpoint: Cell Density  
Analyzed: 21 Dec-18 10:15      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2  
Official Results: Yes

Graphics



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 1 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test			Aquatic Bioassay & Consulting Labs, Inc.								
<b>Batch ID:</b> 07-4374-8636	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>									
<b>Start Date:</b> 06 Dec-18 13:04	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Diluent:</b> Laboratory Water									
<b>Ending Date:</b> 10 Dec-18 12:30	<b>Species:</b> Selenastrum capricornutum	<b>Brine:</b> Not Applicable									
<b>Duration:</b> 95h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b>									
<b>Sample ID:</b> 00-9351-0249	<b>Code:</b> SEL120618	<b>Client:</b> Internal Lab									
<b>Sample Date:</b> 06 Dec-18 13:04	<b>Material:</b> Cadmium chloride	<b>Project:</b>									
<b>Receipt Date:</b>	<b>Source:</b> Reference Toxicant										
<b>Sample Age:</b> n/a	<b>Station:</b> REF TOX										
Alkalinity (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	68			68	68	0	0	0.0%	0
10		1	60			60	60	0	0	0.0%	0
20		1	61			61	61	0	0	0.0%	0
40		1	63			63	63	0	0	0.0%	0
80		1	56			56	56	0	0	0.0%	0
140		1	55			55	55	0	0	0.0%	0
Overall		6	60.5	55.5	65.5	55	68	1.945	4.764	7.88%	0 (0%)
Conductivity-µmhos											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	432	399.2	464.8	417	479	11.8	26.39	6.11%	0
10		5	434.4	428.2	440.6	430	443	2.249	5.03	1.16%	0
20		5	424.6	420.2	429	420	428	1.6	3.578	0.84%	0
40		5	410.2	403.7	416.7	405	419	2.354	5.263	1.28%	0
80		5	397	395.5	398.5	395	398	0.5477	1.225	0.31%	0
140		5	378.2	371.2	385.2	373	387	2.518	5.63	1.49%	0
Overall		30	412.7	404.2	421.3	373	479	4.197	22.99	5.57%	0 (0%)
Hardness (CaCO3)-mg/L											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	1	110			110	110	0	0	0.0%	0
10		1	108			108	108	0	0	0.0%	0
20		1	112			112	112	0	0	0.0%	0
40		1	116			116	116	0	0	0.0%	0
80		1	99			99	99	0	0	0.0%	0
140		1	96			96	96	0	0	0.0%	0
Overall		6	106.8	98.69	115	96	116	3.167	7.757	7.26%	0 (0%)
pH-Units											
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	5	7.52	7.384	7.656	7.4	7.7	0.04899	0.1095	1.46%	0
10		5	7.6	7.448	7.752	7.5	7.8	0.05477	0.1225	1.61%	0
20		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
40		5	7.62	7.516	7.724	7.5	7.7	0.03742	0.08367	1.1%	0
80		5	7.64	7.498	7.782	7.5	7.8	0.05099	0.114	1.49%	0
140		5	7.6	7.476	7.724	7.5	7.7	0.04472	0.1	1.32%	0
Overall		30	7.6	7.562	7.638	7.4	7.8	0.01857	0.1017	1.34%	0 (0%)

**CETIS Measurement Report**

Report Date: 21 Dec-18 10:17 (p 2 of 2)  
 Test Code: SEL120618 | 20-7096-1293

Selenastrum Growth Test												Aquatic Bioassay & Consulting Labs, Inc.
<b>Temperature-°C</b>												
Conc-µg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count	
0	N	5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
10		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
20		5	24.52	23.87	25.17	24	25.2	0.2332	0.5215	2.13%	0	
40		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
80		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
140		5	24.72	24.15	25.29	24	25.2	0.2059	0.4604	1.86%	0	
Overall		30	24.69	24.52	24.85	24	25.2	0.07947	0.4353	1.76%	0 (0%)	
<b>Alkalinity (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	68										
10		60										
20		61										
40		63										
80		56										
140		55										
<b>Conductivity-µmhos</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	417	420	420	424	479						
10		430	434	432	433	443						
20		420	422	425	428	428						
40		408	409	405	410	419						
80		395	397	398	397	398						
140		373	374	377	380	387						
<b>Hardness (CaCO3)-mg/L</b>												
Conc-µg/L	Code	1										
0	N	110										
10		108										
20		112										
40		116										
80		99										
140		96										
<b>pH-Units</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	7.5	7.4	7.5	7.5	7.7						
10		7.6	7.6	7.5	7.5	7.8						
20		7.7	7.6	7.6	7.5	7.7						
40		7.7	7.6	7.5	7.6	7.7						
80		7.7	7.6	7.5	7.6	7.8						
140		7.7	7.6	7.5	7.5	7.7						
<b>Temperature-°C</b>												
Conc-µg/L	Code	1	2	3	4	5						
0	N	24.6	25.2	24	25	24.8						
10		24.6	25.2	24	25	24.8						
20		24.6	25.2	24	24	24.8						
40		24.6	25.2	24	25	24.8						
80		24.6	25.2	24	25	24.8						
140		24.6	25.2	24	25	24.8						

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CHAIN OF CUSTODY FORM

Client Name/Address. Haley & Aldrich, Inc. 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Semiannual Outfall [003-007, 009, 010] Outfall 009 Comp		R	R	S/R	R	R	R	R	R	R	R	R	R	R	ANALYSIS REQUIRED							
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement # 2015-18. Test America by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and Test America Laboratories Inc		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl TODD (and all congeners) (E1613B) Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300) TDS (SM2540C/E160.1) Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1) Cyanide (SM4500-CN-E / E335.2) Chronic Toxicity - Selenium (EPA-821-R-02-013) Total Recoverable Metals - Mercury (E245.1) Total Dissolved Metals - Mercury (E245.1) TSS (160.2 (SM2540D))												Comments						
Sampler: Dan Smith <i>Dan Smith</i>		Field Manager: Mark Dominick 978 234 5033, 818 599.0702 (cell)																						
Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	TODD (and all congeners) (E1613B)	Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300)	TDS (SM2540C/E160.1)	Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Cyanide (SM4500-CN-E / E335.2)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Recoverable Metals - Mercury (E245.1)	Total Dissolved Metals - Mercury (E245.1)	TSS (160.2 (SM2540D))	Comments				
Outfall 009	Outfall009_20181207_Comp	12/7/2018 6:40	WM	500 mL Poly	3	HNO <sub>3</sub>	95	Yes	X															
			WM	1 L Glass Amber	2	None	110	No		X														
			WM	500 mL Poly	6	None	140	Yes			X												48 hours Holding Time NO3 & NO2	
			WM	500 mL Poly	1	None	155	No				X												
			WM	500 mL Poly	3	NaOH	220	Yes									X							
			WM	2.5 Gal Cube	3	None	225	Yes								X							Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MS/MSD	
			WM	1 L Glass Amber	3	None	230	Yes										X					Only test if first or second rain events of the year	
			WM	borosilicate vials	2	HNO <sub>3</sub>	315	Yes											X					Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures
			WM	1 L Poly	1	None	185	No													X			
			WM	1 L Poly	3	None	205	Yes					X											Filter and preserve w/in 24hrs of receipt at lab
Outfall009_20181207_Comp_F		12/7/2018 10:00	WM	borosilicate vials	3	None	320	Yes										X			Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures			
Outfall009_20181207_Comp_Extra		12/7/2018 1:40	WM	1 L Glass Amber	2	None	110	No			H										Hold			
			WM	500 mL Poly	2	None	145	No				H									Hold			

Page 41 of 45

Relinquished By <i>Mark Dominick</i> Date/Time 12-7-18/14:35 Company Haley & Aldrich	Received By <i>Javier Vega</i> Date/Time 12-7-18 14:35	Turn-around time (Check) 24 Hour _____ 72 Hour _____ 10 Day <input checked="" type="checkbox"/> 48 Hour _____ 5 Day _____ Normal _____
Relinquished By <i>Javier Vega</i> Date/Time 12-7-18 16:50 Company	Received By <i>Victor</i> Date/Time 12-7-18 16:50	Sample Integrity (Check) Intact <input checked="" type="checkbox"/> On Ice: <input type="checkbox"/>
Relinquished By <i>Javier Vega</i> Date/Time 12-7-18 9:05 Company Javier Vega	Received By <i>Javier Vega</i> Date/Time 12/7/18 Company THIRV 2103	Store samples for 6 months. Data Requirements (Check) No Level IV _____ All Level IV: <input checked="" type="checkbox"/>



440-226822 Chain of Custody

0.9/1.1 3.9/4.1 2.4/2.6 11294

12/28/2018





**TestAmerica Irvine**

17461 Derian Ave Suite 100  
 Irvine, CA 92614-5817  
 Phone (949) 261-1022 Fax (949) 260-3297

**Chain of Custody Record**



12/28/2018

<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM: Patel, Urvashi		Carrier Tracking No(s):		COC No: 440-130568.1											
Client Contact: Shipping/Receiving		Phone:		E-Mail: urvashi.patel@testamericainc.com		State of Origin: California		Page: Page 1 of 1											
Company: TestAmerica Laboratories, Inc.		Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email:		Due Date Requested: 12/19/2018 TAT Requested (days):		Accreditations Required (See note): State Program - California		Job #: 440-226822-1											
Project Name: Semiannual Outfall 009 Comp Site:		PO #: WO #:		Project #: 44009879 SSOW#:		<b>Analysis Requested</b>		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)											
<b>Sample Identification - Client ID (Lab ID)</b>		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type (C=comp, G=grab)</b>		<b>Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)</b>		<b>Field Filtered Sample (Yes or No)</b>		<b>Perform MS/MSD (Yes or No)</b>		<b>905_Sr90/PrecSep_7 Strontium-90</b>		<b>Total Number of containers</b>		<b>Special Instructions/Note:</b>	
Outfall009_20181207_Comp (440-226822-1)		12/7/18		09:00 Pacific				Water				X				2		Boeing SSFL; DO NOT FILTER; use prep date from preservation	
Outfall009_20181207_Comp (440-226822-1MS)		12/7/18		09:00 Pacific		MS		Water				X				2		Boeing SSFL; DO NOT FILTER; use prep date from preservation	
Outfall009_20181207_Comp (440-226822-1MSD)		12/7/18		09:00 Pacific		MSD		Water				X				2		Boeing SSFL; DO NOT FILTER; use prep date from preservation	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte &amp; accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>																			
<b>Possible Hazard Identification</b>										<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>									
Unconfirmed										<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)										Primary Deliverable Rank: 2									
Empty Kit Relinquished by:										Special Instructions/QC Requirements:									
Relinquished by:					Date: 12/15/18 17:00					Time: 17:00					Method of Shipment:				
Relinquished by:					Date/Time: 12/11/18 11:10					Received by:					Company: TA STL				
Relinquished by:					Date/Time:					Received by:					Company:				
Relinquished by:					Date/Time:					Received by:					Company:				
Custody Seals Intact: Δ Yes Δ No					Custody Seal No.:					Cooler Temperature(s) °C and Other Remarks:									

Page 42 of 45



**TestAmerica Irvine**

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**Chain of Custody Record**



**TestAmerica**  
 THE LEADER IN ENVIRONMENTAL TESTING

12/28/2018

<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM: Patel, Urvashi		Carrier Tracking No(s):		COC No: 440-130568.1			
Client Contact: Shipping/Receiving		Phone:		E-Mail: urvashi.patel@testamericainc.com		State of Origin: California		Page: Page 1 of 1			
Company: TestAmerica Laboratories, Inc.				Accreditations Required (See note): State Program - California				Job #: 440-226822-3			
Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045		Due Date Requested: 1/8/2019		<b>Analysis Requested</b>						<b>Preservation Codes:</b> A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		TAT Requested (days):									
Email:		PO #:		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		<b>Other:</b>			
Project Name: Semiannual Outfall 009 Comp		WO #:		901.1_Cs/Fill_Geo_0 K-40 and Cesium-137		901R_U/ExtChrom_Actin Total Uranium					
Site:		Project #: 44009879		900.0/Evaporation Gross Alpha/Beta		903.0/PrecSep_21 Radium-226		<b>Special Instructions/Note:</b>			
Sample Identification - Client ID (Lab ID)		SSOW#:		904.0/PrecSep_0 Radium-228		906.0/LSC_Dist_Susp Tritium					
Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)		Total Number of containers			
Outfall009_20181207_Comp (440-226822-1)		12/7/18 09:00 Pacific				Water		2			
Outfall009_20181207_Comp (440-226822-1MS)		12/7/18 09:00 Pacific		MS		Water		2			
Outfall009_20181207_Comp (440-226822-1MSD)		12/7/18 09:00 Pacific		MSD		Water		2			

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

<b>Possible Hazard Identification</b>		<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>	
Unconfirmed		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Primary Deliverable Rank: 2	
Empty Kit Relinquished by:		Special Instructions/QC Requirements:	
Relinquished by:		Date/Time: 12/11/18 11:00	
Relinquished by:		Date/Time: 12/11/18 11:00	
Relinquished by:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:	
Cooler Temperature(s) °C and Other Remarks:			

Page 43 of 45



# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226822-1

**Login Number: 226822**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226822-2**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**11 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





**TABLE OF CONTENTS**

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. EPA METHOD 1613B — Dioxin/Furans..... 6

    III.1. Holding Times ..... 6

    III.2. Instrument Performance ..... 6

        III.2.1. GC Column Performance ..... 6

        III.2.2. Mass Spectrometer Performance..... 6

    III.3. Calibration..... 6

    III.4. Quality Control Samples ..... 6

        III.4.1. Method Blanks ..... 6

        III.4.2. Laboratory Control Samples ..... 7

    III.5. Field QC Samples..... 7

        III.5.1. Field Blanks and Equipment Blanks ..... 7

        III.5.2. Field Duplicates..... 7

    III.6. Internal Standards Performance..... 7

    III.7. Compound Identification..... 7

    III.8. Compound Quantification and Reported Detection Limits ..... 7

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>X</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226822-2

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall009_20181207_ Comp	440-226822-1	N/A	Water	12/07/2018 09:00 AM	E1613B



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226822-2:

- The laboratory received the sample in this SDG on ice and within the temperature limits of <6 degrees Celsius (°C) and >0°C.
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the original and transfer COCs.
- The transfer COC to TA-West Sacramento noted custody seals were present and intact on the cooler.



TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.





Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. EPA METHOD 1613B — DIOXIN/FURANS

---

L. Calvin of MEC<sup>X</sup> reviewed the SDG on January 11, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>X</sup> *Data Validation Procedure for Dioxins and Furans* (DVP-19, Rev. 0), *USEPA Method 1613B*, and the *National Functional Guidelines Chlorinated Dioxin/Furan Data Review* (2011).

#### III.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted and analyzed within one year of collection.

#### III.2. INSTRUMENT PERFORMANCE

Instrument performance criteria were met. Following are findings associated with instrument performance:

##### III.2.1. GC COLUMN PERFORMANCE

A Windows Defining Mix (WDM) containing the first and last eluting congeners of each descriptor and isomer specificity compounds was analyzed prior to the initial calibration sequence and at the beginning of each analytical sequence. The GC column performance in the calibrations was acceptable, with the height of the valley between the closely eluting isomers and 2,3,7,8-TCDD reported as <25%.

##### III.2.2. MASS SPECTROMETER PERFORMANCE

The mass spectrometer performance was acceptable with the static resolving power >10,000.

#### III.3. CALIBRATION

Calibration criteria were met. The initial calibration was acceptable with %RSDs  $\leq 20\%$  for the 15 native compounds (calibration by isotope dilution) and  $\leq 35\%$  for the two native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the Method 1613B control limits for all standards.

Continuing Calibration: Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of the analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in Table 6 of EPA Method 1613B. The ion abundance ratios and relative retention times were within the method control limits.

#### III.4. QUALITY CONTROL SAMPLES

##### III.4.1. METHOD BLANKS

The method blank had detects above the EDL and below the reporting limit (RL) for isomers 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,7,8-TCDF, OCDD, and OCDF, and for totals TCDF, HpCDD, HpCDF, HxCDD, and HxCDF. Isomer results for the method blank contaminants detected below the RL were qualified as nondetects (U) at the level of contamination based upon professional judgement and the guidance for blank qualification in the National Functional Guidelines for Dioxin Review. The method blank concentration of 1,2,3,4,6,7,8-HpCDD was not sufficient to qualify the sample result above the RL. As total



HpCDD in the sample consisted only of the unqualified isomer, total HpCDD was not qualified. The result above the RL for OCDD was  $<10\times$  the method blank concentration, and was therefore qualified as a nondetect (U) at the level of contamination. As total TCDF in the sample consisted only of the rejected isomer result (which would have been qualified for method blank contamination if retained), total TCDF was qualified as a nondetect (U) at the level of contamination. The reviewer verified that peaks comprising total HpCDF in the method blank were the same peaks comprising total HpCDF in sample Outfall009\_20181207\_Comp at similar concentrations. The result for total HpCDF was qualified as a nondetect (U) at the level of contamination. Results for totals HxCDD and HxCDF were qualified as estimated (J) as they contained one or more peaks not present in the method blank.

#### III.4.2. LABORATORY CONTROL SAMPLES

Recoveries were within the acceptance criteria listed in Table 6 of Method 1613B, and RPDs were within the laboratory control limit of  $\leq 50\%$ .

#### III.5. FIELD QC SAMPLES

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### III.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

##### III.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

#### III.6. INTERNAL STANDARDS PERFORMANCE

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613B.

#### III.7. COMPOUND IDENTIFICATION

Compound identification was verified. With the exception of estimated maximum possible concentrations (EMPCs), detected compounds met the ion abundance ratio, retention time window and signal-to-noise ratio criteria for identification. The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613B. Isomer 2,3,7,8-TCDF was detected in the initial analysis of the sample; however, the detect was not confirmed by second-column analysis. Both initial and confirmation analyses were reported. As the confirmation column is more specific for the detection of 2,3,7,8-TCDF, the initial result was rejected (R) in favor of the nondetect confirmation result.

#### III.8. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified by recalculating a representative number of sample results. The laboratory calculated and reported compound-specific detection limits. Detects between the EDL and the RL were qualified as estimated (J) and coded with DNQ to comply with the NPDES permit. Nondetects are valid to the EDL. Per client request, results below the EDL meeting retention time and signal to noise (S/N) criteria were to be reported; however, this sample had no reported detects below the EDL.



Isomers reported as EMPCs not previously qualified as nondetects for method blank contamination were qualified as estimated nondetects (UJ) at the level of contamination. The result for total TCDD matched the isomer concentration qualified as an EMPC; therefore, total TCDD was also qualified as an estimated nondetect (UJ). Totals HxCDD and PeCDF contained both EMPC peaks and non-EMPC peaks, and were qualified as estimated (J). The total result for TCDF was not further qualified as an EMPC, as it would have been qualified as a nondetect for method blank contamination had the result been retained over the confirmation column.

# Validated Sample Result Forms: 4402268222

**Analysis Method:** E1613B

**Sample Name:** Outfall009\_20181207\_Comp      **Matrix Type:** W      **Result Type:** TRG  
**Lab Sample Name:** 440-226822-1      **Sample Date/Time:** 12/07/2018 09:00      **Validation Level:** 8

Analyte	CAS No	Result Value	DL	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.000074	0.00000074	0.000048	ug/L	MB		
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.000012	0.00000036	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.0000021	0.00000043	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8-HxCDD	39227-28-6	0.0000028	0.00000026	0.000048	ug/L	J,DXMB	U	B
1,2,3,4,7,8-HxCDF	70648-26-9	0.0000016	0.00000024	0.000048	ug/L	J,DX	J	DNQ
1,2,3,6,7,8-HxCDD	57653-85-7	0.0000031	0.00000025	0.000048	ug/L	J,DXMB	U	B
1,2,3,6,7,8-HxCDF	57117-44-9	0.0000014	0.00000021	0.000048	ug/L	J,DXMB	U	B
1,2,3,7,8,9-HxCDD	19408-74-3	0.0000031	0.00000024	0.000048	ug/L	J,DXqMB	U	B
1,2,3,7,8,9-HxCDF	72918-21-9	0.0000019	0.00000014	0.000048	ug/L	J,DXMB	U	B
1,2,3,7,8-PeCDD	40321-76-4	0.0000017	0.00000025	0.000048	ug/L	J,DX	J	DNQ
1,2,3,7,8-PeCDF	57117-41-6	0.0000011	0.00000021	0.000048	ug/L	J,DXq	UJ	*III
2,3,4,6,7,8-HxCDF	60851-34-5	0.0000013	0.00000015	0.000048	ug/L	J,DX	J	DNQ
2,3,4,7,8-PeCDF	57117-31-4	0.0000011	0.00000027	0.000048	ug/L	J,DX	J	DNQ
2,3,7,8-TCDD	1746-01-6	0.00000081	0.00000022	0.0000097	ug/L	J,DXq	UJ	*III
2,3,7,8-TCDF	51207-31-9		0.00000057	0.0000097	ug/L	U	U	
2,3,7,8-TCDF	51207-31-9	0.00000045	0.00000010	0.0000097	ug/L	J,DXqMB	R	D
OCDD	3268-87-9	0.000090	0.0000010	0.000097	ug/L	MB	U	B
OCDF	39001-02-0	0.000046	0.00000051	0.000097	ug/L	J,DXMB	U	B
Total HpCDD	37871-00-4	0.00015	0.00000074	0.000048	ug/L	MB		
Total HpCDF	38998-75-3	0.000033	0.00000036	0.000048	ug/L	J,DXMB	U	B
Total HxCDD	34465-46-8	0.000017	0.00000024	0.000048	ug/L	J,DXqMB	J	B, *III
Total HxCDF	55684-94-1	0.0000094	0.00000014	0.000048	ug/L	J,DXMB	J	B
Total PeCDD	36088-22-9	0.0000017	0.00000025	0.000048	ug/L	J,DX	J	DNQ
Total PeCDF	30402-15-4	0.0000022	0.00000021	0.000048	ug/L	J,DXq	J	DNQ, *III
Total TCDD	41903-57-5	0.00000081	0.00000022	0.0000097	ug/L	J,DXq	UJ	*III
Total TCDF	55722-27-5	0.00000045	0.00000010	0.0000097	ug/L	J,DXqMB	U	B

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226822-2

Client Project/Site: Semiannual Outfall 009 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

12/28/2018 11:34:07 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

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results through

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
12/28/2018 11:34:07 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
QC Sample Results . . . . .	10
QC Association Summary . . . . .	14
Definitions/Glossary . . . . .	15
Certification Summary . . . . .	16
Chain of Custody . . . . .	17
Receipt Checklists . . . . .	19
Isotope Dilution Summary . . . . .	21
Field Data Sheets . . . . .	23



# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226822-1	Outfall009_20181207_Comp	Water	12/07/18 09:00	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

**Job ID: 440-226822-2**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226822-2**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.6° C and 4.1° C.

