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Via Email to losangeles@waterboards.ca.gov

May 7, 2021

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

Subject: First Quarter 2021 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 January 1 through March 31, 2021 (First Quarter 2021). 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, which includes approximately 2,400 acres owned by Boeing, approximately 450 acres owned by the United States and administered by the National Aeronautics and Space Administration (NASA), and approximately 290 acres of Boeing's land for which the Department of Energy (DOE) has assumed responsibility for soil remediation.

Hard copies of this DMR are available to the public at the California State University Northridge Oviatt Library, the 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

FIRST QUARTER 2021 DMR CONTENTS

This DMR includes the following sections and appendices:

- **Discharge and Sample Collection Summary:** This section describes the number of rain events, the number of samples collected, sample dates, and sample locations during the First Quarter 2021. Table I summarizes the First Quarter 2021 sampling record by outfall or location, sample frequency, and sample type collected per the requirements of the NPDES Permit.
- **Receiving Water Surveys:** This section summarizes the receiving water surveys required by the NPDES Permit.
- **Summary of Exceedances and/or Non-Compliance:** This section summarizes the First Quarter 2021 sample results that exceeded NPDES Permit Limits, Benchmarks, and Receiving Water Limits, and the potential causes thereof.
- **Stormwater Treatment System at Outfall 011 Activities:** This section summarizes the First Quarter 2021 activities at the stormwater treatment system (SWTS) at Outfall 011.
- **Stormwater Treatment System at Outfall 018 Activities:** This section summarizes the First Quarter 2021 activities at the SWTS at Outfall 018.

- **Stormwater Pollution Prevention Plan/Best Management Practice Activities:** This section presents the Santa Susana Site-Wide Stormwater Pollution Prevention Plan (SWPPP) and Best Management Practice (BMP)-related activities implemented in the First Quarter 2021 as well as activities associated with NASA, DOE, the Stormwater Expert Panel (Expert Panel), NASA and Boeing BMP Monitoring-related activities, the Northern Drainage, the Outfall 001/002 BMP Compliance Report, and Other BMP Activities. Table II summarizes typical BMP-related activities that occur at outfalls every quarter. Table III summarizes specific BMP activities completed during the First Quarter 2021 by outfall location.
- **Figure 1** shows the stormwater collection and 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 sampling location (RSW 002, Frontier Park) and upstream monitoring location.
- **Appendix A** summarizes the rainfall measured at the Santa Susana Site during the First Quarter 2021.
- **Appendix B** tabulates waste shipments during the First Quarter 2021.
- **Appendix C** presents chemical analytical results from the First Quarter 2021 stormwater and/or receiving water sample discharge monitoring in tabular form by sampling locations, constituents evaluated (analytes), sample dates, and data validation qualifiers.
- **Appendix D** contains copies of the laboratory analytical reports, chain-of-custody forms, and data validation reports (if validation was performed).
- **Appendix E** presents laboratory methods and State Water Resources Control Board (SWRCB) Environmental Laboratory Accreditation Program (ELAP) renewal certifications for all laboratories.

DISCHARGE AND SAMPLE COLLECTION SUMMARY

The Santa Susana Site had four qualifying rain events during the First Quarter 2021 that measured 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 anticipated rain events. No discharge occurred at any of the outfalls; therefore, no samples were collected. 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).

Table I summarizes the First Quarter 2021 sampling record by outfall or location, sample frequency, and sample type collected per NPDES Permit requirements, and results are included in Appendix C.

TABLE I: Sampling Record during the First Quarter 2021

Date	Outfall/Location	Sample Frequency	Sample Type
3/17/2021	Arroyo Simi Receiving Water (RSW-002, Frontier Park)	Annual and Quarterly Surface Water	Grab

All analyses were conducted at analytical laboratories certified by the State Water Resources Control Board (SWRCB) for such analyses (i.e., all have current certification from the Environmental Laboratory Accreditation Program [ELAP] established by the California Environmental Laboratory Improvement Act) or have been approved by the SWRCB Executive Officer in accordance with current U.S. Environmental Protection Agency (EPA) guideline procedures or as specified in the NPDES Permit. Laboratory analytical reports, including validation reports and notes (if validation was performed), are included in Appendix D. 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 First Quarter 2021 except when reporting limits were above the minimum levels (generally because of matrix interference). In cases where the NPDES Permit Limit was less than the reporting limit and minimum level or there was no minimum level specified in the NPDES Permit, the reporting limit was used to determine compliance.

The annual requirement to include reporting limits, method detection limits, laboratory analytical methods, SWRCB ELAP renewal certifications for all laboratories, and associated laboratory quality assurance and quality control (QA/QC) procedures are included in Appendix E.

FIRST QUARTER 2021 RECEIVING WATER SURVEYS

The receiving water monitoring program required by the Permit includes surveys of Bell Creek, Dayton Canyon Creek, and Arroyo Simi. Observations are made only during discharge from Outfalls 002, 008, and 009, respectively, and at most, monthly during periods of multiple flow events. During First Quarter 2021, Outfalls 002, 008, and 009 did not discharge, thus, no receiving water surveys were conducted.

FIRST QUARTER 2021 SUMMARY OF EXCEEDANCES AND/OR NON-COMPLIANCE

No surface water discharges occurred from the Santa Susana Site during First Quarter 2021. As such, there are no onsite compliance issues to report for this period. Additionally, in the quarterly surface water sample collected at Arroyo Simi sampling location (RSW-002, Frontier Park) in Simi Valley, no constituents exceeded receiving water limits.

STORMWATER TREATMENT SYSTEM AT OUTFALL 011 ACTIVITIES

The SWTS located near R-1 Pond is situated to discharge through Outfall 011 (SWTS 011). Maintenance items were completed in the First Quarter 2021 as follows:

- Installed a new pH controller for ACTIFLO.
- Fabricated and installed pump guards for the filter feed pumps.
- Installed a new electrical outlet on top of ACTIFLO.
- Removed old, unused air solenoids on the sand filters.
- Shut down and drained the system at the end of the First Quarter 2021.

SWTS 011 did not operate in the First Quarter 2021.

STORMWATER TREATMENT SYSTEM AT OUTFALL 018 ACTIVITIES

The SWTS located at Silvernale Pond discharges through Outfall 018 (SWTS 018). Maintenance items were completed in the First Quarter 2021 as follows:

- Reprogrammed the turbidity meter for the sand filter to enable communication with the Programmable Logic Controller (PLC).
- Fabricated and installed pump guards for the filter feed pumps.
- Installed electrical outlets on the Weir Tanks for increased operational safety.
- Installed a Variable Frequency Driver (VFD) on the mixer motor in the potassium permanganate tank.
- Replaced the cotter pin inside the check valve for pump P-107 in order to allow the valve to fully close.
- Opened the drum on the screw press and cleaned out debris.
- Shut down and drained the system at the end of the First Quarter 2021.

SWTS 018 did not operate in the First Quarter 2021.

STORMWATER POLLUTION PREVENTION PLAN/BEST MANAGEMENT PRACTICE ACTIVITIES

Boeing implemented significant BMP activities in compliance with the Site-Wide SWPPP (Haley & Aldrich, 2020) to assist in improving stormwater quality and compliance at the Santa Susana Site. Table II summarizes typical BMP-related activities that occur at outfalls every quarter.

TABLE II: Routine Quarterly Outfall BMP Activities

BMP Activities	Outfalls											
	001	002	003	004	005	006	007	008	009	010	011	018
Conducted erosion and 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	N/A

Notes:

X = BMP activity is applicable to the outfall and was completed in First Quarter 2021.

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.

Table III summarizes the additional activities completed during the First Quarter 2021 by outfall or BMP location.

TABLE III: Additional First Quarter 2021 BMP Activities

Outfall, Watershed or BMP Location	BMP Activities During First Quarter 2021
001 and 011	Removed pipe supports and bollards for the former Groundwater Extraction and Treatment System (GETS) discharge line between the Outfall 001 and Outfall 011 watersheds. Removed damaged and spent fiber rolls from the top banks of the channel.
002	Removed sediment buildup on the stairs and landing by the Autosampler enclosure.
006	Removed fallen oak tree branches hindering access to Outfall 006.
008	Repaired the silt fence south of the flume.
009	Removed deteriorated sandbags along Well 13 road.
010	Removed and cleaned the seating plate on the check valve of the large submersible pump.
011	Installed media wattles around telephone poles in and around the Former Burn Pit.
Area I and Area II Roadways	Cleaned the concrete and asphalt swales along the roadways, removing sediment and leaf debris.
CM-4	Repaired damaged weir boards.
Upper Parking Lot	Removed sediment and debris from along the eastern curb. Performed weed abatement throughout the parking lot.
Sage Ranch	Replaced damaged sandbags.

In addition to Site-Wide SWPPP-related activities, specific BMP projects included: NASA, DOE, Expert Panel, Northern Drainage, and Outfall 001/002 BMP Compliance Report. These are discussed in more detail below.

NASA-Related Activities

Demolition BMPs and stormwater activities covered by NASA's Construction SWPPP for the Alfa and Bravo areas are inspected in accordance with the Construction General Permit (CGP) (NASA, 2017). All demolition and soil disturbance activities were completed in 2018. During the First Quarter 2021, NASA maintained fiber rolls as perimeter and linear sediment controls, maintained silt fencing and gravel/riprap in areas within these sites where construction activities had been completed. A Notice of Termination (NOT) was submitted to the Regional Board in Second Quarter 2020.

DOE-Related Activities

Demolition BMPs and stormwater activities covered by DOE's Construction SWPPPs for the Hazardous Waste Management Facility (HWMF), Radioactive Materials Handling Facility (RMHF), and other facilities within Area IV were inspected in accordance with the CGP (DOE, 2020a, 2020b, 2020c).

Expert Panel-Related Activities

The BMP activities discussed below were performed, commenced, or completed during the First Quarter 2021 in coordination with the Expert Panel.

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 from roads and/or the surrounding hillsides. The First Quarter 2021 activities included:

- BMP inspections, including the culvert inlets and riprap check dams;
- Cleaning CM basins and weir boards of debris as needed and;
- Repaired damaged weir boards at CM-4.

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 from the ELV area. After being pumped from the cistern at the bottom of the swale to the ELV system, 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 sandbag berm was placed across the ELV asphalt swale to divert stormwater toward CM-1 for treatment instead of directly discharging to the Northern Drainage. A generator was installed at the ELV system during the Third Quarter 2019. The First Quarter 2021 activities included BMP inspections.

Well 13 Road

Sandbag berms located near the culvert inlet and downgradient of the hydroseeded area were reinforced and increased in height during Fourth Quarter 2017. The First Quarter 2021 activities included BMP inspections and removal of deteriorated sandbags.

B-1 Area

The B-1 Area BMPs include:

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

The First Quarter 2021 activities included continued BMP inspections and sediment and debris removal from the curb cuts, the grating at the Boeing water tank, the Bioswale inlets, and inside the 407 Storage Yard.

Upper Parking Lot Media Filter

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 and designed to treat runoff from parts of the parking lot as well as parts of the adjacent entrance road. The First Quarter 2021 activities included BMP inspections, sediment and debris removal along the eastern curb and weed abatement throughout the parking lot.

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 stormwater 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 First Quarter 2021 activities included BMP inspections and removal of damaged and spent fiber rolls.

Lower Lot Biofilter

The lower lot biofilter is a stormwater treatment BMP designed and built to capture, convey, and treat stormwater from the lower 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 First Quarter 2021 activities included inspections to verify that the sedimentation basin and biofilter were free of sediment and debris, checks of the cistern area and pump, weed abatement as needed, in addition to inspections of surrounding BMPs.

Approximately 182,400 gallons of stormwater were pumped from the cistern to the sedimentation basin during the First Quarter 2021.

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 placed upstream of the inlet to increase the settling of solids. The First Quarter 2021 activities included BMP inspections.

Former Shooting Range

BMPs at the Former Shooting Range consist 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;
- Water bar across the trail;
- Three check structures on the Northern Drainage Trail;
- Sandbags with fiber rolls;
- A check structure at the dissipater; and
- Hydroseeding.

The entire area continues to benefit from the growth of dense vegetation that shields lead shot from direct contact with or dislodging during precipitation events and prevents soil erosion and mobility of the shot to downstream areas.

At the request of the Expert Panel, the Sage Ranch side of the Former Shooting Range was inspected to confirm that BMPs (i.e., fiber rolls, silt fence, etc.) control and/or treat stormwater runoff from that side of the Former Shooting Range to the Northern Drainage. The First Quarter 2021 activities included BMP inspections and replacing damaged sandbags.

NASA and Boeing BMP Monitoring-Related Activities

In addition to activities performed in coordination with the Expert Panel described above, BMP performance monitoring samples were collected in the watershed associated with Outfall 003 and Outfall 011 during the First Quarter 2021. These sampling results will be reported by the Expert Panel in their 2021 Annual Report.

Northern Drainage BMPs

Boeing restored the Northern Drainage (Outfall 009) following cleanup activities performed under the Department of Toxic Substance Control (DTSC) oversight and in accordance with the requirements of the Regional Board's Cleanup and Abatement Order No. R4-2007-0054 (Regional Water Quality Control Board, 2007). The restoration and mitigation activities proposed in the Northern Drainage Restoration, Mitigation, and Monitoring Plan (RMMP)[1] 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 according to 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 had complied with all terms of the Cleanup and Abatement Order and Boeing's obligations under the Order would therefore be 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 First Quarter 2021.

Outfall 001/002 BMP Compliance Report Related Activities

Boeing and the Expert Panel will continue to monitor and evaluate the effectiveness of BMPs within the watersheds of Outfall 001 and Outfall 002. Recommendations for these watersheds are provided in the 2020 Expert Panel Annual Report (Geosyntec and the Expert Panel, 2020).

Other BMP Activities

BMP observations and maintenance inspections were conducted in conformance with the Site-Wide SWPPP (Haley & Aldrich, 2020) at and around the former test stands Alfa and Bravo and former Advanced Propulsion Test Facility.

CONCLUSIONS

Boeing continues to implement, maintain, and monitor wide ranging control practices intended 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

[1] Available at: http://www.boeing.com/principles/environment/santa-susana/technical-reports.page

erosion control/restoration measures. The Expert Panel is reviewing the data collected this year and will make BMP and monitoring recommendations that will be communicated in the Expert Panel's 2021 Annual Report.

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 7th of May 2021 at The Boeing Company, Seal Beach, California Site.

Sincerely,

Kim O'Rourke

Kim O'Rourke
Global Remediation and Due Diligence Program Manager
Global Enterprise Sustainability – Environment

Enclosures:

References
Figure 1 – Site Map with Stormwater Collection and Conveyance System and Site Features
Figure 2 – Arroyo Simi Receiving Water (RSW-002, Frontier Park) Sampling Location and Upstream Monitoring Point
Appendix A – First Quarter 2021 Daily Rainfall Summary
Appendix B – First Quarter 2021 Waste Shipment Summary Table
Appendix C – First Quarter 2021 Discharge Monitoring Data Summary Table
Appendix D – First Quarter 2021 Analytical Laboratory Reports, Chain of Custody Forms, and Validation Reports
Appendix E – First Quarter 2021 Analytical Laboratory Methods, Method Detection Limits, Reporting Limits, QA/QC Procedures, and ELAP Certifications

c: Los Angeles Regional Water Quality Control Board; Attn: Mr. Duong H. Trinh
Los Angeles Regional Water Quality Control Board; Attn: Ms. Kelly Bronwyn
California Department of Toxic Substances Control; Attn: Mr. Mark Malinowski
California State University Northridge Oviatt Library
Simi Valley Public Library
Los Angeles Public Library, Platt Branch

REFERENCES

1. California Regional Water Quality Control Board, 2007. Cleanup and Abatement Order No. R4-2007-0054. 6 November.

2. California Regional Water Quality Control Board, Los Angeles Region, 2015. Waste Discharge Requirements for The Boeing Company, Santa Susana Field Laboratory (Order No. R4-2015-0033, NPDES No. CA0001309). 12 February.

3. California State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ).

4. U.S. Department of Energy, 2020a. Stormwater Pollution Prevention Plan for HWMF Phase 1 Decommissioning and Demolition U.S. Department of Energy, Energy Technology Engineering Center – Area IV, Santa Susana Field Laboratory, Ventura County, California, October.

5. U.S. Department of Energy, 2020b. Stormwater Pollution Prevention Plan for RMHF Phase 1 Decommissioning and Demolition U.S. Department of Energy, Energy Technology Engineering Center – Area IV, Santa Susana Field Laboratory, Ventura County, California, July.

6. U.S. Department of Energy, 2020c, Stormwater Pollution Prevention Plan for CLIN 008 Phase I Decommissioning and Demolition, U.S. Department of Energy, Energy Technology Engineering Center – Area IV, Santa Susana Field Laboratory, Ventura County California, December.

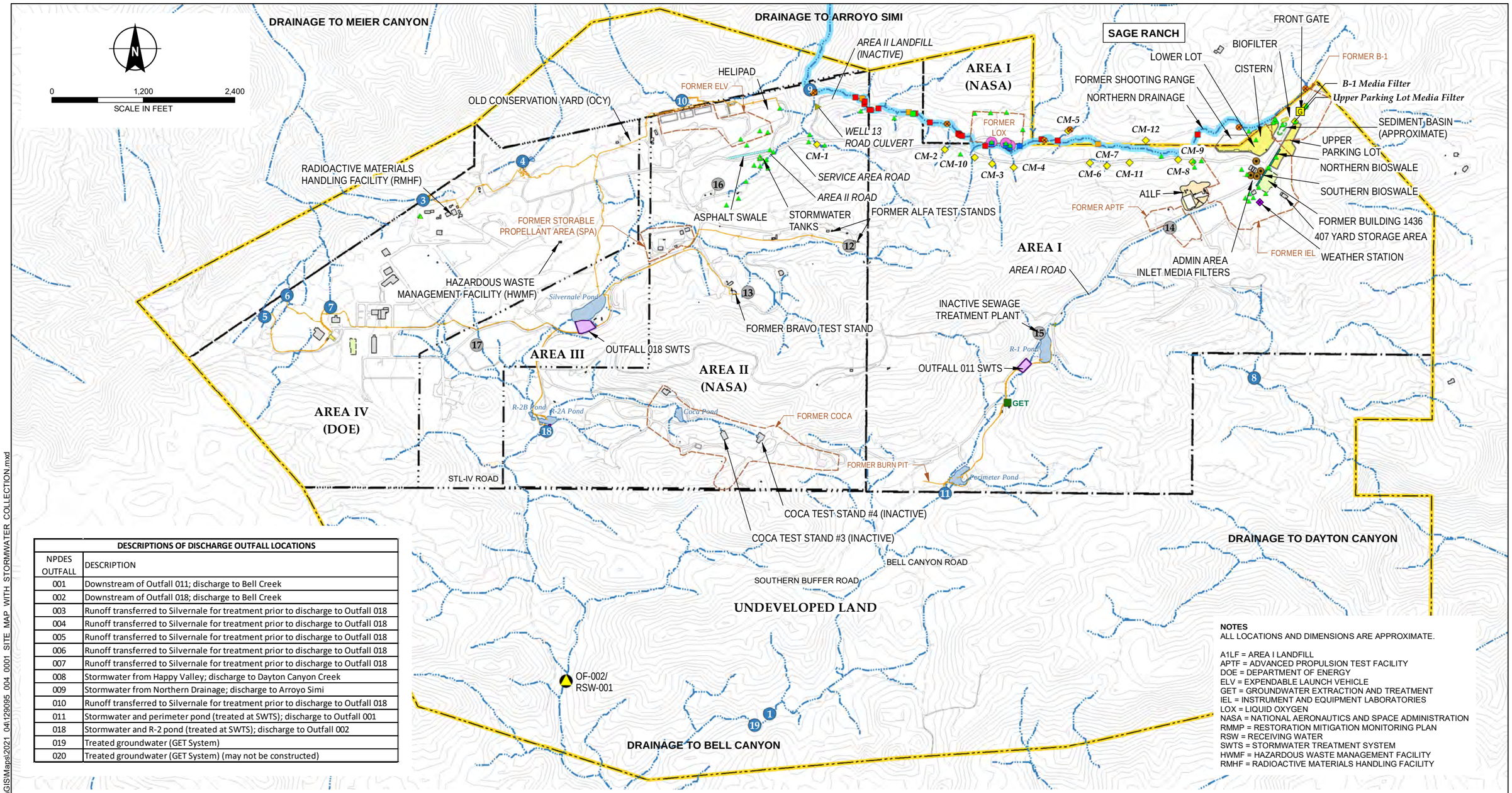
7. Geosyntec and the Expert Panel, 2020. Santa Susana Field Laboratory Site-Wide Stormwater Annual Report, 2019/20 Reporting Year, Ventura County, California (NPDES No. CA0001309, CI No.6027). 31 October.

8. Haley & Aldrich, Inc., 2017. Northern Drainage 2017 Annual Report, Clean Water Act Section 401 Water Quality Certification, File No. 12-001, Cleanup and Abatement Order No. R4-2007-0054, Streambed Alteration Agreement No. 1600-2003-5052-R5, Streambed Alteration Agreement No. 1600-2015-0079-R5, U.S. Army Corps of Engineers SPL-2012-00015, Santa Susana Field Laboratory, Ventura County, California. 13 December.

9. Haley & Aldrich, Inc., 2020. Stormwater Pollution and Prevention Plan (Version 7 for Compliance with 2015 NPDES Permit). 26 September.

   NASA, 2017. Stormwater Pollution and Prevention Plan, Pacific Region MATOC FY17 NASA SSFL, Ventura County, California, Phase IIIa Demolition. 31 March.