### Dioxin

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: (CCV 320-266136/54), (LCS 320-264993/2-A), (LCSD 320-264993/3-A) and (MB 320-264993/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: Outfall009\_20181207\_Comp (440-226822-1), (CCV 320-266136/54), (LCS 320-264993/2-A), (LCSD 320-264993/3-A) and (MB 320-264993/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: Outfall009\_20181207\_Comp (440-226822-1) and (CCV 320-267413/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Dioxin Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

Date Collected: 12/07/18 09:00

Matrix: Water

Date Received: 12/07/18 21:05

**Method: 1613B - Dioxins and Furans (HRGC/HRMS)**

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.0000081	J,DX q	0.0000097	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,7,8-PeCDD	0.0000017	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,7,8-PeCDF	0.0000011	J,DX q	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
2,3,4,7,8-PeCDF	0.0000011	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,4,7,8-HxCDD	0.0000028	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,6,7,8-HxCDD	0.0000031	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,7,8,9-HxCDD	0.0000031	J,DX q MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,4,7,8-HxCDF	0.0000016	J,DX	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,6,7,8-HxCDF	0.0000014	J,DX MB	0.000048	0.0000002	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,7,8,9-HxCDF	0.0000019	J,DX MB	0.000048	0.0000001	ug/L		12/13/18 08:34	12/19/18 12:44	1
2,3,4,6,7,8-HxCDF	0.0000013	J,DX	0.000048	0.0000001	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,4,6,7,8-HpCDD	0.000074	MB	0.000048	0.0000007	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,4,6,7,8-HpCDF	0.000012	J,DX MB	0.000048	0.0000003	ug/L		12/13/18 08:34	12/19/18 12:44	1
1,2,3,4,7,8,9-HpCDF	0.0000021	J,DX MB	0.000048	0.0000004	ug/L		12/13/18 08:34	12/19/18 12:44	1
OCDD	0.00090	MB	0.000097	0.0000010	ug/L		12/13/18 08:34	12/19/18 12:44	1
OCDF	0.000046	J,DX MB	0.000097	0.0000005	ug/L		12/13/18 08:34	12/19/18 12:44	1
<b>Total TCDD</b>	<b>0.0000081</b>	<b>J,DX q</b>	<b>0.0000097</b>	<b>0.0000002</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total TCDF</b>	<b>0.0000045</b>	<b>J,DX q MB</b>	<b>0.0000097</b>	<b>0.0000001</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total PeCDD</b>	<b>0.0000017</b>	<b>J,DX</b>	<b>0.000048</b>	<b>0.0000002</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total PeCDF</b>	<b>0.0000022</b>	<b>J,DX q</b>	<b>0.000048</b>	<b>0.0000002</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total HxCDD</b>	<b>0.000017</b>	<b>J,DX q MB</b>	<b>0.000048</b>	<b>0.0000002</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total HxCDF</b>	<b>0.0000094</b>	<b>J,DX MB</b>	<b>0.000048</b>	<b>0.0000001</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total HpCDD</b>	<b>0.00015</b>	<b>MB</b>	<b>0.000048</b>	<b>0.0000007</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Total HpCDF</b>	<b>0.000033</b>	<b>J,DX MB</b>	<b>0.000048</b>	<b>0.0000003</b>	<b>ug/L</b>		<b>12/13/18 08:34</b>	<b>12/19/18 12:44</b>	<b>1</b>
<b>Isotope Dilution</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C-2,3,7,8-TCDD	77		25 - 164				12/13/18 08:34	12/19/18 12:44	1
13C-2,3,7,8-TCDF	75		24 - 169				12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,7,8-PeCDD	65		25 - 181				12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,7,8-PeCDF	68		24 - 185				12/13/18 08:34	12/19/18 12:44	1
13C-2,3,4,7,8-PeCDF	61		21 - 178				12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,4,7,8-HxCDD	71		32 - 141				12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,6,7,8-HxCDD	71		28 - 130				12/13/18 08:34	12/19/18 12:44	1

TestAmerica Irvine

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)**

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-1,2,3,4,7,8-HxCDF	69		26 - 152	12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,6,7,8-HxCDF	71		26 - 123	12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,7,8,9-HxCDF	84		29 - 147	12/13/18 08:34	12/19/18 12:44	1
13C-2,3,4,6,7,8-HxCDF	77		28 - 136	12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,4,6,7,8-HpCDD	86		23 - 140	12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,4,6,7,8-HpCDF	79		28 - 143	12/13/18 08:34	12/19/18 12:44	1
13C-1,2,3,4,7,8,9-HpCDF	88		26 - 138	12/13/18 08:34	12/19/18 12:44	1
13C-OCDD	59		17 - 157	12/13/18 08:34	12/19/18 12:44	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
37Cl4-2,3,7,8-TCDD	111		35 - 197	12/13/18 08:34	12/19/18 12:44	1

**Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA**

<i>Analyte</i>	<i>Result</i>	<i>Qualifier</i>	<i>RL</i>	<i>EDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
2,3,7,8-TCDF	ND		0.0000097	0.0000005	ug/L		12/13/18 08:34	12/24/18 15:08	1
				7					
<b>Isotope Dilution</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>			
13C-2,3,7,8-TCDF	78		24 - 169	12/13/18 08:34	12/24/18 15:08	1			
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>			
37Cl4-2,3,7,8-TCDD	82		35 - 197	12/13/18 08:34	12/24/18 15:08	1			

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	40CFR136A	TAL SAC
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	40CFR136A	TAL SAC

**Protocol References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			1033.8 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B		1			266136	12/19/18 12:44	AS	TAL SAC
Total/NA	Prep	1613B	RA		1033.8 mL	20 uL	264993	12/13/18 08:34	ITH	TAL SAC
Total/NA	Analysis	1613B	RA	1			267413	12/24/18 15:08	KSS	TAL SAC

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600





# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: MB 320-264993/1-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C-1,2,3,7,8-PeCDF	67		24 - 185	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,7,8-PeCDF	63		21 - 178	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDD	74		32 - 141	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8-HxCDF	70		26 - 152	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,6,7,8-HxCDF	70		26 - 123	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,7,8,9-HxCDF	80		29 - 147	12/13/18 08:34	12/19/18 05:04	1
13C-2,3,4,6,7,8-HxCDF	75		28 - 136	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDD	84		23 - 140	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,6,7,8-HpCDF	83		28 - 143	12/13/18 08:34	12/19/18 05:04	1
13C-1,2,3,4,7,8,9-HpCDF	85		26 - 138	12/13/18 08:34	12/19/18 05:04	1
13C-OCDD	53		17 - 157	12/13/18 08:34	12/19/18 05:04	1
Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	105		35 - 197	12/13/18 08:34	12/19/18 05:04	1

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
2,3,7,8-TCDD	0.000200	0.000210		ug/L		105	67 - 158
2,3,7,8-TCDF	0.000200	0.000215	MB	ug/L		108	75 - 158
1,2,3,7,8-PeCDD	0.00100	0.00106		ug/L		106	70 - 142
1,2,3,7,8-PeCDF	0.00100	0.00107		ug/L		107	80 - 134
2,3,4,7,8-PeCDF	0.00100	0.00106		ug/L		106	68 - 160
1,2,3,4,7,8-HxCDD	0.00100	0.000974	MB	ug/L		97	70 - 164
1,2,3,6,7,8-HxCDD	0.00100	0.00102	MB	ug/L		102	76 - 134
1,2,3,7,8,9-HxCDD	0.00100	0.00124	MB	ug/L		124	64 - 162
1,2,3,4,7,8-HxCDF	0.00100	0.00101		ug/L		101	72 - 134
1,2,3,6,7,8-HxCDF	0.00100	0.000995	MB	ug/L		100	84 - 130
1,2,3,7,8,9-HxCDF	0.00100	0.00104	MB	ug/L		104	78 - 130
2,3,4,6,7,8-HxCDF	0.00100	0.00101		ug/L		101	70 - 156
1,2,3,4,6,7,8-HpCDD	0.00100	0.000963	MB	ug/L		96	70 - 140
1,2,3,4,6,7,8-HpCDF	0.00100	0.000963	MB	ug/L		96	82 - 122
1,2,3,4,7,8,9-HpCDF	0.00100	0.000965	MB	ug/L		97	78 - 138
OCDD	0.00200	0.00191	MB	ug/L		95	78 - 144
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170
Isotope Dilution	LCS LCS		Limits				
13C-2,3,7,8-TCDD	79		20 - 175				
13C-2,3,7,8-TCDF	81		22 - 152				
13C-1,2,3,7,8-PeCDD	70		21 - 227				
13C-1,2,3,7,8-PeCDF	72		21 - 192				
13C-2,3,4,7,8-PeCDF	60		13 - 328				
13C-1,2,3,4,7,8-HxCDD	67		21 - 193				
13C-1,2,3,6,7,8-HxCDD	67		25 - 163				
13C-1,2,3,4,7,8-HxCDF	64		19 - 202				

TestAmerica Irvine



# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

**Lab Sample ID: LCS 320-264993/2-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<u>Isotope Dilution</u>	LCS LCS		<u>Limits</u>
	<u>%Recovery</u>	<u>Qualifier</u>	
13C-1,2,3,6,7,8-HxCDF	69		21 - 159
13C-1,2,3,7,8,9-HxCDF	90		17 - 205
13C-2,3,4,6,7,8-HxCDF	78		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	94		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	85		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	98		20 - 186
13C-OCDD	72		13 - 199
<b>LCS LCS</b>			
<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
37Cl4-2,3,7,8-TCDD	109		31 - 191

**Lab Sample ID: LCSD 320-264993/3-A**  
**Matrix: Water**  
**Analysis Batch: 266136**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 264993**

<u>Analyte</u>	<u>Spike Added</u>	<u>LCSD Result</u>	<u>LCSD Qualifier</u>	<u>Unit</u>	<u>D</u>	<u>%Rec</u>	%Rec.		<u>RPD</u>	<u>RPD Limit</u>
							<u>Limits</u>	<u>RPD</u>		
2,3,7,8-TCDD	0.000200	0.000206		ug/L		103	67 - 158	2	50	
2,3,7,8-TCDF	0.000200	0.000211	MB	ug/L		106	75 - 158	2	50	
1,2,3,7,8-PeCDD	0.00100	0.00104		ug/L		104	70 - 142	2	50	
1,2,3,7,8-PeCDF	0.00100	0.00103		ug/L		103	80 - 134	4	50	
2,3,4,7,8-PeCDF	0.00100	0.00102		ug/L		102	68 - 160	4	50	
1,2,3,4,7,8-HxCDD	0.00100	0.000968	MB	ug/L		97	70 - 164	1	50	
1,2,3,6,7,8-HxCDD	0.00100	0.00100	MB	ug/L		100	76 - 134	2	50	
1,2,3,7,8,9-HxCDD	0.00100	0.00106	MB	ug/L		106	64 - 162	16	50	
1,2,3,4,7,8-HxCDF	0.00100	0.000988		ug/L		99	72 - 134	2	50	
1,2,3,6,7,8-HxCDF	0.00100	0.000987	MB	ug/L		99	84 - 130	1	50	
1,2,3,7,8,9-HxCDF	0.00100	0.00102	MB	ug/L		102	78 - 130	2	50	
2,3,4,6,7,8-HxCDF	0.00100	0.000995		ug/L		99	70 - 156	1	50	
1,2,3,4,6,7,8-HpCDD	0.00100	0.000950	MB	ug/L		95	70 - 140	1	50	
1,2,3,4,6,7,8-HpCDF	0.00100	0.000973	MB	ug/L		97	82 - 122	1	50	
1,2,3,4,7,8,9-HpCDF	0.00100	0.000940	MB	ug/L		94	78 - 138	3	50	
OCDD	0.00200	0.00193	MB	ug/L		97	78 - 144	1	50	
OCDF	0.00200	0.00217	MB	ug/L		108	63 - 170	0	50	

<u>Isotope Dilution</u>	LCSD LCSD		<u>Limits</u>
	<u>%Recovery</u>	<u>Qualifier</u>	
13C-2,3,7,8-TCDD	82		20 - 175
13C-2,3,7,8-TCDF	82		22 - 152
13C-1,2,3,7,8-PeCDD	71		21 - 227
13C-1,2,3,7,8-PeCDF	74		21 - 192
13C-2,3,4,7,8-PeCDF	68		13 - 328
13C-1,2,3,4,7,8-HxCDD	77		21 - 193
13C-1,2,3,6,7,8-HxCDD	76		25 - 163
13C-1,2,3,4,7,8-HxCDF	73		19 - 202
13C-1,2,3,6,7,8-HxCDF	73		21 - 159
13C-1,2,3,7,8,9-HxCDF	88		17 - 205
13C-2,3,4,6,7,8-HxCDF	79		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	91		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	87		21 - 158

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-264993/3-A

Matrix: Water

Analysis Batch: 266136

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 264993

	<i>LCSD</i>	<i>LCSD</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,7,8,9-HpCDF	94		20 - 186
13C-OCDD	63		13 - 199

	<i>LCSD</i>	<i>LCSD</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	110		31 - 191

- 1
- 2
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- 8
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- 10
- 11
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- 13
- 14
- 15

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Specialty Organics

### Prep Batch: 264993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	1613B	
440-226822-1 - RA	Outfall009_20181207_Comp	Total/NA	Water	1613B	
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	

### Analysis Batch: 266136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	1613B	264993
MB 320-264993/1-A	Method Blank	Total/NA	Water	1613B	264993
LCS 320-264993/2-A	Lab Control Sample	Total/NA	Water	1613B	264993
LCSD 320-264993/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	264993

### Analysis Batch: 267413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1 - RA	Outfall009_20181207_Comp	Total/NA	Water	1613B	264993

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Qualifiers

### Dioxin

Qualifier	Qualifier Description
MB	Analyte present in the method blank
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

CHAIN OF CUSTODY FORM

Client Name/Address: Haley & Aldrich, Inc. 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Semiannual Outfall [003-007, 009, 010] Outfall 009 Comp		R	R	S/R	R	R	R	R	R	R	R	R	R	R	R	R	ANALYSIS REQUIRED							
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Test America's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement # 2015-18. Test America by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and Test America Laboratories Inc		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Field Manager: Mark Dominick 978 234 5033, 818 599.0702 (cell)		Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl TODD (and all congeners) (E1613B) Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300) TDS (SM2540C/E160 1) Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1) Cyanide (SM4500-CN-E / E335 2) Chronic Toxicity - Selenium (EPA-821-R-02-013) Total Recoverable Metals: Mercury (E245 1) Total Dissolved Metals: Mercury (E245 1) TSS (160.2 (SM2540D))												Comments						
Sampler: Dan Smith <i>Dan Smith</i>																										
Sample Description	Sample ID	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	TODD (and all congeners) (E1613B)	Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300)	TDS (SM2540C/E160 1)	Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Cyanide (SM4500-CN-E / E335 2)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Recoverable Metals: Mercury (E245 1)	Total Dissolved Metals: Mercury (E245 1)	TSS (160.2 (SM2540D))	Comments						
Outfall 009	Outfall009_20181207_Comp	12/7/2018 <i>6:40</i>	WM	500 mL Poly	3	HNO <sub>3</sub>	95	Yes	X																	
			WM	1 L Glass Amber	2	None	110	No		X																
			WM	500 mL Poly	6	None	140	Yes			X													48 hours Holding Time NO3 & NO2		
			WM	500 mL Poly	1	None	155	No				X														
			WM	500 mL Poly	3	NaOH	220	Yes									X									
			WM	2.5 Gal Cube	3	None	225	Yes								X									Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MS/MSD	
			WM	1 L Glass Amber	3	None	230	Yes										X							Only test if first or second rain events of the year	
			WM	borosilicate vials	2	HNO <sub>3</sub>	315	Yes											X							Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures
			WM	1 L Poly	1	None	185	No														X				Filter and preserve w/in 24hrs of receipt at lab
			WM	1 L Poly	3	None	205	Yes					X													Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures
	Outfall009_20181207_Comp_F	12/7/2018 <i>10:00</i>	WM	borosilicate vials	3	None	320	Yes											X					Hold		
	Outfall009_20181207_Comp_Extra	12/7/2018 <i>1:40</i>	WM	1 L Glass Amber	2	None	110	No			H													Hold		
WM	500 mL Poly	2	None	145	No						H													Hold		

Page 17 of 23

Relinquished By <i>Mark Dominick</i>	Date/Time <i>12-7-18/14:35</i>	Company <i>Haley &amp; Aldrich</i>	Received By <i>Javier Vega</i>	Date/Time <i>12-7-18 14:35</i>	Turn-around time (Check) 24 Hour _____ 72 Hour _____ 10 Day <input checked="" type="checkbox"/> _____ 48 Hour _____ 5 Day _____ Normal _____
Relinquished By <i>Javier Vega</i>	Date/Time <i>12-7-18 16:50</i>	Company <i>Haley &amp; Aldrich</i>	Received By <i>Victor</i>	Date/Time <i>12-7-18 16:50</i>	Sample Integrity (Check) Intact <input checked="" type="checkbox"/> _____ On Ice: <input checked="" type="checkbox"/> _____
Relinquished By <i>Javier Vega</i>	Date/Time <i>12-7-18 9:05</i>	Company <i>Haley &amp; Aldrich</i>	Received By <i>Javier Vega</i>	Date/Time <i>12/7/18 21:00</i>	Store samples for 6 months. Data Requirements (Check) No Level IV _____ All Level IV: <input checked="" type="checkbox"/> _____



440-226822 Chain of Custody

0.9/1.1 3.9/4.1 2.4/2.6 11294

12/28/2018







## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226822-2

**Login Number: 226822**

**List Number: 1**

**Creator: Soderblom, Tim**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226822-2

**Login Number: 226822**

**List Number: 3**

**Creator: Her, David A**

**List Source: TestAmerica Sacramento**

**List Creation: 12/11/18 05:45 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (25-164)	TCDF (24-169)	PeCDD (25-181)	PeCDF (24-185)	PeCF (21-178)	HxCDD (32-141)	HxDD (28-130)	HxCDF (26-152)
440-226822-1	Outfall009_20181207_Comp	77	75	65	68	61	71	71	69
440-226822-1 - RA	Outfall009_20181207_Comp		78						
MB 320-264993/1-A	Method Blank	77	76	65	67	63	74	74	70

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (26-123)	HxCF (29-147)	13CHxCF (28-136)	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	OCDD (17-157)
440-226822-1	Outfall009_20181207_Comp	71	84	77	86	79	88	59
440-226822-1 - RA	Outfall009_20181207_Comp							
MB 320-264993/1-A	Method Blank	70	80	75	84	83	85	53

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD  
 HxCDF = 13C-1,2,3,4,7,8-HxCDF  
 HxDF = 13C-1,2,3,6,7,8-HxCDF  
 HxCF = 13C-1,2,3,7,8,9-HxCDF  
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
 HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
 OCDD = 13C-OCDD

## Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (20-175)	TCDF (22-152)	PeCDD (21-227)	PeCDF (21-192)	PeCF (13-328)	HxCDD (21-193)	HxDD (25-163)	HxCDF (19-202)
LCS 320-264993/2-A	Lab Control Sample	79	81	70	72	60	67	67	64
LCSD 320-264993/3-A	Lab Control Sample Dup	82	82	71	74	68	77	76	73

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HxDF (21-159)	HxCF (17-205)	13CHxCF (22-176)	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	OCDD (13-199)
LCS 320-264993/2-A	Lab Control Sample	69	90	78	94	85	98	72
LCSD 320-264993/3-A	Lab Control Sample Dup	73	88	79	91	87	94	63

#### Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD  
 TCDF = 13C-2,3,7,8-TCDF  
 PeCDD = 13C-1,2,3,7,8-PeCDD  
 PeCDF = 13C-1,2,3,7,8-PeCDF  
 PeCF = 13C-2,3,4,7,8-PeCDF  
 HxCDD = 13C-1,2,3,4,7,8-HxCDD  
 HxDD = 13C-1,2,3,6,7,8-HxCDD

TestAmerica Irvine

# Isotope Dilution Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-2

HxCDF = 13C-1,2,3,4,7,8-HxCDF  
HxDF = 13C-1,2,3,6,7,8-HxCDF  
HxCF = 13C-1,2,3,7,8,9-HxCDF  
13CHxCF = 13C-2,3,4,6,7,8-HxCDF  
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD  
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF  
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF  
OCDD = 13C-OCDD

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**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226822-3**

**Prepared for**

Haley & Aldrich, Inc.  
600 South Meyer Avenue, Suite 100  
Tucson, Arizona 85701

**22 January 2019**

MEC<sup>x</sup>, Inc.  
8864 Interchange Drive  
Houston, Texas 77054

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

I. INTRODUCTION..... 1

II. Sample Management..... 2

III. VARIOUS EPA METHODS —Radionuclides..... 6

    III.1. Holding Times:..... 6

    III.2. Calibration: ..... 6

    III.3. Quality Control Samples ..... 6

        III.3.1. Method Blanks..... 6

        III.3.2. Laboratory Control Samples: ..... 6

        III.3.3. Laboratory Duplicates:..... 6

        III.3.4. Matrix Spike/Matrix Spike Duplicate: ..... 6

    III.4. Sample Result Verification:..... 6

    III.5. Field QC Samples: ..... 7

        III.5.1. Field Blanks and Equipment Blanks: ..... 7

        III.5.2. Field Duplicates:..... 7

TABLES

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

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**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>x</sup> Project No.:** 1272.003H.01

**Sample Delivery Group:** 440-226822-3

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** III

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Outfall009_20181207 _Comp	440-226822-1	N/A	Water	12/07/2018 09:00	E900, E901.1, E903.0, E904.0, E905.0, E906.0, HASL-300 U Mod



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt forms and the chains-of-custody (COCs) provided by the laboratories for sample delivery group (SDG) 440-226822-3:

- The laboratories received the samples in this SDG on ice and within the temperature limits of  $\leq 6$  degrees Celsius ( $^{\circ}\text{C}$ ) and  $> 0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact.
- Field and laboratory personnel signed and dated the COCs.
- Some corrections to the original COCs were not initialed or dated. These cross-outs did not affect data quality.
- Sample containers were transferred to TestAmerica – St. Louis laboratory for all radionuclide analyses.





TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

**TABLE 3 - REASON CODE REFERENCE**

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. VARIOUS EPA METHODS — RADIONUCLIDES

---

E. Wessling of MEC<sup>x</sup> reviewed the SDGs on January 22, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the *EPA Methods 900, 901.1, 903.0, 904.0, 905.0, 906.0 and HASL-300 U Mod*, and the *National Functional Guidelines for Inorganic Data Review* (2014).

#### III.1. HOLDING TIMES:

The sample was received unpreserved. The sample was acidified and allowed to equilibrate. The sample was prepared within five days of preservation and analyzed following in-growth.

#### III.2. CALIBRATION:

The detector efficiencies were greater than 20% for all applicable isotopes; therefore, no qualifications were required. Carrier/tracer recoveries were within the laboratory control limits. Calibration checks were not verified at a Level III validation.

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. *METHOD BLANKS*

Target isotopes were not detected in the method blanks above the MDA. However, a comparison normalized absolute difference of the sample results and the method blank results indicated the method blank and the sample results were not significantly different at the 1% level of confidence for total uranium. The detected sample result for total uranium was qualified as nondetect (U). The comparison normalized absolute difference of the sample results and the method blank results indicated the method blank and the sample results were not significantly different at the 5% level of confidence for gross beta. The detected sample result for gross beta was qualified as estimated (J). No further qualifications were required.

##### III.3.2. *LABORATORY CONTROL SAMPLES:*

The recoveries and RPDs, as applicable, were within laboratory-established control limits.

##### III.3.3. *LABORATORY DUPLICATES:*

Laboratory duplicates were not performed on the sample in this SDG.

##### III.3.4. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE:*

Matrix spike (MS)/MSD analyses were performed on the sample in this SDG for total uranium, gross alpha, gross beta, radium-226, radium-228, strontium-90 and tritium. Recoveries and RPDs were within the laboratory control limits.

#### III.4. SAMPLE RESULT VERIFICATION:

An EPA Level III review was performed on the sample in this data package. As such, the sample results were not verified. Reported nondetects are valid to the MDC.



### III.5. FIELD QC SAMPLES:

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. The following are findings associated with field QC samples:

#### III.5.1. *FIELD BLANKS AND EQUIPMENT BLANKS:*

This SDG had no identified field blank or equipment blank samples.

#### III.5.2. *FIELD DUPLICATES:*

There were no field duplicate samples identified for this SDG.

# Validated Sample Result Forms: 4402268223

## Analysis Method E900

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Gross Alpha Analytes	GROSSALPHA	1.10	0.829	3.00	1.22	pCi/L	U	U	
Gross Beta Analytes	GROSSBETA	2.28	0.829	4.00	1.09	pCi/L		J	B

## Analysis Method E901.1

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Cesium-137	10045-97-3	3.71	7.73	20.0	13.5	pCi/L	U	U	
Potassium-40	13966-00-2	-23.2	87.3	178	178	pCi/L	U	U	

## Analysis Method E903.0

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226	13982-63-3	0.117	0.162	1.00	0.274	pCi/L	U	U	

## Analysis Method E904.0

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-228	15262-20-1	0.407	0.416	1.00	0.675	pCi/L	U	U	

*Analysis Method E905.0*

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Strontium-90	10098-97-2	0.0693	0.367	3.00	0.644	pCi/L	U	U	

*Analysis Method E906.0*

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Tritium	10028-17-8	-198	193	500	368	pCi/L	U	U	

*Analysis Method HASL-300 U Mod*

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Uranium	URANIUM	0.490	0.363	1.00	0.339	pCi/L		U	B

*Analysis Method RADIUM*

Sample Name OUTFALL009\_20181207\_COMP Matrix Type: WM Result Type: TRG

Sample Date: 12/7/2018 9:00:00 AM Validation Level: 9

Lab Sample Name: 440-226822-1

Analyte	CAS No	Result Value	Total Uncert.	RL	MDC	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Radium-226 & 228	RADIUM226228	0.675	0.445499					U	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226822-3

Client Project/Site: Semiannual Outfall 009 Comp

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/10/2019 10:23:33 PM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

### LINKS

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results through  
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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



---

Urvashi Patel  
Manager of Project Management  
1/10/2019 10:23:33 PM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
QC Sample Results . . . . .	10
QC Association Summary . . . . .	17
Definitions/Glossary . . . . .	19
Certification Summary . . . . .	20
Chain of Custody . . . . .	21
Receipt Checklists . . . . .	24
Tracer Carrier Summary . . . . .	26
Field Data Sheets . . . . .	28

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226822-1	Outfall009_20181207_Comp	Water	12/07/18 09:00	12/07/18 21:05

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

**Job ID: 440-226822-3**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative  
440-226822-3**

### Comments

No additional comments.

### Receipt

The samples were received on 12/7/2018 9:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1° C, 2.6° C and 4.1° C.

### Receipt Exceptions

The reference method requires samples to be preserved to a pH <2. The following samples were received with insufficient preservation at a pH of 7: Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD]). The samples were preserved with 10mL of nitric acid reagent #1598157, at 16:00 on 12/11/18 to reach the appropriate pH of 2 in the laboratory.

### RAD

Method(s) ExtChrom: Uranium Prep Batch 160-405494:

Samples Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD]) were prepared at a reduced aliquot due to gray and yellow discoloration and cloudiness.

Method(s) PrecSep\_0: Radium-228 Prep Batch 405521:

The following samples were prepared at a reduced aliquot due to sediment and discoloration: Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD]).

Method(s) PrecSep-21: Radium-226 Prep Batch 160-405504:

The following samples were prepared at a reduced aliquot due to sediment and discoloration: Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD]).

Method(s) PrecSep-21: Radium-226 Prep Batch 160-405504:

The following samples have a different barium carrier recovery than the accompanying Ra-228 analysis method. This is due to the planchets getting re-tared and re-weighed after the separation step.

Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD])

Method(s) PrecSep-7: Strontium-90 Prep Batch 405485:

The following samples were prepared at a reduced aliquot.

Outfall009\_20181207\_Comp (440-226822-1), Outfall009\_20181207\_Comp (440-226822-1[MSJ]) and Outfall009\_20181207\_Comp (440-226822-1[MSD])

Job number 440-226822, 440-226863, 440-226867, and 440-226869 contained samples with a yellow, cloudy matrix.

Sample 440-226830-I-1 contained black sediment.

The samples in job 280-117873 contained red sediment.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Gross Alpha	1.10	U	0.820	0.829	3.00	1.22	pCi/L	12/27/18 10:23	12/31/18 09:30	1
<b>Gross Beta</b>	<b>2.28</b>		0.797	0.829	4.00	1.09	pCi/L	12/27/18 10:23	12/31/18 09:30	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	3.71	U	7.72	7.73	20.0	13.5	pCi/L	12/12/18 02:07	12/12/18 06:14	1
Potassium-40	-23.2	U	87.2	87.3		178	pCi/L	12/12/18 02:07	12/12/18 06:14	1

## Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.117	U	0.162	0.162	1.00	0.274	pCi/L	12/13/18 11:03	01/04/19 08:38	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	49.9		40 - 110					12/13/18 11:03	01/04/19 08:38	1

## Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.407	U	0.415	0.416	1.00	0.675	pCi/L	12/13/18 13:19	12/21/18 14:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	74.9		40 - 110					12/13/18 13:19	12/21/18 14:10	1
Y Carrier	80.7		40 - 110					12/13/18 13:19	12/21/18 14:10	1

## Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.0693	U	0.367	0.367	3.00	0.644	pCi/L	12/13/18 08:52	12/31/18 11:18	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Sr Carrier	72.7		40 - 110					12/13/18 08:52	12/31/18 11:18	1
Y Carrier	89.7		40 - 110					12/13/18 08:52	12/31/18 11:18	1

## Method: 906.0 - Tritium, Total (LSC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	-198	U	193	193	500	368	pCi/L	01/07/19 11:23	01/07/19 18:31	1

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# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

**Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Total Uranium</b>	<b>0.490</b>		0.362	0.363	1.00	0.339	pCi/L	12/13/18 09:58	12/14/18 17:42	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	60.9		30 - 110					12/13/18 09:58	12/14/18 17:42	1



# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Cesium 137 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
905	Strontium-90 (GFPC)	EPA	TAL SL
906.0	Tritium, Total (LSC)	EPA	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Evaporation	Preparation, Evaporation	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-0	Fill Geometry, No In-Growth	None	TAL SL
LSC_Dist_Susp	Distillation and Suspension (LSC)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL
PrecSep-7	Preparation, Precipitate Separation (7-Day In-Growth)	None	TAL SL

#### Protocol References:

DOE = U.S. Department of Energy  
EPA = US Environmental Protection Agency  
None = None

#### Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Lab Chronicle

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

**Client Sample ID: Outfall009\_20181207\_Comp**

**Lab Sample ID: 440-226822-1**

**Date Collected: 12/07/18 09:00**

**Matrix: Water**

**Date Received: 12/07/18 21:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Evaporation			200 mL	1.0 g	407614	12/27/18 10:23	MRB	TAL SL
Total/NA	Analysis	900.0		1			408344	12/31/18 09:30	CDR	TAL SL
Total/NA	Prep	Fill_Geo-0			1000 mL	1.0 mL	405196	12/12/18 02:07	MPT	TAL SL
Total/NA	Analysis	901.1		1			405201	12/12/18 06:14	KLS	TAL SL
Total/NA	Prep	PrecSep-21			750.02 mL	1.0 g	405504	12/13/18 11:03	MMO	TAL SL
Total/NA	Analysis	903.0		1			408962	01/04/19 08:38	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.02 mL	1.0 g	405521	12/13/18 13:19	MMO	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	406931	12/21/18 14:10	CDR	TAL SL
Total/NA	Prep	PrecSep-7			500.53 mL	1.0 g	405485	12/13/18 08:52	HET	TAL SL
Total/NA	Analysis	905		1			408344	12/31/18 11:18	CDR	TAL SL
Total/NA	Prep	LSC_Dist_Susp			100.1 mL	1.0 g	409225	01/07/19 11:23	JDL	TAL SL
Total/NA	Analysis	906.0		1			409354	01/07/19 18:31	RTM	TAL SL
Total/NA	Prep	ExtChrom			250.63 mL	1.0 mL	405494	12/13/18 09:58	KNF	TAL SL
Total/NA	Analysis	A-01-R		1			405839	12/14/18 17:42	ALS	TAL SL

**Laboratory References:**

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

**Lab Sample ID: MB 160-407614/1-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Gross Alpha	0.6321	U	0.677	0.680	3.00	1.10	pCi/L	12/27/18 10:23	12/31/18 09:20	1
Gross Beta	-0.1631	U	0.514	0.514	4.00	0.930	pCi/L	12/27/18 10:23	12/31/18 09:20	1

**Lab Sample ID: LCS 160-407614/2-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Alpha	50.9	46.07		6.69	3.00	1.74	pCi/L	90	73 - 133

**Lab Sample ID: LCSB 160-407614/3-A**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Spike Added	LCSB Result	LCSB Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Gross Beta	87.1	86.97		9.22	4.00	0.929	pCi/L	100	75 - 125

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
						Uncert. (2σ+/-)					
Gross Alpha	1.10	U	50.9	38.18		5.35	3.00	1.02	pCi/L	73	60 - 140

**Lab Sample ID: 440-226822-1 MSBT**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBT Result	MSBT Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
						Uncert. (2σ+/-)					
Gross Beta	2.28		87.1	88.52		9.38	4.00	1.06	pCi/L	99	60 - 140

**Lab Sample ID: 440-226822-1 MSBTD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample Result	Sample Qual	Spike Added	MSBTD Result	MSBTD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
						Uncert. (2σ+/-)							
Gross Beta	2.28		87.1	87.44		9.26	4.00	1.04	pCi/L	98	60 - 140	0.06	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 900.0 - Gross Alpha and Gross Beta Radioactivity (Continued)

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 407614**

Analyte	Sample		Spike Added	MSD		Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
	Result	Qual		Result	Qual								
Gross Alpha	1.10	U	50.9	46.14		6.30	3.00	1.16	pCi/L	88	60 - 140	0.68	1

## Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

**Lab Sample ID: MB 160-405196/1-A**  
**Matrix: Water**  
**Analysis Batch: 405206**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Cesium-137	2.771	U	6.28	6.28	20.0	11.0	pCi/L	12/12/18 02:07	12/12/18 06:12	1
Potassium-40	-48.63	U	190	190		236	pCi/L	12/12/18 02:07	12/12/18 06:12	1

**Lab Sample ID: LCS 160-405196/2-A**  
**Matrix: Water**  
**Analysis Batch: 405207**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Cesium-137	45100	42160		4230	20.0	168	pCi/L	94	90 - 111
Cobalt-60	31300	30340		3000		66.0	pCi/L	97	89 - 110

**Lab Sample ID: 280-117873-B-1-B DU**  
**Matrix: Water**  
**Analysis Batch: 405207**

**Client Sample ID: Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 405196**

Analyte	Sample		DU DU		Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit
	Result	Qual	Result	Qual						
Cesium-137	-3.30	U	5.059	U	8.98	20.0	15.1	pCi/L	0.45	1
Potassium-40	1.18	U	25.26	U	141		185	pCi/L	0.08	1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-405504/20-A**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-226	0.09638	U	0.181	0.182	1.00	0.323	pCi/L	12/13/18 11:03	01/04/19 08:39	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	51.3		40 - 110					12/13/18 11:03	01/04/19 08:39	1

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 903.0 - Radium-226 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405504/1-A**  
**Matrix: Water**  
**Analysis Batch: 408961**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	13.80		1.60	1.00	0.236	pCi/L	91	68 - 137
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	63.4		40 - 110						

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	0.117	U	15.1	14.50		1.77	1.00	0.317	pCi/L	95	75 - 138
<b>Carrier</b>	<b>MS %Yield</b>	<b>MS Qualifier</b>	<b>Limits</b>								
Ba Carrier	45.4		40 - 110								

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 408962**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405504**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	0.117	U	15.1	15.06		1.84	1.00	0.365	pCi/L	99	75 - 138	0.15	1
<b>Carrier</b>	<b>MSD %Yield</b>	<b>MSD Qualifier</b>	<b>Limits</b>										
Ba Carrier	43.1		40 - 110										

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-405521/20-A**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.01266	U	0.314	0.314	1.00	0.566	pCi/L	12/13/18 13:19	12/21/18 14:11	1
<b>Carrier</b>	<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>		<b>Prepared</b>		<b>Analyzed</b>		<b>Dil Fac</b>	
Ba Carrier	90.0		40 - 110		12/13/18 13:19		12/21/18 14:11		1	
Y Carrier	81.9		40 - 110		12/13/18 13:19		12/21/18 14:11		1	

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# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405521/1-A**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	12.1	13.92		1.64	1.00	0.603	pCi/L	115	56 - 140
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Ba Carrier	90.6		40 - 110						
Y Carrier	76.3		40 - 110						

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	0.407	U	12.1	17.84		2.13	1.00	0.816	pCi/L	144	45 - 150
<b>MS MS</b>											
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Ba Carrier	70.2		40 - 110								
Y Carrier	71.4		40 - 110								

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 406931**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405521**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	0.407	U	12.1	13.69		1.68	1.00	0.666	pCi/L	109	45 - 150	1.09	1
<b>MSD MSD</b>													
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Ba Carrier	72.0		40 - 110										
Y Carrier	80.7		40 - 110										

## Method: 905 - Strontium-90 (GFPC)

**Lab Sample ID: MB 160-405485/17-A**  
**Matrix: Water**  
**Analysis Batch: 408308**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac		
Strontium-90	1.005		0.356	0.365	3.00	0.482	pCi/L	12/13/18 08:52	12/31/18 12:21	1		
<b>MB MB</b>												
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Sr Carrier	87.5		40 - 110							12/13/18 08:52	12/31/18 12:21	1
Y Carrier	93.1		40 - 110							12/13/18 08:52	12/31/18 12:21	1

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 905 - Strontium-90 (GFPC) (Continued)

**Lab Sample ID: LCS 160-405485/1-A**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Strontium-90	16.3	16.09		1.66	3.00	0.590	pCi/L	99	75 - 125
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Sr Carrier	86.5		40 - 110						
Y Carrier	91.6		40 - 110						

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 408344**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Strontium-90	0.0693	U	16.2	16.08		1.68	3.00	0.616	pCi/L	99	19 - 150
<b>MS MS</b>											
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Sr Carrier	79.7		40 - 110								
Y Carrier	93.1		40 - 110								

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 408333**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405485**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Strontium-90	0.0693	U	16.2	14.35		1.55	3.00	0.596	pCi/L	88	19 - 150	0.54	1
<b>MSD MSD</b>													
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Sr Carrier	72.0		40 - 110										
Y Carrier	93.8		40 - 110										

## Method: 906.0 - Tritium, Total (LSC)

**Lab Sample ID: MB 160-409225/1-A**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tritium	-243.2	U	191	192	500	374	pCi/L	01/07/19 11:23	01/07/19 17:46	1

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 906.0 - Tritium, Total (LSC) (Continued)

**Lab Sample ID: LCS 160-409225/2-A**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	2650	2230		404	500	380	pCi/L	84	74 - 114

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Tritium	-198	U	2650	2644		443	500	384	pCi/L	100	67 - 130

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 409354**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 409225**

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Tritium	-198	U	2660	2568		440	500	392	pCi/L	97	67 - 130	0.09	1

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

**Lab Sample ID: MB 160-405494/1-A**  
**Matrix: Water**  
**Analysis Batch: 405954**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Uranium	0.1880	U	0.175	0.175	1.00	0.191	pCi/L	12/13/18 09:58	12/14/18 17:43	1
<b>Tracer</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Uranium-232	87.7		30 - 110					12/13/18 09:58	12/14/18 17:43	1

**Lab Sample ID: LCS 160-405494/2-A**  
**Matrix: Water**  
**Analysis Batch: 405955**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Uranium-234	12.7	12.06		1.52	1.00	0.201	pCi/L	95	75 - 125
Uranium-238	13.0	12.91		1.59	1.00	0.136	pCi/L	99	75 - 125
<b>Tracer</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Uranium-232	84.0		30 - 110						

# QC Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

**Lab Sample ID: 440-226822-1 MS**  
**Matrix: Water**  
**Analysis Batch: 405841**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Sample	Sample	Spike Added	MS	MS	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
	Result	Qual		Result	Qual						
Uranium-234	0.347		25.4	23.35		3.51	1.00	0.550	pCi/L	90	65 - 146
Uranium-238	0.157	U	26.0	25.55		3.72	1.00	0.549	pCi/L	98	68 - 143
<b>MS MS</b>											
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Uranium-232	40.8		30 - 110								

**Lab Sample ID: 440-226822-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 405842**

**Client Sample ID: Outfall009\_20181207\_Comp**  
**Prep Type: Total/NA**  
**Prep Batch: 405494**

Analyte	Sample	Sample	Spike Added	MSD	MSD	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
	Result	Qual		Result	Qual								
Uranium-234	0.347		25.5	24.00		3.98	1.00	0.747	pCi/L	93	65 - 146	0.09	1
Uranium-238	0.157	U	26.0	25.07		4.09	1.00	0.694	pCi/L	96	68 - 143	0.06	1
<b>MSD MSD</b>													
<b>Tracer</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>										
Uranium-232	30.3		30 - 110										