FIGURES



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)

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
HWMF = HAZARDOUS WASTE MANAGEMENT FACILITY
RMHF = RADIOACTIVE MATERIALS HANDLING FACILITY

LEGEND

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

HALEY ALDRICH

NPDES PERMIT COMPLIANCE FIRST QUARTER 2021
DISCHARGE MONITORING REPORT
THE BOEING COMPANY
VENTURA COUNTY, CALIFORNIA

SITE MAP WITH STORMWATER COLLECTION AND CONVEYANCE SYSTEM AND SITE FEATURES

MAY 2021

FIGURE 1

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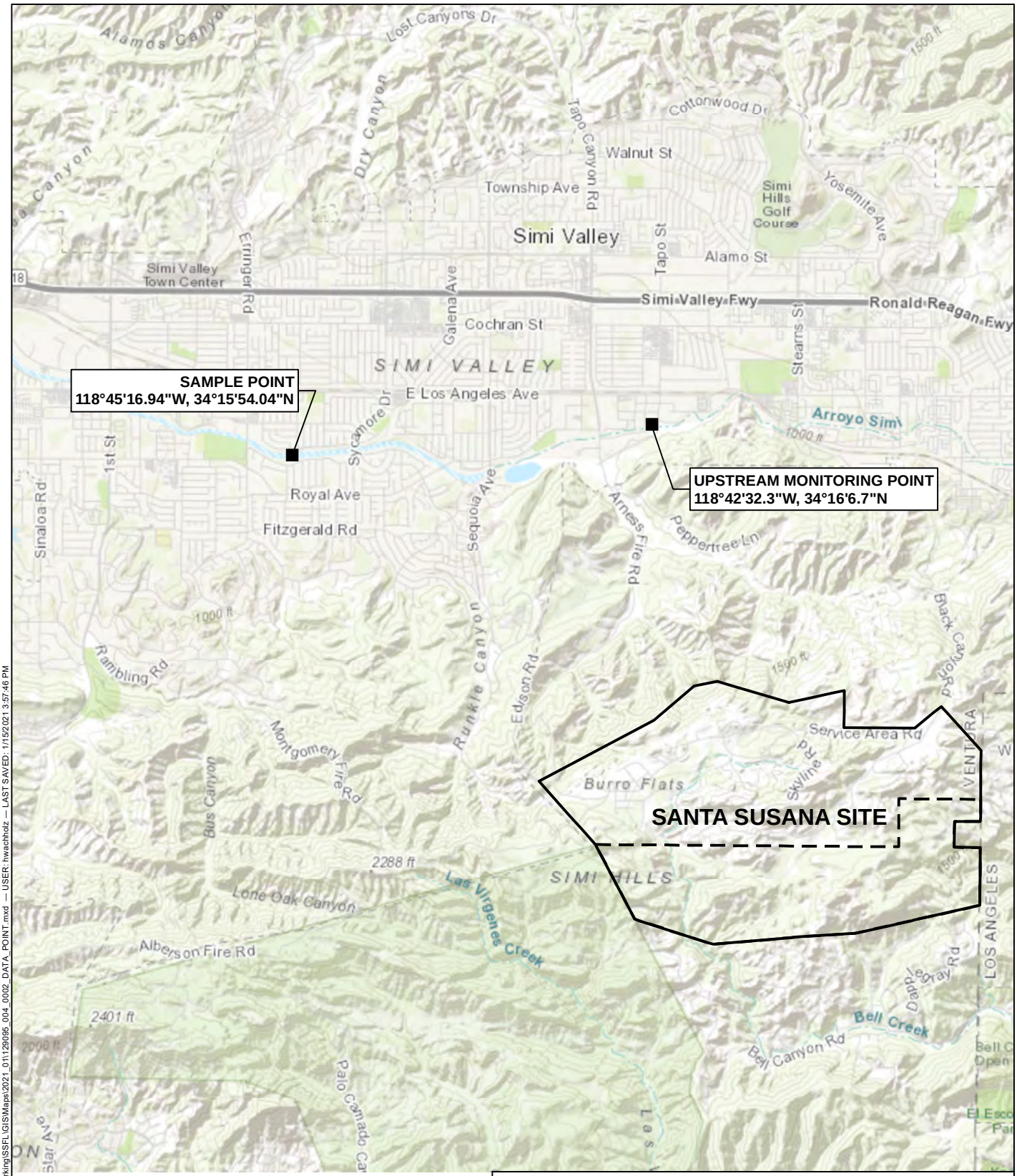

NOTES

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.

N

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SCALE IN MILES

HALEY ALDRICH

NPDES PERMIT COMPLIANCE FIRST QUARTER 2021
DISCHARGE MONITORING REPORT
THE BOEING COMPANY
VENTURA COUNTY, CALIFORNIA

ARROYO SIMI RECEIVING WATER (RSW-002, FRONTIER PARK) SAMPLING LOCATION AND UPSTREAM MONITORING POINT

MAY 2021

FIGURE 2

GIS FILE PATH: C:\Users\hwachholz\Documents\working\SSFL\GIS\Maps\2021_01\129095_004_0002_DATA_POINT.mxd — USER: hwachholz — LAST SAVED: 1/15/2021 3:57:46 PM

APPENDIX A

First Quarter 2021 Rainfall Data Summary

APPENDIX A

TABLE OF CONTENTS

TABLE A
DAILY RAINFALL SUMMARY

THE BOEING COMPANY
NPDES PERMIT CA0001309

Station: AREA 1
Parameter: Rain
Month/Year: January 2021

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	
	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
	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
	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
	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
	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
	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
	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
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
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
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
	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
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
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
	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
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
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
E	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
	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
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
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
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	0.00	0.00
T	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
H	23	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.07	0.00	0.02	0.04	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	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
	25	0.00	0.11	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	0.12
	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
	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
	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	0.07	0.27	0.25	0.11	0.11	0.12	0.04	0.97
	29	0.04	0.05	0.01	0.00	0.11	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
	30	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	0.00	0.01
	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

TABLE A
DAILY RAINFALL SUMMARY

THE BOEING COMPANY
NPDES PERMIT CA0001309

Station: AREA 1
Parameter: Rain
Month/Year: February 2021

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	
	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
	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
	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
	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
	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
	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
	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
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
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
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
	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
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
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
	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
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
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
E	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
	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
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
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
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	0.00	0.00
T	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
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
	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
	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
	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
	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
	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
	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

TABLE A
DAILY RAINFALL SUMMARY

THE BOEING COMPANY
NPDES PERMIT CA0001309

Station: AREA 1
Parameter: Rain
Month/Year: March 2021

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	
	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
	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
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	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	0.04
	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
	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
	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
	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
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
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
Y	10	0.00	0.09	0.05	0.01	0.02	0.03	0.01	0.00	0.00	0.00	0.16	0.06	0.00	0.06	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.61
	11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.11	0.00	0.00	0.03	0.12	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.32
O	12	0.00	0.00	0.00	0.01	0.00	0.00	0.00	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	0.01
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
	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
T	15	0.00	0.00	0.00	0.00	0.03	0.06	0.08	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
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
E	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
	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
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
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
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	0.00	0.00
T	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
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
	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
	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
	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
	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
	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
	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
	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
	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

Flags: d = Off-line part of hour, invalid hour due to semi-annual calibration (March 12). For the off-line event, the rain gauge at Sage Ranch confirmed no rainfall on March 12 during hour 0700-0800.

APPENDIX B

First Quarter 2021 Waste Shipment Summary Tables

APPENDIX B

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TABLE B
WASTE SHIPMENT SUMMARY TABLE

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

TYPE OF WASTE	MATRIX	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	DESTINATION
Hazardous Waste	Liquid	5,826	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Wilmington LLC 1737 East Denni Street Wilmington, CA 90744
Hazardous Waste	Solid	358	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Environemntal Services, Inc. 2247 South Highway 71 Kimball, NE 69145
Non RCRA Hazardous Waste	Solid	27	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Tri-State Motor Transit Co. 17235 N 75th Ave., Suite D175 Glendale, AZ 85308	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Hazardous Waste, Corrosive	Solid	20	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Tri-State Motor Transit Co. 17235 N 75th Ave., Suite D175 Glendale, AZ 85308	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Hazardous Waste	Solid	20	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Tri-State Motor Transit Co. 17235 N 75th Ave., Suite D175 Glendale, AZ 85308	Clean Harbors Aragonite LLC 11600 North Aptus Road Grantsville, UT 84029
Hazardous Waste, Flammable	Liquid	47	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Environemntal Services, Inc. 2247 South Highway 71 Kimball, NE 69145
Hazardous Waste	Liquid	7,800	G	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	US Ecology Vernon 5375 South Boyle Avenue Los Angeles, CA 90058
Non RCRA Hazardous Waste	Solid	69	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Non Hazardous Waste	Liquid	6,800	G	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Southwest Processors, Inc. 4120 Bandini Boulevard Vernon, CA 90058
Non Hazardous, Non D.O.T. Regulated Material	Solid	148	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	Tri-State Motor Transit Co. 17235 N 75th Ave., Suite D175 Glendale, AZ 85308	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Non Hazardous, Non D.O.T. Regulated Material	Solid	10,393	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Non Hazardous, Non D.O.T. Regulated Material	Liquid	835	P	Clean Harbors Environmental Services, Inc. 42 Longwater Drive Norwell, MA 02061	n/a	Clean Harbors Grassy Mountain LLC 3 Miles East 7 Miles North of Knolls Grantsville, UT 84029
Non Hazardous Waste	Liquid	40,000	G	Southwest Processors, Inc. 4120 Bandini Boulevard Vernon, CA 90058	n/a	Southwest Processors, Inc. 4120 Bandini Boulevard Vernon, CA 90058
Hazardous Waste	Solid	2,000	P	Patriot Environmental Services	n/a	US Ecology Beatty US Hwy 95, 11 Miles South of Beatty Beatty, NV 89003

TABLE B
WASTE SHIPMENT SUMMARY TABLE

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

TYPE OF WASTE	MATRIX	QTY.	UNITS	TRANSPORTER 1	TRANSPORTER 2	DESTINATION
Hazardous Waste	Solid	20	Y	Ecology Control Industries	n/a	US Ecology Beatty US Hwy 95, 11 Miles South of Beatty Beatty, NV 89003
Hazardous Waste	Liquid	520	G	Patriot Environmental Services	n/a	US Ecology Vernon 5375 South Boyle Avenue Los Angeles, CA 90058
Non-regulated Construction Debris	Solid	240,760	P	MP Environmental Services	n/a	US Ecology, Idaho 20400 Lemley Rd. Grandview, ID 83624
Uniform Low-level Radioactive	Solid	726,700	P	MP Environmental Services	n/a	Energy Solutions, LLC Clive Disposal Site, I-80 Exit 49 Clive, UT 84029

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

APPENDIX C

First Quarter 2021 Discharge Monitoring Data Summary Tables

APPENDIX C

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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 compared to 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 receiving water limit.
<(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
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*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
Chromium VI	Hexavalent chromium
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.

REPORTING SUMMARY NOTES
THE BOEING COMPANY
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EB	Equipment blank.
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 (CaCO3).
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.

REPORTING SUMMARY NOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
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MDL	Method detection limit.
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	Milliliters per liter
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.
NR	Not reported by laboratory by the deadline of this report.
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.

REPORTING SUMMARY NOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
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RL-1	Reporting limit raised due to sample matrix effects.
RPD	Relative percent difference.
%R	Percent recovery.
%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.

REPORTING SUMMARY NOTES
THE BOEING COMPANY
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(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.
(a)	Based on Order No. R4-2015-0033, page 17, footnote 7, sampling event is a dry discharge and the NPDES Permit Limit for cadmium is 4.0 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 for cadmium 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/or 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/or 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 for selenium 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 for selenium is 8.2 ug/L and 8.06 lbs/day.
(g)	The sampling frequency of this constituent is increased from once per year to once per discharge until four consecutive sample results demonstrate compliance per the NPDES permit. The corresponding dissolved metal also increased in sampling frequency to once per discharge. During the First Quarter 2020, various metals reverted back to annual sampling but may have continued to be analyzed due to laboratory or field error.
(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)	Reserved.
(l)	When field staff arrived onsite to collect the composite sample they discovered that the autosampler had malfunctioned and had not collected "sips." Field staff repaired the autosampler, reset it, determined it was functioning properly, then returned the next day to collect the composite sample.
(m)	The composite sample was collected as a grab sample from the sample box due to insufficient flow.
(n)	The grab sample was collected at the first opportunity given the short duration and low-flow at this Outfall.
(o)	Unsafe conditions all day prevented access to the Outfall.
(p)	Various annual constituents were analyzed by laboratory due to field and laboratory error.
(q)	Minimum level not met due to laboratory error.

ARROYO SIMI
DISCHARGE MONITORING DATA SUMMARY TABLE

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

January 1 through March 31, 2021

				3/17/2021 07:30		
ANALYTE	**UNITS**	**PERMIT LIMIT DAILY MAX**	**SAMPLE FREQUENCY**	**SAMPLE TYPE**	**RESULT**	**LABORATORY/ VALIDATION QUALIFIER**
POLLUTANTS WITH LIMITS						
4,4'-DDD	µg/L	0.0014	1/Quarter	Grab	ND < 0.00080	--
4,4'-DDE	µg/L	0.001	1/Quarter	Grab	ND < 0.00050	--
4,4'-DDT	µg/L	0.001	1/Quarter	Grab	ND < 0.0016	--
Aroclor 1016	µg/L	0.0003	1/Quarter	Grab	ND < 0.039	--
Aroclor 1221	µg/L	0.0003	1/Quarter	Grab	ND < 0.039	--
Aroclor 1232	µg/L	0.0003	1/Quarter	Grab	ND < 0.039	--
Aroclor 1242	µg/L	0.0003	1/Quarter	Grab	ND < 0.039	--
Aroclor 1248	µg/L	0.0003	1/Quarter	Grab	ND < 0.039	--
Aroclor 1254	µg/L	0.0003	1/Quarter	Grab	ND < 0.017	--
Aroclor 1260	µg/L	0.0003	1/Quarter	Grab	ND < 0.017	--
Chlordane	µg/L	0.001	1/Quarter	Grab	ND < 0.0065	--
Chlorpyrifos	µg/L	0.02	1/Quarter	Grab	ND < 0.0069	--
Diazinon	µg/L	0.16	1/Quarter	Grab	ND < 0.0052	--
Dieldrin	µg/L	0.0002	1/Quarter	Grab	ND < 0.00050	--
E. coli	MPN/100 mL	235	1/Year	Grab	130	--
pH (Field)	s.u.	6.5-8.5	1/Quarter	Grab	6.69	*
Toxaphene	µg/L	0.0003	1/Quarter	Grab	ND < 0.013	--
POLLUTANTS WITHOUT LIMITS						
Hardness (as CaCO3)	mg/L	-	1/Quarter	Grab	250	--
Priority Pollutants	NA	-	1/5 Years	ANR	ANR	ANR
Temperature (Field)	Deg F	-	1/Quarter	Grab	50.8	*
Total Suspended Solids	mg/L	-	1/Year	Grab	5.9	--
Water Velocity	ft/sec	-	1/Quarter	Meas	0	*

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

ARROYO SIMI
DISCHARGE MONITORING DATA SUMMARY TABLE

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

January 1 through March 31, 2021

					3/17/2021 07:30 (Grab)			
ANALYTE	**SAMPLE FREQUENCY**	**1998 WHO TEF**	**BEF GREAT LAKES WATER QUALITY INITIATIVE**	**UNITS**	**LAB MDL**	**LAB RESULT**	**LABORATORY/ VALIDATION QUALIFIER**	**TCDD EQUIVALENT (w/out DNQ Values)**
1,2,3,4,6,7,8-HpCDD	1/Year	0.01	0.05	µg/L	8.9E-07	1.4E-05	U (B)	ND
1,2,3,4,6,7,8-HpCDF	1/Year	0.01	0.01	µg/L	7.9E-07	6.9E-06	U (B)	ND
1,2,3,4,7,8,9-HpCDF	1/Year	0.01	0.4	µg/L	1.1E-06	1.7E-06	UJ (*III)	ND
1,2,3,4,7,8-HxCDD	1/Year	0.1	0.3	µg/L	1.4E-06	3.9E-06	U (B)	ND
1,2,3,4,7,8-HxCDF	1/Year	0.1	0.08	µg/L	1.8E-06	ND	U	ND
1,2,3,6,7,8-HxCDD	1/Year	0.1	0.1	µg/L	1.4E-06	2.5E-06	J (DNQ)	ND
1,2,3,6,7,8-HxCDF	1/Year	0.1	0.2	µg/L	1.6E-06	ND	U	ND
1,2,3,7,8,9-HxCDD	1/Year	0.1	0.1	µg/L	1.3E-06	2.9E-06	J (DNQ)	ND
1,2,3,7,8,9-HxCDF	1/Year	0.1	0.6	µg/L	1.0E-06	1.7E-06	U (B)	ND
1,2,3,7,8-PeCDD	1/Year	1.0	0.9	µg/L	2.2E-06	ND	U	ND
1,2,3,7,8-PeCDF	1/Year	0.05	0.2	µg/L	1.3E-06	ND	U	ND
2,3,4,6,7,8-HxCDF	1/Year	0.1	0.7	µg/L	1.1E-06	1.6E-06	U (B)	ND
2,3,4,7,8-PeCDF	1/Year	0.5	1.6	µg/L	1.4E-06	ND	U	ND
2,3,7,8-TCDD	1/Year	1.0	1.0	µg/L	2.0E-06	ND	U	ND
2,3,7,8-TCDF	1/Year	0.1	0.8	µg/L	9.8E-07	ND	U	ND
OCDD	1/Year	0.0001	0.01	µg/L	1.2E-06	6.4E-05	U (B)	ND
OCDF	1/Year	0.0001	0.02	µg/L	1.4E-06	1.4E-05	U (B)	ND

TCDD TEQ w/out DNQ Values (POLLUTANTS WITHOUT LIMITS)[4]	ND

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

APPENDIX D

First Quarter 2021 Analytical Laboratory Reports, Chain of Custody Forms, and Validation Reports

APPENDIX D

TABLE OF CONTENTS

Section No.

DATA VALIDATION REPORT

Boeing SSFL NPDES

SAMPLE DELIVERY GROUP: 570-54055-1

Prepared for

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

15 April 2021

MEC^X, Inc.
12269 East Vassar Drive
Aurora, Colorado 80014
www.mecx.net

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TABLES

I. INTRODUCTION

Task Order Title: Boeing SSFL NPDES

Contract: 40458-078 and 40458-083

MEC^X Project No.: 1272.003D.04

Sample Delivery Group: 570-54055-1

Project Manager: Katherine Miller

Matrix: Water

QC Level: II

No. of Samples: 1

No. of Reanalyses/Dilutions: 0

Laboratory: TestAmerica-Irvine

TABLE 1 - SAMPLE IDENTIFICATION

Sample Name	Lab Sample Name	Matrix	Collection	Method
Arroyo_Simi_20210317_Grab	570-54055-1	WM	3/17/21 7:30 AM	E608.3, SM2340, SM2540D

II. SAMPLE MANAGEMENT

According to the case narrative, Login Sample Receipt Checklist, and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 570-54055-1:

- The laboratories received the sample in this SDG on ice and within the temperature limits of <6 degrees Celsius (°C) and >0°C.
- Field and laboratory personnel signed and dated the COCs.
- The samples were transferred from Eurofins Calscience LLC Lincoln to Eurofins Calscience Irvine for analysis of Methods 608.3.
- According to the Login Sample Receipt Checklists custody seals were present upon receipt at Eurofins Calscience LLC Lincoln but were absent upon receipt at Eurofins Calscience Irvine; 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 608.3 –PESTICIDES AND PCBS

L. Calvin of MEC[X] reviewed the SDG on April 15, 2021

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC[X] Data Validation Procedure for Organochlorine Pesticides/PCBs by GC (DVP-4, Rev. 1), EPA Method 608.3* 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

Calibration data were not evaluated at a Stage II validation level.

III.3. QUALITY CONTROL SAMPLES

III.3.1. *METHOD BLANKS*

Target compounds were not detected in the method blanks above the MDL.

III.3.2. *LABORATORY CONTROL SAMPLES*

LCS/LCSD recoveries and RPDs were within the laboratory control limits for pesticides. Toxaphene and chlordane were not spiked into the pesticide LCS/LCSD samples. The PCB LCS had a recovery above the control limits of 8-140% for Aroclor 1260, and the LCSD had a recovery above the control limits of 50-140% for Aroclor 1016; however, as the sample had no detects, no qualification was necessary.

III.3.3. *SURROGATE RECOVERY*

Pesticide surrogate tetrachloro-m-xylene (TCMX) was recovered within the laboratory control limits of 20-139% in the site sample and PCB surrogate decachlorobiphenyl (DCB) was recovered within the laboratory control limits of 20-154%.

III.3.4. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE*

MS/MSD analyses were not performed on the sample in this SDG. MEC[X] evaluated method accuracy and precision based on the associated LCS/LCSD results.

III.4. FIELD QC SAMPLES

MEC[X] 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[X] 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 not verified at a Stage II validation level. The laboratory analyzed for seven Aroclors and six pesticide target compounds by EPA Method 608.3.

III.6. Compound Quantification and Reported Detection Limits

Compound quantification was not verified at a Stage II validation level. Pesticides and PCB Aroclors were not detected in the sample. Reported nondetects are valid to the reporting limit. The sample did not require dilution.

IV. Methods SM2540D and SM2340— Total Suspended Solids (TSS) and Hardness

M. Hilchey of MEC^X reviewed the SDG on April 15, 2021.

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the *MEC^X Data Validation Procedure for General Minerals (DVP-6, Rev. 1), Standard Methods for the Examination of Water and Wastewater 2540D and 2340* and the *National Functional Guidelines for Inorganic Superfund Data Review* (2017).

IV.1. Holding Times

The QAPP holding times, 7 days for TSS and six months for hardness, were met.

IV.2. Calibration

Instrument calibration review is not performed at Level II validation. ICP-AES 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%.

IV.3. Quality Control Samples

IV.3.1. *Method Blanks*

The method blanks and calibration blanks, as applicable, had no detection for target analytes.

IV.3.2. *Laboratory Control Samples*

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

IV.3.3. *Laboratory Duplicates*

Laboratory duplicate analysis was 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

Sample result verification is not performed at Level II validation. Reported nondetects are valid to the MDL.

IV.5. FIELD QC SAMPLES

MEC^X 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^X 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: 570540551

Analysis Method E608.3

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
4,4'-DDD	N	72-54-8	ND	0.0013	0.00080	ug/L	U	U	--
4,4'-DDE	N	72-55-9	ND	0.0013	0.00050	ug/L	U	U	--
4,4'-DDT	N	50-29-3	ND	0.0033	0.0016	ug/L	U	U	--
Aroclor-1016 (PCB-1016)	N	12674-11-2	ND	0.10	0.039	ug/L	ULQ	U	--
Aroclor-1221 (PCB-1221)	N	11104-28-2	ND	0.10	0.039	ug/L	U	U	--
Aroclor-1232 (PCB-1232)	N	11141-16-5	ND	0.10	0.039	ug/L	U	U	--
Aroclor-1242 (PCB-1242)	N	53469-21-9	ND	0.10	0.039	ug/L	U	U	--
Aroclor-1248 (PCB-1248)	N	12672-29-6	ND	0.10	0.039	ug/L	U	U	--
Aroclor-1254 (PCB-1254)	N	11097-69-1	ND	0.10	0.017	ug/L	U	U	--
Aroclor-1260 (PCB-1260)	N	11096-82-5	ND	0.10	0.017	ug/L	ULQ	U	--
Chlordane	N	57-74-9	ND	0.010	0.0065	ug/L	U	U	--
Dieldrin	N	60-57-1	ND	0.0013	0.00050	ug/L	U	U	--
Toxaphene	N	8001-35-2	ND	0.10	0.013	ug/L	U	U	--

Analysis Method SM2340

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Hardness as CaCO3	T	HARDNESSCACO3	250	0.33	0.17	mg/L		=	--

Analysis Method SM2540D

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Total Suspended Solids (TSS)	N	TSS	5.9	1.1	0.53	mg/L		=	--

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-54055-1
Client Project/Site: Annual Arroyo Simi-Frontier Park
Revision: 1

For:
Haley & Aldrich, Inc.
400 E Van Buren St.
Suite 545
Phoenix, Arizona 85004

Attn: Ms. Katherine Miller

Virendra R Patel

Authorized for release by:
4/15/2021 3:12:58 PM

Virendra Patel, Project Manager I
(714)895-5494
Virendra.Patel@eurofinset.com

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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.

Table of Contents

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
LQ	LCS/LCSD recovery above method control limits
PI	Primary and confirm results varied by > than 40% RPD

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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Job ID: 570-54055-1

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative
570-54055-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 3/31/2021. The report (revision 1) is being revised due to: Removed Ca/Mg per client request..

Receipt
The samples were received on 3/17/2021 5:42 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 2.7º C.

Receipt Exceptions

Removed Ca/Mg per client request.

GC Semi VOA
Method 608.3: The closing continuing calibration verification (CCV) associated with 570-136995 recovered high and outside the control limits for < Endrin> on one column. Results are confirmed on both columns and reported from the passing column. The associated sample is: (CCV 570-136995/36).

Method 608.3: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 570-136765 and analytical batch 570-137172 recovered outside control limits for the following analytes: < Aroclor 1016 and Aroclor 1260>. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

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

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

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

Organic Prep
Method 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 570-136765. LCS/LCSD performed to meet QC requirement.

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

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

Client Sample ID: Arroyo_Simi_20210317_Grab

Lab Sample ID: 570-54055-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Hardness, as CaCO3	250		0.33	0.17	mg/L	1		SM 2340B	Total Recoverable
Total Suspended Solids	5.9		1.1	0.53	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

Method: 608.3 - Organochlorine Pesticides in Water

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.010	0.0065	ug/L		03/18/21 05:49	03/19/21 14:29	1
4,4'-DDD	ND		0.0013	0.00080	ug/L		03/18/21 05:49	03/19/21 14:29	1
4,4'-DDE	ND		0.0013	0.00050	ug/L		03/18/21 05:49	03/19/21 14:29	1
4,4'-DDT	ND		0.0033	0.0016	ug/L		03/18/21 05:49	03/19/21 14:29	1
Dieldrin	ND		0.0013	0.00050	ug/L		03/18/21 05:49	03/19/21 14:29	1
Toxaphene	ND		0.10	0.013	ug/L		03/18/21 05:49	03/19/21 14:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*35*	*PI*	*20 - 139*	*03/18/21 05:49*	*03/19/21 14:29*	*1*

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

Method: 608.3 - Polychlorinated Biphenyls (PCBs) (GC)

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1016	ND	LQ	0.10	0.039	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1221	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1232	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1242	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1248	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1254	ND		0.10	0.017	ug/L		03/18/21 05:49	03/19/21 21:52	1
Aroclor 1260	ND	LQ	0.10	0.017	ug/L		03/18/21 05:49	03/19/21 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*66*		*20 - 139*	*03/18/21 05:49*	*03/19/21 21:52*	*1*
DCB Decachlorobiphenyl (Surr)	*124*		*20 - 154*	*03/18/21 05:49*	*03/19/21 21:52*	*1*

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

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

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	250		0.33	0.17	mg/L			03/24/21 15:46	1

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

General Chemistry

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	5.9		1.1	0.53	mg/L			03/18/21 18:36	1

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

Method: 608.3 - Organochlorine Pesticides in Water

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		TCX1
Lab Sample ID	Client Sample ID	(20-139)
570-54055-1	Arroyo_Simi_20210317_Grab	35 PI
LCS 570-136765/2-A	Lab Control Sample	78
LCSD 570-136765/3-A	Lab Control Sample Dup	77
MB 570-136765/1-A	Method Blank	60

Surrogate Legend

TCX = Tetrachloro-m-xylene

Method: 608.3 - Polychlorinated Biphenyls (PCBs) (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCB1
Lab Sample ID	Client Sample ID	(20-139)	(20-154)
570-54055-1	Arroyo_Simi_20210317_Grab	66	124
LCS 570-136765/4-A	Lab Control Sample	56	64
LCSD 570-136765/5-A	Lab Control Sample Dup	73	76
MB 570-136765/1-A	Method Blank	76	75

Surrogate Legend

TCX = Tetrachloro-m-xylene (Surr)

DCB = DCB Decachlorobiphenyl (Surr)

Method: 608.3 - Organochlorine Pesticides in Water

Lab Sample ID: MB 570-136765/1-A
Matrix: Water
Analysis Batch: 136995

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 136765

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.010	0.0065	ug/L		03/18/21 05:49	03/19/21 13:03	1
4,4'-DDD	ND		0.0013	0.00080	ug/L		03/18/21 05:49	03/19/21 13:03	1
4,4'-DDE	ND		0.0013	0.00050	ug/L		03/18/21 05:49	03/19/21 13:03	1
4,4'-DDT	ND		0.0033	0.0016	ug/L		03/18/21 05:49	03/19/21 13:03	1
Dieldrin	ND		0.0013	0.00050	ug/L		03/18/21 05:49	03/19/21 13:03	1
Toxaphene	ND		0.10	0.013	ug/L		03/18/21 05:49	03/19/21 13:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*60*		*20 - 139*	*03/18/21 05:49*	*03/19/21 13:03*	*1*

Lab Sample ID: LCS 570-136765/2-A
Matrix: Water
Analysis Batch: 136995

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 136765

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
4,4'-DDD			0.0333	0.0270		ug/L		81	31 - 141		
4,4'-DDE			0.0333	0.0272		ug/L		81	30 - 145		
4,4'-DDT			0.0333	0.0220		ug/L		66	25 - 160		
Dieldrin			0.0333	0.0282		ug/L		85	36 - 146		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*78*		*20 - 139*

Lab Sample ID: LCSD 570-136765/3-A
Matrix: Water
Analysis Batch: 136995

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 136765

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD			0.0333	0.0275		ug/L		83	31 - 141	2	39
4,4'-DDE			0.0333	0.0283		ug/L		85	30 - 145	4	35
4,4'-DDT			0.0333	0.0256		ug/L		77	25 - 160	15	42
Dieldrin			0.0333	0.0285		ug/L		86	36 - 146	1	49

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*77*		*20 - 139*

Method: 608.3 - Polychlorinated Biphenyls (PCBs) (GC)

Lab Sample ID: MB 570-136765/1-A
Matrix: Water
Analysis Batch: 137172

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 136765

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1016	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 20:41	1
Aroclor 1221	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 20:41	1
Aroclor 1232	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 20:41	1
Aroclor 1242	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 20:41	1
Aroclor 1248	ND		0.10	0.039	ug/L		03/18/21 05:49	03/19/21 20:41	1

Method: 608.3 - Polychlorinated Biphenyls (PCBs) (GC) (Continued)

Lab Sample ID: MB 570-136765/1-A
Matrix: Water
Analysis Batch: 137172

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 136765

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor 1254	ND		0.10	0.017	ug/L		03/18/21 05:49	03/19/21 20:41	1
Aroclor 1260	ND		0.10	0.017	ug/L		03/18/21 05:49	03/19/21 20:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*76*		*20 - 139*	*03/18/21 05:49*	*03/19/21 20:41*	*1*
DCB Decachlorobiphenyl (Surr)	*75*		*20 - 154*	*03/18/21 05:49*	*03/19/21 20:41*	*1*

Lab Sample ID: LCS 570-136765/4-A
Matrix: Water
Analysis Batch: 137172

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 136765

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aroclor 1016	0.133	0.183		ug/L		137	50 - 140
Aroclor 1260	0.133	0.229	LQ	ug/L		172	8 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*56*		*20 - 139*
DCB Decachlorobiphenyl (Surr)	*64*		*20 - 154*

Lab Sample ID: LCSD 570-136765/5-A
Matrix: Water
Analysis Batch: 137172

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 136765

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aroclor 1016	0.133	0.231	LQ	ug/L		173	50 - 140	23	36
Aroclor 1260	0.133	0.184		ug/L		138	8 - 140	22	38

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*73*		*20 - 139*
DCB Decachlorobiphenyl (Surr)	*76*		*20 - 154*

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 440-641760/1
Matrix: Water
Analysis Batch: 641760

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			03/18/21 18:36	1

Lab Sample ID: LCS 440-641760/2
Matrix: Water
Analysis Batch: 641760

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	994		mg/L		99	85 - 115

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

GC Semi VOA

Prep Batch: 136765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	608	
MB 570-136765/1-A	Method Blank	Total/NA	Water	608	
LCS 570-136765/2-A	Lab Control Sample	Total/NA	Water	608	
LCS 570-136765/4-A	Lab Control Sample	Total/NA	Water	608	
LCSD 570-136765/3-A	Lab Control Sample Dup	Total/NA	Water	608	
LCSD 570-136765/5-A	Lab Control Sample Dup	Total/NA	Water	608	

Analysis Batch: 136995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	608.3	136765
MB 570-136765/1-A	Method Blank	Total/NA	Water	608.3	136765
LCS 570-136765/2-A	Lab Control Sample	Total/NA	Water	608.3	136765
LCSD 570-136765/3-A	Lab Control Sample Dup	Total/NA	Water	608.3	136765

Analysis Batch: 137172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	608.3	136765
MB 570-136765/1-A	Method Blank	Total/NA	Water	608.3	136765
LCS 570-136765/4-A	Lab Control Sample	Total/NA	Water	608.3	136765
LCSD 570-136765/5-A	Lab Control Sample Dup	Total/NA	Water	608.3	136765

Metals

Analysis Batch: 641349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total Recoverable	Water	SM 2340B	

General Chemistry

Analysis Batch: 641760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	SM 2540D	
MB 440-641760/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-641760/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	608			1500 mL	1 mL	136765	03/18/21 05:49	H1SH	ECL 1
Total/NA	Analysis	608.3		1			136995	03/19/21 14:29	UHHN	ECL 1
	Instrument ID: GC51									
Total/NA	Prep	608			1500 mL	1 mL	136765	03/18/21 05:49	H1SH	ECL 1
Total/NA	Analysis	608.3		1			137172	03/19/21 21:52	UHHN	ECL 1
	Instrument ID: GC58									
Total Recoverable	Analysis	SM 2340B		1			641349	03/24/21 15:46	P1R	TAL IRV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540D		1	950 mL	1000 mL	641760	03/18/21 18:36	ZL7L	TAL IRV
	Instrument ID: BAL065									

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

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

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-1
Project/Site: Annual Arroyo Simi-Frontier Park

Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-0161	11-19-21
California	Los Angeles County Sanitation Districts	10109	09-30-21
California	SCAQMD LAP	17LA0919	11-30-21
California	State	2944	09-30-21
Guam	State	20-003R	10-31-20 *
Nevada	State	CA00111	07-31-21
Oregon	NELAP	CA300001	01-30-22
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-21

Laboratory: Eurofins Calscience Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2706	06-30-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

Method	Method Description	Protocol	Laboratory
608.3	Organochlorine Pesticides in Water	40CFR136A	ECL 1
608.3	Polychlorinated Biphenyls (PCBs) (GC)	40CFR136A	ECL 1
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
608	Liquid-Liquid Extraction (Separatory Funnel)	40CFR136A	ECL 1

Protocol References:

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:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

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

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-54055-1	Arroyo_Simi_20210317_Grab	Water	03/17/21 07:30	03/17/21 13:00	

54055

Eurofins Calscience Irvine

CHAIN OF CUSTODY FORM

570-54055 Chain of Custody

W8C300WR

Client Name/Address.	Project:	ANALYSIS REQUIRED	Field Readings / Meter serial #
Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108	Boeing-SSFL NPDES Permit 2015 **Annual Arroyo Simi-Frontier Park** **Dry Weather**	A Q A A Q Q	**Field Readings. (Include units)** Time of Readings. 0720
Eurofins Calscience Irvine Contact: Virendra Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel: 714-895-5494			pH 6.69 pH unit Temp 50.8 °C/(F) Velocity 0.0 ft/sec
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2019-22-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 QC** Checked by. mmd Date/Time: 3/17/2021 / 0720
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	E coli (SM9221) Enthalpy Analytical Orange CA	Hardness as $CaCO_3$, Recoverable (SM2340B)	TCDD (and all congeners) (E1613B)	TSS (Method 160 2 (SM2540D))	Chlorpyrifos, Diazinon (E525 2) Weck Labs in Hacienda Heights CA	Pesticides Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Toxaphene + PCBs only (E608)			Comments
Arroyo Simi	Arroyo_Simi_20210317_Grab	3-17-2021 / 0730	WS	125 mL Sterile Poly	3	$Na_2S_2O_3$	10	No	X								Deliver to lab ASAP 8 hr hold time Send 1x E 0x di lor
			WS	250 mL Poly	3	HNO_3	100	Yes		X							
			WS	1L Glass Amber	2	None	110	No			X						
			WS	1L Poly	1	None	185	No				X					
			WS	1L Glass Amber	6	None	275	Yes					X				Ext act with n 24-Hours of sampling Weck .a
			WS	1L Glass Amber	6	None	285	Yes						X			
	Arroyo_Simi_20210317_Grab_Extra	3-17-2021 / 0730	WS	1L Glass Amber	2	None	110	No			H						Hold
			WS	1L Glass Amber	2	None	275	No					H				Hold
			WS	1L Glass Amber	2	None	285	No						H			Hold

Legend A=Annual, Q=Quarterly

Relinquished By	Date/Time	Company	Received By	Date/Time
M Dominick	3-17-2021 / 1105	Haley & Aldrich		3/17/21 1105
	3/17/21 1742	ECA		3/17/21 1742

Turn-around time. (Check)
24 Hour ____ 72 Hour ____ 10 Day X
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: X

3 6/27, 33/22 SCG

2019-2020 Rainy Season
Version 2

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88969 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 880 Riverside Parkway,	Due Date Requested: 4/2/2021			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: 44024446			
Site	SSOW#:			

Analysis Requested

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)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/1613B_Sox_Sep_P Standard List w/ Totals	1613B/1613B_Sox_Sep_P Standard List w/ Totals (Hold)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X		2	See QAS, Boeing_w/u to zero, Use Boeing glassware
Arroyo_Simi_20210317_Grab_Extra (570-54055-2)	3/17/21	07:30 Pacific		Water				X	2	See QAS, Boeing_w/u to zero Use Boeing glassware

Note: Since laboratory accreditations are subject to change Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Calscience attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ 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
	3/18/21 1000	ECI			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time.	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Ver: 11/01/2020

ORIGIN ID:APVA (714) 895-5494
SAMPLE CONTROL
CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY

GARDEN GROVE, CA 92841
UNITED STATES US

SHIP DATE: 18MAR21
ACTWGT: 51.00 LB
CAD: 1533735/INET4340

BILL SENDER

TO **SAMPLE RECEIVING**
EUROFINS TESTAMERICA-W.SAC
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605
(916) 373-5600 REF: VP/54055, TC/54116
INV:
PO: DEPT

56DJ3/AC39/FE4A

FedEx Express

J211121161951uw

FRI - 19 MAR 10:30A
PRIORITY OVERNIGHT

1 of 2
TRK# 0201 **7731 9953 6096**
MASTER

WD BLUA

95605
CA-US **SMF**

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4/15/2021 (20210318.3.1)

ORIGIN ID:APVA (714) 895-5494
SAMPLE CONTROL
CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY

GARDEN GROVE, CA 92841
UNITED STATES US

SHIP DATE: 18MAR21
ACTWGT 51 00 LB
CAD· 1533735/INET4340

BILL SENDER

TO **SAMPLE RECEIVING**
EUROFINS TESTAMERICA-W.SAC
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605
(916) 373-5600 REF VP/54055 TC/54116
INV
PO· DEPT

56DJ3/AC39/FE4A

FedEx Express

FRI - 19 MAR 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# 0263 **7731 9953 6199**
Mstr# 7731 9953 6096
0201

95605
SMF
CA-US

WD BLUA

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3 Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss Maximum for items of extraordinary value is $1,000, e g jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide Written claims must be filed within strict time limits, see current FedEx Service Guide

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88971.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: Eurofins Calscience LLC		Accreditations Required (See note): State Program - California		Job #: 570-54055-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 3/25/2021			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817	PO #:			
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	WO #:			
Email:	Project #: 44024446			
Project Name: Boeing-SSFL NPDES SSFL	SSOW#:			
Site:				

Analysis Requested

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)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540D/ Solids, Total Suspended (TSS)	200.7/200.2 Calcium & Magnesium	SM2340B/Auto_TotalRec (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X	X	X	4	

Note: Since laboratory accreditations are subject to change, Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ 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
1		3/18/21 11:15	EC-IRV		3-18-21 11:20	EC-IRV
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time 3-18-21 1323	Company EC-IRV	Received by:	Date/Time: 3/18/21 1323	Company EC-IRV

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.3/4.5 IR-93

Ver: 11/01/2020

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 570-54055-1

Login Number: 54055
List Number: 1
Creator: Cruise, Noel

List Source: Eurofins Calscience

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 570-54055-1

Login Number: 54055
List Number: 2
Creator: Lagunas, Jorge L

List Source: Eurofins Irvine
List Creation: 03/18/21 02:10 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.	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?	N/A	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").	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: 570-54055-2

Prepared for

Haley & Aldrich, Inc.

600 South Meyer Avenue, Suite 100

Tucson, Arizona 85701

13 April 2021

TABLE OF CONTENTS

TABLES

I. INTRODUCTION

Task Order Title: Boeing SSFL NPDES

Contract: 40458-078 and 40458-083

MEC^X Project No.: 1272.003D.04

Sample Delivery Group: 570-54055-2

Project Manager: Katherine Miller

Matrix: Surface water

QC Level: II

No. of Samples: 1

No. of Reanalyses/Dilutions: 0

Laboratory: TestAmerica-Irvine

TABLE 1 - SAMPLE IDENTIFICATION

Sample Name	Lab Sample Name	Matrix	Collection	Method
Arroyo_Simi_20210317_Grab	570-54055-1	WM	3/17/21 7:30 AM	E1613B
Arroyo_Simi_20210317_Grab	570-54055-2	WM	3/17/21 7:30 AM	E525.2M, SM9221F

II. SAMPLE MANAGEMENT

According to the case narrative, Login Sample Receipt Checklists, and the chains-of-custody (COC) provided by the laboratories for sample delivery group (SDG) 570-54055-2:

- The laboratories received the samples in this SDG on ice and within the temperature limits of <6 degrees Celsius (°C) and >0°C with the following exception. The sample was received at Enthalpy Analytical for analysis by Method 9221 at 12.1°C; however, it was received the same day as collection with evidence that cooling had begun. No qualifiers were applied.
- Samples were received intact and properly preserved, as applicable.
- Field and laboratory personnel signed and dated the original COC, and laboratory personnel signed and dated the transfer COCs.
- E. coli was requested by Method 9221, but a note on the COC for Enthalpy Analytical stated that analysis by Method 9223 was acceptable. The EDD indicates that the result is reported by Method SM9221F.
- Custody seals were present and intact on the coolers upon receipt at Eurofins Calscience and Eurofins TestAmerica-West Sacramento. Custody seals were not present upon receipt at Enthalpy Analytical. Weck Laboratories did not provide additional receipt information.

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[X] reviewed the SDG on April 13, 2021.

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC[X] 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 not evaluated at a Stage II validation level.

III.3. CALIBRATION

Calibration criteria were not evaluated at a Stage II validation level.

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-HxCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,4,6,7,8-HxCDF, 2,3,7,8-TCDF, OCDD and OCDF, and for all totals except PeCDF. Sample results for the isomer method blank contaminants detected below the RL were qualified as nondetects (U) at the level of contamination. The sample total results were qualified as estimated (J), as only a portion of the total was probable method blank contamination.

III.4.2. *LABORATORY CONTROL SAMPLES*

LCS/LCSD recoveries were within the acceptance criteria listed in Table 6 of Method 1613B and RPDs were within the control limit of ≤50%.

III.5. FIELD QC SAMPLES

MEC[X] 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[X] 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 not evaluated at a Stage II validation level.

III.7. Compound Identification

Compound identification was not evaluated at a Stage II validation level. Isomer 2,3,7,8-TCDF was not detected in the sample, and therefore required no confirmation analysis.

III.8. Compound Quantification and Reported Detection Limits

Compound quantitation was not evaluated at a Stage II validation level. 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 and the case narrative for this SDG indicated results were reported below the EDL; however, review indicated this sample had no reported detects below the EDL.

Isomers previously qualified as method blank contamination were not further qualified as EMPCs. The remaining isomer reported as an EMPCs was qualified as an estimated nondetect (UJ) at the level of the EMPC. Totals flagged by the laboratory as including one or more EMPC peaks were qualified as estimated (J).

IV. EPA METHOD 525.2 — Chlorpyrifos and Diazinon

L. Calvin of MEC^X reviewed the SDG on April 13, 2021

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC^X 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).

IV.1. Holding Times

The extraction holding time of 24-hours from collection for diazinon was met. The sample was analyzed within 30 days of extraction.

IV.2. GC/MS Tuning and Calibration

Tuning and calibration criteria were not evaluated at a Stage II validation level.

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*

LCS/LCSD recoveries were within the laboratory control limits and RPDs were within the control limit of ≤30%.

IV.3.3. *Surrogate Recovery*

Surrogate recoveries were within the laboratory control limits.

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

MS/MSD analyses were performed on the sample in this SDG. Recoveries and RPDs were within the laboratory control limits.

IV.4. FIELD QC SAMPLES

MEC^X 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^X 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

Sample internal standard recoveries were not evaluated at a Stage II validation level.

IV.6. COMPOUND IDENTIFICATION

Compound identification was not verified at a Stage II validation level. The laboratory analyzed for chlorpyrifos and diazinon by Method 525.2. The requested target compounds were not reported above the MDL in the sample.

IV.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification was not verified at a Stage II validation level. Reported nondetects are valid to the reporting limit. The sample did not require dilution.

IV.8. SYSTEM PERFORMANCE

System performance was not evaluated at a Stage II validation level.

V. VARIOUS METHODS — GENERAL CHEMISTRY

M. Hilchey of MEC^X reviewed the SDG on April 15, 2021.

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC^X Data Validation Procedure for General Minerals (DVP-6, Rev. 1), Standard Methods for the Examination of Water and Wastewater 9221F* and the *National Functional Guidelines for Inorganic Superfund Data Review* (2014).

V.1. HOLDING TIMES

The holding time, 8 hours per the COC, was met.

V.2. CALIBRATION

Instrument calibration review is not performed at Level II validation. Calibration information was not provided in the data package.

V.3. QUALITY CONTROL SAMPLES

V.3.1. *METHOD BLANKS*

The negative control for the *E. Coli* analysis was acceptable.

V.3.2. *LABORATORY CONTROL SAMPLES*

The presumptive test was analyzed with the positive detects for *E. Coli*.

V.3.3. *LABORATORY DUPLICATES*

Laboratory duplicate analysis was not performed on the sample in this SDG.