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Rad

### Prep Batch: 405196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	Fill_Geo-0	
MB 160-405196/1-A	Method Blank	Total/NA	Water	Fill_Geo-0	
LCS 160-405196/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-0	
280-117873-B-1-B DU	Duplicate	Total/NA	Water	Fill_Geo-0	

### Prep Batch: 405485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-7	
MB 160-405485/17-A	Method Blank	Total/NA	Water	PrecSep-7	
LCS 160-405485/1-A	Lab Control Sample	Total/NA	Water	PrecSep-7	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-7	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-7	

### Prep Batch: 405494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	ExtChrom	
MB 160-405494/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-405494/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	ExtChrom	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	ExtChrom	

### Prep Batch: 405504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-21	
MB 160-405504/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-405504/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-21	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	PrecSep-21	

### Prep Batch: 405521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	PrecSep_0	
MB 160-405521/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-405521/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	PrecSep_0	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	PrecSep_0	

### Prep Batch: 407614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	Evaporation	
MB 160-407614/1-A	Method Blank	Total/NA	Water	Evaporation	
LCS 160-407614/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-407614/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	Evaporation	
440-226822-1 MSBT	Outfall009_20181207_Comp	Total/NA	Water	Evaporation	
440-226822-1 MSBTD	Outfall009_20181207_Comp	Total/NA	Water	Evaporation	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	Evaporation	

### Prep Batch: 409225

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226822-1	Outfall009_20181207_Comp	Total/NA	Water	LSC_Dist_Susp	

TestAmerica Irvine



# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Rad (Continued)

### Prep Batch: 409225 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-409225/1-A	Method Blank	Total/NA	Water	LSC_Dist_Susp	
LCS 160-409225/2-A	Lab Control Sample	Total/NA	Water	LSC_Dist_Susp	
440-226822-1 MS	Outfall009_20181207_Comp	Total/NA	Water	LSC_Dist_Susp	
440-226822-1 MSD	Outfall009_20181207_Comp	Total/NA	Water	LSC_Dist_Susp	

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# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

## Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	90125	12-31-18 *
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19 *
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

CHAIN OF CUSTODY FORM

Client Name/Address. Haley & Aldrich, Inc. 5333 Mission Center Rd Suite 300 San Diego, CA 92108		Project: Boeing-SSFL NPDES Permit 2018 Semiannual Outfall [003-007, 009, 010] Outfall 009 Comp		R	R	S/R	R	R	R	R	R	R	R	R	R	R	R	R	ANALYSIS REQUIRED	Comments						
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055		Project Manager: Katherine Miller 520.289.8606, 520.904.6944 (cell)		Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl TODD (and all congeners) (E1613B) Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300) TDS (SM2540C/E160.1) Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1) Cyanide (SM4500-CN-E / E335.2) Chronic Toxicity - Selenium (EPA-821-R-02-013) Total Recoverable Metals: Mercury (E245.1) Total Dissolved Metals: Mercury (E245.1) TSS (160.2 (SM2540D))																						
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement # 2015-18. TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc		Field Manager: Mark Dominick 978.234.5033, 818.599.0702 (cell)		Sampler: Dan Smith <i>Dan Smith</i>																						
Sample Description	Sample I.D.	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	Total Recoverable Metals (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	TODD (and all congeners) (E1613B)	Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate (E300)	TDS (SM2540C/E160.1)	Total Dissolved Metals: (E200.7): Ni, Zn (E200.8); Ag, Cu, Pb, Sb, Se, Tl	Gross Alpha (E900.0), Gross Beta (E900.0), Tritium (H-3) (E906.0), Sr-90 (E905.0), Total Combined Radium 226 (E903.0 or E903.1) & Radium 228 (E904.0), Uranium (E908.0), K-40, CS-137 (E901.0 or E901.1)	Cyanide (SM4500-CN-E / E335.2)	Chronic Toxicity - Selenium (EPA-821-R-02-013)	Total Recoverable Metals: Mercury (E245.1)	Total Dissolved Metals: Mercury (E245.1)	TSS (160.2 (SM2540D))	ANALYSIS REQUIRED	Comments					
Outfall 009	Outfall009_20181207_Comp	12/7/2018 <i>6:40</i>	WM	500 mL Poly	3	HNO <sub>3</sub>	95	Yes	X																	
			WM	1 L Glass Amber	2	None	110	No			X															
			WM	500 mL Poly	6	None	140	Yes				X												48 hours Holding Time NO3 & NO2		
			WM	500 mL Poly	1	None	155	No					X													
			WM	500 mL Poly	3	NaOH	220	Yes									X									
			WM	2.5 Gal Cube	3	None	225	Yes								X									Unfiltered and unpreserved analysis. Separate RAD onto another workorder. Analyze duplicate, not MS/MSD	
			WM	1 L Glass Amber	3	None	230	Yes																	Only test if first or second rain events of the year	
			WM	borosilicate vials	2	HNO <sub>3</sub>	315	Yes												X						Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures
			WM	1 L Poly	1	None	185	No														X				
			WM	1 L Poly	3	None	205	Yes						X												Filter and preserve w/in 24hrs of receipt at lab
Outfall009_20181207_Comp_F		12/7/2018 <i>6:50</i>	WM	borosilicate vials	3	None	320	Yes											X				Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures			
Outfall009_20181207_Comp_Extra		12/7/2018 <i>7:40</i>	WM	1 L Glass Amber	2	None	110	No			H												Hold			
			WM	500 mL Poly	2	None	145	No				H												Hold		

Page 21 of 28

Relinquished By <i>Mark Dominick</i> Date/Time <i>12-7-18/14:35</i> Company <i>Haley &amp; Aldrich</i>	Received By <i>Javier Vega</i> Date/Time <i>12-7-18 14:35</i>	Turn-around time (Check) 24 Hour _____ 72 Hour _____ 10 Day <input checked="" type="checkbox"/> 48 Hour _____ 5 Day _____ Normal _____
Relinquished By <i>Javier Vega</i> Date/Time <i>12-7-18 16:50</i> Company <i>Javier Vega</i>	Received By <i>Victor</i> Date/Time <i>12-7-18 16:50</i>	Sample Integrity (Check) Intact <input checked="" type="checkbox"/> On Ice: <input checked="" type="checkbox"/>
Relinquished By <i>Javier Vega</i> Date/Time <i>12-7-18 9:05</i> Company <i>Javier Vega</i>	Received By <i>Javier Vega</i> Date/Time <i>12/7/18</i> <i>TA IRV 2103</i>	Store samples for 6 months. Data Requirements (Check) No Level IV _____ All Level IV: <input checked="" type="checkbox"/>



440-226822 Chain of Custody

0.9/1.1 3.9/4.1 2.4/2.6 11294

1/10/2019









# Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226822-3

**Login Number: 226822**

**List Source: TestAmerica Irvine**

**List Number: 1**

**Creator: Soderblom, Tim**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226822-3

**Login Number: 226822**

**List Number: 2**

**Creator: Dupart, Lacey S**

**List Source: TestAmerica St. Louis**

**List Creation: 12/11/18 03:43 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
 Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)		
440-226822-1	Outfall009_20181207_Comp	49.9		
440-226822-1 MS	Outfall009_20181207_Comp	45.4		
440-226822-1 MSD	Outfall009_20181207_Comp	43.1		
LCS 160-405504/1-A	Lab Control Sample	63.4		
MB 160-405504/20-A	Method Blank	51.3		
<b>Tracer/Carrier Legend</b>				
Ba Carrier = Ba Carrier				

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

				Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)		
440-226822-1	Outfall009_20181207_Comp	74.9	80.7		
440-226822-1 MS	Outfall009_20181207_Comp	70.2	71.4		
440-226822-1 MSD	Outfall009_20181207_Comp	72.0	80.7		
LCS 160-405521/1-A	Lab Control Sample	90.6	76.3		
MB 160-405521/20-A	Method Blank	90.0	81.9		
<b>Tracer/Carrier Legend</b>					
Ba Carrier = Ba Carrier					
Y Carrier = Y Carrier					

## Method: 905 - Strontium-90 (GFPC)

Matrix: Water

Prep Type: Total/NA

				Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Sr Carrier (40-110)	Y Carrier (40-110)		
440-226822-1	Outfall009_20181207_Comp	72.7	89.7		
440-226822-1 MS	Outfall009_20181207_Comp	79.7	93.1		
440-226822-1 MSD	Outfall009_20181207_Comp	72.0	93.8		
LCS 160-405485/1-A	Lab Control Sample	86.5	91.6		
MB 160-405485/17-A	Method Blank	87.5	93.1		
<b>Tracer/Carrier Legend</b>					
Sr Carrier = Sr Carrier					
Y Carrier = Y Carrier					

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	uranium-23 (30-110)		
440-226822-1	Outfall009_20181207_Comp	60.9		
440-226822-1 MS	Outfall009_20181207_Comp	40.8		
440-226822-1 MSD	Outfall009_20181207_Comp	30.3		

TestAmerica Irvine

# Tracer/Carrier Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Semiannual Outfall 009 Comp

TestAmerica Job ID: 440-226822-3

## Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	uranium-23 (30-110)
LCS 160-405494/2-A	Lab Control Sample	84.0
MB 160-405494/1-A	Method Blank	87.7

### Tracer/Carrier Legend

Uranium-232 = Uranium-232

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## Sacramento Sample Receiving Notes



Job: 440-226822 Field Sheet

Tracking # 4538 3728 1540 SO (PO) FO / 2-Day / SAT / Ground / UPS / Courier /  
Drop Off / GSO / OnTrac / Goldstreak / USPS / Other \_\_\_\_\_

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	Therm. ID: <u>AK-2 / AK-3</u> <u>(AK-5)</u> / AK-6 / HACCP / Other _____ <small>(+0.7°C)</small>
	Ice <input checked="" type="checkbox"/> Wet <input checked="" type="checkbox"/> Gel _____ Other _____
	Cooler Custody Seal: <u>Seal</u>
	Sample Custody Seal: _____
	Cooler ID: _____
	Temp: Observed <u>10</u> Corrected <u>10</u>
	From: Temp Blank <input type="checkbox"/> Sample <input checked="" type="checkbox"/>
	NCM Filed: Yes <input type="checkbox"/> No <input type="checkbox"/>

	Yes	No	NA
Perchlorate has headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alkalinity has no headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CoC is complete w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample preservatives verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cooler compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples compromised/tampered with?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples w/o discrepancies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample containers have legible labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Containers are not broken or leaking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample date/times are provided.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate containers are used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample bottles are completely filled?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zero headspace?*	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Multiphasic samples are not present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample temp OK?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample out of temp?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Initials: JM Date: 12-11-18

\*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

*WVW*

---

**DATA VALIDATION REPORT**

**Boeing SSFL NPDES**

**SAMPLE DELIVERY GROUP: 440-226534-1**

**Prepared for**

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

**9 January 2019**

**MEC<sup>x</sup>, Inc.**  
12269 East Vassar Drive  
Aurora, Colorado 80014

[www.mecx.net](http://www.mecx.net)





TABLE OF CONTENTS

- I. INTRODUCTION..... 1
- II. Sample Management..... 2
- III. Method Analyses – 608 Pesticides and PCBs..... 6
  - III.1. Holding Times ..... 6
  - III.2. Calibration..... 6
  - III.3. Quality Control Samples ..... 6
    - III.3.1. Method Blanks ..... 6
    - III.3.2. Laboratory Control Samples ..... 6
    - III.3.3. Surrogate Recovery..... 6
    - III.3.4. Matrix Spike/Matrix Spike Duplicate ..... 6
  - III.4. Field QC Samples..... 6
    - III.4.1. Field Blanks and Equipment Blanks ..... 6
    - III.4.2. Field Duplicates..... 7
  - III.5. Compound Identification ..... 7
  - III.6. Compound Quantification and Reported Detection Limits ..... 7
  - III.7. System Performance..... 7
- IV. EPA METHOD 525.2— Semivolatile Organic Compounds (SVOCs)..... 7
  - IV.1. Holding Times ..... 7
  - IV.2. GC/MS Tuning and Calibration ..... 7
  - IV.3. Quality Control Samples ..... 7
    - IV.3.1. Method Blanks ..... 7
    - IV.3.2. Laboratory Control Samples ..... 7
    - IV.3.3. Surrogate Recovery..... 8
    - IV.3.4. Matrix Spike/Matrix Spike Duplicate ..... 8
  - IV.4. Field QC Samples..... 8
    - IV.4.1. Field Blanks and Equipment Blanks ..... 8



- IV.4.2. Field Duplicates ..... 8
- IV.5. Internal Standards Performance..... 8
- IV.6. Compound Identification ..... 8
- IV.7. Compound Quantification and Reported Detection Limits ..... 8
- IV.8. System Performance..... 8
- V. Method SM2340B —Hardness ..... 8
  - V.1. Holding Times ..... 8
  - V.2. MS Tuning and Calibration..... 9
  - V.3. Quality Control Samples ..... 9
    - V.3.1. Method Blanks ..... 9
    - V.3.2. Interference Check Samples: ..... 9
    - V.3.3. Laboratory Control Samples ..... 9
    - V.3.4. Laboratory Duplicates:..... 9
    - V.3.5. Matrix Spike/Matrix Spike Duplicate ..... 9
  - V.4. Serial Dilution..... 9
  - V.5. Internal Standards Performance..... 9
  - V.6. Compound Quantification and Reported Detection Limits ..... 9
  - V.7. Field QC Samples..... 9
    - V.7.1. Field Blanks and Equipment Blanks ..... 10
    - V.7.2. Field Duplicates ..... 10

**TABLES**

- 1 – Sample Identification
- 2 – Data Qualifier Reference
- 3 - Reason Code Reference



## I. INTRODUCTION

---

**Task Order Title:** Boeing SSFL NPDES

**Contract:** 40458-078 and 40458-083

**MEC<sup>x</sup> Project No.:** 1272.003D.01 002

**Sample Delivery Group:** 440-226534-1

**Project Manager:** Katherine Miller

**Matrix:** Water

**QC Level:** IV

**No. of Samples:** 1

**No. of Reanalyses/Dilutions:** 0

**Laboratory:** TestAmerica-Irvine

**TABLE 1 - SAMPLE IDENTIFICATION**

Sample Name	Lab Sample Name	Sub Lab Sample ID	Matrix	Collection	Method
Arroyo_Simi_20181206 _Grab	440-226534-1	N/A	Water	12/06/2018 12:35 AM	E608, E525.2 SM2340



## II. SAMPLE MANAGEMENT

---

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-226534-1:

- The laboratories received the sample in this SDG on ice and within the temperature limits of less than 6 degrees Celsius ( $^{\circ}\text{C}$ ) and greater than  $0^{\circ}\text{C}$ .
- The laboratories received the sample containers intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the original COC, and transfer COCs were signed by personnel from both laboratories.
- According to the Login Sample Receipt Checklist, custody seals were absent on the cooler upon receipt at TA-Irvine; however, no evidence of tampering was noted.
- Method 608, for low level PCBs, was subcontracted to Eurofins Lancaster Laboratories Env LLC. Method 525.2, for diazinon and chlorpyrifos, was subcontracted to Weck Laboratories, Inc.
- The Receipt Documentation log from Eurofins noted the shipping container was sealed; however, custody seals were absent.





TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.



TABLE 3 - REASON CODE REFERENCE

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination ( $r^2$ ) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.



Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
§	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. METHOD ANALYSES – 608 PESTICIDES AND PCBs

---

L. Calvin of MEC<sup>x</sup> reviewed the SDG on January 15, 2019

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for Organochlorine Pesticides/PCBs by GC (DVP-4, Rev. 1)*, EPA Method 608, and the *National Functional Guidelines for Superfund Organic Methods Data Review* (2017).

#### III.1. HOLDING TIMES

Extraction and analytical holding times were met. The sample was extracted within seven days of collection and analyzed within 40 days of extraction.

#### III.2. CALIBRATION

The pesticide initial calibration %RSDs were  $\leq 10\%$  or  $r^2 \geq 0.990$  on both analytical columns. The average %RSD of the Aroclor 1016 initial calibration exceeded 10% (10.7%) on the primary analytical column and within the control limit on the secondary column; however, the laboratory also analyzed six-point initial calibrations for Aroclors 1248, 1254, and 1260 with acceptable %RSDs on both analytical columns. In the professional judgement of the reviewer, no qualifications were assigned. The initial calibration verification (ICV) and continuing calibration verification (CCV) %Ds were within the control limit of  $\leq 15\%$ .

#### III.3. QUALITY CONTROL SAMPLES

##### III.3.1. METHOD BLANKS

Target compounds were not detected in method blanks.

##### III.3.2. LABORATORY CONTROL SAMPLES

Recoveries were within the laboratory control limits, and RPDs for the PCB LCS/LCSD were within the control limit of  $\leq 30\%$ . Chlordane and toxaphene were not spiked in the pesticide LCS.

##### III.3.3. SURROGATE RECOVERY

Pesticide surrogate tetrachloro-m-xylene (TCMX) and PCB surrogate decachlorobiphenyl (DCB) were recovered within the laboratory control limits of 10-150% and 10-148%, respectively, in the site sample.

##### III.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Matrix spike (MS)/MS duplicate (MSD) analyses were performed on sample Arroyo\_Simi\_20181206\_Grab of this SDG for pesticides. Recoveries and RPDs were within the laboratory control limits. Chlordane and toxaphene were not spiked in the MS/MSD. Method accuracy and precision for PCBs was evaluated based on the LCS/LCSD results.

#### III.4. FIELD QC SAMPLES

MEC<sup>x</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>x</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

##### III.4.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.



### III.4.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

### III.5. COMPOUND IDENTIFICATION

Compound identification was verified. Review of the sample chromatograms and retention times indicated no issues with target compound identification. The laboratory analyzed for six select pesticides and seven Aroclors by Method 608. Aroclors were not detected in the site sample. The intercolumn RPD of 17% for the 4,4'-DDE detect was within the control limit of  $\leq 40\%$ .

### III.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibrations and the laboratory MDLs. The detect below the RL for 4,4'-DDE was flagged as DNQ to comply with permit reporting. Reported nondetects are valid to the reporting limit.

### III.7. SYSTEM PERFORMANCE

Review of the raw data indicated no issues with system performance.

## IV. EPA METHOD 525.2— SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)

---

E. Wessling of MEC<sup>x</sup> reviewed the SDG on January 18, 2019

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC<sup>x</sup> *Data Validation Procedure for Semivolatile Organics* (DVP-3, Rev. 1), *EPA Method 525.2*, and the *National Functional Guidelines for Superfund Organic Methods Data Review* (2017). The sample was validated at Level III.

### IV.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted within 24 hours of collection and analyzed within 30 days of extraction.

### IV.2. GC/MS TUNING AND CALIBRATION

As the analyses were acquired in SIM mode, tuning was not applicable.

Calibration criteria were met. The initial calibration average RRFs were  $\geq 0.05$  and %RSDs  $\leq 30\%$  or  $r^2 \geq 0.990$ . The continuing calibration RRFs were  $\geq 0.05$  and recoveries were within the method QC limits of 70-130%.

### IV.3. QUALITY CONTROL SAMPLES

#### IV.3.1. METHOD BLANKS

Target compounds were not detected in the method blank.

#### IV.3.2. LABORATORY CONTROL SAMPLES

The recoveries were within the laboratory control limits of 37-169% for chlorpyrifos and 43-152% for diazinon.



#### IV.3.3. **SURROGATE RECOVERY**

Recoveries of both surrogates were within laboratory control limits of 76-128% for 1,3-dimethyl-2-nitrobenzene and 40-163% for triphenyl phosphite.

#### IV.3.4. **MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were not performed on the sample in this SDG. Method accuracy was evaluated based upon LCS recoveries.

#### IV.4. **FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

##### IV.4.1. **FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

##### IV.4.2. **FIELD DUPLICATES**

Field duplicate samples were not identified in this SDG.

#### IV.5. **INTERNAL STANDARDS PERFORMANCE**

The internal standard performance was not evaluated at Level III.

#### IV.6. **COMPOUND IDENTIFICATION**

Compound identification was not verified at Level III. The laboratory analyzed for chlorpyrifos and diazinon by Method 525.2.

#### IV.7. **COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Compound quantification was not verified at Level III. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit. The sample was analyzed at a 5× dilution prior to analysis due to potential matrix interference. The reporting limits and MDLs were adjusted accordingly.

#### IV.8. **SYSTEM PERFORMANCE**

System performance was not evaluated at Level III.

### V. **METHOD SM2340B —HARDNESS**

---

M. Hilchey of MEC<sup>X</sup> reviewed the SDG on January 9, 2019.

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC<sup>X</sup> Data Validation Procedure for Metals (DVP-5, Rev. 2)*, *EPA Method 200.7, Standard Methods for the Examination of Water and Wastewater 2340B*, and the *National Functional Guidelines for Inorganic Data Review (2014)*.

#### V.1. **HOLDING TIMES**

---



The analytical holding time, six months for metals, were met.

## **V.2. MS TUNING AND CALIBRATION**

QAPP calibration criteria were met. A blank and three standards were used for calibration of ICP-AES. The initial calibration  $r$  values were  $\geq 0.995$ . CRQL recoveries were within the laboratory control limits of 50-150%. Initial calibration verification recoveries were within QAPP control limits of 95-105%. Continuing calibration verification recoveries were within QAPP control limits of 90-110%.

## **V.3. QUALITY CONTROL SAMPLES**

### **V.3.1. METHOD BLANKS**

There were no target analyte detections in the method blank and calibration blanks.