V.3.4. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE*

MS/MSD analyses are not applicable to this method.

V.4. SAMPLE RESULT VERIFICATION

Sample result verification is not performed at Level II validation.

The sample was analyzed at 1× and 10× dilutions, as requested on the COC. The result from the 1× dilution was reported.

V.5. FIELD QC SAMPLES

MEC^X 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^X 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: 570540552

Analysis Method E1613B

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-1

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	N	39001-02-0	0.000014	0.00010	0.0000014	ug/L	J,DXMB	U	B
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	N	3268-87-9	0.000064	0.00010	0.0000012	ug/L	J,DXMB	U	B
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	N	67562-39-4	0.0000069	0.000051	0.00000079	ug/L	J,DXMB	U	B
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	N	35822-46-9	0.000014	0.000051	0.00000089	ug/L	J,DXMB	U	B
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	N	55673-89-7	0.0000017	0.000051	0.0000011	ug/L	J,DXq	UJ	*III
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	N	70648-26-9	ND	0.000051	0.0000018	ug/L	U	U	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	N	39227-28-6	0.0000039	0.000051	0.0000014	ug/L	J,DXMB	U	B
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	N	57117-44-9	ND	0.000051	0.0000016	ug/L	U	U	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	N	57653-85-7	0.0000025	0.000051	0.0000014	ug/L	J,DX	J	DNQ
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	N	72918-21-9	0.0000017	0.000051	0.0000010	ug/L	J,DXqMB	U	B
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	N	19408-74-3	0.0000029	0.000051	0.0000013	ug/L	J,DX	J	DNQ
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	N	57117-41-6	ND	0.000051	0.0000013	ug/L	U	U	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	N	40321-76-4	ND	0.000051	0.0000022	ug/L	U	U	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	N	60851-34-5	0.0000016	0.000051	0.0000011	ug/L	J,DXqMB	U	B
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	N	57117-31-4	ND	0.000051	0.0000014	ug/L	U	U	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	N	51207-31-9	ND	0.000010	0.00000098	ug/L	U	U	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	N	1746-01-6	ND	0.000010	0.0000020	ug/L	U	U	--
Total Heptachlorodibenzofuran (HpCDF)	N	38998-75-3	0.000011	0.000051	0.00000079	ug/L	J,DXqMB	J	DNQ, B, *III
Total Heptachlorodibenzo-p-dioxin (HpCDD)	N	37871-00-4	0.000024	0.000051	0.00000089	ug/L	J,DXqMB	J	DNQ, B, *III
Total Hexachlorodibenzofuran (HxCDF)	N	55684-94-1	0.0000066	0.000051	0.0000010	ug/L	J,DXqMB	J	DNQ, B, *III
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	N	34465-46-8	0.000014	0.000051	0.0000013	ug/L	J,DXqMB	J	DNQ, B, *III
Total Pentachlorodibenzofuran (PeCDF)	N	30402-15-4	ND	0.000051	0.0000013	ug/L	U	U	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	N	36088-22-9	ND	0.000051	0.0000022	ug/L	U	U	--
Total Tetrachlorodibenzofuran (TCDF)	N	55722-27-5	ND	0.000010	0.00000098	ug/L	U	U	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	N	41903-57-5	0.0000093	0.000010	0.0000020	ug/L	J,DXMB	J	DNQ, B

Analysis Method E525.2M

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chlorpyrifos	N	2921-88-2	ND	10	6.9	ng/L	U	U	--
Diazinon	N	333-41-5	ND	10	5.2	ng/L	U	U	--

Analysis Method SM9221F

Sample Name Arroyo_Simi_20210317_Grab **Matrix Type:** WM **Result Type:** TRG

Sample Date: 3/17/2021 7:30:00 AM **Validation Level:** 5

Lab Sample Name: 570-54055-2

Analyte	Fraction:	CAS No	Result Value	RL	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Escherichia coli	N	ECOLI	130	1		mpn/100		=	--

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ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-54055-2
Client Project/Site: Annual Arroyo Simi-Frontier Park
Revision: 2

For:
Haley & Aldrich, Inc.
400 E Van Buren St.
Suite 545
Phoenix, Arizona 85004

Attn: Ms. Katherine Miller

Virendra R Patel

Authorized for release by:
5/7/2021 2:03:50 PM

Virendra Patel, Project Manager I
(714)895-5494
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LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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.

Table of Contents

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

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.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Job ID: 570-54055-2

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative
570-54055-2

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 4/8/2021. The report (revision 2) is being revised due to: The client requested the Weck Laboratories report to be revised to include the Method Detection Limits..

Report revision history
Revision 1 - 4/16/2021 - Reason - The client requested the Weck Laboratories report to be revised to include the Method Detection Limits..

Receipt
The samples were received on 3/17/2021 5:42 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 2.7º C.

Receipt Exceptions

The Level 2/Level 4 were revised to correct the Enthalpy report to include QC documents.

The client requested the Weck Laboratories report to be revised to include the Method Detection Limits.

Dioxin
Method 1613B: The following sample have one or more analytes with a concentration less than the corresponding estimated detection limit (EDL): Arroyo_Simi_20210317_Grab (570-54055-1). The associated peaks elute at the correct retention time for both characteristic ions and have a signal to noise ratio greater than the method required 2.5:1; therefore, per client request, the detections have been reported.

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.

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

Subcontract Work
Method SM9221 - E Coli (1x, 5x, 10x Dilutions): This method was subcontracted to Enthalpy Analytical - Barkley. The subcontract laboratory certification is different from that of the facility issuing the final report.

Method Weck- 525.2 - Diaznon 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.

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

Client Sample ID: Arroyo_Simi_20210317_Grab

Lab Sample ID: 570-54055-1

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,4,7,8-HxCDD	0.0000039	J,DX MB	0.000051	0.0000014	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.0000025	J,DX	0.000051	0.0000014	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000029	J,DX	0.000051	0.0000013	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.0000017	J,DX q MB	0.000051	0.0000010	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000016	J,DX q MB	0.000051	0.0000011	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.000014	J,DX MB	0.000051	0.00000089	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.0000069	J,DX MB	0.000051	0.00000079	ug/L	1		1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000017	J,DX q	0.000051	0.0000011	ug/L	1		1613B	Total/NA
OCDD	0.000064	J,DX MB	0.00010	0.0000012	ug/L	1		1613B	Total/NA
OCDF	0.000014	J,DX MB	0.00010	0.0000014	ug/L	1		1613B	Total/NA
Total TCDD	0.0000093	J,DX MB	0.000010	0.0000020	ug/L	1		1613B	Total/NA
Total HxCDD	0.000014	J,DX q MB	0.000051	0.0000013	ug/L	1		1613B	Total/NA
Total HxCDF	0.0000066	J,DX q MB	0.000051	0.0000010	ug/L	1		1613B	Total/NA
Total HpCDD	0.000024	J,DX q MB	0.000051	0.00000089	ug/L	1		1613B	Total/NA
Total HpCDF	0.000011	J,DX q MB	0.000051	0.00000079	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Client Sample ID: Arroyo_Simi_20210317_Grab
Date Collected: 03/17/21 07:30
Date Received: 03/17/21 13:00

Lab Sample ID: 570-54055-1
Matrix: Water

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000010	0.0000020	ug/L		03/23/21 05:15	03/25/21 00:23	1
2,3,7,8-TCDF	ND		0.000010	0.00000098	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,7,8-PeCDD	ND		0.000051	0.0000022	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,7,8-PeCDF	ND		0.000051	0.0000013	ug/L		03/23/21 05:15	03/25/21 00:23	1
2,3,4,7,8-PeCDF	ND		0.000051	0.0000014	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,4,7,8-HxCDD	**0.0000039**	**J,DX MB**	0.000051	0.0000014	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,6,7,8-HxCDD	**0.0000025**	**J,DX**	0.000051	0.0000014	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,7,8,9-HxCDD	**0.0000029**	**J,DX**	0.000051	0.0000013	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,4,7,8-HxCDF	ND		0.000051	0.0000018	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,6,7,8-HxCDF	ND		0.000051	0.0000016	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,7,8,9-HxCDF	**0.0000017**	**J,DX q MB**	0.000051	0.0000010	ug/L		03/23/21 05:15	03/25/21 00:23	1
2,3,4,6,7,8-HxCDF	**0.0000016**	**J,DX q MB**	0.000051	0.0000011	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,4,6,7,8-HpCDD	**0.000014**	**J,DX MB**	0.000051	0.00000089	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,4,6,7,8-HpCDF	**0.0000069**	**J,DX MB**	0.000051	0.00000079	ug/L		03/23/21 05:15	03/25/21 00:23	1
1,2,3,4,7,8,9-HpCDF	**0.0000017**	**J,DX q**	0.000051	0.0000011	ug/L		03/23/21 05:15	03/25/21 00:23	1
OCDD	**0.000064**	**J,DX MB**	0.00010	0.0000012	ug/L		03/23/21 05:15	03/25/21 00:23	1
OCDF	**0.000014**	**J,DX MB**	0.00010	0.0000014	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total TCDD	**0.0000093**	**J,DX MB**	0.000010	0.0000020	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total TCDF	ND		0.000010	0.00000098	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total PeCDD	ND		0.000051	0.0000022	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total PeCDF	ND		0.000051	0.0000013	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total HxCDD	**0.000014**	**J,DX q MB**	0.000051	0.0000013	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total HxCDF	**0.0000066**	**J,DX q MB**	0.000051	0.0000010	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total HpCDD	**0.000024**	**J,DX q MB**	0.000051	0.00000089	ug/L		03/23/21 05:15	03/25/21 00:23	1
Total HpCDF	**0.000011**	**J,DX q MB**	0.000051	0.00000079	ug/L		03/23/21 05:15	03/25/21 00:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*71*		*25 - 164*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-2,3,7,8-TCDF	*83*		*24 - 169*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,7,8-PeCDD	*63*		*25 - 181*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,7,8-PeCDF	*72*		*24 - 185*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-2,3,4,7,8-PeCDF	*74*		*21 - 178*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,4,7,8-HxCDD	*62*		*32 - 141*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,6,7,8-HxCDD	*63*		*28 - 130*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,4,7,8-HxCDF	*66*		*26 - 152*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,6,7,8-HxCDF	*67*		*26 - 123*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,7,8,9-HxCDF	*64*		*29 - 147*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*62*		*23 - 140*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*68*		*28 - 143*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*69*		*26 - 138*	*03/23/21 05:15*	*03/25/21 00:23*	*1*
13C-OCDD	*53*		*17 - 157*	*03/23/21 05:15*	*03/25/21 00:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*119*		*35 - 197*	*03/23/21 05:15*	*03/25/21 00:23*	*1*

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	37TCDD (35-197)
570-54055-1	Arroyo_Simi_20210317_Grab	119
MB 320-472939/1-A	Method Blank	115

Surrogate Legend

37TCDD = 37Cl4-2,3,7,8-TCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	37TCDD (31-191)
LCS 320-472939/2-A	Lab Control Sample	118
LCSD 320-472939/3-A	Lab Control Sample Dup	119

Surrogate Legend

37TCDD = 37Cl4-2,3,7,8-TCDD

Isotope Dilution Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

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)
570-54055-1	Arroyo_Simi_20210317_Grab	71	83	63	72	74	62	63	66
MB 320-472939/1-A	Method Blank	60	69	56	62	65	55	55	60

		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)
570-54055-1	Arroyo_Simi_20210317_Grab	67	64	68	62	68	69	53
MB 320-472939/1-A	Method Blank	60	58	61	50	58	55	37

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 320-472939/2-A	Lab Control Sample	73	80	68	74	77	64	60	69
LCSD 320-472939/3-A	Lab Control Sample Dup	73	78	68	74	77	69	69	75

		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 320-472939/2-A	Lab Control Sample	68	66	70	56	64	63	44
LCSD 320-472939/3-A	Lab Control Sample Dup	74	72	75	63	71	72	49

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

Isotope Dilution Summary

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-2
Project/Site: Annual Arroyo Simi-Frontier Park

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)

Lab Sample ID: MB 320-472939/1-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 472939

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000010	0.00000064	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8-PeCDD	ND		0.000050	0.00000067	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8-PeCDF	ND		0.000050	0.00000059	ug/L		03/23/21 05:15	03/24/21 22:06	1
2,3,4,7,8-PeCDF	ND		0.000050	0.00000061	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8-HxCDD	0.00000151	J,DX q	0.000050	0.00000058	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,6,7,8-HxCDD	ND		0.000050	0.00000058	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8,9-HxCDD	ND		0.000050	0.00000054	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8-HxCDF	0.00000178	J,DX	0.000050	0.00000058	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,6,7,8-HxCDF	0.000000872	J,DX q	0.000050	0.00000053	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8,9-HxCDF	0.000000659	J,DX q	0.000050	0.00000034	ug/L		03/23/21 05:15	03/24/21 22:06	1
2,3,4,6,7,8-HxCDF	0.00000188	J,DX	0.000050	0.00000036	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,6,7,8-HpCDD	0.00000368	J,DX	0.000050	0.00000049	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,6,7,8-HpCDF	0.00000262	J,DX	0.000050	0.00000043	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8,9-HpCDF	ND		0.000050	0.00000060	ug/L		03/23/21 05:15	03/24/21 22:06	1
OCDD	0.0000185	J,DX	0.00010	0.00000077	ug/L		03/23/21 05:15	03/24/21 22:06	1
OCDF	0.00000305	J,DX q	0.00010	0.00000074	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total TCDD	0.0000156	q	0.000010	0.00000064	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total TCDF	0.000000985	J,DX q	0.000010	0.00000033	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total PeCDD	0.00000454	J,DX q	0.000050	0.00000067	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total PeCDF	ND		0.000050	0.00000059	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HxCDD	0.00000559	J,DX q	0.000050	0.00000054	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HxCDF	0.00000638	J,DX q	0.000050	0.00000034	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HpCDD	0.00000707	J,DX	0.000050	0.00000049	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HpCDF	0.00000262	J,DX	0.000050	0.00000043	ug/L		03/23/21 05:15	03/24/21 22:06	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*60*		*25 - 164*	*03/23/21 05:15*	*03/24/21 22:06*	*1*
13C-2,3,7,8-TCDF	*69*		*24 - 169*	*03/23/21 05:15*	*03/24/21 22:06*	*1*
13C-1,2,3,7,8-PeCDD	*56*		*25 - 181*	*03/23/21 05:15*	*03/24/21 22:06*	*1*
13C-1,2,3,7,8-PeCDF	*62*		*24 - 185*	*03/23/21 05:15*	*03/24/21 22:06*	*1*

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-472939/1-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 472939

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,4,7,8-PeCDF	65		21 - 178	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8-HxCDD	55		32 - 141	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,6,7,8-HxCDD	55		28 - 130	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8-HxCDF	60		26 - 152	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,6,7,8-HxCDF	60		26 - 123	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,7,8,9-HxCDF	58		29 - 147	03/23/21 05:15	03/24/21 22:06	1
13C-2,3,4,6,7,8-HxCDF	61		28 - 136	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,6,7,8-HpCDD	50		23 - 140	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,6,7,8-HpCDF	58		28 - 143	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8,9-HpCDF	55		26 - 138	03/23/21 05:15	03/24/21 22:06	1
13C-OCDD	37		17 - 157	03/23/21 05:15	03/24/21 22:06	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	115		35 - 197	03/23/21 05:15	03/24/21 22:06	1

Lab Sample ID: LCS 320-472939/2-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 472939

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	0.000200	0.000235		ug/L		117	67 - 158
2,3,7,8-TCDF	0.000200	0.000216	MB	ug/L		108	75 - 158
1,2,3,7,8-PeCDD	0.00100	0.00118		ug/L		118	70 - 142
1,2,3,7,8-PeCDF	0.00100	0.00113		ug/L		113	80 - 134
2,3,4,7,8-PeCDF	0.00100	0.00109		ug/L		109	68 - 160
1,2,3,4,7,8-HxCDD	0.00100	0.00120	MB	ug/L		120	70 - 164
1,2,3,6,7,8-HxCDD	0.00100	0.00126		ug/L		126	76 - 134
1,2,3,7,8,9-HxCDD	0.00100	0.00128		ug/L		128	64 - 162
1,2,3,4,7,8-HxCDF	0.00100	0.00115	MB	ug/L		115	72 - 134
1,2,3,6,7,8-HxCDF	0.00100	0.00119	MB	ug/L		119	84 - 130
1,2,3,7,8,9-HxCDF	0.00100	0.00121	MB	ug/L		121	78 - 130
2,3,4,6,7,8-HxCDF	0.00100	0.00116	MB	ug/L		116	70 - 156
1,2,3,4,6,7,8-HpCDD	0.00100	0.00127	MB	ug/L		127	70 - 140
1,2,3,4,6,7,8-HpCDF	0.00100	0.00121	MB	ug/L		121	82 - 122
1,2,3,4,7,8,9-HpCDF	0.00100	0.00119		ug/L		119	78 - 138
OCDD	0.00200	0.00249	MB	ug/L		124	78 - 144
OCDF	0.00200	0.00285	MB	ug/L		142	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-2,3,7,8-TCDD	73		20 - 175
13C-2,3,7,8-TCDF	80		22 - 152
13C-1,2,3,7,8-PeCDD	68		21 - 227
13C-1,2,3,7,8-PeCDF	74		21 - 192
13C-2,3,4,7,8-PeCDF	77		13 - 328
13C-1,2,3,4,7,8-HxCDD	64		21 - 193
13C-1,2,3,6,7,8-HxCDD	60		25 - 163
13C-1,2,3,4,7,8-HxCDF	69		19 - 202
13C-1,2,3,6,7,8-HxCDF	68		21 - 159

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-472939/2-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 472939

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,7,8,9-HxCDF	66		17 - 205
13C-2,3,4,6,7,8-HxCDF	70		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	56		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	64		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186
13C-OCDD	44		13 - 199

Surrogate	LCS %Recovery	LCS Qualifier	Limits
37Cl4-2,3,7,8-TCDD	118		31 - 191

Lab Sample ID: LCSD 320-472939/3-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 472939

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,3,7,8-TCDD			0.000200	0.000225		ug/L		112	67 - 158	4	50
2,3,7,8-TCDF			0.000200	0.000210	MB	ug/L		105	75 - 158	3	50
1,2,3,7,8-PeCDD			0.00100	0.00116		ug/L		116	70 - 142	2	50
1,2,3,7,8-PeCDF			0.00100	0.00111		ug/L		111	80 - 134	2	50
2,3,4,7,8-PeCDF			0.00100	0.00109		ug/L		109	68 - 160	1	50
1,2,3,4,7,8-HxCDD			0.00100	0.00117	MB	ug/L		117	70 - 164	3	50
1,2,3,6,7,8-HxCDD			0.00100	0.00113		ug/L		113	76 - 134	11	50
1,2,3,7,8,9-HxCDD			0.00100	0.00117		ug/L		117	64 - 162	9	50
1,2,3,4,7,8-HxCDF			0.00100	0.00110	MB	ug/L		110	72 - 134	5	50
1,2,3,6,7,8-HxCDF			0.00100	0.00113	MB	ug/L		113	84 - 130	5	50
1,2,3,7,8,9-HxCDF			0.00100	0.00114	MB	ug/L		114	78 - 130	6	50
2,3,4,6,7,8-HxCDF			0.00100	0.00113	MB	ug/L		113	70 - 156	3	50
1,2,3,4,6,7,8-HpCDD			0.00100	0.00120	MB	ug/L		120	70 - 140	6	50
1,2,3,4,6,7,8-HpCDF			0.00100	0.00114	MB	ug/L		114	82 - 122	5	50
1,2,3,4,7,8,9-HpCDF			0.00100	0.00111		ug/L		111	78 - 138	7	50
OCDD			0.00200	0.00237	MB	ug/L		118	78 - 144	5	50
OCDF			0.00200	0.00272	MB	ug/L		136	63 - 170	5	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-2,3,7,8-TCDD	73		20 - 175
13C-2,3,7,8-TCDF	78		22 - 152
13C-1,2,3,7,8-PeCDD	68		21 - 227
13C-1,2,3,7,8-PeCDF	74		21 - 192
13C-2,3,4,7,8-PeCDF	77		13 - 328
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,6,7,8-HxCDD	69		25 - 163
13C-1,2,3,4,7,8-HxCDF	75		19 - 202
13C-1,2,3,6,7,8-HxCDF	74		21 - 159
13C-1,2,3,7,8,9-HxCDF	72		17 - 205
13C-2,3,4,6,7,8-HxCDF	75		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	63		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	71		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	72		20 - 186

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-472939/3-A
Matrix: Water
Analysis Batch: 473727

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 472939

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-OCDD	49		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl4-2,3,7,8-TCDD	119		31 - 191

Specialty Organics

Prep Batch: 472939

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	1613B	
MB 320-472939/1-A	Method Blank	Total/NA	Water	1613B	
LCS 320-472939/2-A	Lab Control Sample	Total/NA	Water	1613B	
LCSD 320-472939/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	

Analysis Batch: 473727

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-54055-1	Arroyo_Simi_20210317_Grab	Total/NA	Water	1613B	472939
MB 320-472939/1-A	Method Blank	Total/NA	Water	1613B	472939
LCS 320-472939/2-A	Lab Control Sample	Total/NA	Water	1613B	472939
LCSD 320-472939/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	472939

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-2
Project/Site: Annual Arroyo Simi-Frontier Park

Client Sample ID: Arroyo_Simi_20210317_Grab
Lab Sample ID: 570-54055-1
Date Collected: 03/17/21 07:30
Matrix: Water
Date Received: 03/17/21 13:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			970.9 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473727	03/25/21 00:23	SMA	TAL SAC
	Instrument ID: 10D5									

Laboratory References:

Enthalpy = Enthalpy Analytical - Barkley, 931 W. Barkley Ave, Orange, CA 92868

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Weck Lab = Weck Laboratories, Inc., 14859 E. Clark Avenue, City of Industry, CA 91745

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 570-54055-2
Project/Site: Annual Arroyo Simi-Frontier Park

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-29-22
Hawaii	State	<cert No.>	01-29-22
Illinois	NELAP	200060	03-18-22
Kansas	NELAP	E-10375	10-31-21
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-22
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Ohio	State	41252	01-29-22
Oregon	NELAP	4040	01-30-23
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442021-12	03-01-22
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-28-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-21
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	EPA	TAL SAC
1103.1	E. Coli	EPA	Enthalpy
Subcontract	Weck- 525.2 - Diaznon and Chlorpyrifos	None	Weck Lab
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

Enthalpy = Enthalpy Analytical - Barkley, 931 W. Barkley Ave, Orange, CA 92868
TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600
Weck Lab = Weck Laboratories, Inc., 14859 E. Clark Avenue, City of Industry, CA 91745

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Annual Arroyo Simi-Frontier Park

Job ID: 570-54055-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-54055-1	Arroyo_Simi_20210317_Grab	Water	03/17/21 07:30	03/17/21 13:00	

Enthalpy Analytical
931 West Barkley Ave
Orange, CA 92868
(714) 771-6900

enthalpy.com

Lab Job Number: 442581
Report Level: II
Report Date: 04/16/2021

Analytical Report *prepared for:*

Virendra Patel
Eurofins Calscience, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1427

Location: Boeing-SSFL NPDES SSFL (570-54055)

Authorized for release by:

Quynhgiao Le, Project Manager
714-7716900
quynhgiao.le@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 1338, NELAP# 4038, SCAQMD LAP# 18LA0518, LACSD ID# 10105, CDC ELITE Member

ENTHALPY ANALYTICAL

Sample Summary

Virendra Patel Eurofins Calscience, Inc. 7440 Lincoln Way Garden Grove, CA 92841-1427	Lab Job #: Location: Date Received:	442581 Boeing-SSFL NPDES SSFL (570-54055) 03/17/21

Sample ID	Lab ID	Collected	Matrix
ARROYO_SIMI_20210317_GRAB (570-54055-1)	442581-001	03/17/21 07:30	Water

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

442581

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88586.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: Enthalpy Analytical LLC		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 931 W. Barkley Ave,	Due Date Requested: 3/29/2021			
City: Orange	TAT Requested (days):			
State, Zip: CA, 92868				
Phone:	PO #:			
Email:	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: ~~44024446~~ 570-54055			
Site:	SSOW#:			

Analysis Requested

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)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (SM9221 - E Coli (1x, 5x, 10x Dilutions))	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X	3	E Coli (1x, 5x, 10x Dilutions) - 8 hour hold time

Note: Since laboratory accreditations are subject to change, Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ 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
1		03/17/21 14:07	ES		03/17/21	GA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 11.4 / 1.0

Ver: 11/01/2020

ENTHALPY ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Eurofin Calscience Garden Grove

Project: Boeing SSFL NPDES

Date Received: 3/17/21

Sampler's Name Present: ☑ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)

Sample Temp (°C) (No Cooler): _____

Sample Temp (°C), One from each cooler: #1: 12.1 #2: _____ #3: _____ #4: _____

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: _____

Section 3

Was the cooler packed with: ☐ Ice ☑ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other _____

Cooler Temp (°C): #1: 0.1 #2: _____ #3: _____ #4: _____

Section 4	YES	NO	N/A
Was a COC received?	✓		
Are sample IDs present?	✓		
Are sampling dates & times present?	✓		
Is a relinquished signature present?	✓		
Are the tests required clearly indicated on the COC?	✓		
Are custody seals present?		✓	
If custody seals are present, were they intact?			✓
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)	✓		
Did all samples arrive intact? If no, indicate in Section 4 below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were the samples collected in the correct containers for the required tests?	✓		
Are the containers labeled with the correct preservatives?	✓		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✓
Was a sufficient amount of sample submitted for the requested tests?	✓		

Section 5 Explanations/Comments

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: _____ Date/Time _____

☐ Email (email sent to/on): _____ / _____

Project Manager's response:

Completed By: _____ Date: 3/17/17

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88586.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: Enthalpy Analytical LLC		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 931 W. Barkley Ave, ,	Due Date Requested: 3/29/2021			
City: Orange	TAT Requested (days):			
State, Zip: CA, 92868				
Phone:	PO #:			
Email:	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: ~~44024446~~ 570-54055			
Site:	SSOW#:			

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)

Other:

Analysis Requested

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (SM9221 - E Coli (1x, 5x, 10x Dilutions))	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X	3	E Coli (1x, 5x, 10x Dilutions) - 8 hour hold time

Ok to switch from SM9221 to SM 9223 (Coliler 18).
- Virendra Patel (03/17/2021)

Note: Since laboratory accreditations are subject to change, Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *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: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 11/01/2020

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88586.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: Enthalpy Analytical LLC		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 931 W. Barkley Ave, ,	Due Date Requested: 3/29/2021			
City: Orange	TAT Requested (days):			
State, Zip: CA, 92868				
Phone:	PO #:			
Email:	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: ~~44024446~~ 570-54055			
Site:	SSOW#:			

Analysis Requested

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)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (SM9221 - E Coli (1x, 5x, 10x Dilutions))	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X	3	E Coli (1x, 5x, 10x Dilutions) - 8 hour hold time

Ok to switch from SM9221 to SM 9223 (Coliler 18).
- Virendra Patel (03/17/2021)

Note: Since laboratory accreditations are subject to change, Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *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: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 11/01/2020

ENTHALPY ANALYTICAL

Analysis Results for 442581

Virendra Patel
Eurofins Calscience, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1427

Lab Job #: 442581
Location: Boeing-SSFL NPDES SSFL (570-54055)
Date Received: 03/17/21

Sample ID: ARROYO_SIMI_20210317_GRAB (570-54055-1) **Lab ID:** 442581-001 **Collected:** 03/17/21 07:30
Matrix: Water

442581-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: SM 9223Bb									
Coliform, E. Coli	**130**		MPN/100ml	1.0	1	263463	03/17/21 14:17	03/18/21 10:55	SZL

1 of 1

Results for any subcontracted analyses are not included in this section.

Batch 263463
9223BB QUANTI-TRAY / Water

Type	Sample	Prepped	Analyzed	Analyte	DF	Result	Units	MDL	RL	Analyst	Flags
SAMPLE	442581-001	17-MAR-2021 14:17	18-MAR-2021 10:55	Coliform, E. Coli	1x	130	MPN/100ml		1.0	SZL	
SAMPLE	442581-001	17-MAR-2021 14:17	18-MAR-2021 10:55	Coliform, Total	10x	5200	MPN/100ml		10	SZL	

Generate All Reports

Vers	442581 Reports	Export	Prn	User	Modified
2.1	9223BB QUANTI-TRAY Water report for 442581-001 (ARROYO_SIMI_20210317_GRAB (570-54055-1))	Exported	0	QGL	03/31/21 10:14:37 History HTML

Update Batch 263463 Microbiology Status

SZL *reviewed 03/18/21 12:02*
SLL *reviewed 03/18/21 16:47*

SM 9223 B-b, Quanti-Tray

Prep Analyst: SL Prep Date/Time: 3/17/21 / 1417 QC Batch ID: 263463 Batch Page 1 of 1

Read Analyst: SL Read Date/Time 3/18/21 / 1055 (SL 3/17/21)

Media Used (check one): ☐Colisure ☒Colilert 18 ☐Colilert 24 Media Lot #: ~~A103660~~ JS882 Pipette Lot #: A103660

Monthly Quanti-tray Sealer Check: Did it Pass? ☒Yes ☐No Date of last check*: 3/1/21 * Quanti-Tray Sealer Check must be performed monthly

Total and E. coli: Incubator ID: M1 Incubator In, Temp/Time: 34.9 °C / 1433 Incubator Out, Temp/Time: 35.1 °C / 1055

Fecal Coliform: Water Bath ID: N/A Water Bath In, Temp/Time: N/A Water Bath Out, Temp/Time: N/A

Client	Client Sample ID	Enthalpy Sample ID	Dilution Factor	Total Coliform Counts		MPN Table Value	Final Result, MPN	E. coli Counts		MPN Table Value	Final Result, MPN	Fecal Coliform Counts (Colilert 18 only)		MPN Table Value	Final Result, MPN	Comments
				Large Wells	Small Wells			Large Wells	Small Wells			Large Wells	Small Wells			
EUROFIN CALSCIENCE		442581-001	1X	49	48	>2419.6	>2400	45	9	131.4	130					ECL-01
↓		↓	10X	49	27	517.2	~~5400~~ 5,200	7	0	7.5	75					↓
							(SL 3/18/21)									
Quality Control	Culture ID															
Positive +/+ (E. Coli)	3/14/21			49	48	>2419.6	>2400	49	48	>2419.6	>2400					
Positive +/- (K. Pneumonia)	↓			49	48	>2419.6	>2400	0	0	<1	<1					
Negative -/- (P. Aeruginosa)				0	0	<1	<1	0	0	<1	<1					

Data Entered By: SL 3/18/21 Data Reviewed By:

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders: 1C17075

Project: 570-54055-2

Attn: Terri Chang

Client: Eurofins Calscience - Garden Grove
7440 Lincoln Way
Garden Grove, CA 92841-1432

Report Date: 5/07/2021
Received Date: 3/17/2021
Turnaround Time: 1 workday
Phones: (714) 895-5494
Fax: (714) 894-7501
P.O. #: 570-54055-2
Billing Code:

Dear Terri Chang,

Enclosed are the results of analyses for samples received 3/17/21 with the Chain-of-Custody document. The samples were received in good condition, at 3.9 °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: Arroyo_Simi_20210317_Grab (570-54055-1) Sampled: 03/17/21 7:30 by Client
1C17075-01 (Water)

Analyte	Result	MDL	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 525.2M			**Instr:** GCMS13				
Batch ID: W1C1138 **Preparation:** EPA 525.2/SPE			**Prepared:** 03/17/21 15:37			**Analyst:** EFC	
Chlorpyrifos	ND	0.0069	0.010	ug/l	1	03/20/21	
Diazinon	ND	0.0052	0.010	ug/l	1	03/20/21	
Surrogate(s)							
1,3-Dimethyl-2-nitrobenzene	*83%*		*76-128*	*Conc: 0.416*		*03/20/21*	
Triphenyl phosphate	*139%*		*40-163*	*Conc: 0.693*		*03/20/21*	

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Quality Control Results

Semivolatile Organics - Low Level by Tandem GC/MS/MS

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Blank (W1C1138-BLK1)					**Prepared: 03/17/21**	**Analyzed: 03/20/21**					
Chlorpyrifos	ND	0.0069	0.010	ug/l							
Diazinon	ND	0.0052	0.010	ug/l							
Surrogate(s)											
1,3-Dimethyl-2-nitrobenzene	*0.661*			*ug/l*	*0.500*		*132*	*76-128*			*S-11*
Triphenyl phosphate	*0.730*			*ug/l*	*0.500*		*146*	*40-163*			
LCS (W1C1138-BS1)					**Prepared: 03/17/21**	**Analyzed: 03/20/21**					
Chlorpyrifos	0.0519	0.0069	0.010	ug/l	0.0500		104	37-169			
Diazinon	0.0464	0.0052	0.010	ug/l	0.0500		93	43-152			
Surrogate(s)											
1,3-Dimethyl-2-nitrobenzene	*0.500*			*ug/l*	*0.500*		*100*	*76-128*			
Triphenyl phosphate	*0.682*			*ug/l*	*0.500*		*136*	*40-163*			
Matrix Spike (W1C1138-MS1)	**Source: 1C17075-01**				**Prepared: 03/17/21**	**Analyzed: 03/20/21**					
Chlorpyrifos	0.0506	0.0069	0.010	ug/l	0.0500	*ND*	101	37-168			
Diazinon	0.0520	0.0052	0.010	ug/l	0.0500	*ND*	104	36-153			
Surrogate(s)											
1,3-Dimethyl-2-nitrobenzene	*0.501*			*ug/l*	*0.500*		*100*	*76-128*			
Triphenyl phosphate	*0.757*			*ug/l*	*0.500*		*151*	*40-163*			
Matrix Spike Dup (W1C1138-MSD1)	**Source: 1C17075-01**				**Prepared: 03/17/21**	**Analyzed: 03/20/21**					
Chlorpyrifos	0.0566	0.0069	0.010	ug/l	0.0500	*ND*	113	37-168	11	30	
Diazinon	0.0586	0.0052	0.010	ug/l	0.0500	*ND*	117	36-153	12	30	
Surrogate(s)											
1,3-Dimethyl-2-nitrobenzene	*0.533*			*ug/l*	*0.500*		*107*	*76-128*			
Triphenyl phosphate	*0.689*			*ug/l*	*0.500*		*138*	*40-163*			

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Notes and Definitions

Item	Definition
S-11	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
%REC	Percent Recovery
Dil	Dilution
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)
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.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

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 MIS002.

Reviewed by:

Regina M. Giancola
Project Manager

DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NJ-DEP #CA015

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.

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www.wecklabs.com

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

1017075

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California
Company: Weck Laboratories, Inc.		Accreditations Required (See note): State Program - California	
Address: 14859 E. Clark Avenue, ,	Due Date Requested: 4/7/2021	Analysis Requested	
City: City of Industry	TAT Requested (days):		
State, Zip: CA, 91745			
Phone:	PO #:		
Email:	WO #:		
Project Name: Boeing-SSFL NPDES SSFL	Project #: ~~4402440~~ 570-54055		
Site:	SSOW#:		

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Weck- 525.2 - Diazinon and Chlorpyrifos)	SUB (Weck- 525.2 - Diazinon and Chlorpyrifos) (Hold)
			Preservation Code:					
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X	
Arroyo_Simi_20210317_Grab_Extra (570-54055-2)	3/17/21	07:30 Pacific		Water				X

Note: Since laboratory accreditations are subject to change, Eurofins Calscience places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under cha maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Calscience laboratory or other instructions will be provided. Any changes to accred Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are reta
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ A
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: 3/17/21	Company EC	Received by: Date/Time: 3/17/2
Relinquished by:	Date/Time:	Company	Received by: Date/Time:

54055

Eurofins Calscience Irvine

CHAIN OF CUSTODY FORM

570-54055 Chain of Custody

W8C300WR

Client Name/Address.	Project:	ANALYSIS REQUIRED	Field Readings	Meter serial #
Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108	Boeing-SSFL NPDES Permit 2015 **Annual Arroyo Simi-Frontier Park** **Dry Weather**			
Eurofins Calscience Irvine Contact: Virendra Patel 17461 Derian Ave Suite #100 Irvine CA 92614 Tel: 714-895-5494				
TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2019-22-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: 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	A E coli (SM9221) Enhalpy Analytical Orange CA	Q Hardness as $CaCO_3$, Recoverable (SM2340B)	A TCDD (and all congeners) (E1613B)	A TSS (Method 160 2 (SM2540D))	Q Chlorpyrifos, Diazinon (E525 2) Weck Labs in Hacienda Heights CA	Q Pesticides Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Toxaphene + PCBs only (E608)			Comments
Arroyo Simi	Arroyo_Simi_20210317_Grab	3-17-2021 / 0730	WS	125 mL Sterile Poly	3	$Na_2S_2O_3$	10	No	X								Deliver to lab ASAP 8 hr hold time Send 1x 5 0x di to
			WS	250 mL Poly	3	HNO_3	100	Yes		X							
			WS	1L Glass Amber	2	None	110	No			X						
			WS	1L Poly	1	None	185	No				X					
			WS	1L Glass Amber	6	None	275	Yes					X				Ext act with n 24-Hours of sampling Weck a
			WS	1L Glass Amber	6	None	285	Yes						X			
	Arroyo_Simi_20210317_Grab_Extra	3-17-2021 / 0730	WS	1L Glass Amber	2	None	110	No			H						Hold
			WS	1L Glass Amber	2	None	275	No					H				Hold
			WS	1L Glass Amber	2	None	285	No						H			Hold

Legend A=Annual, Q=Quarterly

Relinquished By	Date/Time	Company	Received By	Date/Time
M Dominick	3-17-2021 / 1105	Haley & Aldrich		3/17/21 1105
	3/17/21 1742	ECA		3/17/21 1742

Turn-around time. (Check)
24 Hour: ____ 72 Hour: ____ 10 Day: X
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: X

Field Readings. (Include units)
Time of Readings: 0720
pH 6.69 pH unit
Temp 50.8 °C/(F)
Velocity 0.0 ft/sec

Field readings QC
Checked by: [signature]
Date/Time: 3/17/2021 / 0720

5/7/2021 (Rev. 2)

2019-2020 Rainy Season
Version 2

3 6/27, 3 3/2 2 SC6

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88969 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 880 Riverside Parkway,	Due Date Requested: 4/2/2021			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: 44024446			
Site	SSOW#:			

Analysis Requested

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)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/1613B_Sox_Sep_P Standard List w/ Totals	1613B/1613B_Sox_Sep_P Standard List w/ Totals (Hold)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X		2	See QAS, Boeing_w/u to zero, Use Boeing glassware
Arroyo_Simi_20210317_Grab_Extra (570-54055-2)	3/17/21	07:30 Pacific		Water				X	2	See QAS, Boeing_w/u to zero Use Boeing glassware

Note: Since laboratory accreditations are subject to change Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Calscience attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ 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
1		3/18/21 1000	ECI			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time.	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Ver: 11/01/2020

ORIGIN ID:APVA (714) 895-5494
SAMPLE CONTROL
CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY

GARDEN GROVE, CA 92841
UNITED STATES US

SHIP DATE: 18MAR21
ACTWGT: 51.00 LB
CAD: 1533735/INET4340

BILL SENDER

TO **SAMPLE RECEIVING**
EUROFINS TESTAMERICA-W.SAC
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605
(916) 373-5600 REF: VP/54055, TC/54116
INV:
PO: DEPT

56DJ3/AC39/FE4A

FedEx Express

J211121161951uw

1 of 2

TRK# 0201 **7731 9953 6096**

MASTER

FRI - 19 MAR 10:30A
PRIORITY OVERNIGHT

WD BLUA

95605
CA-US **SMF**

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:APVA (714) 895-5494
SAMPLE CONTROL
CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY

GARDEN GROVE, CA 92841
UNITED STATES US

SHIP DATE: 18MAR21
ACTWGT 51 00 LB
CAD· 1533735/INET4340

BILL SENDER

TO **SAMPLE RECEIVING**
EUROFINS TESTAMERICA-W.SAC
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605
(916) 373-5600 REF VP/54055 TC/54116
INV
PO DEPT

56DJ3/AC39/FE4A

FedEx Express

FRI - 19 MAR 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# 0263 **7731 9953 6199**
Mstr# 7731 9953 6096
0201

95605
CA-US **SMF**

WD BLUA

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Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Patel, Virendra	Carrier Tracking No(s):	COC No: 570-88969.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Virendra.Patel@eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - California		Job #: 570-54055-2
Address: 880 Riverside Parkway, ,	Due Date Requested: 4/2/2021			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Boeing-SSFL NPDES SSFL	Project #: 44024446			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/1613B_Sox_Sep_P Standard List w/ Totals	1613B/1613B_Sox_Sep_P Standard List w/ Totals (Hold)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
Arroyo_Simi_20210317_Grab (570-54055-1)	3/17/21	07:30 Pacific		Water			X		2	See QAS, Boeing_w/u to zero; Use Boeing glassware.
Arroyo_Simi_20210317_Grab_Extra (570-54055-2)	3/17/21	07:30 Pacific		Water				X	2	See QAS, Boeing_w/u to zero; Use Boeing glassware.

Note: Since laboratory accreditations are subject to change, Eurofins Calscience 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 Eurofins Calscience laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Calscience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Calscience.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ 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
1	[signature]	3/18/21 1000	ECI	[signature]	3-19-21 0940	ETASAC
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: Seal	Cooler Temperature(s) °C and Other Remarks: 3.5

Ver: 11/01/2020

APPENDIX E

First Quarter 2021 Analytical Laboratory Methods, Method Detection Limits, Reporting Limits, QA/QC Procedures, and ELAP Certifications

APPENDIX E

TABLE OF CONTENTS

TABLE E
ANNUAL LIST OF ANALYTICAL METHODS BY ANALYTE WITH CORRESPONDING LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

							Permit Limits/Benchmarks					
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							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
EPA 624 - Low-level	1,1,1-Trichloroethane	µg/L	0.250	0.500	2	--[b]						
	1,1,2,2-Tetrachloroethane	µg/L	0.250	0.500	1	--[b]						
	1,1,2-Trichloroethane	µg/L	0.250	0.500	2	--[b]						
	1,1-Dichloroethane	µg/L	0.250	0.500	1	--[b]						
	1,1-Dichloroethene	µg/L	0.250	0.500	2	--[a]	3.2	6.0				
	1,2-Dichlorobenzene	µg/L	0.250	0.500	2	--[b]						
	1,2-Dichloroethane	µg/L	0.250	0.500	2	--[a]		0.5				
	1,2-Dichloropropane	µg/L	0.250	0.500	1	--[b]						
	1,3-Dichlorobenzene	µg/L	0.250	0.500	2	--[b]						
	1,3-Dichloropropene (reported as cis & trans)	µg/L	0.250	0.500	2	--[b]						
	1,4-Dichlorobenzene	µg/L	0.250	0.500	2	--[b]						
	Benzene	µg/L	0.250	0.500	2	--[b]						
	Bromoform	µg/L	0.400	1.00	2	--[b]						
	Bromomethane	µg/L	0.250	0.500	2	--[b]						
	Carbon tetrachloride	µg/L	0.250	0.500	2	--[b]						
	Chlorobenzene	µg/L	0.250	0.500	2	--[b]						
	Chlorodibromomethane	µg/L	0.250	0.500	2	--[b]						
	Chloroethane	µg/L	0.400	1.00	2	--[b]						
	Chloroform (Trichloromethane)	µg/L	0.250	0.500	2	--[b]						
	Chloromethane (Methyl Chloride)	µg/L	0.250	0.500	2	--[b]						
	Dibromochloromethane	µg/L	0.250	0.500	2	--[b]						
	Ethylbenzene	µg/L	0.250	0.500	2	--[b]						
	Methylene chloride	µg/L	0.880	2.00	2	--[b]						
	Tetrachloroethene	µg/L	0.250	0.500	2	--[b]						
	Toluene	µg/L	0.250	0.500	2	--[b]						
	trans-1,2-Dichloroethene	µg/L	0.250	0.500	1	--[b]						
	Trichloroethene	µg/L	0.250	0.500	2	--[a]		5.0				
	Vinyl chloride	µg/L	0.250	0.500	2	--[b]						
	m,p-Xylenes	µg/L	0.500	1.00	n/a	--[d]						
	Naphthalene	µg/L	0.400	1.00	n/a	--[d]						
	o-Xylene	µg/L	0.250	0.500	n/a	--[d]						
	Trichlorofluoromethane	µg/L	0.250	0.500	n/a	--[d]						
VOC - Add-ons (EPA 624)	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	0.500	2.00	n/a	--[d]						
	1,2-Dichloro-1,1,2-trifluoroethane	µg/L	1.00	2.00	n/a	--[d]						
	Cyclohexane	µg/L	1.00	2.00	n/a	--[d]						
EPA 624/8260B A-A+2CVE LOW	Acrolein	µg/L	2.50	5.00	5	--[b]						
	Acrylonitrile	µg/L	1.00	2.00	2	--[b]						
	2-Chloroethyl vinyl ether	µg/L	1.00	2.00	1	--[b]						