### **V.3.2. INTERFERENCE CHECK SAMPLES:**

ICP-AES ICSAB recoveries were within the control limits of 80-120% or  $\pm 2\times$  the reporting limit, whichever is greater. As both target analytes were spiked for ICSA, interference was not evaluated.

### **V.3.3. LABORATORY CONTROL SAMPLES**

Laboratory control samples recoveries were within the QAPP control limits of 85-115%.

### **V.3.4. LABORATORY DUPLICATES:**

Laboratory duplicate analyses were not performed on the sample in this SDG.

### **V.3.5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

MS/MSD analyses were performed on the sample in this SDG for ICP-AES. Results were not assessed when the parent sample concentration exceeded the spike amount by  $4\times$ . Recoveries and RPDs were within the QAPP control limits of 70-130% and  $\leq 20\%$ , respectively, for all target analytes.

## **V.4. SERIAL DILUTION**

No serial dilution analyses were performed on a sample in this SDG.

## **V.5. INTERNAL STANDARDS PERFORMANCE**

Internal standard review is not applicable to this method.

## **V.6. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS**

Calculations for ICP-AES and hardness were verified, and the sample results reported on the sample result summary were verified against the raw data. No transcription errors or calculation errors were noted. Nondetects are valid to the MDL.

## **V.7. FIELD QC SAMPLES**

MEC<sup>X</sup> evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC<sup>X</sup> used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:



**V.7.1. FIELD BLANKS AND EQUIPMENT BLANKS**

Field blank or equipment blank samples were not identified for this SDG.

**V.7.2. FIELD DUPLICATES**

There were no field duplicate samples identified for this SDG.



# Validated Sample Result Forms: 4402265341

## Analysis Method E525.2M

Sample Name ARROYO\_SIMI\_20181206\_GRAB Matrix Type: WS Result Type: TRG

Sample Date: 12/6/2018 12:35:00 PM Validation Level: 8

Lab Sample Name: 440-226534-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chlorpyrifos	N	2921-88-2		50	34	ng/L	U, M-02	U	
Diazinon	N	333-41-5		50	26	ng/L	U, M-02	U	

## Analysis Method E608

Sample Name ARROYO\_SIMI\_20181206\_GRAB Matrix Type: WS Result Type: TRG

Sample Date: 12/6/2018 12:35:00 PM Validation Level: 8

Lab Sample Name: 440-226534-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
4,4'-DDD	N	72-54-8		0.0052	0.0041	ug/L	U	U	
4,4'-DDE	N	72-55-9	0.0040	0.0052	0.0031	ug/L	J,DX	J	DNQ
4,4'-DDT	N	50-29-3		0.010	0.0041	ug/L	U	U	
Aroclor-1016 (PCB-1016)	N	12674-11-2		0.52	0.10	ug/L	U	U	
Aroclor-1221 (PCB-1221)	N	11104-28-2		0.52	0.10	ug/L	U	U	
Aroclor-1232 (PCB-1232)	N	11141-16-5		0.52	0.10	ug/L	U	U	
Aroclor-1242 (PCB-1242)	N	53469-21-9		0.52	0.10	ug/L	U	U	
Aroclor-1248 (PCB-1248)	N	12672-29-6		0.52	0.10	ug/L	U	U	
Aroclor-1254 (PCB-1254)	N	11097-69-1		0.52	0.10	ug/L	U	U	
Aroclor-1260 (PCB-1260)	N	11096-82-5		0.52	0.10	ug/L	U	U	
Chlordane	N	57-74-9		0.10	0.082	ug/L	U	U	
Dieldrin	N	60-57-1		0.0052	0.0021	ug/L	U	U	
Toxaphene	N	8001-35-2		0.52	0.10	ug/L	U	U	

## Analysis Method SM2340

Sample Name ARROYO\_SIMI\_20181206\_GRAB Matrix Type: WS Result Type: TRG

Sample Date: 12/6/2018 12:35:00 PM Validation Level: 8

Lab Sample Name: 440-226534-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	T	HARDNESSCA CO3	73	0.33	0.17	mg/L			

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine

17461 Derian Ave

Suite 100

Irvine, CA 92614-5817

Tel: (949)261-1022

TestAmerica Job ID: 440-226534-1

Client Project/Site: Quarterly Arroyo Simi-Frontier Park

Revision: 1

For:

Haley & Aldrich, Inc.

400 E Van Buren St.

Suite 545

Phoenix, Arizona 85004

Attn: Katherine Miller



Authorized for release by:

1/3/2019 11:26:09 AM

Urvashi Patel, Manager of Project Management

(949)261-1022

[urvashi.patel@testamericainc.com](mailto:urvashi.patel@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.



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Urvashi Patel  
Manager of Project Management  
1/3/2019 11:26:09 AM



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Sample Summary . . . . .	4
Case Narrative . . . . .	5
Client Sample Results . . . . .	6
Method Summary . . . . .	7
Lab Chronicle . . . . .	8
QC Sample Results . . . . .	9
QC Association Summary . . . . .	11
Definitions/Glossary . . . . .	12
Certification Summary . . . . .	13
Subcontract Data . . . . .	14
Chain of Custody . . . . .	26
Receipt Checklists . . . . .	27

# Sample Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-226534-1	Arroyo_Simi_20181206_Grab	Water	12/06/18 12:35	12/06/18 18:00

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# Case Narrative

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

**Job ID: 440-226534-1**

**Laboratory: TestAmerica Irvine**

## Narrative

**Job Narrative**  
**440-226534-1**

### Comments

Revision created to remove PCB from TA as PCB was reported from Sublab (Eurofins)

### Receipt

The samples were received on 12/6/2018 6:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

### GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Subcontract non-Sister

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Subcontract Work

Method 608\_LL-PCB- Lancaster Labs: This method was subcontracted to Eurofins Lancaster Laboratories Env LLC. The subcontract laboratory certification is different from that of the facility issuing the final report.

Method Weck-525.2-Diazinon and Chlorpyrifos: This method was subcontracted to Weck Laboratories, Inc.. The subcontract laboratory certification is different from that of the facility issuing the final report.

# Client Sample Results

Client: Haley & Aldrich, Inc.  
 Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

**Client Sample ID: Arroyo\_Simi\_20181206\_Grab**

**Lab Sample ID: 440-226534-1**

**Date Collected: 12/06/18 12:35**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

**Method: 608 - Organochlorine Pesticides in Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.10	0.082	ug/L		12/07/18 06:07	12/07/18 16:53	1
Dieldrin	ND		0.0052	0.0021	ug/L		12/07/18 06:07	12/07/18 16:53	1
Toxaphene	ND		0.52	0.26	ug/L		12/07/18 06:07	12/07/18 16:53	1
4,4'-DDD	ND		0.0052	0.0041	ug/L		12/07/18 06:07	12/07/18 16:53	1
<b>4,4'-DDE</b>	<b>0.0040</b>	<b>J,DX</b>	0.0052	0.0031	ug/L		12/07/18 06:07	12/07/18 16:53	1
4,4'-DDT	ND		0.010	0.0041	ug/L		12/07/18 06:07	12/07/18 16:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Tetrachloro-m-xylene</i>	53		10 - 150	12/07/18 06:07	12/07/18 16:53	1

**Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Hardness, as CaCO3</b>	<b>73</b>		0.33	0.17	mg/L			12/09/18 16:08	1

# Method Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

Method	Method Description	Protocol	Laboratory
608	Organochlorine Pesticides in Water	40CFR136A	TAL IRV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
Subcontract	608_LL-PCB- Lancaster Labs	None	SC0103
Subcontract	Weck-525.2-Diazinon and Chlorpyrifos	None	Weck Lab
608	Liquid-Liquid Extraction (Separatory Funnel)	40CFR136A	TAL IRV

#### Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

#### Laboratory References:

SC0103 = Eurofins Lancaster Laboratories Env LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396



# Lab Chronicle

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

**Client Sample ID: Arroyo\_Simi\_20181206\_Grab**

**Lab Sample ID: 440-226534-1**

**Date Collected: 12/06/18 12:35**

**Matrix: Water**

**Date Received: 12/06/18 18:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	608			970 mL	2 mL	515512	12/07/18 06:07	L1H	TAL IRV
Total/NA	Analysis	608		1			515629	12/07/18 16:53	D1D	TAL IRV
Total Recoverable	Analysis	SM 2340B		1			514864	12/09/18 16:08	B1H	TAL IRV

## Laboratory References:

SC0103 = Eurofins Lancaster Laboratories Env LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

## Method: 608 - Organochlorine Pesticides in Water

**Lab Sample ID: MB 440-515512/1-A**  
**Matrix: Water**  
**Analysis Batch: 515629**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 515512**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.10	0.080	ug/L		12/07/18 06:07	12/07/18 15:10	1
Dieldrin	ND		0.0050	0.0020	ug/L		12/07/18 06:07	12/07/18 15:10	1
Toxaphene	ND		0.50	0.25	ug/L		12/07/18 06:07	12/07/18 15:10	1
4,4'-DDD	ND		0.0050	0.0040	ug/L		12/07/18 06:07	12/07/18 15:10	1
4,4'-DDE	ND		0.0050	0.0030	ug/L		12/07/18 06:07	12/07/18 15:10	1
4,4'-DDT	ND		0.010	0.0040	ug/L		12/07/18 06:07	12/07/18 15:10	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	58		10 - 150	12/07/18 06:07	12/07/18 15:10	1

**Lab Sample ID: LCS 440-515512/2-A**  
**Matrix: Water**  
**Analysis Batch: 515629**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 515512**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Dieldrin	0.250	0.191		ug/L		76	36 - 146
4,4'-DDD	0.250	0.182		ug/L		73	31 - 141
4,4'-DDE	0.250	0.189		ug/L		76	30 - 145
4,4'-DDT	0.250	0.200		ug/L		80	25 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	63		10 - 150

**Lab Sample ID: 440-226534-1 MS**  
**Matrix: Water**  
**Analysis Batch: 515629**

**Client Sample ID: Arroyo\_Simi\_20181206\_Grab**  
**Prep Type: Total/NA**  
**Prep Batch: 515512**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Dieldrin	ND		0.262	0.221		ug/L		85	50 - 120
4,4'-DDD	ND		0.262	0.214		ug/L		82	50 - 125
4,4'-DDE	0.0040	J,DX	0.262	0.212		ug/L		80	45 - 125
4,4'-DDT	ND		0.262	0.221		ug/L		84	50 - 125

Surrogate	MS %Recovery	MS Qualifier	Limits
Tetrachloro-m-xylene	69		10 - 150

**Lab Sample ID: 440-226534-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 515629**

**Client Sample ID: Arroyo\_Simi\_20181206\_Grab**  
**Prep Type: Total/NA**  
**Prep Batch: 515512**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Dieldrin	ND		0.258	0.221		ug/L		86	50 - 120	0	30
4,4'-DDD	ND		0.258	0.220		ug/L		85	50 - 125	3	30
4,4'-DDE	0.0040	J,DX	0.258	0.211		ug/L		80	45 - 125	1	30
4,4'-DDT	ND		0.258	0.222		ug/L		86	50 - 125	0	30

TestAmerica Irvine

# QC Sample Results

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

## Method: 608 - Organochlorine Pesticides in Water (Continued)

Lab Sample ID: 440-226534-1 MSD  
Matrix: Water  
Analysis Batch: 515629

Client Sample ID: Arroyo\_Simi\_20181206\_Grab  
Prep Type: Total/NA  
Prep Batch: 515512

<i>Surrogate</i>	<i>MSD</i>	<i>MSD</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
<i>Tetrachloro-m-xylene</i>	68		10 - 150

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- 14

# QC Association Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

## GC Semi VOA

### Prep Batch: 515512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226534-1	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	
MB 440-515512/1-A	Method Blank	Total/NA	Water	608	
LCS 440-515512/2-A	Lab Control Sample	Total/NA	Water	608	
440-226534-1 MS	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	
440-226534-1 MSD	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	

### Analysis Batch: 515629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226534-1	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	515512
MB 440-515512/1-A	Method Blank	Total/NA	Water	608	515512
LCS 440-515512/2-A	Lab Control Sample	Total/NA	Water	608	515512
440-226534-1 MS	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	515512
440-226534-1 MSD	Arroyo_Simi_20181206_Grab	Total/NA	Water	608	515512

## Metals

### Analysis Batch: 514864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-226534-1	Arroyo_Simi_20181206_Grab	Total Recoverable	Water	SM 2340B	

# Definitions/Glossary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

## Qualifiers

### GC Semi VOA

Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.  
Project/Site: Quarterly Arroyo Simi-Frontier Park

TestAmerica Job ID: 440-226534-1

## Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	CA ELAP 2706	06-30-19

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# Certificate of Analysis

FINAL REPORT

**Work Orders:** 8L06141

**Report Date:** 12/26/2018

**Project:** 440-226534-1

**Received Date:** 12/6/2018

**Turnaround Time:** 1 workday

**Phones:** (949) 261-1022

**Fax:** (949) 260-3297

**Attn:** Patty Mata

**P.O. #:**

**Client:** TestAmerica - Irvine CA  
17461 Derian Ave, Suite 100  
Irvine, CA 92614

**Billing Code:**

Dear Patty Mata,

Enclosed are the results of analyses for samples received 12/06/18 with the Chain-of-Custody document. The samples were received in good condition, at 2.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

## Sample Results

Sample: 440-226534-1, Alias: Arroyo\_Simi\_20181206\_Grab  
8L06141-01 (Water) Sampled: 12/06/18 12:35 by Neal Smith

Analyte	Result	MDL	MRL	Units	Dil	Analyzed	Qualifier
<b>Method:</b> EPA 525.2M							
<b>Batch ID:</b> W8L0362							
<b>Instr:</b> GCMS13							
<b>Prepared:</b> 12/07/18 09:00							
<b>Analyst:</b> EFC							
Chlorpyrifos	ND	34	50	ng/l	1	12/12/18 11:58	M-02
Diazinon	ND	26	50	ng/l	1	12/12/18 11:58	M-02
<i>Surrogate(s)</i>							
1,3-Dimethyl-2-nitrobenzene	83%		76-128	Conc: 2080		12/12/18 11:58	M-02
Triphenyl phosphate	128%		40-163	Conc: 3200		12/12/18 11:58	M-02



WECK LABORATORIES, INC.

# Certificate of Analysis

FINAL REPORT

## Quality Control Results

Semivolatiles Organics - Low Level by Tandem GC/MS/MS

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	Limits	RPD	RPD Limit	Qualifier
<b>Blank (W8L0362-BLK1)</b>					Prepared: 12/06/18 Analyzed: 12/12/18						
Chlorpyrifos	ND	6.9	10	ng/l							
Diazinon	ND	5.2	10	ng/l							
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			447	ng/l	500		89	76-128			
Triphenyl phosphate			467	ng/l	500		93	40-163			
<b>LCS (W8L0362-BS1)</b>					Prepared: 12/06/18 Analyzed: 12/12/18						
Chlorpyrifos	57.0	6.9	10	ng/l	50.0		114	37-169			
Diazinon	36.8	5.2	10	ng/l	50.0		74	43-152			
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			449	ng/l	500		90	76-128			
Triphenyl phosphate			528	ng/l	500		106	40-163			
<b>Matrix Spike (W8L0362-MS1)</b>					Source: 8K23003-06		Prepared: 12/06/18 Analyzed: 12/12/18				
Chlorpyrifos	160	14	20	ng/l	100	ND	160	37-168			
Diazinon	211	10	20	ng/l	100	ND	211	36-153			MS-05
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			881	ng/l	1000		88	76-128			
Triphenyl phosphate			1450	ng/l	1000		145	40-163			
<b>Matrix Spike Dup (W8L0362-MSD1)</b>					Source: 8K23003-06		Prepared: 12/06/18 Analyzed: 12/12/18				
Chlorpyrifos	148	14	20	ng/l	100	ND	148	37-168	7	30	
Diazinon	176	10	20	ng/l	100	ND	176	36-153	18	30	MS-05
<i>Surrogate(s)</i>											
1,3-Dimethyl-2-nitrobenzene			947	ng/l	1000		95	76-128			
Triphenyl phosphate			1390	ng/l	1000		139	40-163			





WECK LABORATORIES, INC.

# Certificate of Analysis

FINAL REPORT

## Notes and Definitions

Item	Definition
M-02	Due to the nature of matrix interferences, sample was diluted prior to preparation. The MDL and MRL were raised due to the dilution.
MS-05	The spike recovery and/or RPD were outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
MDL	Method Detection Limit
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ) and Detection Limit for Reporting (DLR)
MDA	Minimum Detectable Activity
NR	Not Reportable
TIC	Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.  
 An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB)  
 All results are expressed on wet weight basis unless otherwise specified.  
 All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS 002.

### Reviewed by:



Regina Giancola  
Project Manager



ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO 17025 #L2457.01 • LACSD #10143 •  
 NELAP-CA #04229CA • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

*This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.*



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Test America  
17461 Derian Ave  
Suite #100  
Irvine CA 92614

Report Date: December 19, 2018 14:13

### Project: Quarterly Arroyo Simi-Frontier Park

Account #: 41440  
Group Number: 2017375  
SDG: SSF11  
PO Number: 44009879  
State of Sample Origin: CA

Electronic Copy To Test America

Attn: Urvashi Patel

Respectfully Submitted,



Kay Hower

(717) 556-7364

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



### SAMPLE INFORMATION

Client Sample Description

Sample Collection  
Date/Time

ELLE#

Arroyo\_Simi\_20181206\_Grab (440-226534-1) Water

12/06/2018 12:35

9934719

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** Arroyo\_Simi\_20181206\_Grab (440-226534-1) Water  
Quarterly Arroyo Simi-Frontier Park

**Test America**  
**ELLE Sample #:** WW 9934719  
**ELLE Group #:** 2017375  
**Matrix:** Water

**Project Name:** Quarterly Arroyo Simi-Frontier Park

**Submittal Date/Time:** 12/11/2018 12:40  
**Collection Date/Time:** 12/06/2018 12:35  
**SDG#:** SSF11-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>PCBs</b>		<b>EPA 608</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
06030	PCB-1016	12674-11-2	N.D. D1	0.10	0.52	1
06030	PCB-1221	11104-28-2	N.D. D1	0.10	0.52	1
06030	PCB-1232	11141-16-5	N.D. D1	0.10	0.52	1
06030	PCB-1242	53469-21-9	N.D. D1	0.10	0.52	1
06030	PCB-1248	12672-29-6	N.D. D1	0.10	0.52	1
06030	PCB-1254	11097-69-1	N.D. D1	0.10	0.52	1
06030	PCB-1260	11096-82-5	N.D. D1	0.15	0.52	1
06030	Total PCBs	1336-36-3	N.D.	0.10	0.52	1

The response for the decachlorobiphenyl surrogate in the ending calibration verification standard is outside the QC acceptance limits on D2. Since the surrogate recovery is within the acceptance limits, the data is reported.

### Sample Comments

CA ELAP Lab Certification No. 2792

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06030	PCBs in Water by 608	EPA 608	1	183460019A	12/18/2018 02:26	Kirby B Turner	1
11960	Method 608 PCB Water Ext.	EPA 608	1	183460019A	12/12/2018 17:11	Christine E Gleim	1

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: Test America  
Reported: 12/19/2018 14:13

Group Number: 2017375

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL** ug/l	LOQ ug/l
Batch number: 183460019A	Sample number(s): 9934719		
PCB-1016	N.D.	0.10	0.50
PCB-1221	N.D.	0.10	0.50
PCB-1232	N.D.	0.10	0.50
PCB-1242	N.D.	0.10	0.50
PCB-1248	N.D.	0.10	0.50
PCB-1254	N.D.	0.10	0.50
PCB-1260	N.D.	0.15	0.50
Total PCBs	N.D.	0.10	0.50

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 183460019A	Sample number(s): 9934719								
PCB-1016	5.01	3.98	5.01	3.83	80	76	60-117	4	30
PCB-1260	5.00	4.37	5.00	4.37	87	87	57-134	0	30

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PCBs in Water by 608  
Batch number: 183460019A

	Tetrachloro-m-xylene-D1	Decachlorobiphenyl-D1	Tetrachloro-m-xylene-D2	Decachlorobiphenyl-D2
9934719	81	78	86	102
Blank	73	45	76	54
LCS	44	91	44	111
LCSD	42	74	43	92
Limits:	33-137	10-148	33-137	10-148

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Test America  
Reported: 12/19/2018 14:13

Group Number: 2017375

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

**TestAmerica Irvine**

17461 Derian Ave Suite 100  
Irvine, CA 92614-5817  
Phone (949) 261-1022 Fax (949) 260-3297

**Chain of Custody Record**

41440 2017375 9934719



**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM: Patel, Urvashi		Carrier Tracking No(s):		COC No: 440-130592.1			
Client Contact: Shipping/Receiving		Phone:		E-Mail: urvashi.patel@testamericainc.com		State of Origin: California		Page: Page 1 of 1			
Company: Eurofins Lancaster Laboratories Env LLC				Accreditations Required (See note): State Program - California				Job #: 440-226534-1			
Address: 2425 New Holland Pike,		Due Date Requested: 12/18/2018		<b>Analysis Requested</b>						<b>Preservation Codes:</b> A - HCL                      M - Hexane B - NaOH                    N - None C - Zn Acetate              O - AsNaO2 D - Nitric Acid              P - Na2O4S E - NaHSO4                  Q - Na2SO3 F - MeOH                     R - Na2S2O3 G - Amchlor                 S - H2SO4 H - Ascorbic Acid          T - TSP Dodecahydrate I - Ice                         U - Acetone J - DI Water                 V - MCAA K - EDTA                     W - pH 4-5 L - EDA                        Z - other (specify)	
City: Lancaster		TAT Requested (days):									
State, Zip: PA, 17601		PO #:		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		SUB (608_LL-PCB- Lancaster Labs)/608_LL-PCB- Lancaster Labs		Total Number of containers	
Phone: 717-656-2300(Tel)		WO #:									
Email:		Project #: 44009879		Project Name: Quarterly Arroyo Simi-Frontier Park		SSOW#:		Site:		Other:	
Project Name: Quarterly Arroyo Simi-Frontier Park		Project #: 44009879		Project Name: Quarterly Arroyo Simi-Frontier Park		SSOW#:		Site:		Other:	
Site:		SSOW#:		Site:		Other:		Special Instructions/Note:			
<b>Sample Identification - Client ID (Lab ID)</b>		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type (C=comp, G=grab)</b>		<b>Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)</b>		<b>Preservation Code:</b>	
Arroyo_Simi_20181206_Grab (440-226534-1)		12/6/18		12:35 Pacific		Water		X		1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

<b>Possible Hazard Identification</b>				<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>			
Unconfirmed				<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Primary Deliverable Rank: 2		Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: <i>[Signature]</i>		Date/Time: 12/10/18 0:17:00		Company: <i>[Signature]</i>		Received by:	
Relinquished by:		Date/Time:		Company:		Received by:	
Relinquished by:		Date/Time:		Company:		Received by: <i>[Signature]</i>	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 2.0 IR		Date/Time: 12-11-18 1240	
						Company: ELLE	



Lancaster Laboratories  
Environmental

# Sample Administration Receipt Documentation Log

Doc Log ID: 235717



Group Number(s): 2017875

Client: TestAmerica

## Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>12/11/2018 12:40</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

## Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace $\geq$ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Christopher Stief (12429) at 13:31 on 12/11/2018*

## Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	8013596-IR	2.0	IR	Wet	Y	Loose/Bag	N





The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.