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							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
EPA 625+NDMA+Hydrazine -Low-level	1,2,4-Trichlorobenzene	µg/L	0.200	1.00	5	--[b]						
	1,2-Dichlorobenzene	µg/L	0.200	0.500	2	--[b]						
	1,2-Diphenylhydrazine/Azobenzene	µg/L	0.200	1.00	1	--[b]						
	1,3-Dichlorobenzene	µg/L	0.200	0.500	1	--[b]						
	1,4-Dichlorobenzene	µg/L	0.200	0.500	1	--[b]						
	2,4-Dichlorophenol	µg/L	0.200	2.00	5	--[b]						
	2,4-Dimethylphenol	µg/L	0.500	2.00	2	--[b]						
	2,4-Dinitrophenol	µg/L	1.00	5.00	5	--[b]						
	2,4-Dinitrotoluene	µg/L	2.00	5.00	5	--[a]	9.1	18				
	2,4,6-Trichlorophenol	µg/L	0.110	1.0-6.6	10	--[a]	6.5	13				
	2,6-Dinitrotoluene	µg/L	2.00	5.00	5	--[b]						
	2-Chloronaphthalene	µg/L	0.100	0.500	10	--[b]						
	2-Chlorophenol	µg/L	0.100	1.00	5	--[b]						
	2-Methyl-4,6-Dinitrophenol	µg/L	1.00	5.00	5	--[b]						
	2-Nitrophenol	µg/L	0.200	2.00	10	--[b]						
	3,3'-Dichlorobenzidine	µg/L	1.00	5.00	5	--[b]						
	4-Bromophenyl phenyl ether	µg/L	0.100	1.00	5	--[b]						
	4-Chloro-3-methylphenol	µg/L	0.200	2.00	1	--[b]						
	4-Chlorophenyl phenyl ether	µg/L	0.100	0.500	5	--[b]						
	4-Nitrophenol	µg/L	2.00	5.00	10	--[b]						
	Acenaphthene	µg/L	0.100	0.500	1	--[b]						
	Acenaphthylene	µg/L	0.100	0.500	10	--[b]						
	Anthracene	µg/L	0.100	0.500	10	--[b]						
	Benzidine	µg/L	5.00	10.0	5	--[b]						
	Benzo(a)anthracene	µg/L	1.00	5.00	5	--[b]						
	Benzo(a)pyrene	µg/L	0.200	2.00	10	--[b]						
	Benzo(b)fluoranthene	µg/L	0.300	2.00	10	--[b]						
	Benzo(g,h,i)perylene	µg/L	1.00	5.00	5	--[b]						
	Benzo(k)fluoranthene	µg/L	0.100	0.500	10	--[b]						
	Bis (2-chloroethoxy) methane	µg/L	0.200	0.500	5	--[b]						
	Bis (2-chloroethyl) ether	µg/L	0.050	0.500	1	--[b]						
	Bis (2-chloroisopropyl) ether	µg/L	0.100	0.500	2	--[b]						
	Bis (2-ethylhexyl) phthalate	µg/L	2.00	5.00	5	--[a]		4.0				
	Butyl benzylphthalate	µg/L	2.00	5.00	10	--[b]						
	Chrysene	µg/L	0.100	0.500	10	--[b]						
EPA 625+NDMA+Hydrazine -Low-level	Dibenz(a,h)anthracene	µg/L	0.200	0.500	10	--[b]						
	Diethyl phthalate	µg/L	0.200	1.00	2	--[b]						
	Dimethyl phthalate	µg/L	0.100	0.500	2	--[b]						
	Di-n-butyl phthalate	µg/L	0.500	2.00	10	--[b]						
	Di-n-octyl phthalate	µg/L	1.00	5.00	10	--[b]						
	Fluoranthene	µg/L	0.100	0.500	1	--[b]						
	Fluorene	µg/L	0.100	0.500	10	--[b]						
	Hexachlorobenzene	µg/L	0.100	1.00	1	--[b]						
	Hexachlorobutadiene	µg/L	0.500	2.00	1	--[b]						
	Hexachlorocyclopentadiene	µg/L	2.00	5.00	5	--[b]						
	Hexachloroethane	µg/L	0.500	3.00	1	--[b]						
	Indeno(1,2,3-cd)pyrene	µg/L	0.400	2.00	10	--[b]						
	Isophorone	µg/L	0.200	1.00	1	--[b]						
	Naphthalene	µg/L	0.050	1.00	1	--[b]						
	Nitrobenzene	µg/L	0.200	1.00	1	--[b]						

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							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
	n-Nitrosodimethylamine	µg/L	0.300	2.1-5.5	5	--[a]	8.1	16				
	n-Nitroso-di-n-propylamine	µg/L	0.200	2.00	5	--[b]						
	n-Nitrosodiphenylamine	µg/L	0.200	1.00	1	--[b]						
	Pentachlorophenol	µg/L	1.00	2.1-5.5	5	--[a]	8.2	16.5				
	Phenanthrene	µg/L	0.100	0.500	5	--[b]						
	Phenol	µg/L	0.100	1.00	1	--[b]						
	Pyrene	µg/L	0.100	0.500	10	--[b]						
PCB, Low Level (EPA 608)	Aroclor 1016	µg/L	0.039-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1221	µg/L	0.039-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1232	µg/L	0.039-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1242	µg/L	0.039-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1248	µg/L	0.039-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1254	µg/L	0.017-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1260	µg/L	0.017-0.26	0.1-0.5	0.5	--[g]					0.0003	
	Aroclor 1016	µg/g	0.005	0.045	n/a	--[c]						0.12
	Aroclor 1221	µg/g	0.006	0.049	n/a	--[c]						0.12
	Aroclor 1232	µg/g	0.010	0.049	n/a	--[c]						0.12
	Aroclor 1242	µg/g	0.004	0.049	n/a	--[c]						0.12
	Aroclor 1248	µg/g	0.004	0.049	n/a	--[c]						0.12
	Aroclor 1254	µg/g	0.004	0.049	n/a	--[c]						0.12
	Aroclor 1260	µg/g	0.006	0.049	n/a	--[c]						0.12
Pesticides, Low Level (EPA 608)	Aldrin	µg/L	0.00150	0.00500	0.005	--[b]						
	alpha-BHC	µg/L	0.0025-0.021	0.005-0.1	0.01	--[h]	0.01	0.03				
	alpha-Endosulfan	µg/L	0.00300	0.00500	0.02	--[b]						
	beta-BHC	µg/L	0.00400	0.0100	0.005	--[b]						
	beta-Endosulfan	µg/L	0.00200	0.00500	0.01	--[b]						
	delta-BHC	µg/L	0.00350	0.00500	0.005	--[b]						
	gamma-BHC (Lindane)	µg/L	0.00300	0.0100	0.02	--[b]						
	Chlordane	µg/L	0.0800	0.100	0.1	--[g]					0.001	
	4,4'-DDD	µg/L	0.0008-0.004	0.0013-0.0052	0.05	--[g]					0.0014	
	4,4'-DDE	µg/L	0.0005-0.003	0.0013-0.0052	0.05	--[g]					0.001	
	4,4'-DDT	µg/L	0.0016-0.004	0.0033-0.01	0.01	--[g]					0.001	
	Dieldrin	µg/L	0.0005-0.002	0.0013-0.005	0.01	--[g]					0.0002	
	Endosulfan sulfate	µg/L	0.00300	0.0100	0.05	--[b]						
	Endrin	µg/L	0.00200	0.00500	0.01	--[b]						
	Endrin aldehyde	µg/L	0.00200	0.0100	0.01	--[b]						
	Heptachlor	µg/L	0.00300	0.00900	0.01	--[b]						
	Heptachlor epoxide	µg/L	0.00250	0.00500	0.01	--[b]						
	Toxaphene	µg/L	0.013-0.25	0.1-0.5	0.5	--[g]					0.0003	
	Chlordane	µg/g	0.01500	0.05000	n/a	--[f]						0.0033
	4,4'-DDD	µg/g	0.00150	0.00500	n/a	--[c]						0.002
	4,4'-DDE	µg/g	0.00150	0.00500	n/a	--[f]						0.0014
	4,4'-DDT	µg/g	0.00150	0.00500	n/a	--[f]						0.0003
	Dieldrin	µg/g	0.00150	0.00500	n/a	--[f]						0.0002
	Toxaphene	µg/g	0.05000	0.20000	n/a	--[f]						0.0006
EPA 525.2	Chlorpyrifos	µg/L	0.0069	0.0010	n/a	--[c]					0.02	
	Diazinon	µg/L	0.0052	0.0010	n/a	--[c]					0.16	

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							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
ICP/MS 200.8	Antimony	µg/L	0.500	2.00	0.5	--[a]		6.0	6.0	6.0		
	Cadmium	µg/L	0.250	1.00	0.25	--[a]	2.0	4.0/3.1	4.0	4.0/3.1		
	Copper	µg/L	0.500	2.00	0.5	--[a]	5.8	14	13	14		
	Lead	µg/L	0.500	1.00	0.5	--[a]	2.6	5.2	5.2	5.2		
	Selenium	µg/L	0.500	2.00	2	--[a]	4.1	8.2/5		5		
	Silver	µg/L	0.500	1.00	0.25	--[a]	2.0	4.1				
	Thallium	µg/L	0.200	1.00	1	--[a]		2.0	2.0	2.0		
ICP 200.7	Aluminum	µg/L	50.0	100	n/a	--[d]						
	Arsenic	µg/L	8.90	10.0	10	--[a]		10.0				
	Barium	µg/L	5.00	10.0	n/a	--[c]		1000				
	Beryllium	µg/L	1.00	2.00	2	--[a]		4.0				
	Boron	mg/L	0.0250	0.0500	n/a	--[c]			1.0	1.0		
	Chromium	µg/L	2.50	5.00	10	--[a]	see Cr VI	see Cr VI				
	Cobalt	µg/L	5.00	10.0	n/a	--[d]						
	Hardness (as CaCO3)	mg/L	0.170	0.330	n/a	--[d]						
	Iron	mg/L	0.0500	0.100	n/a	--[c]		0.3				
	Manganese	µg/L	15.0	20.0	n/a	--[c]		50				
	Nickel	µg/L	5.00	10.0	20	--[a]	35	94	86	86		
	Vanadium	µg/L	5.00	10.0	n/a	--[d]						
	Zinc	µg/L	12.0	20.0	20	--[a]	43	119	120	120		
Mercury (EPA 245.1)	Mercury	µg/L	0.100	0.200	0.2	--[a]	0.05	0.10	0.13	0.13		
Chromium VI (EPA 218.6)	Chromium VI (Hexavalent)	µg/L	0.250	1.00	n/a	--[c]	8.0	16				
Cyanide by EPA (SM4500)	Cyanide	µg/L	2.50	5.00	5	--[a]	4.3	8.5	9.5	9.5		
Asbestos by EPA 600	Asbestos	MFL	n/a [2]	n/a [2]	n/a	--[d]						
EPA 8260B-Mod	1,4-Dioxane	µg/L	0.500	2.00	n/a	--[d]						
EPA 8015-Mod	Diesel Range Organics (DRO C13-C28)	mg/L	0.100	0.500	n/a	--[d]						
	Gasoline Range Organics (GRO C4-C12)	mg/L	0.0250	0.0500	n/a	--[d]						
EPA 314.0	Perchlorate	µg/L	0.950	4.00	n/a	--[c]		6.0	6.0	6.0		
EPA 1613	TCDD TEQ	µg/L	n/a	n/a	n/a	--[e]	1.4E-08	2.8E-08	2.8E-08	2.8E-08		
General Chemistry, (Field Test)	Chlorine, Total Residual [3]	mg/L	n/a	0.1	n/a	--[c]		0.1				
	Dissolved Oxygen [3]	mg/L	n/a	1	n/a	--[d]						
General Chemistry, EPA 120.1	Conductivity	µmhos/cm	n/a	1.00	n/a	--[d]						
General Chemistry, EPA 1664	Oil & Grease	mg/L	1.40	5.00	n/a	--[c]	10	15	15	15		

TABLE E
ANNUAL LIST OF ANALYTICAL METHODS BY ANALYTE WITH CORRESPONDING LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

							Permit Limits/Benchmarks					
Method	**Analyte**	**Units**	**TestAmerica Laboratory 2020-Q12021 MDL**	**TestAmerica Laboratory 2020-Q12021 RL**	**SWRCB ML**	**Laboratory vs ML[1]**	**Monthly Average Limits**	**Daily Maximum Limits**	**Daily Maximum Limits**	**Daily Maximum Limits**	**Receiving Water Limits**	**Receiving Water Sediment Limits**
							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
General Chemistry, EPA 180.1	Turbidity	NTU	0.04-0.8	0.1-2	n/a	--[d]						
General Chemistry, EPA 300	Chloride	mg/L	0.25-5	0.50-10	n/a	--[c]		150	150	150		
	Nitrate + Nitrite as Nitrogen (N)	mg/L	0.055	0.110	n/a	--[c]		8	10	8		
	Nitrate - N	mg/L	0.0550	0.110	n/a	--[c]		8		8		
	Nitrite - N	mg/L	0.0250	0.150	n/a	--[c]		1		1		
	Sulfate	mg/L	0.25-5.0	0.50-10	n/a	--[c]		300	250	300		
General Chemistry, SM2540C	Total Dissolved Solids	mg/L	5.00	10.0	n/a	--[c]		950	850	950		
General Chemistry, SM2540D	Total Suspended Solids	mg/L	0.50-1.7	1.0-3.3	n/a	--[c]	15	45				
General Chemistry, SM2540F	Settleable Solids	ml/L	n/a	0.100	n/a	--[c]	0.1	0.3				
General Chemistry, SM4500F-C	Fluoride	mg/L	0.250	0.500	n/a	--[c]		1.6	1.6	1.6		
General Chemistry, SM4500-NH3	Ammonia – N	mg/L	0.100	0.200	n/a	--[c]	1.96	10.1		10.1		
General Chemistry, SM5210B	Biochemical Oxygen Demand (BOD)(5-Day @ 20 deg. C)	mg/L	2.00	2.00	n/a	--[c]	20	30				
General Chemistry, SM5310B	Total Organic Carbon	mg/L	0.650	1.00	n/a	--[d]						
General Chemistry, SM5540	Detergents (as MBAS)	mg/L	0.0500	0.100	n/a	--[c]		0.5				
Radiochemistry	Uranium	pCi/L	n/a	1.00 [4]	n/a	--[c]		20	20	20		
Radiochemistry, EPA 900	Gross Alpha	pCi/L	n/a	3.00 [4]	n/a	--[c]		15	15	15		
	Gross Beta	pCi/L	n/a	4.00 [4]	n/a	--[c]		50	50	50		
Radiochemistry, EPA 901.1	Cesium-137	pCi/L	n/a	20.0 [4]	n/a	--[c]		200	200	200		
	Potassium-40	pCi/L	n/a	n/a	n/a	--[d]						
Radiochemistry, EPA 903/904	Combined Radium-226 & Radium-228	pCi/L	n/a	n/a	n/a	--[e]		5.0	5.0	5.0		
Radiochemistry, EPA 905.0	Strontium-90	pCi/L	n/a	3.00 [4]	n/a	--[c]		8.0	8.0	8.0		
Radiochemistry, EPA 906.0	Tritium	pCi/L	n/a	500 [4]	n/a	--[c]		20000	20000	20000		

TABLE E
ANNUAL LIST OF ANALYTICAL METHODS BY ANALYTE WITH CORRESPONDING LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

FIRST QUARTER 2021
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
NPDES PERMIT CA0001309

							Permit Limits/Benchmarks					
Method	**Analyte**	**Units**	**TestAmerica Laboratory 2020-Q12021 MDL**	**TestAmerica Laboratory 2020-Q12021 RL**	**SWRCB ML**	**Laboratory vs ML[1]**	**Monthly Average Limits**	**Daily Maximum Limits**	**Daily Maximum Limits**	**Daily Maximum Limits**	**Receiving Water Limits**	**Receiving Water Sediment Limits**
							019, 020	**001, 002 011, 018**	**003-007, 009, 010**	**008**	**Arroyo Simi**	**Arroyo Simi**
8315M (Truesdail Lab)	Monomethyl hydrazine	µg/L	2.0	2.0	n/a	--[d]						
Toxicity (Aquatic Lab), EPA 1002	Chronic Toxicity	Pass or Fail, % Effect	n/a	n/a	n/a	--[e]	Pass or Fail	Pass or % Effect <50	Pass or % Effect <50	Pass or % Effect <50		
Biological, SM9221F/SM9223B	E. Coli	MPN/100ml	1-1.8	1-180	n/a	--[c]					235	

Notes:
Benchmark limitations: Outfalls 001, 002
Compliance limitations: Outfalls 003-011, 018-020
The RLs and MDLs may vary slightly based on a number of factors such as instrument used, dilution factor, aliquot, blank contamination, etc.

Columns are used to compare laboratory's reporting limits (RLs) and method detection limits (MDLs) to the SWRCB Minimum Levels (MLs) and the permit limits (PLs).
(1) This column indicates the status of analytical capabilities if the ML is less than the laboratory RL and/or MDL. See explanation for "--" below.
The following designations summarize the comparison of RLs, MDLs, MLs, and permit limits:
-- = Laboratory reporting limit meets ML if applicable and permit limit requirements.
--[a] Laboratory reporting limit or method detection limit meets ML and permit limit requirements.
--[b] Laboratory reporting limit or method detection limit meets ML. This analyte has no permit limit requirements.
--[c] Laboratory reporting limit or method detection limit meets permit limit. This analyte has no ML.
--[d] This analyte has no ML or permit limit.
--[e] This analyte is a calculation or chronic toxicity and does not have a reporting limit. This calculation or chronic toxicity has no ML.
--[f] This analyte has no ML. Laboratory reporting limit or method detection limit does not meet permit limit.
--[g] Laboratory reporting limit or method detection limit meets ML, but does not meet permit limit requirements.
--[h] Laboratory reporting limit or method detection limit meets ML and permit limit requirements for most of the samples. However due to a laboratory error, some samples were reported at a higher method detection limit of 0.02 ug/L. The method detection limit was below the permit limit for these samples.

In the above context, "meet" means equal to or less than (IE if a Laboratory reporting limit or method detection limit meets a criteria, the laboratory reporting limit is less than or equal to that criteria
The receiving water sediment limits do not have a ML and are included for reference only.

(2) The RL and MDL for asbestos varies based upon the sample.
(3) Total residual chlorine (TRC) and dissolved oxygen (DO) are measured in the field. The RL is the lowest limit of the instrument. The MDL is not relevant for field parameters.
(4) This value is the minimum detectable activity (MDA) which applies only to radiological constituents.

Acronyms:
MFL = million fibers per liter
mg/L = milligrams per liter
MPN/100ml = most probable number per 100 milliliters
pCi/L = picoCuries per liter
SWRCB = State Water Resources Control Board
µg/L = micrograms per liter
µg/g = micrograms per gram
n/a = not applicable

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins TestAmerica Sacramento

880 Riverside Parkway

West Sacramento, CA 95605

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2897**

Expiration Date: **1/31/2022**

Effective Date: **2/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Fields of Accreditation

Eurofins TestAmerica Sacramento

880 Riverside Parkway
West Sacramento, CA 95605
Phone: 9163735600

Certificate Number: 2897
Expiration Date: 1/31/2022

Field of Accreditation: 102 - Inorganic Chemistry of Drinking Water			
102.045	001	Perchlorate	EPA 314.0
102.047	001	Perchlorate	EPA 331.0
Field of Accreditation: 105 - Semi-volatile Organic Chemistry of Drinking Water			
105.106	000	Per- and Polyfluorinated Alkyl Substances (PFAS)	EPA 537.1
105.230	001	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B
Field of Accreditation: 108 - Inorganic Constituents in Non-Potable Water			
108.001	001	Specific Conductance	EPA 120.1 (1982 Rev.1.0)
108.009	001	Turbidity	EPA 180.1 (1993 Rev. 2.0)
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)
108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	005	Nitrate-Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	007	Phosphate,Ortho (as P)	EPA 300.0 (1993 Rev. 2.1)
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)
108.033	001	Nitrate-Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.033	002	Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)
108.059	001	Turbidity	SM 2130 B-2011
108.063	001	Alkalinity	SM 2320 B-2011
108.065	001	Hardness (Calculation)	SM 2340 B-2011
108.069	001	Specific Conductance	SM 2510 B-2011
108.071	001	Residue, Total	SM 2540 B-2011
108.073	001	Residue, Filterable TDS	SM 2540 C-2011
108.075	001	Residue, Non-filterable TSS	SM 2540 D-2011
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011
108.173	001	Oxygen, Dissolved	SM 4500-O G-2011
108.213	001	Chemical Oxygen Demand	SM 5220 D-2011
Field of Accreditation: 109 - Metals and Trace Elements in Non-Potable Water			

109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)

Field of Accreditation: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.250	001	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B
111.250	002	Total Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B
111.250	003	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	EPA 1613 B
111.250	004	Total Tetrachlorodibenzofuran (TCDF)	EPA 1613 B
111.250	005	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	EPA 1613 B
111.250	006	Total Pentachlorodibenzo-p-dioxin (PeCDD)	EPA 1613 B
111.250	007	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 1613 B
111.250	008	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 1613 B
111.250	009	Total Pentachlorodibenzofuran (PeCDF)	EPA 1613 B
111.250	010	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B
111.250	011	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B
111.250	012	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B
111.250	013	Total Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B
111.250	014	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B
111.250	015	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B
111.250	016	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B
111.250	017	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B
111.250	018	Total Hexachlorodibenzofuran (HxCDF)	EPA 1613 B
111.250	019	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 1613 B
111.250	020	Total Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 1613 B

111.250	021	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	
111.250	022	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	
111.250	023	Total Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	
111.250	024	OCDD	EPA 1613 B	
111.250	025	OCDF	EPA 1613 B	
111.345	001	N-Ethylperfluorooctane Sulfonamido Acetic Acid (NEtFOSAA)	DoD QSM Version 5.1 (or newer)	
111.345	002	4:2 Fluorotelomer Sulfonic Acid (4:2 FTS)	DoD QSM Version 5.1 (or newer)	
111.345	003	6:2 Fluorotelomer Sulfonic Acid (6:2 FTS)	DoD QSM Version 5.1 (or newer)	
111.345	004	8:2 Fluorotelomer Sulfonic Acid (8:2 FTS)	DoD QSM Version 5.1 (or newer)	
111.345	005	N-Methylperfluorooctane Sulfonamido Acetic Acid (NMeFOSAA)	DoD QSM Version 5.1 (or newer)	
111.345	006	Perfluorobutanoic Acid (PFBA)	DoD QSM Version 5.1 (or newer)	
111.345	007	Perfluorobutane Sulfonic Acid (PFBS)	DoD QSM Version 5.1 (or newer)	
111.345	008	Perfluorodecanoic Acid (PFDA)	DoD QSM Version 5.1 (or newer)	
111.345	009	Perfluorododecanoic Acid (PFDoA)	DoD QSM Version 5.1 (or newer)	
111.345	010	Perfluorodecane Sulfonic Acid (PFDS)	DoD QSM Version 5.1 (or newer)	
111.345	011	Perfluoroheptanoic Acid (PFHpA)	DoD QSM Version 5.1 (or newer)	
111.345	012	Perfluoroheptane Sulfonic Acid (PFHpS)	DoD QSM Version 5.1 (or newer)	
111.345	013	Perfluorohexane Sulfonic Acid (PFHxS)	DoD QSM Version 5.1 (or newer)	
111.345	014	Perfluorohexanoic Acid (PFHxA)	DoD QSM Version 5.1 (or newer)	
111.345	015	Perfluorononanoic Acid (PFNA)	DoD QSM Version 5.1 (or newer)	
111.345	016	Perfluorooctanoic Acid (PFOA)	DoD QSM Version 5.1 (or newer)	
111.345	017	Perfluorooctane Sulfonic Acid (PFOS)	DoD QSM Version 5.1 (or newer)	
111.345	018	Perfluorooctane Sulfonamide (PFOSAm)	DoD QSM Version 5.1 (or newer)	
111.345	019	Perfluoropentanoic Acid (PFPeA)	DoD QSM Version 5.1 (or newer)	
111.345	020	Perfluoropentane Sulfonic Acid (PFPeS)	DoD QSM Version 5.1 (or newer)	
111.345	021	Perfluorotetradecanoic Acid (PFTDA)	DoD QSM Version 5.1 (or newer)	
111.345	022	Perfluorotridecanoic Acid (PFTrDA)	DoD QSM Version 5.1 (or newer)	
111.345	023	Perfluoroundecanoic Acid (PFUnDA)	DoD QSM Version 5.1 (or newer)	
111.345	024	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3	DoD QSM Version 5.1 (or newer)	DOD
111.345	024	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3	DoD QSM Version 5.1 (or newer)	
111.345	025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	DoD QSM Version 5.1 (or newer)	DOD
111.345	025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	DoD QSM Version 5.1 (or newer)	
111.345	026	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	DoD QSM Version 5.1 (or newer)	
111.345	027	N-Ethylperfluorooctane Sulfonamide (EtFOSAm)	DoD QSM Version 5.1 (or newer)	
111.345	028	N-Ethylperfluorooctane Sulfonamido Ethanol (EtFOSE)	DoD QSM Version 5.1 (or newer)	
111.345	029	10:2 Fluorotelomer Sulfonic Acid (10:2 FTS)	DoD QSM Version 5.1 (or newer)	
111.345	030	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	DoD QSM Version 5.1 (or newer)	
111.345	031	N-Methylperfluorooctane Sulfonamide (NMeFOSA)	DoD QSM Version 5.1 (or newer)	
111.345	032	N-Methylperfluorooctane Sulfonamido Ethanol (NMeFOSE)	DoD QSM Version 5.1 (or newer)	
111.345	033	Perfluorohexadecanoic Acid (PFHxDA)	DoD QSM Version 5.1 (or newer)	
111.345	034	Perfluorononane Sulfonic Acid (PFNS)	DoD QSM Version 5.1 (or newer)	
111.345	035	Perfluorooctadecanoic Acid (PFODA)	DoD QSM Version 5.1 (or newer)	

111.345	036	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	DoD QSM Version 5.1 (or newer)	
111.345	037	2H,2H,3H,3H-Perfluorohexaanoic Acid (3:3 FTCA)	DoD QSM Version 5.1 (or newer)	
111.345	038	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	DoD QSM Version 5.1 (or newer)	
111.345	039	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	DoD QSM Version 5.1 (or newer)	
111.345	040	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	DoD QSM Version 5.1 (or newer)	
111.345	041	Perfluoro-3-methoxypropanoic acid (PFMPA)	DoD QSM Version 5.1 (or newer)	
111.345	042	Perfluoro-4-methoxybutanoic acid (PFMBA)	DoD QSM Version 5.1 (or newer)	

Field of Accreditation: 114 - Inorganic Constituents in Hazardous Waste

114.010	001	Antimony	EPA 6010 B	
114.010	002	Arsenic	EPA 6010 B	
114.010	003	Barium	EPA 6010 B	
114.010	004	Beryllium	EPA 6010 B	
114.010	005	Cadmium	EPA 6010 B	
114.010	006	Chromium	EPA 6010 B	
114.010	007	Cobalt	EPA 6010 B	
114.010	008	Copper	EPA 6010 B	
114.010	009	Lead	EPA 6010 B	
114.010	010	Molybdenum	EPA 6010 B	
114.010	011	Nickel	EPA 6010 B	
114.010	012	Selenium	EPA 6010 B	
114.010	013	Silver	EPA 6010 B	
114.010	014	Thallium	EPA 6010 B	
114.010	015	Vanadium	EPA 6010 B	
114.010	016	Zinc	EPA 6010 B	
114.020	001	Antimony	EPA 6020	
114.020	002	Arsenic	EPA 6020	
114.020	003	Barium	EPA 6020	
114.020	004	Beryllium	EPA 6020	
114.020	005	Cadmium	EPA 6020	
114.020	006	Chromium	EPA 6020	
114.020	007	Cobalt	EPA 6020	
114.020	008	Copper	EPA 6020	
114.020	009	Lead	EPA 6020	
114.020	010	Molybdenum	EPA 6020	
114.020	011	Nickel	EPA 6020	
114.020	012	Selenium	EPA 6020	
114.020	013	Silver	EPA 6020	
114.020	014	Thallium	EPA 6020	
114.020	015	Vanadium	EPA 6020	
114.020	016	Zinc	EPA 6020	
114.103	001	Chromium VI (Hexavalent Chromium)	EPA 7196 A	Aqueous Only
114.140	001	Mercury	EPA 7470 A	

114.141	001	Mercury	EPA 7471 A	
114.240	001	Corrosivity - pH Determination	EPA 9040 B	Aqueous Only
114.241	001	Corrosivity - pH Determination	EPA 9045 C	
114.250	001	Fluoride	EPA 9056	

Field of Accreditation: 115 - Leaching/Extraction Tests and Physical Characteristics of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311	
115.021	001	TCLP Inorganics	EPA 1311	
115.022	001	TCLP Extractables	EPA 1311	
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II	
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312	

Field of Accreditation: 116 - Volatile Organic Compounds in Hazardous Waste

116.080	000	Volatile Organic Compounds	EPA 8260 B	
116.080	120	Oxygenates	EPA 8260 B	
116.100	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT GC/MS	
116.100	010	BTEX and MTBE	LUFT GC/MS	

Field of Accreditation: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel Range Organics (DRO)	EPA 8015 B	
117.016	001	Diesel Range Organics (DRO)	LUFT	
117.110	000	Extractable Organics	EPA 8270 C	
117.120	000	Dioxins and Dibenzofurans	EPA 8280 A	
117.130	000	Dioxins and Dibenzofurans	EPA 8290	
117.170	000	Nitroaromatics and Nitramines	EPA 8330	
117.171	000	Nitroaromatics and Nitramines	EPA 8330 A	
117.210	000	Organochlorine Pesticides	EPA 8081 A	
117.220	000	PCBs	EPA 8082	
117.290	000	Per- and Polyfluorinated Alkyl Substances (PFAS)	DoD QSM Version 5.1 (or newer)	

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins TestAmerica Seattle

Seattle

5755 8th Street East

Tacoma, WA 98424

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2901**

Expiration Date: **11/5/2021**

Effective Date: **11/6/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Eurofins TestAmerica Seattle
Seattle
5755 8th Street East
Tacoma, WA 98424
Phone: 2539222310

Certificate No. **2901**
Expiration Date **11/5/2021**

				Primary Accreditation Body
Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste				
114.010	001	Antimony	EPA 6010 B	OR
114.010	002	Arsenic	EPA 6010 B	OR
114.010	003	Barium	EPA 6010 B	OR
114.010	004	Beryllium	EPA 6010 B	OR
114.010	005	Cadmium	EPA 6010 B	OR
114.010	006	Chromium	EPA 6010 B	OR
114.010	007	Cobalt	EPA 6010 B	OR
114.010	008	Copper	EPA 6010 B	OR
114.010	009	Lead	EPA 6010 B	OR
114.010	010	Molybdenum	EPA 6010 B	OR
114.010	011	Nickel	EPA 6010 B	OR
114.010	012	Selenium	EPA 6010 B	OR
114.010	013	Silver	EPA 6010 B	OR
114.010	014	Thallium	EPA 6010 B	OR
114.010	015	Vanadium	EPA 6010 B	OR
114.010	016	Zinc	EPA 6010 B	OR
114.020	001	Antimony	EPA 6020	OR
114.020	002	Arsenic	EPA 6020	OR
114.020	003	Barium	EPA 6020	OR
114.020	004	Beryllium	EPA 6020	OR
114.020	005	Cadmium	EPA 6020	OR
114.020	006	Chromium	EPA 6020	OR
114.020	007	Cobalt	EPA 6020	OR
114.020	008	Copper	EPA 6020	OR
114.020	009	Lead	EPA 6020	OR
114.020	010	Molybdenum	EPA 6020	OR
114.020	011	Nickel	EPA 6020	OR
114.020	012	Selenium	EPA 6020	OR
114.020	013	Silver	EPA 6020	OR
114.020	014	Thallium	EPA 6020	OR
114.020	015	Vanadium	EPA 6020	OR
114.020	016	Zinc	EPA 6020	OR
114.140	001	Mercury	EPA 7470 A	OR

As of 11/6/2020 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

114.141	001	Mercury	EPA 7471 A		OR
114.221	001	Cyanide, Total	EPA 9012 A		OR
114.240	001	Corrosivity - pH Determination	EPA 9040 B	Aqueous Only	OR
114.241	001	Corrosivity - pH Determination	EPA 9045 C		OR
Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste					
116.010	000	EDB and DBCP	EPA 8011	Aqueous Only	OR
116.030	001	Gasoline Range Organics (GRO)	EPA 8015 B		OR
116.080	000	Volatile Organic Compounds	EPA 8260 B		OR
116.080	120	Oxygenates	EPA 8260 B		OR
Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste					
117.010	001	Diesel Range Organics (DRO)	EPA 8015 B		OR
117.110	000	Extractable Organics	EPA 8270 C		OR
117.210	000	Organochlorine Pesticides	EPA 8081 A		OR
117.220	000	PCBs	EPA 8082		OR

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins TestAmerica St. Louis

13715 Rider Trail North

Earth City, MO 63045

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2886**

Expiration Date: **6/30/2021**

Effective Date: **7/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Eurofins TestAmerica St. Louis

13715 Rider Trail North
Earth City, MO 63045
Phone: 3142988566

Certificate No. 2886
Expiration Date 6/30/2021

				Primary Accreditation Body
Field of Testing: 106 - Radionuclides in Drinking Water				
106.010	001	Gross Alpha	EPA 900.0	FL
106.010	002	Gross Beta	EPA 900.0	FL
106.030	001	Radioactive Cesium	EPA 901.1	FL
106.050	002	Radium-226	EPA 903.0	FL
106.060	001	Radium-228	EPA 904.0	FL
106.070	003	Strontium-90	EPA 905.0	FL
106.080	001	Tritium	EPA 906.0	FL
106.092	001	Uranium	EPA 200.8	FL
106.220	001	Strontium-89, 90	DOE Sr-01	FL
106.230	001	Uranium	DOE U-02	FL
106.270	001	Gross Alpha	SM 7110 C	FL
106.610	001	Radon-222	SM 7500-Rn	FL
Field of Testing: 108 - Inorganic Constituents in Non-Potable Water				
108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)	FL
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)	FL
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)	FL
108.013	005	Silica, Dissolved	EPA 200.7 (1994 Rev. 4.4)	LA
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)	FL
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)	LA
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)	FL
108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)	LA
108.015	005	Sodium	EPA 200.8 (1994 Rev. 5.4)	FL
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	007	Phosphate,Ortho (as P)	EPA 300.0 (1993 Rev. 2.1)	FL
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)	FL
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011	FL
Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water				
109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)	FL

109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)	FL
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)	FL
109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)	LA
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)	LA
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)	LA
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)	FL
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)	FL
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)	FL

Field of Testing: 112 - Radionuclides in Non-Potable Water

112.001	001	Gross Alpha	EPA 900.0		FL
112.001	002	Gross Beta	EPA 900.0		FL
112.003	001	Total Alpha Radium	EPA 903.0		FL

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B		FL
114.010	002	Arsenic	EPA 6010 B		FL
114.010	003	Barium	EPA 6010 B		FL
114.010	004	Beryllium	EPA 6010 B		FL
114.010	005	Cadmium	EPA 6010 B		FL
114.010	006	Chromium	EPA 6010 B		FL
114.010	007	Cobalt	EPA 6010 B		FL
114.010	008	Copper	EPA 6010 B		FL
114.010	009	Lead	EPA 6010 B		FL
114.010	010	Molybdenum	EPA 6010 B		FL
114.010	011	Nickel	EPA 6010 B		FL
114.010	012	Selenium	EPA 6010 B		FL
114.010	013	Silver	EPA 6010 B		FL
114.010	014	Thallium	EPA 6010 B		FL
114.010	015	Vanadium	EPA 6010 B		FL
114.010	016	Zinc	EPA 6010 B		FL
114.020	001	Antimony	EPA 6020		FL
114.020	002	Arsenic	EPA 6020		FL
114.020	003	Barium	EPA 6020		FL
114.020	004	Beryllium	EPA 6020		FL
114.020	005	Cadmium	EPA 6020		FL
114.020	006	Chromium	EPA 6020		FL
114.020	007	Cobalt	EPA 6020		FL
114.020	008	Copper	EPA 6020		FL
114.020	009	Lead	EPA 6020		FL
114.020	010	Molybdenum	EPA 6020		FL
114.020	011	Nickel	EPA 6020		FL
114.020	012	Selenium	EPA 6020		FL
114.020	013	Silver	EPA 6020		FL
114.020	014	Thallium	EPA 6020		FL
114.020	015	Vanadium	EPA 6020		FL
114.020	016	Zinc	EPA 6020		FL
114.103	001	Chromium (VI)	EPA 7196 A	Aqueous Only	FL
114.140	001	Mercury	EPA 7470 A	Aqueous Only	FL
114.141	001	Mercury	EPA 7471 A		FL
114.240	001	Corrosivity - pH Determination	EPA 9040 B	Aqueous Only	FL
114.241	001	Corrosivity - pH Determination	EPA 9045 C		FL

114.250	001	Fluoride	EPA 9056		FL
Field of Testing: 115 - Extraction Test of Hazardous Waste					
115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311		FL
115.021	001	TCLP Inorganics	EPA 1311		LA
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II		LA
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312		FL
Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste					
116.030	001	Gasoline-range Organics	EPA 8015 B		FL
116.080	000	Volatile Organic Compounds	EPA 8260 B		FL
Field of Testing: 118 - Radionuclides in Hazardous Waste					
118.010	001	Gross Alpha	EPA 9310		FL
118.010	002	Gross Beta	EPA 9310		FL
118.020	001	Radium, Total	EPA 9315		FL
118.030	001	Radium-228	EPA 9320		FL
118.271	001	Strontium	DOE Sr-02		FL
118.290	001	Uranium	DOE U-02		FL
Field of Testing: 120 - Physical Properties of Hazardous Waste					
120.070	001	Corrosivity - pH Determination	EPA 9040 B	Aqueous Only	FL
120.080	001	Corrosivity - pH Determination	EPA 9045 C		FL

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Aquatic Bioassay & Consulting Laboratories, Inc.

29 North Olive Street

Ventura, CA 93001

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1907**

Expiration Date: **7/31/2021**

Effective Date: **8/1/2019**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

Water Boards

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Aquatic Bioassay & Consulting Laboratories, Inc.

29 North Olive Street
Ventura, CA 93001
Phone: 8056435621

Certificate No. 1907
Expiration Date 7/31/2021

Field of Testing: 113 - Whole Effluent Toxicity of Wastewater

113.010	001A	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static
113.010	001B	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static Renewal
113.010	003A	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static
113.010	003B	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static Renewal
113.010	005A	Daphnid (C. dubia)	EPA 600/4-90/027F, Static
113.010	005B	Daphnid (C. dubia)	EPA 600/4-90/027F, Static Renewal
113.010	006A	Daphnia spp.	EPA 600/4-90/027F, Static
113.010	006B	Daphnia spp.	EPA 600/4-90/027F, Static Renewal
113.010	008A	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static
113.010	008B	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static Renewal
113.010	009A	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static
113.010	009B	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static Renewal
113.010	012A	Mysid (M. bahia)	EPA 600/4-90/027F, Static
113.010	012B	Mysid (M. bahia)	EPA 600/4-90/027F, Static Renewal
113.021	001A	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static
113.021	001B	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static Renewal
113.022	003A	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static
113.022	003B	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static Renewal
113.023	005A	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static
113.023	005B	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static Renewal
113.024	006A	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static
113.024	006B	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static Renewal
113.025	009A	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static
113.025	009B	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static Renewal
113.027	012A	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static
113.027	012B	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static Renewal
113.028	008A	Topsmelt (A. affinis)	EPA-821-R-02-012, Static
113.028	008B	Topsmelt (A. affinis)	EPA-821-R-02-012, Static Renewal
113.029	001A	Hyalella spp.	EPA-821-R-02-012, Static
113.029	001B	Hyalella spp.	EPA-821-R-02-012, Static Renewal
113.041	001	Fathead Minnow (P. promelas)	EPA 1000 (EPA-821-R-02-013)
113.050	005	Daphnid (C. dubia)	EPA 1002 (EPA/600/4-91/002)
113.051	005	Daphnid (C. dubia)	EPA 1002 (EPA-821-R-02-013)

As of 7/29/2019 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

113.060	020	Green algae (S. capricornutum)	EPA 1003 (EPA/600/4-91/002)
113.061	020	Green algae (S. capricornutum)	EPA 1003 (EPA-821-R-02-013)
113.071	020	Green algae (S. capricornutum)	ASTM E1218-04
113.080	009	Silverside (Menidia spp.)	EPA 1006 (EPA/600/4-91/003)
113.081	009	Silverside (Menidia spp.)	EPA 1006 (EPA-821-R-02-014)
113.090	012	Mysid (M. bahia)	EPA 1007 (EPA/600/4-91/003)
113.091	012	Mysid (M. bahia)	EPA 1007 (EPA-821-R-02-014)
113.120	008	Topsmelt (A. affinis)	EPA 600/R-95/136
113.120	014	Pacific oyster (C. gigas)	EPA 600/R-95/136
113.120	015D	Sand dollar (D. excentricus)	EPA 600/R-95/136, Fertilization Test
113.120	015E	Sand dollar (D. excentricus)	EPA 600/R-95/136, Development Test
113.120	017D	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Fertilization Test
113.120	017E	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Development Test
113.120	019	Mussels (Mytilus spp.)	EPA 600/R-95/136
113.120	022	Giant Kelp (M. pyrifera)	EPA 600/R-95/136
113.120	023	Red abalone (H. rufescens)	EPA 600/R-95/136
113.160	026	Amphipod (H. azteca)	EPA 600/R-99/064, EPA 100.1
113.210	030	Amphipod (E. estuarius)	EPA 600/R-94/025, EPA 100.4
Field of Testing: 119 - Toxicity Bioassay of Hazardous Waste			
119.010	001	Fathead Minnow (P. promelas)	Polisini & Miller (CDFG 1988)
119.010	003	Rainbow trout (O. mykiss)	Polisini & Miller (CDFG 1988)
119.020	026	Amphipod (H. azteca)	EPA 100.1
119.050	030	Amphipod (E. estuarius)	EPA 100.4
Field of Testing: 126 - Microbiology of Recreational Water			
126.010	001	Total Coliform (Enumeration)	SM 9221 B-2006
126.030	001	Fecal Coliform (Enumeration)	SM 9221 C,E-2006
126.050	001	Total Coliform (Enumeration)	SM 9223 B Colilert
126.050	002	E. coli (Enumeration)	SM 9223 B Colilert
126.080	001	Enterococci	Enterolert

State Water Resources Control Board

July 30, 2019

Scott Johnson
Aquatic Bioassay & Consulting Laboratories, Inc.
29 North Olive Street
Ventura, CA 93001

Dear Scott Johnson: Certificate No. 1907

Congratulations! This notice advises that the laboratory named above has been accredited as an environmental testing laboratory pursuant to the provisions of the California Health and Safety Code (HSC) Sections 100825-100920. The analyses for which this laboratory is accredited are indicated on the enclosed "Accredited Fields of Testing" List.

The laboratory's accreditation begins on the date printed on the enclosed certificate. For renewed accreditations, this date is determined by compliance with applicable deadlines. Noncompliance with these deadlines may have resulted in lapse of accreditation.

Be advised, the laboratory may have been denied accreditation for one or more analyses for which it applied due to failure to comply with regulatory requirements for application or accreditation. It is the laboratory's responsibility to review the enclosed list and know for which methods the laboratory has been accredited. This accreditation is a final action of the state board, subject to petition under Health and Safety Code Section 116701 within 30 days. However, if you believe that a FOT has been left off of your accreditation in error, you may submit to ELAP within 30 days of this letter, an "Accreditation Inquiry Request Form" located at www.waterboards.ca.gov/elap identifying any mistakes or errors you believe occurred in your accreditation, which will begin the period in which to file a petition. ELAP will then review all timely submitted "Accreditation Inquiry Request Forms" and will make a final determination which could then petitioned to the State Water Resources Control Board. **Failure to submit a petition to the State Water Resources Control Board or an "Accreditation Inquiry Request Form" to ELAP within 30 days of this letter will prohibit you from obtaining any further review of your accreditation.**

HSC Section 100890 lists the civil penalties for environmental laboratories that perform analyses for state regulatory purposes without a valid certificate.

Continued accreditation is contingent upon compliance with HSC Sections 100825-100920 and California Code of Regulations, Title 22, Division 4, Chapter 19, Certification of Environmental Laboratories. ELAP reserves the right to take enforcement action, including issuance of civil penalties, or supension and revocation of the laboratory's ELAP certificate, for failure to comply with all applicable regulations, statutes and orders.

Thank you

Christine Sotelo, Chief
California Environmental Laboratory Accreditation Program (CA ELAP)

Water Boards

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Aquatic Bioassay & Consulting Laboratories, Inc.