**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $>40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

CHAIN OF CUSTODY FORM

Client Name/Address: <b>Haley &amp; Aldrich</b> 9040 Friars Road Suite 220 San Diego, CA 92108-5860			Project: Boeing-SSFL NPDES Permit 2015 <b>Quarterly Arroyo Simi-Frontier Park                  Dry Weather</b>			ANALYSIS REQUIRED Hardness as CaCO3, Recoverable (SM2340B) Chlorpyrifos, Diazinon (E525 2) Pesticides: Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Toxaphene + PCBs only (E608)			Field Readings Meter serial # <b>VLT0U/K7</b>				
Test America Contact: Urvashi Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055			Project Manager: Katherine Miller 520 289.8606, 520 904 6944 (cell)			Field Readings: (include units) Time of Readings: <b>12:25</b> pH <b>7.30</b> pH unit Temp <b>8.82</b> °C/F Velocity <b>0.6</b> ft/sec			Field readings QC Checked by: <b>DB</b> Date/Time: <b>12:55 12/16/18</b>				
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs with Blanket Service Agreement # 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc			Project Manager: Katherine Miller 520 289.8606, 520 904 6944 (cell)										
Sampler: <del>Dan Smith</del> <b>Neal Smith</b>			Field Manager: Mark Dominick 978 234.5033, 818 599 0702 (cell)			Comments			12/16/18 12/16/18				
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs with Blanket Service Agreement # 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc			Project Manager: Katherine Miller 520 289.8606, 520 904 6944 (cell)										
Sample Description	Sample I.D.	Sampling Date/Time	Sample Matrix	Container Type	# of Cont	Preservative	Bottle #	MS/MSD	Hardness as CaCO3, Recoverable (SM2340B)	Chlorpyrifos, Diazinon (E525 2)	Pesticides: Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Toxaphene + PCBs only (E608)	Field Readings	Meter serial #
Arroyo Simi	Arroyo_Simi_20181206_Grab	12/6/2018 <b>12:35</b>	WS	250 mL Poly	<b>3</b>	HNO3	100	<b>Y</b>	X				
			WS	1L Glass Amber	<b>6</b>	HCl	275	<b>No</b>		X		Extract within 24-Hours of sampling	
			WS	1L Glass Amber	<b>6</b>	None	285	<b>No</b>			X		
	<del>Arroyo_Simi_20181206_Grab_Extra</del>	<del>12/6/2018</del>	WS	1L Glass Amber	<del>2</del>	HCl	<del>275</del>	<del>No</del>			H	Hold	
			WS	1L Glass Amber	<del>2</del>	None	<del>285</del>	<del>No</del>			H	Hold	
 440-226534 Chain of Custody													
Relinquished By: <b>Mark Dominick</b> Date/Time: <b>12.6.18/1430</b> Company: <b>Haley &amp; Aldrich</b>			Received By: <b>[Signature]</b> Date/Time: <b>12.6.18 1430</b>			Turn-around time (Check) 24 Hour _____ 72 Hour _____ 10 Day <input checked="" type="checkbox"/> 48 Hour _____ 5 Day _____ Normal _____							
Relinquished By: <b>[Signature]</b> Date/Time: <b>12.6.18 1800</b> Company: <b>TA IRV</b>			Received By: <b>[Signature]</b> Date/Time: <b>12/16/18 1800</b>			Sample Integrity (Check) Intact _____ On Ice <input checked="" type="checkbox"/> <b>2.1</b> Store samples for 6 months Data Requirements (Check) No Level IV _____ All Level IV: <input checked="" type="checkbox"/> <b>1.6</b> <b>12.43</b>							

Page 26 of 27

1/3/2019 (Rev. 1)



## Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 440-226534-1

**Login Number: 226534**

**List Number: 1**

**Creator: Avila, Stephanie 1**

**List Source: TestAmerica Irvine**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**APPENDIX F**

**Fourth Quarter 2018 Reasonable Potential Analysis Tables**

**REASONABLE POTENTIAL ANALYSIS SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

**Notes:**

1. The following Reasonable Potential Analysis (RPA) provides the analytical results as performed by the procedures outlined in *Reasonable Potential Analysis Methodology Technical Memo* (MWH and Flow Science, 2006).
2. The monitoring data set utilized to conduct the RPA consists of all applicable and relevant data from the present reporting quarter.
3. As directed by the CTR and the Regional Water Control Board 2,3,7,8-TCDD (Dioxin) values are to be expressed in NPDES permitting and this RPA as TCDD Total Equivalence units (TEQs). A TCDD TEQ is determined by multiplying each of the seventeen dioxin and furan congeners by their respective toxicity equivalency factor (TEF) and bioaccumulation equivalency factor (BEF) then summing the results of those products. For the purposes of this RPA, the resulting TCDD TEQ does not include those congener concentrations that are reported as DNQ, as specified on Page 26, of the NPDES Permit Effective April 1, 2015 (Water Board, 2015).
4. Data reported with qualifiers (e.g., J [DNQ] or R) are considered estimated or rejected and are not used in this RPA.
5. All of the following abbreviations and/or notes may not occur on every table.
6. Based on ORDER NO. R4-2015-0033, page E-2, Section I.C, only pollutants which do not have a final effluent limitation in the NPDES permit are included in this RPA analysis.

Definition of Acronyms, Abbreviations, and Terminology Used

>=	Greater than or equal to
*	Freshwater aquatic life criteria for metals are expressed as a function of total hardness (mg/L) in the water body. The equations are provided in the CTR, (US EPA, 2011). Values displayed correspond to a total hardness of 100 mg/l.
µg/L	Concentration units, micrograms per liter
All Data Qualified	All available monitoring data are qualified and no statistical analysis is performed.
Annual	The 2015 NPDES Permit requires annual monitoring.
Available Data < DL	All available monitoring data that are not qualified are below detection limits.
B	Background
C	Concentration
CCC	Criterion Continuous Concentration
CMC	Criterion Maximum Concentration
CTR	California Toxics Rule
CV	Coefficient of Variation
DL	Detection Limit
EPA TSD	EPA's Technical Support Document for Water Quality Based Toxics Control, (see references).
Fibers/L	Units for asbestos concentration, fibers per liter
HH O	Human Health criteria for consumption of Organisms only

**REASONABLE POTENTIAL ANALYSIS SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Definition of Acronyms, Abbreviations, and Terminology Used (Continued)

HH W&OMEC	Maximum Observed Effluent Concentration
mg/L	Concentration units, milligrams per liter
Min	Minimum
MPN/100ml	Most probable number per 100 milliliters
NA	Not Applicable
Narrative	Water quality criteria are expressed as a narrative objective rather than a numeric objective, and therefore are not part of the statistical RPA calculations.
None	No available CTR or Basin Plan criteria.
pH Dependent	CTR Criteria are based on pH.
Discharge	The 2015 NPDES Permit requires monitoring once per discharge event.
Qualified Data	Data qualifier definitions are: (a) J- The reported result is an estimate. The value is less than the minimum calibration level but greater than the estimated detection limit (EDL), (b) U/UJ- The analyte was not detected in the sample at the detection limit /estimated detection limit (EDL), (c) B - Analyte found in sample and associated blank, and (d) DNQ- Detected Not Quantified.
Reserved	EPA has reserved the CTR criteria.
RPA	Reasonable Potential Analysis
SIP	The State Water Resources Control Board "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," (see references).
Tot	Total

Priority Pollutant RPA Column Explanation

CTR	Provides CTR constituent reference number.
Constituent	Provides CTR constituent common name.
Units	Provides the data set's concentration units as referenced by 2015 NPDES Permit.
MEC	Provides the outfall monitoring group's maximum value from the applicable data set.
CV	Equal to the standard deviation divided by the average of the applicable data set. If the number of samples is less than 10, the CV is assumed to be 0.6.
<i>Step 1 identifies all applicable water quality criteria.</i>	
CTR Criteria	Concentration criteria as listed in the CTR.
CMC = Acute	The Freshwater CMC is listed as the acute concentration criterion.
CCC = Chronic	The Freshwater CCC is listed as the chronic concentration criterion.
HH W&O (Not App)	The HH W&O is deemed not applicable based on past Regional Board RPAs.
HH O = HH	The HH O is listed as the CTR human health concentration criterion.
Basin Plan Criteria	Applicable Basin Plan Criteria are listed for the Los Angeles River and/or Calleguas Creek watersheds.
C = Lowest Criteria	The comparison concentration (C) is equal to the lowest criterion for a constituent based on the CMC, CCC, HH O, and Basin Plan Criteria listed.
<i>Step 2 defines the applicable data set.</i>	
Is Effluent Data Available	If all data is qualified, then NO. If not, then YES.

**REASONABLE POTENTIAL ANALYSIS SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Priority Pollutant RPA Column Explanation (Continued)

<i>Step 3 determines the maximum observed effluent concentration.</i>	
Was Constituent Detected in Effluent Data	If the constituent was detected, then YES. If all monitoring data are non-detected or qualified then NO.
Are all Detection Limits >C	If constituent was detected in effluent data then not applicable (NA). If constituent was not detected and all analysis detection limits are greater than the comparison concentration, then YES, if not then NO.
If DL > C, MEC = Min (DL)	If the previous cell answer was yes, then the MEC is equal to the minimum detection limit. If not, then NA.
<i>Step 4 compares the MEC to the lowest applicable water quality criteria.</i>	
MEC >= C	If the MEC is greater than or equal to the comparison concentration then YES, if not then NO.

Note: Steps 5 and 6 of the Priority Pollutant RPA do not apply to the Santa Susana Site because the Regional Board gives no consideration for receiving water background constituent concentrations. Furthermore, Boeing defers the application of best professional judgment in Step 7 and final determination of reasonable potential in Step 8 to the Regional Board Staff.

Non-priority Pollutant RPA Column Explanation

Constituent	Provides the Non-Priority Pollutant constituent common name
Monitoring	Provides the 2015 NPDES Permit directed monitoring frequency
Units	Provides the data set's concentration units
Number of Samples	Provides the number of available samples that are not qualified
MEC	Provides the outfall monitoring group's maximum value from the applicable data set
CV	Equal to the standard deviation divided by the average of the applicable data set. If the number of samples is less than 10, the CV is assumed to be 0.6.
Multiplier	Utilizes the EPA's TSD calculation to determine multiplier for which the maximum effluent concentration is calculated. (MWH and Flow Science, 2006, or EPA TSD, 1991)
Projected Maximum Effluent Concentration	Utilizes the product of the multiplier and the MEC as an estimate for the projected maximum effluent concentration.
Dilution Ratio	The Regional Board allocates no dilution ratio to the Santa Susana Site (NA).
Background Concentration	The Regional Board allocates no background concentration to the Santa Susana Site (NA).
Projected Maximum Receiving Water Concentration	The Regional Board estimates the projected maximum receiving water concentration as equal to the projected maximum effluent concentration.
Step 1, Determine Water Quality Objectives	The water quality objective is based on appropriate Basin Plan criteria as noted in the Reasonable Potential Analysis Methodology Technical Memo.
BU – Beneficial Use Protection, NC – Human Non-carcinogen, AP- Aquatic Life Protection, TMDL – Total Maximum Daily Load	This is the Regional Board's Basis for determining if reasonable potential should be evaluated for a non-priority pollutant.

Note: Boeing has completed appropriate statistical calculations but defers the application of best professional judgment and the final determination of reasonable potential to the Regional Board Staff.



**REASONABLE POTENTIAL ANALYSIS SUMMARY NOTES  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

References:

1. Los Angeles Regional Water Quality Control Board, "Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, (Basin Plan)." June 13, 1994.
2. MWH and Flow Science, "Reasonable Potential Analysis Methodology Technical Memo- Version 1, Final, Santa Susan Field Laboratory, Ventura County, California." April 28, 2006.
3. State Water Resources Control Board, "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, (SIP)" Resolution No. 2005-0019, February 24, 2005.
4. US EPA, *40CFR part 131, Water Quality Standards; Establishment of numeric Criteria for Priority Toxic Pollutants for the State of California*, (CTR) Federal Registry, 2011, pp. 496 - 507.
5. US EPA, "Technical Support Document for Water Quality-based Toxics Control." EPA/505/2-90-001, PB-91-127415, March 1991.

**TABLE F-1  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 001, 002, 011, AND 018)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
1, 2, 11, 18	15	Asbestos	Fibers/L	Not Analyzed	0.6	NONE	NONE	7,000,000	NONE	7,000,000	7,000,000	No	NA	NA	NA	NA
1, 2, 11, 18	17	Acrolein	µg/L	Annual	0.6	NONE	NONE	320	780	NONE	780	No	NA	NA	NA	NA
1, 2, 11, 18	18	Acrylonitrile	µg/L	Annual	0.6	NONE	NONE	0.059	0.66	NONE	0.66	No	NA	NA	NA	NA
1, 2, 11, 18	19	Benzene	µg/L	Available Data <DL	0.6	NONE	NONE	1.2	71	1	1	Yes	No	No	NA	No
1, 2, 11, 18	20	Bromoform	µg/L	Available Data <DL	0.6	NONE	NONE	4.3	360	NONE	360	Yes	No	No	NA	No
1, 2, 11, 18	21	Carbon Tetrachloride	µg/L	Available Data <DL	0.6	NONE	NONE	0.25	4.4	0.5	0.5	Yes	No	No	NA	No
1, 2, 11, 18	22	Chlorobenzene	µg/L	Available Data <DL	0.6	NONE	NONE	680	21,000	70	70	Yes	No	No	NA	No
1, 2, 11, 18	23	Dibromochloromethane	µg/L	Available Data <DL	0.6	NONE	NONE	0.401	34	NONE	34	Yes	No	No	NA	No
1, 2, 11, 18	24	Chloroethane	µg/L	Available Data <DL	0.6	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
1, 2, 11, 18	25	2-Chloroethyl vinyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	26	Chloroform (Trichloromethane)	µg/L	Available Data <DL	0.6	NONE	NONE	Reserved	Reserved	NONE	NONE	Yes	No	No	NA	No
1, 2, 11, 18	27	Chlorodibromomethane	µg/L	Annual	0.6	NONE	NONE	0.56	46	NONE	46	No	NA	NA	NA	NA
1, 2, 11, 18	28	1,1-Dichloroethane	µg/L	Available Data <DL	0.6	NONE	NONE	NONE	NONE	5	5	Yes	No	No	NA	No
1, 2, 11, 18	31	1,2-Dichloropropane	µg/L	Available Data <DL	0.6	NONE	NONE	0.52	39	5	5	Yes	No	No	NA	No
1, 2, 11, 18	32	cis-1,3-Dichloropropene	µg/L	Available Data <DL	0.6	NONE	NONE	10	1,700	0.5	0.5	Yes	No	No	NA	No
1, 2, 11, 18	32a	trans-1,3-Dichloropropene	µg/L	Available Data <DL	0.6	NONE	NONE	10	1,700	0.5	0.5	Yes	No	No	NA	No
1, 2, 11, 18	33	Ethylbenzene	µg/L	Available Data <DL	0.6	NONE	NONE	3,100	29,000	700	700	Yes	No	No	NA	No
1, 2, 11, 18	34	Bromomethane	µg/L	Available Data <DL	0.6	NONE	NONE	48	4,000	NONE	4,000	Yes	No	No	NA	No
1, 2, 11, 18	35	Chloromethane (Methyl Chloride)	µg/L	Available Data <DL	0.6	NONE	NONE	Narrative	Narrative	NONE	NONE	Yes	No	No	NA	No
1, 2, 11, 18	36	Methylene chloride	µg/L	Available Data <DL	0.6	NONE	NONE	4.7	1,600	NONE	1,600	Yes	No	No	NA	No
1, 2, 11, 18	37	1,1,2,2-Tetrachloroethane	µg/L	Available Data <DL	0.6	NONE	NONE	0.17	11	1	1	Yes	No	No	NA	No
1, 2, 11, 18	38	Tetrachloroethene	µg/L	Available Data <DL	0.6	NONE	NONE	0.8	8.85	5	5	Yes	No	No	NA	No
1, 2, 11, 18	39	Toluene	µg/L	Available Data <DL	0.6	NONE	NONE	6,800	200,000	150	150	Yes	No	No	NA	No
1, 2, 11, 18	40	trans-1,2-Dichloroethene	µg/L	Available Data <DL	0.6	NONE	NONE	700	140,000	10	10	Yes	No	No	NA	No
1, 2, 11, 18	41	1,1,1-Trichloroethane	µg/L	Available Data <DL	0.6	NONE	NONE	Narrative	Narrative	200	200	Yes	No	No	NA	No
1, 2, 11, 18	42	1,1,2-Trichloroethane	µg/L	Available Data <DL	0.6	NONE	NONE	0.60	42	5	5	Yes	No	No	NA	No
1, 2, 11, 18	44	Vinyl chloride	µg/L	Available Data <DL	0.6	NONE	NONE	2	525	0.5	0.5	Yes	No	No	NA	No
1, 2, 11, 18	45	2-Chlorophenol	µg/L	Annual	0.6	NONE	NONE	120	400	NONE	400	No	NA	NA	NA	NA
1, 2, 11, 18	46	2,4-Dichlorophenol	µg/L	Annual	0.6	NONE	NONE	93	790	NONE	790	No	NA	NA	NA	NA
1, 2, 11, 18	47	2,4-Dimethylphenol	µg/L	Annual	0.6	NONE	NONE	540	2,300	NONE	2,300	No	NA	NA	NA	NA
1, 2, 11, 18	48	2-Methyl-4,6-dinitrophenol	µg/L	Annual	0.6	NONE	NONE	13.4	765	NONE	765	No	NA	NA	NA	NA
1, 2, 11, 18	49	2,4-Dinitrophenol	µg/L	Annual	0.6	NONE	NONE	70	14,000	NONE	14,000	No	NA	NA	NA	NA
1, 2, 11, 18	50	2-Nitrophenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	51	4-Nitrophenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	52	4-Chloro-3-methylphenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	54	Phenol	µg/L	Annual	0.6	NONE	NONE	21,000	4,600,000	NONE	4,600,000	No	NA	NA	NA	NA
1, 2, 11, 18	56	Acenaphthene	µg/L	Annual	0.6	NONE	NONE	1,200	2,700	NONE	2,700	No	NA	NA	NA	NA
1, 2, 11, 18	57	Acenaphthylene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	58	Anthracene	µg/L	Annual	0.6	NONE	NONE	9,600	110,000	NONE	110,000	No	NA	NA	NA	NA
1, 2, 11, 18	59	Benidine	µg/L	Annual	0.6	NONE	NONE	0.00012	0.00054	NONE	0.00054	No	NA	NA	NA	NA
1, 2, 11, 18	60	Benzo(a)Anthracene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	61	Benzo(a)Pyrene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	0.2	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	62	Benzo(b)Fluoranthene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA

**TABLE F-1  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 001, 002, 011, AND 018)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
1, 2, 11, 18	63	Benzo(g,h,i)Perylene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA	
1, 2, 11, 18	64	Benzo(k)Fluoranthene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	65	Bis (2-Chloroethoxy) methane	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	66	Bis (2-Chloroethyl) ether	µg/L	Annual	0.6	NONE	NONE	0.0310	1.4	NONE	1.4	No	NA	NA	NA	NA
1, 2, 11, 18	67	Bis (2-Chloroisopropyl) Ether	µg/L	Annual	0.6	NONE	NONE	1,400	170,000	NONE	170,000	No	NA	NA	NA	NA
1, 2, 11, 18	69	4-Bromophenyl phenyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	70	Butyl benzylphthalate	µg/L	Annual	0.6	NONE	NONE	3,000	5,200	NONE	5,200	No	NA	NA	NA	NA
1, 2, 11, 18	71	2-Chloronaphthalene	µg/L	Annual	0.6	NONE	NONE	1,700	4,300	NONE	4,300	No	NA	NA	NA	NA
1, 2, 11, 18	72	4-Chlorophenyl phenyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	73	Chrysene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	74	Dibenz(a,h)anthracene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	75	1,2-Dichlorobenzene	µg/L	Available Data <DL	0.6	NONE	NONE	2,700	17,000	600	600	Yes	No	No	NA	No
1, 2, 11, 18	76	1,3-Dichlorobenzene	µg/L	Available Data <DL	0.6	NONE	NONE	400	2,600	NONE	2,600	Yes	No	No	NA	No
1, 2, 11, 18	77	1,4-Dichlorobenzene	µg/L	Available Data <DL	0.6	NONE	NONE	400	2,600	5	5	Yes	No	No	NA	No
1, 2, 11, 18	78	3,3'-Dichlorobenzidine	µg/L	Annual	0.6	NONE	NONE	0.04	0.077	NONE	0.077	No	NA	NA	NA	NA
1, 2, 11, 18	79	Diethyl phthalate	µg/L	Annual	0.6	NONE	NONE	23,000	120,000	NONE	120,000	No	NA	NA	NA	NA
1, 2, 11, 18	80	Dimethyl phthalate	µg/L	Annual	0.6	NONE	NONE	313,000	2,900,000	NONE	2,900,000	No	NA	NA	NA	NA
1, 2, 11, 18	81	Di-n-butyl phthalate	µg/L	Annual	0.6	NONE	NONE	2,700	12,000	NONE	12,000	No	NA	NA	NA	NA
1, 2, 11, 18	83	2,6-Dinitrotoluene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	84	Di-n-octyl phthalate	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	85	1,2-Diphenylhydrazine/Azobenzene	µg/L	Annual	0.6	NONE	NONE	0.040	0.54	NONE	0.54	No	NA	NA	NA	NA
1, 2, 11, 18	86	Fluoranthene	µg/L	Annual	0.6	NONE	NONE	300	370	NONE	370	No	NA	NA	NA	NA
1, 2, 11, 18	87	Fluorene	µg/L	Annual	0.6	NONE	NONE	1,300	14,000	NONE	14,000	No	NA	NA	NA	NA
1, 2, 11, 18	88	Hexachlorobenzene	µg/L	Annual	0.6	NONE	NONE	0.00075	0.00077	1	0.00077	No	NA	NA	NA	NA
1, 2, 11, 18	89	Hexachlorobutadiene	µg/L	Annual	0.6	NONE	NONE	0.44	50	NONE	50	No	NA	NA	NA	NA
1, 2, 11, 18	90	Hexachlorocyclopentadiene	µg/L	Annual	0.6	NONE	NONE	240	17,000	50	50	No	NA	NA	NA	NA
1, 2, 11, 18	91	Hexachloroethane	µg/L	Annual	0.6	NONE	NONE	1.9	8.9	NONE	8.9	No	NA	NA	NA	NA
1, 2, 11, 18	92	Indeno(1,2,3-cd)Pyrene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
1, 2, 11, 18	93	Isophorone	µg/L	Annual	0.6	NONE	NONE	8.4	600	NONE	600	No	NA	NA	NA	NA
1, 2, 11, 18	94	Naphthalene	µg/L	Available Data <DL	0.6	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
1, 2, 11, 18	95	Nitrobenzene	µg/L	Annual	0.6	NONE	NONE	17	1,900	NONE	1,900	No	NA	NA	NA	NA
1, 2, 11, 18	97	n-Nitroso-di-n-propylamine	µg/L	Annual	0.6	NONE	NONE	0.005	1.4	NONE	1.4	No	NA	NA	NA	NA
1, 2, 11, 18	98	N-Nitrosodiphenylamine	µg/L	Annual	0.6	NONE	NONE	5.0	16	NONE	16	No	NA	NA	NA	NA
1, 2, 11, 18	99	Phenanthrene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	100	Pyrene	µg/L	Annual	0.6	NONE	NONE	960	11,000	NONE	11,000	No	NA	NA	NA	NA
1, 2, 11, 18	101	1,2,4-Trichlorobenzene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	70	70	No	NA	NA	NA	NA
1, 2, 11, 18	102	Aldrin	µg/L	Annual	0.6	3	NONE	0.00013	0.00014	NONE	0.00014	No	NA	NA	NA	NA
1, 2, 11, 18	104	beta-BHC	µg/L	Annual	0.6	NONE	NONE	0.014	0.046	NONE	0.046	No	NA	NA	NA	NA
1, 2, 11, 18	105	gamma-BHC (Lindane)	µg/L	Annual	0.6	0.95	NONE	0.019	0.063	0.2	0.063	No	NA	NA	NA	NA
1, 2, 11, 18	106	delta-BHC	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
1, 2, 11, 18	107	Chlordane	µg/L	Available Data <DL	0.6	2.4	0.0043	0.00057	0.00059	0.1	0.00059	Yes	No	Yes	0.00059	No
1, 2, 11, 18	108	4,4'-DDT	µg/L	Available Data <DL	0.6	1.1	0.001	0.00059	0.00059	NONE	0.00059	Yes	No	Yes	0.00059	No
1, 2, 11, 18	109	4,4'-DDE	µg/L	Available Data <DL	0.6	NONE	NONE	0.00059	0.00059	NONE	0.00059	Yes	No	Yes	0.00059	No

**TABLE F-1  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 001, 002, 011, AND 018)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
1, 2, 11, 18	110	4,4'-DDD	µg/L	Available Data <DL	0.6	NONE	NONE	0.00083	0.00084	NONE	0.00084	Yes	No	Yes	0.00084	No
1, 2, 11, 18	111	Dieldrin	µg/L	Available Data <DL	0.6	0.24	0.056	0.00014	0.00014	NONE	0.00014	Yes	No	Yes	0.00014	No
1, 2, 11, 18	112	alpha-Endosulfan	µg/L	Annual	0.6	0.22	0.056	110	240	NONE	0.056	No	NA	NA	NA	NA
1, 2, 11, 18	113	beta-Endosulfan	µg/L	Annual	0.6	0.22	0.056	110	240	NONE	0.056	No	NA	NA	NA	NA
1, 2, 11, 18	114	Endosulfan Sulfate	µg/L	Annual	0.6	NONE	NONE	110	240	NONE	240	No	NA	NA	NA	NA
1, 2, 11, 18	115	Endrin	µg/L	Annual	0.6	0.086	0.036	0.76	0.81	2	0.036	No	NA	NA	NA	NA
1, 2, 11, 18	116	Endrin Aldehyde	µg/L	Annual	0.6	NONE	NONE	0.76	0.81	NONE	0.81	No	NA	NA	NA	NA
1, 2, 11, 18	117	Heptachlor	µg/L	Annual	0.6	0.52	0.0038	0.00021	0.00021	0.01	0.00021	No	NA	NA	NA	NA
1, 2, 11, 18	118	Heptachlor Epoxide	µg/L	Annual	0.6	0.52	0.0038	0.00010	0.00011	0.01	0.00011	No	NA	NA	NA	NA
1, 2, 11, 18	119	Aroclor 1016	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	120	Aroclor 1221	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	121	Aroclor 1232	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	122	Aroclor 1242	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	123	Aroclor 1248	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	124	Aroclor 1254	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	125	Aroclor 1260	µg/L	Available Data <DL	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
1, 2, 11, 18	126	Toxaphene	µg/L	Available Data <DL	0.6	0.73	0.0002	0.00073	0.00075	3	0.0002	Yes	No	Yes	0.0002	No
1, 2, 11, 18	127	E. Coli	MPN/100ml	Annual	0.6	NA	NA	NA	NA	235	235	No	NA	NA	NA	NA

**TABLE F-2  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 003-007, 009, AND 010)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
3-7, 9, 10	2	Arsenic	µg/L	Annual	0.6	340	150	NONE	NONE	50	50	No	NA	NA	NA	NA
3-7, 9, 10	3	Beryllium	µg/L	Annual	0.6	NONE	NONE	Narrative	Narrative	4	4	No	NA	NA	NA	NA
3-7, 9, 10	5a	Chromium	µg/L	Annual	0.6	550	180	Narrative	Narrative	50	50	No	NA	NA	NA	NA
3-7, 9, 10	5b	Chromium VI (Hexavalent)	µg/L	Annual	0.6	16	11	Narrative	Narrative	NONE	11	No	NA	NA	NA	NA
3-7, 9, 10	10	Selenium	µg/L	All Data Qualified	0.6	Reserved	5	Narrative	Narrative	50	5	No	No	No	NA	No
3-7, 9, 10	11	Silver	µg/L	Available Data < DL	0.6	3.4	NONE	NONE	NONE	NONE	3.4	Yes	No	No	NA	No
3-7, 9, 10	15	Asbestos	Fibers/L	Annual	0.6	NONE	NONE	7,000,000	NONE	7,000,000	7000000	No	NA	NA	NA	NA
3-7, 9, 10	17	Acrolein	µg/L	Annual	0.6	NONE	NONE	320	780	NONE	780	No	NA	NA	NA	NA
3-7, 9, 10	18	Acrylonitrile	µg/L	Annual	0.6	NONE	NONE	0.059	0.66	NONE	0.66	No	NA	NA	NA	NA
3-7, 9, 10	19	Benzene	µg/L	Annual	0.6	NONE	NONE	1.2	71	1	1	No	NA	NA	NA	NA
3-7, 9, 10	20	Bromoform	µg/L	Annual	0.6	NONE	NONE	4.3	360	NONE	360	No	NA	NA	NA	NA
3-7, 9, 10	21	Carbon Tetrachloride	µg/L	Annual	0.6	NONE	NONE	0.25	4.4	0.5	0.5	No	NA	NA	NA	NA
3-7, 9, 10	22	Chlorobenzene	µg/L	Annual	0.6	NONE	NONE	680	21,000	70	70	No	NA	NA	NA	NA
3-7, 9, 10	23	Dibromochloromethane	µg/L	Annual	0.6	NONE	NONE	0.401	34	NONE	34	No	NA	NA	NA	NA
3-7, 9, 10	24	Chloroethane	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	25	2-Chloroethyl vinyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	26	Chloroform	µg/L	Annual	0.6	NONE	NONE	Reserved	Reserved	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	27	Chlorodibromomethane	µg/L	Annual	0.6	NONE	NONE	0.56	46	NONE	46	No	NA	NA	NA	NA
3-7, 9, 10	28	1,1-Dichloroethane	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	5	5	No	NA	NA	NA	NA
3-7, 9, 10	29	1,2-Dichloroethane	µg/L	Annual	0.6	NONE	NONE	0.38	99	0.5	0.5	No	NA	NA	NA	NA
3-7, 9, 10	30	1,1-Dichloroethene	µg/L	Annual	0.6	NONE	NONE	0.057	3.2	6	3.2	No	NA	NA	NA	NA
3-7, 9, 10	31	1,2-Dichloropropane	µg/L	Annual	0.6	NONE	NONE	0.52	39	5	5	No	NA	NA	NA	NA
3-7, 9, 10	32	cis-1,3-Dichloropropene	µg/L	Annual	0.6	NONE	NONE	10	1,700	0.5	0.5	No	NA	NA	NA	NA
3-7, 9, 10	32a	trans-1,3-Dichloropropene	µg/L	Annual	0.6	NONE	NONE	10	1,700	0.5	0.5	No	NA	NA	NA	NA
3-7, 9, 10	33	Ethylbenzene	µg/L	Annual	0.6	NONE	NONE	3,100	29,000	700	700	No	NA	NA	NA	NA
3-7, 9, 10	34	Bromomethane	µg/L	Annual	0.6	NONE	NONE	48	4,000	NONE	4000	No	NA	NA	NA	NA
3-7, 9, 10	35	Chloromethane (Methyl Chloride)	µg/L	Annual	0.6	NONE	NONE	Narrative	Narrative	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	36	Methylene chloride	µg/L	Annual	0.6	NONE	NONE	4.7	1,600	NONE	1600	No	NA	NA	NA	NA
3-7, 9, 10	37	1,1,2,2-Tetrachloroethane	µg/L	Annual	0.6	NONE	NONE	0.17	11	1	1	No	NA	NA	NA	NA
3-7, 9, 10	38	Tetrachloroethene	µg/L	Annual	0.6	NONE	NONE	0.8	8.85	5	5	No	NA	NA	NA	NA
3-7, 9, 10	39	Toluene	µg/L	Annual	0.6	NONE	NONE	6,800	200,000	150	150	No	NA	NA	NA	NA
3-7, 9, 10	40	trans-1,2-Dichloroethene	µg/L	Annual	0.6	NONE	NONE	700	140,000	10	10	No	NA	NA	NA	NA
3-7, 9, 10	41	1,1,1-Trichloroethane	µg/L	Annual	0.6	NONE	NONE	Narrative	Narrative	200	200	No	NA	NA	NA	NA
3-7, 9, 10	42	1,1,2-Trichloroethane	µg/L	Annual	0.6	NONE	NONE	0.6	42	5	5	No	NA	NA	NA	NA
3-7, 9, 10	43	Trichloroethene	µg/L	Annual	0.6	NONE	NONE	2.7	81	5	5	No	NA	NA	NA	NA
3-7, 9, 10	44	Vinyl chloride	µg/L	Annual	0.6	NONE	NONE	2	525	0.5	0.5	No	NA	NA	NA	NA
3-7, 9, 10	45	2-Chlorophenol	µg/L	Annual	0.6	NONE	NONE	120	400	NONE	400	No	NA	NA	NA	NA
3-7, 9, 10	46	2,4-Dichlorophenol	µg/L	Annual	0.6	NONE	NONE	93	790	NONE	790	No	NA	NA	NA	NA
3-7, 9, 10	47	2,4-Dimethylphenol	µg/L	Annual	0.6	NONE	NONE	540	2,300	NONE	2300	No	NA	NA	NA	NA
3-7, 9, 10	48	2-Methyl-4,6-dinitrophenol	µg/L	Annual	0.6	NONE	NONE	13.4	765	NONE	765	No	NA	NA	NA	NA
3-7, 9, 10	49	2,4-Dinitrophenol	µg/L	Annual	0.6	NONE	NONE	70	14,000	NONE	14000	No	NA	NA	NA	NA
3-7, 9, 10	50	2-Nitrophenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	51	4-Nitrophenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA

**TABLE F-2  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 003-007, 009, AND 010)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
3-7, 9, 10	52	4-Chloro-3-methylphenol	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA	
3-7, 9, 10	53	Pentachlorophenol	µg/L	Annual	0.6	pH dependent	pH dependent	0.28	8.2	1	1	No	NA	NA	NA	NA
3-7, 9, 10	54	Phenol	µg/L	Annual	0.6	NONE	NONE	21,000	4,600,000	NONE	4600000	No	NA	NA	NA	NA
3-7, 9, 10	55	2,4,6-Trichlorophenol	µg/L	Annual	0.6	NONE	NONE	2.1	6.5	NONE	6.5	No	NA	NA	NA	NA
3-7, 9, 10	56	Acenaphthene	µg/L	Annual	0.6	NONE	NONE	1,200	2,700	NONE	2700	No	NA	NA	NA	NA
3-7, 9, 10	57	Acenaphthylene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	58	Anthracene	µg/L	Annual	0.6	NONE	NONE	9,600	110,000	NONE	110000	No	NA	NA	NA	NA
3-7, 9, 10	59	Benzdine	µg/L	Annual	0.6	NONE	NONE	0.00012	0.00054	NONE	0.00054	No	NA	NA	NA	NA
3-7, 9, 10	60	Benzo(a)Anthracene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	61	Benzo(a)Pyrene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	0.2	0.049	No	NA	NA	NA	NA
3-7, 9, 10	62	Benzo(b)Fluoranthene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	63	Benzo(g,h,i)Perylene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	64	Benzo(k)Fluoranthene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	65	Bis (2-Chloroethoxy) methane	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	66	Bis (2-Chloroethyl) ether	µg/L	Annual	0.6	NONE	NONE	0.031	1.4	NONE	1.4	No	NA	NA	NA	NA
3-7, 9, 10	67	Bis (2-Chloroisopropyl) Ether	µg/L	Annual	0.6	NONE	NONE	1,400	170,000	NONE	170000	No	NA	NA	NA	NA
3-7, 9, 10	68	Bis (2-ethylhexyl) Phthalate	µg/L	Annual	0.6	NONE	NONE	1.8	5.9	4	4	No	NA	NA	NA	NA
3-7, 9, 10	69	4-Bromophenyl phenyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	70	Butyl benzylphthalate	µg/L	Annual	0.6	NONE	NONE	3,000	5,200	NONE	5200	No	NA	NA	NA	NA
3-7, 9, 10	71	2-Chloronaphthalene	µg/L	Annual	0.6	NONE	NONE	1,700	4,300	NONE	4300	No	NA	NA	NA	NA
3-7, 9, 10	72	4-Chlorophenyl phenyl ether	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	73	Chrysene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	74	Dibenz(a,h)anthracene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	75	1,2-Dichlorobenzene	µg/L	Annual	0.6	NONE	NONE	2,700	17,000	600	600	No	NA	NA	NA	NA
3-7, 9, 10	76	1,3-Dichlorobenzene	µg/L	Annual	0.6	NONE	NONE	400	2,600	NONE	2600	No	NA	NA	NA	NA
3-7, 9, 10	77	1,4-Dichlorobenzene	µg/L	Annual	0.6	NONE	NONE	400	2,600	5	5	No	NA	NA	NA	NA
3-7, 9, 10	78	3,3'-Dichlorobenzidine	µg/L	Annual	0.6	NONE	NONE	0.04	0.077	NONE	0.077	No	NA	NA	NA	NA
3-7, 9, 10	79	Diethyl phthalate	µg/L	Annual	0.6	NONE	NONE	23,000	120,000	NONE	120000	No	NA	NA	NA	NA
3-7, 9, 10	80	Dimethyl phthalate	µg/L	Annual	0.6	NONE	NONE	313,000	2,900,000	NONE	2900000	No	NA	NA	NA	NA
3-7, 9, 10	81	Di-n-butyl phthalate	µg/L	Annual	0.6	NONE	NONE	2,700	12,000	NONE	12000	No	NA	NA	NA	NA
3-7, 9, 10	82	2,4-Dinitrotoluene	µg/L	Annual	0.6	NONE	NONE	0.11	9.1	NONE	9.1	No	NA	NA	NA	NA
3-7, 9, 10	83	2,6-Dinitrotoluene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	84	Di-n-octyl phthalate	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	85	1,2-Diphenylhydrazine/Azobenzene	µg/L	Annual	0.6	NONE	NONE	0.04	0.54	NONE	0.54	No	NA	NA	NA	NA
3-7, 9, 10	86	Fluoranthene	µg/L	Annual	0.6	NONE	NONE	300	370	NONE	370	No	NA	NA	NA	NA
3-7, 9, 10	87	Fluorene	µg/L	Annual	0.6	NONE	NONE	1,300	14,000	NONE	14000	No	NA	NA	NA	NA
3-7, 9, 10	88	Hexachlorobenzene	µg/L	Annual	0.6	NONE	NONE	0.00075	0.00077	1	0.00077	No	NA	NA	NA	NA
3-7, 9, 10	89	Hexachlorobutadiene	µg/L	Annual	0.6	NONE	NONE	0.44	50	NONE	50	No	NA	NA	NA	NA
3-7, 9, 10	90	Hexachlorocyclopentadiene	µg/L	Annual	0.6	NONE	NONE	240	17,000	50	50	No	NA	NA	NA	NA
3-7, 9, 10	91	Hexachloroethane	µg/L	Annual	0.6	NONE	NONE	1.9	8.9	NONE	8.9	No	NA	NA	NA	NA
3-7, 9, 10	92	Indeno(1,2,3-cd)Pyrene	µg/L	Annual	0.6	NONE	NONE	0.0044	0.049	NONE	0.049	No	NA	NA	NA	NA
3-7, 9, 10	93	Isophorone	µg/L	Annual	0.6	NONE	NONE	8.4	600	NONE	600	No	NA	NA	NA	NA
3-7, 9, 10	94	Naphthalene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA

**TABLE F-2  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALLS 003-007, 009, AND 010)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA							Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
3-7, 9, 10	95	Nitrobenzene	µg/L	Annual	0.6	NONE	NONE	17	1,900	NONE	1900	No	NA	NA	NA	NA
3-7, 9, 10	96	N-Nitrosodimethylamine	µg/L	Annual	0.6	NONE	NONE	0.00069	8.1	NONE	8.1	No	NA	NA	NA	NA
3-7, 9, 10	97	n-Nitroso-di-n-propylamine	µg/L	Annual	0.6	NONE	NONE	0.005	1.4	NONE	1.4	No	NA	NA	NA	NA
3-7, 9, 10	98	N-Nitrosodiphenylamine	µg/L	Annual	0.6	NONE	NONE	5	16	NONE	16	No	NA	NA	NA	NA
3-7, 9, 10	99	Phenanthrene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	100	Pyrene	µg/L	Annual	0.6	NONE	NONE	960	11,000	NONE	11000	No	NA	NA	NA	NA
3-7, 9, 10	101	1,2,4-Trichlorobenzene	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	70	70	No	NA	NA	NA	NA
3-7, 9, 10	102	Aldrin	µg/L	Annual	0.6	3	NONE	0.00013	0.00014	NONE	0.00014	No	NA	NA	NA	NA
3-7, 9, 10	103	alpha-BHC	µg/L	Annual	0.6	NONE	NONE	0.0039	0.013	NONE	0.013	No	NA	NA	NA	NA
3-7, 9, 10	104	beta-BHC	µg/L	Annual	0.6	NONE	NONE	0.014	0.046	NONE	0.046	No	NA	NA	NA	NA
3-7, 9, 10	105	gamma-BHC (Lindane)	µg/L	Annual	0.6	0.95	NONE	0.019	0.063	0.2	0.063	No	NA	NA	NA	NA
3-7, 9, 10	106	delta-BHC	µg/L	Annual	0.6	NONE	NONE	NONE	NONE	NONE	NONE	No	NA	NA	NA	NA
3-7, 9, 10	107	Chlordane	µg/L	Annual	0.6	2.4	0.0043	0.00057	0.00059	0.1	0.00059	No	NA	NA	NA	NA
3-7, 9, 10	108	4,4'-DDT	µg/L	Annual	0.6	1.1	0.001	0.00059	0.00059	NONE	0.00059	No	NA	NA	NA	NA
3-7, 9, 10	109	4,4'-DDE	µg/L	Annual	0.6	NONE	NONE	0.00059	0.00059	NONE	0.00059	No	NA	NA	NA	NA
3-7, 9, 10	110	4,4'-DDD	µg/L	Annual	0.6	NONE	NONE	0.00083	0.00084	NONE	0.00084	No	NA	NA	NA	NA
3-7, 9, 10	111	Dieldrin	µg/L	Annual	0.6	0.24	0.056	0.00014	0.00014	NONE	0.00014	No	NA	NA	NA	NA
3-7, 9, 10	112	alpha-Endosulfan	µg/L	Annual	0.6	0.22	0.056	110	240	NONE	0.056	No	NA	NA	NA	NA
3-7, 9, 10	113	beta-Endosulfan	µg/L	Annual	0.6	0.22	0.056	110	240	NONE	0.056	No	NA	NA	NA	NA
3-7, 9, 10	114	Endosulfan Sulfate	µg/L	Annual	0.6	NONE	NONE	110	240	NONE	240	No	NA	NA	NA	NA
3-7, 9, 10	115	Endrin	µg/L	Annual	0.6	0.086	0.036	0.76	0.81	2	0.036	No	NA	NA	NA	NA
3-7, 9, 10	116	Endrin Aldehyde	µg/L	Annual	0.6	NONE	NONE	0.76	0.81	NONE	0.81	No	NA	NA	NA	NA
3-7, 9, 10	117	Heptachlor	µg/L	Annual	0.6	0.52	0.0038	0.00021	0.00021	0.01	0.00021	No	NA	NA	NA	NA
3-7, 9, 10	118	Heptachlor Epoxide	µg/L	Annual	0.6	0.52	0.0038	0.0001	0.00011	0.01	0.00011	No	NA	NA	NA	NA
3-7, 9, 10	119	Aroclor 1016	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	120	Aroclor 1221	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	121	Aroclor 1232	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	122	Aroclor 1242	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	123	Aroclor 1248	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	124	Aroclor 1254	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	125	Aroclor 1260	µg/L	Annual	0.6	NONE	0.014	0.00017	0.00017	0.5	0.00017	No	NA	NA	NA	NA
3-7, 9, 10	126	Toxaphene	µg/L	Annual	0.6	0.73	0.0002	0.00073	0.00075	3	0.0002	No	NA	NA	NA	NA
3-7, 9, 10	127	E. Coli	MPN/100ml	Annual	0.6	NA	NA	NA	NA	235	235	No	NA	NA	NA	NA

**TABLE F-3**  
**REASONABLE POTENTIAL ANALYSIS - NONPRIORITY POLLUTANTS (OUTFALLS 003-007,009, AND 010)**

**FOURTH QUARTER 2018 REPORTING SUMMARY**  
**THE BOEING COMPANY**  
**SANTA SUSANA FIELD LABORATORY**  
**NPDES PERMIT CA0001309**

Outfall	Constituent	Monitoring	Units	Number of Samples	MEC	CV	Multiplier	Projected Maximum Effluent Concentration (99/99)	Dilution Ratio	Background Concentration	Projected Maximum Receiving Water Concentration	Step 1, Determine Water Quality Objectives	BU - Beneficial use protection NC-Human noncarcinogen AP-Aquatic life protection TMDL-Total Maximum Daily Load
3-7, 9, 10	Total Suspended Solids	Annual	mg/L	1	14.0	0.6	13.20	184.76	NA	NA	184.76	45	BU



**TABLE F-3  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALL 008)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C					C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA				Basin Plan Title 22 GWR			Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
8	002	Arsenic	µg/L	13	0.60	340	150	NONE	NONE	50	50	Yes	Yes	NA	NA	No
8	003	Beryllium	µg/L	All Data Qualified	0.60	NONE	NONE	Narrative	Narrative	4	4	No	No	No	NA	No
8	005a	Chromium	µg/L	10	0.60	550	180	Narrative	Narrative	50	50	Yes	Yes	NA	NA	No
8	005b	Chromium VI	µg/L	Available Data <DL	0.60	16	11	Narrative	Narrative	NONE	11	Yes	No	No	NA	No
8	011	Silver	µg/L	Available Data <DL	0.60	3.4	NONE	NONE	NONE	NONE	3.4	Yes	No	No	NA	No
8	015	Asbestos	Fibers/L	Available Data <DL	0.60	NONE	NONE	7,000,000	NONE	7,000,000	7000000	Yes	Yes	No	NA	No
8	017	Acrolein	µg/L	Available Data <DL	0.60	NONE	NONE	320	780	NONE	780	Yes	No	No	NA	No
8	018	Acrylonitrile	µg/L	Available Data <DL	0.60	NONE	NONE	0.059	0.66	NONE	0.66	Yes	No	Yes	0.66	No
8	019	Benzene	µg/L	Available Data <DL	0.60	NONE	NONE	1.2	71	1	1	Yes	No	No	NA	No
8	020	Bromoform	µg/L	Available Data <DL	0.60	NONE	NONE	4.3	360	NONE	360	Yes	No	No	NA	No
8	021	Carbon Tetrachloride	µg/L	Available Data <DL	0.60	NONE	NONE	0.25	4.4	0.5	0.5	Yes	No	No	NA	No
8	022	Chlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	680	21,000	70	70	Yes	No	No	NA	No
8	023	Dibromochloromethane	µg/L	Available Data <DL	0.60	NONE	NONE	0.401	34	NONE	34	Yes	No	No	NA	No
8	024	Chloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	025	2-Chloroethylvinylether	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	026	Chloroform	µg/L	Available Data <DL	0.60	NONE	NONE	Reserved	Reserved	NONE	NONE	Yes	No	No	NA	No
8	027	Bromodichloromethane	µg/L	Available Data <DL	0.60	NONE	NONE	0.56	46	NONE	46	Yes	No	No	NA	No
8	028	1,1-Dichloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	5	5	Yes	No	No	NA	No
8	029	1,2-Dichloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	0.38	99	0.5	0.5	Yes	No	No	NA	No
8	030	1,1-Dichloroethene	µg/L	Available Data <DL	0.60	NONE	NONE	0.057	3.2	6	3.2	Yes	No	No	NA	No
8	031	1,2-Dichloropropane	µg/L	Available Data <DL	0.60	NONE	NONE	0.52	39	5	5	Yes	No	No	NA	No
8	032	cis-1,3-Dichloropropene	µg/L	Available Data <DL	0.60	NONE	NONE	10	1,700	0.5	0.5	Yes	No	No	NA	No
8	032a	trans-1,3-Dichloropropene	µg/L	Available Data <DL	0.60	NONE	NONE	10	1,700	0.5	0.5	Yes	No	No	NA	No
8	033	Ethylbenzene	µg/L	Available Data <DL	0.60	NONE	NONE	3,100	29,000	700	700	Yes	No	No	NA	No
8	034	Bromomethane	µg/L	Available Data <DL	0.60	NONE	NONE	48	4,000	NONE	4000	Yes	No	No	NA	No
8	035	Chloromethane	µg/L	Available Data <DL	0.60	NONE	NONE	Narrative	Narrative	NONE	NONE	Yes	No	No	NA	No
8	036	Methylene chloride	µg/L	Available Data <DL	0.60	NONE	NONE	4.7	1,600	NONE	1600	Yes	No	No	NA	No
8	037	1,1,2,2-Tetrachloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	0.17	11	1	1	Yes	No	No	NA	No
8	038	Tetrachloroethene	µg/L	Available Data <DL	0.60	NONE	NONE	0.8	8.85	5	5	Yes	No	No	NA	No
8	039	Toluene	µg/L	All Data Qualified	0.60	NONE	NONE	6,800	200,000	150	150	No	No	No	NA	No
8	040	trans-1,2-Dichloroethene	µg/L	Available Data <DL	0.60	NONE	NONE	700	140,000	10	10	Yes	No	No	NA	No
8	041	1,1,1-Trichloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	Narrative	Narrative	200	200	Yes	No	No	NA	No
8	042	1,1,2-trichloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	0.6	42	5	5	Yes	No	No	NA	No
8	043	Trichloroethene	µg/L	Available Data <DL	0.60	NONE	NONE	2.7	81	5	5	Yes	No	No	NA	No
8	044	Vinyl chloride	µg/L	Available Data <DL	0.60	NONE	NONE	2	525	0.5	0.5	Yes	No	No	NA	No
8	045	2-chlorophenol	µg/L	Available Data <DL	0.60	NONE	NONE	120	400	NONE	400	Yes	No	No	NA	No
8	046	2,4-Dichlorophenol	µg/L	Available Data <DL	0.60	NONE	NONE	93	790	NONE	790	Yes	No	No	NA	No
8	047	2,4-dimethylphenol	µg/L	Available Data <DL	0.60	NONE	NONE	540	2,300	NONE	2300	Yes	No	No	NA	No
8	048	2-Methyl-4,6-dinitrophenol	µg/L	Available Data <DL	0.60	NONE	NONE	13.4	765	NONE	765	Yes	No	No	NA	No
8	049	2,4-dinitrophenol	µg/L	Available Data <DL	0.60	NONE	NONE	70	14,000	NONE	14000	Yes	No	No	NA	No
8	050	2-nitrophenol	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	051	4-nitrophenol	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	052	4-Chloro-3-methylphenol	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No

**TABLE F-3  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALL 008)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C				Basin Plan Title 22 GWR	C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3		Step 4 MEC >= C	
						CTR CRITERIA		HH W&O (Not App)	HH O = HH				Was Constituent Detected in Effluent Data	Are all Detection Limits > C		If DL > C, MEC = Min (DL)
						Freshwater	Human Health									
						CMC = Acute	CCC = Chronic									
8	053	Pentachlorophenol	µg/L	Available Data <DL	0.60	pH dependent	pH dependent	0.28	8.2	1	1	Yes	No	No	NA	No
8	054	Phenol	µg/L	Available Data <DL	0.60	NONE	NONE	21,000	4,600,000	NONE	4600000	Yes	No	No	NA	No
8	055	2,4,6-Trichlorophenol	µg/L	Available Data <DL	0.60	NONE	NONE	2.1	6.5	NONE	6.5	Yes	No	No	NA	No
8	056	Acenaphthene	µg/L	Available Data <DL	0.60	NONE	NONE	1,200	2,700	NONE	2700	Yes	No	No	NA	No
8	057	Acenaphthylene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	058	Anthracene	µg/L	Available Data <DL	0.60	NONE	NONE	9,600	110,000	NONE	110000	Yes	No	No	NA	No
8	059	Benzdine	µg/L	Available Data <DL	0.60	NONE	NONE	0.00012	0.00054	NONE	0.00054	Yes	No	Yes	0.00054	No
8	060	Benzo(a)Anthracene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	061	Benzo(a)Pyrene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	0.2	0.049	Yes	No	Yes	0.049	No
8	062	Benzo(b)Fluoranthene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	063	Benzo(g,h,i)Perylene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	064	Benzo(k)Fluoranthene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	065	Bis(2-Chloroethoxy) methane	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	066	bis (2-Chloroethyl) ether	µg/L	Available Data <DL	0.60	NONE	NONE	0.031	1.4	NONE	1.4	Yes	No	No	NA	No
8	067	Bis(2-Chloroisopropyl) Ether	µg/L	Available Data <DL	0.60	NONE	NONE	1,400	170,000	NONE	170000	Yes	No	No	NA	No
8	068	bis (2-ethylhexyl) Phthalate	µg/L	Available Data <DL	0.60	NONE	NONE	1.8	5.9	4	4	Yes	No	No	NA	No
8	069	4-Bromophenylphenylether	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	070	Butylbenzylphthalate	µg/L	Available Data <DL	0.60	NONE	NONE	3,000	5,200	NONE	5200	Yes	No	No	NA	No
8	071	2-Chloronaphthalene	µg/L	Available Data <DL	0.60	NONE	NONE	1,700	4,300	NONE	4300	Yes	No	No	NA	No
8	072	4-Chlorophenylphenylether	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	073	Chrysene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	074	Dibenzo(a,h)Anthracene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	075	1,2-Dichlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	2,700	17,000	600	600	Yes	No	No	NA	No
8	076	1,3-Dichlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	400	2,600	NONE	2600	Yes	No	No	NA	No
8	077	1,4-Dichlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	400	2,600	5	5	Yes	No	No	NA	No
8	078	3,3'-Dichlorobenzidine	µg/L	Available Data <DL	0.60	NONE	NONE	0.04	0.077	NONE	0.077	Yes	No	Yes	0.077	No
8	079	Diethylphthalate	µg/L	Available Data <DL	0.60	NONE	NONE	23,000	120,000	NONE	120000	Yes	No	No	NA	No
8	080	Dimethylphthalate	µg/L	Available Data <DL	0.60	NONE	NONE	313,000	2,900,000	NONE	2900000	Yes	No	No	NA	No
8	081	Di-n-butylphthalate	µg/L	Available Data <DL	0.60	NONE	NONE	2,700	12,000	NONE	12000	Yes	No	No	NA	No
8	082	2,4-Dinitrotoluene	µg/L	Available Data <DL	0.60	NONE	NONE	0.11	9.1	NONE	9.1	Yes	No	No	NA	No
8	083	2,6-Dinitrotoluene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	084	Di-n-octylphthalate	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	085	1,2-Diphenylhydrazine	µg/L	Available Data <DL	0.60	NONE	NONE	0.04	0.54	NONE	0.54	Yes	No	No	NA	No
8	086	Fluoranthene	µg/L	Available Data <DL	0.60	NONE	NONE	300	370	NONE	370	Yes	No	No	NA	No
8	087	Fluorene	µg/L	Available Data <DL	0.60	NONE	NONE	1,300	14,000	NONE	14000	Yes	No	No	NA	No
8	088	Hexachlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	0.00075	0.00077	1	0.00077	Yes	No	Yes	0.00077	No
8	089	Hexachlorobutadiene	µg/L	Available Data <DL	0.60	NONE	NONE	0.44	50	NONE	50	Yes	No	No	NA	No
8	090	Hexachlorocyclopentadiene	µg/L	Available Data <DL	0.60	NONE	NONE	240	17,000	50	50	Yes	No	No	NA	No
8	091	Hexachloroethane	µg/L	Available Data <DL	0.60	NONE	NONE	1.9	8.9	NONE	8.9	Yes	No	No	NA	No
8	092	Indeno(1,2,3-cd)Pyrene	µg/L	Available Data <DL	0.60	NONE	NONE	0.0044	0.049	NONE	0.049	Yes	No	Yes	0.049	No
8	093	Isophorone	µg/L	Available Data <DL	0.60	NONE	NONE	8.4	600	NONE	600	Yes	No	No	NA	No
8	094	Naphthalene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	095	Nitrobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	17	1,900	NONE	1900	Yes	No	No	NA	No

**TABLE F-3  
REASONABLE POTENTIAL ANALYSIS - PRIORITY POLLUTANTS (OUTFALL 008)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	CTR	Constituent	Units	MEC	CV	Step 1: Water Quality Criteria, Determine C					C = Lowest Criteria	Step 2 Is Effluent Data Available	Step 3			Step 4 MEC >= C
						CTR CRITERIA				Basin Plan Title 22 GWR			Was Constituent Detected in Effluent Data	Are all Detection Limits > C	If DL > C, MEC = Min (DL)	
						Freshwater		Human Health								
						CMC = Acute	CCC = Chronic	HH W&O (Not App)	HH O = HH							
8	096	N-Nitrosodimethylamine	µg/L	Available Data <DL	0.60	NONE	NONE	0.00069	8.1	NONE	8.1	Yes	No	No	NA	No
8	097	n-Nitroso-di-n-propylamine	µg/L	Available Data <DL	0.60	NONE	NONE	0.005	1.4	NONE	1.4	Yes	No	No	NA	No
8	098	N-Nitrosodiphenylamine	µg/L	Available Data <DL	0.60	NONE	NONE	5	16	NONE	16	Yes	No	No	NA	No
8	099	Phenanthrene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	100	Pyrene	µg/L	Available Data <DL	0.60	NONE	NONE	960	11,000	NONE	11000	Yes	No	No	NA	No
8	101	1,2,4-Trichlorobenzene	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	70	70	Yes	No	No	NA	No
8	102	Aldrin	µg/L	Available Data <DL	0.60	3	NONE	0.00013	0.00014	NONE	0.00014	Yes	No	Yes	0.00014	No
8	103	alpha-BHC	µg/L	Available Data <DL	0.60	NONE	NONE	0.0039	0.013	NONE	0.013	Yes	No	No	NA	No
8	104	beta-BHC	µg/L	Available Data <DL	0.60	NONE	NONE	0.014	0.046	NONE	0.046	Yes	No	No	NA	No
8	105	Lindane (gamma-BHC)	µg/L	Available Data <DL	0.60	0.95	NONE	0.019	0.063	0.2	0.063	Yes	No	No	NA	No
8	106	delta-BHC	µg/L	Available Data <DL	0.60	NONE	NONE	NONE	NONE	NONE	NONE	Yes	No	No	NA	No
8	107	Chlordane	µg/L	Available Data <DL	0.60	2.4	0.0043	0.00057	0.00059	0.1	0.00059	Yes	No	Yes	0.00059	No
8	108	4,4'-DDT	µg/L	Available Data <DL	0.60	1.1	0.001	0.00059	0.00059	NONE	0.00059	Yes	No	Yes	0.00059	No
8	109	4,4'-DDE	µg/L	Available Data <DL	0.60	NONE	NONE	0.00059	0.00059	NONE	0.00059	Yes	No	Yes	0.00059	No
8	110	4,4'-DDD	µg/L	Available Data <DL	0.60	NONE	NONE	0.00083	0.00084	NONE	0.00084	Yes	No	Yes	0.00084	No
8	111	Dieldrin	µg/L	Available Data <DL	0.60	0.24	0.056	0.00014	0.00014	NONE	0.00014	Yes	No	Yes	0.00014	No
8	112	Endosulfan I	µg/L	Available Data <DL	0.60	0.22	0.056	110	240	NONE	0.056	Yes	No	No	NA	No
8	113	Endosulfan II	µg/L	Available Data <DL	0.60	0.22	0.056	110	240	NONE	0.056	Yes	No	No	NA	No
8	114	Endosulfan Sulfate	µg/L	Available Data <DL	0.60	NONE	NONE	110	240	NONE	240	Yes	No	No	NA	No
8	115	Endrin	µg/L	Available Data <DL	0.60	0.086	0.036	0.76	0.81	2	0.036	Yes	No	No	NA	No
8	116	Endrin Aldehyde	µg/L	Available Data <DL	0.60	NONE	NONE	0.76	0.81	NONE	0.81	Yes	No	No	NA	No
8	117	Heptachlor	µg/L	Available Data <DL	0.60	0.52	0.0038	0.00021	0.00021	0.01	0.00021	Yes	No	Yes	0.00021	No
8	118	Heptachlor Epoxide	µg/L	Available Data <DL	0.60	0.52	0.0038	0.0001	0.00011	0.01	0.00011	Yes	No	Yes	0.00011	No
8	119	Aroclor-1016	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	120	Aroclor-1221	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	121	Aroclor-1232	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	122	Aroclor-1242	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	123	Aroclor-1248	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	124	Aroclor-1254	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	125	Aroclor-1260	µg/L	Available Data <DL	0.60	NONE	0.014	0.00017	0.00017	0.5	0.00017	Yes	No	Yes	0.00017	No
8	126	Toxaphene	µg/L	Available Data <DL	0.60	0.73	0.0002	0.00073	0.00075	3	0.0002	Yes	No	Yes	0.0002	No
8	127	E. Coli	MPN/100ml	8500	0.60	NA	NA	NA	NA	235	235	Yes	Yes	NA	NA	Yes

**TABLE F-6  
REASONABLE POTENTIAL ANALYSIS - NONPRIORITY POLLUTANTS (OUTFALL 008)**

**FOURTH QUARTER 2018 REPORTING SUMMARY  
THE BOEING COMPANY  
SANTA SUSANA FIELD LABORATORY  
NPDES PERMIT CA0001309**

Outfall	Constituent	Monitoring	Units	Number of Samples	MEC	CV	Multiplier	Projected Maximum Effluent Concentration (99/99)	Dilution Ratio	Background Concentration	Projected Maximum Receiving Water Concentration	Step 1, Determine Water Quality Objectives	BU - Beneficial use protection NC-Human noncarcinogen AP-Aquatic life protection
8	Total Suspended Solids	Annual	mg/L	1	750	0.60	13.2	9900.00	0	0	9900.00	45	BU