29 North Olive Street
Ventura, CA 93001
Phone: 8056435621

Certificate No. 1907
Expiration Date 7/31/2021

Field of Testing: 113 - Whole Effluent Toxicity of Wastewater

113.010	001A	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static
113.010	001B	Fathead Minnow (P. promelas)	EPA 600/4-90/027F, Static Renewal
113.010	003A	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static
113.010	003B	Rainbow trout (O. mykiss)	EPA 600/4-90/027F, Static Renewal
113.010	005A	Daphnid (C. dubia)	EPA 600/4-90/027F, Static
113.010	005B	Daphnid (C. dubia)	EPA 600/4-90/027F, Static Renewal
113.010	006A	Daphnia spp.	EPA 600/4-90/027F, Static
113.010	006B	Daphnia spp.	EPA 600/4-90/027F, Static Renewal
113.010	008A	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static
113.010	008B	Topsmelt (A. affinis)	EPA 600/4-90/027F, Static Renewal
113.010	009A	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static
113.010	009B	Silverside (Menidia spp.)	EPA 600/4-90/027F, Static Renewal
113.010	012A	Mysid (M. bahia)	EPA 600/4-90/027F, Static
113.010	012B	Mysid (M. bahia)	EPA 600/4-90/027F, Static Renewal
113.021	001A	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static
113.021	001B	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static Renewal
113.022	003A	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static
113.022	003B	Rainbow trout (O. mykiss)	EPA 2019 (EPA-821-R-02-012), Static Renewal
113.023	005A	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static
113.023	005B	Daphnid (C. dubia)	EPA 2002 (EPA-821-R-02-012), Static Renewal
113.024	006A	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static
113.024	006B	Daphnia spp.	EPA 2021 (EPA-821-R-02-012), Static Renewal
113.025	009A	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static
113.025	009B	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static Renewal
113.027	012A	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static
113.027	012B	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static Renewal
113.028	008A	Topsmelt (A. affinis)	EPA-821-R-02-012, Static
113.028	008B	Topsmelt (A. affinis)	EPA-821-R-02-012, Static Renewal
113.029	001A	Hyalella spp.	EPA-821-R-02-012, Static
113.029	001B	Hyalella spp.	EPA-821-R-02-012, Static Renewal
113.041	001	Fathead Minnow (P. promelas)	EPA 1000 (EPA-821-R-02-013)
113.050	005	Daphnid (C. dubia)	EPA 1002 (EPA/600/4-91/002)
113.051	005	Daphnid (C. dubia)	EPA 1002 (EPA-821-R-02-013)

As of 7/29/2019 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

113.060	020	Green algae (S. capricornutum)	EPA 1003 (EPA/600/4-91/002)
113.061	020	Green algae (S. capricornutum)	EPA 1003 (EPA-821-R-02-013)
113.071	020	Green algae (S. capricornutum)	ASTM E1218-04
113.080	009	Silverside (Menidia spp.)	EPA 1006 (EPA/600/4-91/003)
113.081	009	Silverside (Menidia spp.)	EPA 1006 (EPA-821-R-02-014)
113.090	012	Mysid (M. bahia)	EPA 1007 (EPA/600/4-91/003)
113.091	012	Mysid (M. bahia)	EPA 1007 (EPA-821-R-02-014)
113.120	008	Topsmelt (A. affinis)	EPA 600/R-95/136
113.120	014	Pacific oyster (C. gigas)	EPA 600/R-95/136
113.120	015D	Sand dollar (D. excentricus)	EPA 600/R-95/136, Fertilization Test
113.120	015E	Sand dollar (D. excentricus)	EPA 600/R-95/136, Development Test
113.120	017D	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Fertillzation Test
113.120	017E	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Development Test
113.120	019	Mussels (Mytilus spp.)	EPA 600/R-95/136
113.120	022	Giant Kelp (M. pyrifera)	EPA 600/R-95/136
113.120	023	Red abalone (H. rufescens)	EPA 600/R-95/136
113.160	026	Amphipod (H. azteca)	EPA 600/R-99/064, EPA 100.1
113.210	030	Amphipod (E. estuarius)	EPA 600/R-94/025, EPA 100.4
Field of Testing: 119 - Toxicity Bioassay of Hazardous Waste			
119.010	001	Fathead Minnow (P. promelas)	Polisini & Miller (CDFG 1988)
119.010	003	Rainbow trout (O. mykiss)	Polisini & Miller (CDFG 1988)
119.020	026	Amphipod (H. azteca)	EPA 100.1
119.050	030	Amphipod (E. estuarius)	EPA 100.4
Field of Testing: 126 - Microbiology of Recreational Water			
126.010	001	Total Coliform (Enumeration)	SM 9221 B-2006
126.030	001	Fecal Coliform (Enumeration)	SM 9221 C,E-2006
126.050	001	Total Coliform (Enumeration)	SM 9223 B Colilert
126.050	002	E. coli (Enumeration)	SM 9223 B Colilert
126.080	001	Enterococci	Enterolert

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

EMSL Analytical, Inc.

South Pasadena, CA

520 Mission Street

South Pasadena, CA 91030

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2283**

Expiration Date: **12/31/2021**

Effective Date: **1/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

EMSL Analytical, Inc.
South Pasadena, CA
520 Mission Street
South Pasadena, CA 91030
Phone: 3232549960

Certificate No. 2283
Expiration Date 12/31/2021

Field of Testing: 101 - Microbiology of Drinking Water			
101.010	001	Heterotrophic Bacteria	SM 9215 B
101.050	001	Total Coliform P/A	SM 9223 B Colilert
101.050	002	E. coli P/A	SM 9223 B Colilert
101.050	003	Total Coliform (Enumeration)	SM 9223 B Colilert
Field of Testing: 103 - Toxic Chemical Elements of Drinking Water			
103.301	001	Asbestos	EPA 100.2
Field of Testing: 107 - Microbiological Methods for Non-Potable Water and Sewage Sludge			
107.003	002	Fecal Coliform (Enumeration)	SM 9222 D-2006
Field of Testing: 121 - Bulk Asbestos Analysis of Hazardous Waste			
121.010	001	Bulk Asbestos	EPA 600/M4-82-020
Field of Testing: 126 - Microbiological Methods for Ambient Water			
126.005	003	Fecal Coliform (Enumeration)	SM 9222 D-2006
126.019	001	Enterococci	Enterolert

As of 12/28/2020 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Interim

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Enthalpy Analytical, LLC

Orange

931 West Barkley Avenue

Orange, CA 92868

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1338**

Expiration Date: **10/31/2021**

Effective Date: **11/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Enthalpy Analytical, LLC
Orange
931 West Barkley Avenue
Orange, CA 92868
Phone: 7147716900

Certificate No. 1338
Expiration Date 10/31/2021
INTERIM

Field of Testing: 101 - Microbiology of Drinking Water

101.010	001	Heterotrophic Bacteria	SM 9215 B
101.010	002	Heterotrophic Bacteria	SimPlate
101.020	004	Total Coliform (Enumeration)	SM 9221 B,C
101.020	005	Fecal Coliform (Enumeration)	SM 9221 B,E
101.020	006	E. coli (Enumeration)	SM 9221 B,F
101.050	001	Total Coliform P/A	SM 9223 B Colilert
101.050	002	E. coli P/A	SM 9223 B Colilert
101.050	003	Total Coliform (Enumeration)	SM 9223 B Colilert
101.050	004	E. coli (Enumeration)	SM 9223 B Colilert
101.050	005	Total Coliform P/A	SM 9223 B Colilert 18
101.050	006	E. coli P/A	SM 9223 B Colilert 18
101.050	007	Total Coliform (Enumeration)	SM 9223 B Colilert 18
101.050	008	E. coli (Enumeration)	SM 9223 B Colilert 18
101.050	009	Total Coliform P/A	SM 9223 B Colisure
101.050	010	E. coli P/A	SM 9223 B Colisure
101.050	011	Total Coliform (Enumeration)	SM 9223 B Colisure
101.050	012	E. coli (Enumeration)	SM 9223 B Colisure

Field of Testing: 102 - Inorganic Chemistry of Drinking Water

102.015	001	Hydrogen Ion (pH)	EPA 150.1
102.020	001	Turbidity	EPA 180.1
102.026	001	Calcium	EPA 200.7
102.026	002	Magnesium	EPA 200.7
102.026	003	Potassium	EPA 200.7
102.026	004	Silica	EPA 200.7
102.026	005	Sodium	EPA 200.7
102.026	006	Hardness (Calculation)	EPA 200.7
102.030	003	Chloride	EPA 300.0
102.030	005	Fluoride	EPA 300.0
102.030	006	Nitrate (as N)	EPA 300.0
102.030	007	Nitrite (as N)	EPA 300.0
102.030	009	Sulfate (as SO4)	EPA 300.0
102.045	001	Perchlorate	EPA 314.0
102.050	001	Cyanide, Total	EPA 335.4

102.095	001	Turbidity	SM 2130 B-2001
102.100	001	Alkalinity	SM 2320 B-1997
102.120	001	Hardness (Calculation)	SM 2340 B-1997
102.130	001	Specific Conductance	SM 2510 B-1997
102.140	001	Residue, Filterable TDS	SM 2540 C-1997
102.175	001	Chlorine, Free	SM 4500-Cl G-2000
102.175	002	Chlorine, Total Residual	SM 4500-Cl G-2000
102.190	001	Cyanide, Total	SM 4500-CN E-1999
102.192	001	Cyanide, Amenable	SM 4500-CN G-1999
102.200	001	Fluoride	SM 4500-F C-1997
102.203	001	Hydrogen Ion (pH)	SM 4500-H+ B-2000
102.234	001	Nitrite (as N)	SM 4500-NO3 F-2000
102.234	002	Nitrate (as N)	SM 4500-NO3 F-2000
102.240	001	Phosphate,Ortho (as P)	SM 4500-P E-1999
102.242	001	Silica	SM 4500-SiO2 C-1997
102.243	001	Silica	SM 4500-SiO2 D-1997
102.260	001	Organic Carbon-Total (TOC)	SM 5310 B-2000
102.261	001	Dissolved Organic Carbon (DOC)	SM 5310 B-2000
102.270	001	Surfactants	SM 5540 C-2000

Field of Testing: 103 - Toxic Chemical Elements of Drinking Water

103.130	003	Barium	EPA 200.7
103.130	004	Beryllium	EPA 200.7
103.130	005	Cadmium	EPA 200.7
103.130	007	Chromium	EPA 200.7
103.130	008	Copper	EPA 200.7
103.130	009	Iron	EPA 200.7
103.130	011	Manganese	EPA 200.7
103.130	012	Nickel	EPA 200.7
103.130	015	Silver	EPA 200.7
103.130	017	Zinc	EPA 200.7
103.130	018	Boron	EPA 200.7
103.140	001	Aluminum	EPA 200.8
103.140	002	Antimony	EPA 200.8
103.140	003	Arsenic	EPA 200.8
103.140	004	Barium	EPA 200.8
103.140	005	Beryllium	EPA 200.8
103.140	006	Cadmium	EPA 200.8
103.140	007	Chromium	EPA 200.8
103.140	008	Copper	EPA 200.8
103.140	009	Lead	EPA 200.8
103.140	010	Manganese	EPA 200.8
103.140	012	Nickel	EPA 200.8

103.140	013	Selenium	EPA 200.8
103.140	014	Silver	EPA 200.8
103.140	015	Thallium	EPA 200.8
103.140	016	Zinc	EPA 200.8
103.140	017	Boron	EPA 200.8
103.140	018	Vanadium	EPA 200.8
103.160	001	Mercury	EPA 245.1
103.310	001	Chromium VI (Hexavalent Chromium)	EPA 218.6
103.311	001	Chromium VI (Hexavalent Chromium)	EPA 218.7

Field of Testing: 104 - Volatile Organic Chemistry of Drinking Water

104.035	001	1,2,3-Trichloropropane (TCP)	SRL 524M-TCP
104.040	001	Benzene	EPA 524.2
104.040	007	n-Butylbenzene	EPA 524.2
104.040	008	sec-Butylbenzene	EPA 524.2
104.040	009	tert-Butylbenzene	EPA 524.2
104.040	010	Carbon Tetrachloride	EPA 524.2
104.040	011	Chlorobenzene	EPA 524.2
104.040	015	2-Chlorotoluene	EPA 524.2
104.040	016	4-Chlorotoluene	EPA 524.2
104.040	019	1,3-Dichlorobenzene	EPA 524.2
104.040	020	1,2-Dichlorobenzene	EPA 524.2
104.040	021	1,4-Dichlorobenzene	EPA 524.2
104.040	022	Dichlorodifluoromethane	EPA 524.2
104.040	023	1,1-Dichloroethane	EPA 524.2
104.040	024	1,2-Dichloroethane	EPA 524.2
104.040	025	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 524.2
104.040	026	cis-1,2-Dichloroethylene (cis 1,2 Dichloroethene)	EPA 524.2
104.040	027	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 524.2
104.040	028	Dichloromethane (Methylene Chloride)	EPA 524.2
104.040	029	1,2-Dichloropropane	EPA 524.2
104.040	033	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 524.2
104.040	034	trans-1,3-Dichloropropylene (trans-1,3 Dichloropropene)	EPA 524.2
104.040	035	Ethylbenzene	EPA 524.2
104.040	037	Isopropylbenzene	EPA 524.2
104.040	039	Naphthalene	EPA 524.2
104.040	041	N-propylbenzene	EPA 524.2
104.040	042	Styrene	EPA 524.2
104.040	043	1,1,1,2-Tetrachloroethane	EPA 524.2
104.040	044	1,1,2,2-Tetrachloroethane	EPA 524.2
104.040	045	Tetrachloroethylene (Tetrachloroethene)	EPA 524.2
104.040	046	Toluene	EPA 524.2
104.040	047	1,2,3-Trichlorobenzene	EPA 524.2

104.040	048	1,2,4-Trichlorobenzene	EPA 524.2
104.040	049	1,1,1-Trichloroethane	EPA 524.2
104.040	050	1,1,2-Trichloroethane	EPA 524.2
104.040	051	Trichloroethylene (Trichloroethene)	EPA 524.2
104.040	054	1,2,4-Trimethylbenzene	EPA 524.2
104.040	055	1,3,5-Trimethylbenzene	EPA 524.2
104.040	056	Vinyl Chloride	EPA 524.2
104.040	059	o-Xylene	EPA 524.2
104.040	061	Carbon Disulfide	EPA 524.2
104.040	062	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	EPA 524.2
104.040	063	m+p-Xylene	EPA 524.2
104.045	001	Bromodichloromethane	EPA 524.2
104.045	002	Bromoform	EPA 524.2
104.045	003	Chloroform	EPA 524.2
104.045	004	Dibromochloromethane (Chlorodibromomethane)	EPA 524.2
104.050	002	Methyl tert-butyl Ether (MTBE)	EPA 524.2
104.050	003	tert-Amyl Methyl Ether (TAME)	EPA 524.2
104.050	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.2
104.050	005	Trichlorotrifluoroethane (Freon 113)	EPA 524.2
104.050	006	tert-Butyl Alcohol (TBA)	EPA 524.2

Field of Testing: 107 - Microbiological Methods for Non-Potable Water and Sewage Sludge

107.001	001	Total Coliform (Enumeration)	SM 9221 B,C-2006
107.001	002	Fecal Coliform (Enumeration)	SM 9221 C,E-2006
107.001	003	E. coli (Enumeration)	SM 9221 C,F-2006
107.005	001	E. coli (Enumeration)	SM 9223 B-2004
107.007	001	Enterococci	SM 9230 B-2007
107.007	002	Fecal Streptococci	SM 9230 B-2007
107.011	001	Enterococci	SM 9230 D-2007
107.013	001	E. coli (Enumeration)	Colilert
107.015	001	E. coli (Enumeration)	Colilert 18
107.015	002	Fecal Coliform (Enumeration)	Colilert 18

Field of Testing: 108 - Inorganic Constituents in Non-Potable Water

108.001	001	Specific Conductance	EPA 120.1 (1982 Rev.1.0)
108.007	001	Residue, Volatile	EPA 160.4 (1971)
108.009	001	Turbidity	EPA 180.1 (1993 Rev. 2.0)
108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)
108.013	005	Silica, Dissolved	EPA 200.7 (1994 Rev. 4.4)
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)

108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)
108.015	005	Sodium	EPA 200.8 (1994 Rev. 5.4)
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	005	Nitrate-Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)
108.023	001	Cyanide, Total	EPA 335.4 (1993 Rev. 1.0)
108.025	001	Ammonia (as N)	EPA 350.1 (1993 Rev. 2.0)
108.029	001	Kjeldahl Nitrogen,Total (as N)	EPA 351.2 (1993 Rev. 2.0)
108.033	001	Nitrate-Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.033	002	Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)
108.047	001	Phenols, Total	EPA 420.1 (1978 Rev. 1.0)
108.053	001	Oil & Grease Total	EPA 1664 A
108.055	001	Color	SM 2120 B-2011
108.059	001	Turbidity	SM 2130 B-2011
108.061	001	Acidity	SM 2310 B-2011
108.063	001	Alkalinity	SM 2320 B-2011
108.065	001	Hardness (Calculation)	SM 2340 B-2011
108.069	001	Specific Conductance	SM 2510 B-2011
108.071	001	Residue, Total	SM 2540 B-2011
108.073	001	Residue, Filterable TDS	SM 2540 C-2011
108.077	001	Residue, Volatile	SM 2540 E-2011
108.079	001	Residue, Settleable	SM 2540 F-2011
108.114	001	Chlorine, Total Residual	SM 4500-Cl G-2011
108.114	002	Chlorine, Free	SM 4500-Cl G-2011
108.125	001	Cyanide, Total	SM 4500-CN E-2011
108.129	001	Cyanide, Available	SM 4500-CN G-2011
108.131	001	Fluoride	SM 4500-F C-2011
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011
108.139	001	Ammonia (as N)	SM 4500-NH3 C-2011
108.139	002	Kjeldahl Nitrogen,Total (as N)	SM 4500-NH3 C-2011
108.147	001	Ammonia (as N)	SM 4500-NH3 G-2011
108.147	002	Kjeldahl Nitrogen,Total (as N)	SM 4500-NH3 G-2011
108.159	001	Nitrate-Nitrite (as N)	SM 4500-NO3 F-2011
108.159	002	Nitrite (as N)	SM 4500-NO3 F-2011
108.173	001	Oxygen, Dissolved	SM 4500-O G-2011
108.175	001	Phosphate,Ortho (as P)	SM 4500-P E-2011
108.175	002	Phosphorus,Total	SM 4500-P E-2011

108.184	001	Silica, Dissolved	SM 4500-SiO2 C-2011
108.189	001	Sulfite (as SO3)	SM 4500-SO3 B-2011
108.201	001	Sulfide (as S)	SM 4500-S D-2011
108.207	001	Biochemical Oxygen Demand	SM 5210 B-2011
108.207	002	Carbonaceous BOD	SM 5210 B-2011
108.213	001	Chemical Oxygen Demand	SM 5220 D-2011
108.215	001	Organic Carbon-Total (TOC)	SM 5310 B-2011
108.225	001	Surfactants	SM 5540 C-2011

Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water

109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)
109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)
109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)
109.625	006	Boron	EPA 200.8 (1994 Rev. 5.4)
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)

109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)
109.629	001	Chromium VI (Hexavalent Chromium)	EPA 218.6 (1994 Rev. 3.3)
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)

Field of Testing: 110 - Volatile Organic Constituents in Non-Potable Water

110.040	001	Acetone	EPA 624.1
110.040	002	Acetonitrile	EPA 624.1
110.040	003	Acrolein	EPA 624.1
110.040	004	Acrylonitrile	EPA 624.1
110.040	005	Benzene	EPA 624.1
110.040	006	Bromodichloromethane	EPA 624.1
110.040	007	Bromoform	EPA 624.1
110.040	008	Bromomethane (Methyl Bromide)	EPA 624.1
110.040	009	tert-Butyl Alcohol (TBA)	EPA 624.1
110.040	010	Carbon Tetrachloride	EPA 624.1
110.040	011	Chlorobenzene	EPA 624.1
110.040	012	Chloroethane	EPA 624.1
110.040	013	2-Chloroethyl vinyl Ether	EPA 624.1
110.040	014	Chloroform	EPA 624.1
110.040	015	Chloromethane (Methyl Chloride)	EPA 624.1
110.040	016	Dibromochloromethane (Chlorodibromomethane)	EPA 624.1
110.040	017	1,2-Dichlorobenzene	EPA 624.1
110.040	018	1,3-Dichlorobenzene	EPA 624.1
110.040	019	1,4-Dichlorobenzene	EPA 624.1
110.040	020	1,1-Dichloroethane	EPA 624.1
110.040	021	1,2-Dichloroethane	EPA 624.1
110.040	022	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 624.1
110.040	023	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 624.1
110.040	024	1,2-Dichloropropane	EPA 624.1
110.040	025	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 624.1
110.040	026	trans-1,3-Dichloropropylene (trans-1,3 Dichloropropene)	EPA 624.1
110.040	029	Ethylbenzene	EPA 624.1
110.040	031	Methylene Chloride (Dichloromethane)	EPA 624.1
110.040	032	4-Methyl-2-pentanone (MIBK)	EPA 624.1

110.040	034	1,1,2,2-Tetrachloroethane	EPA 624.1
110.040	035	Tetrachloroethylene (Tetrachloroethene)	EPA 624.1
110.040	037	Toluene	EPA 624.1
110.040	038	1,1,1-Trichloroethane	EPA 624.1
110.040	039	1,1,2-Trichloroethane	EPA 624.1
110.040	040	Trichloroethylene (Trichloroethene)	EPA 624.1
110.040	041	Vinyl Chloride	EPA 624.1
110.040	043	o-Xylene	EPA 624.1
110.040	045	Trichlorofluoromethane	EPA 624.1
110.040	046	m+p-Xylene	EPA 624.1
110.040	047	2-Butanone (MEK)	EPA 624.1

Field of Testing: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.055	001	Aldrin	EPA 608.3
111.055	002	alpha-BHC	EPA 608.3
111.055	003	beta-BHC	EPA 608.3
111.055	004	delta-BHC	EPA 608.3
111.055	005	gamma-BHC (Lindane)	EPA 608.3
111.055	006	Chlordane	EPA 608.3
111.055	007	4,4'-DDD	EPA 608.3
111.055	008	4,4'-DDE	EPA 608.3
111.055	009	4,4'-DDT	EPA 608.3
111.055	010	Dieldrin	EPA 608.3
111.055	011	Endosulfan I	EPA 608.3
111.055	012	Endosulfan II	EPA 608.3
111.055	013	Endosulfan Sulfate	EPA 608.3
111.055	014	Endrin	EPA 608.3
111.055	015	Endrin Aldehyde	EPA 608.3
111.055	016	Heptachlor	EPA 608.3
111.055	017	Heptachlor Epoxide	EPA 608.3
111.055	019	PCB-1016	EPA 608.3
111.055	020	PCB-1221	EPA 608.3
111.055	021	PCB-1232	EPA 608.3
111.055	022	PCB-1242	EPA 608.3
111.055	023	PCB-1248	EPA 608.3
111.055	024	PCB-1254	EPA 608.3
111.055	025	PCB-1260	EPA 608.3
111.160	001	Acenaphthene	EPA 625.1
111.160	002	Acenaphthylene	EPA 625.1
111.160	003	Anthracene	EPA 625.1
111.160	004	Benzidine	EPA 625.1
111.160	005	Benzo(a)anthracene	EPA 625.1
111.160	006	Benzo(a)pyrene	EPA 625.1

111.160	007	Benzo(b)fluoranthene	EPA 625.1
111.160	008	Benzo(g,h,i)perylene	EPA 625.1
111.160	009	Benzo(k)fluoranthene	EPA 625.1
111.160	010	Bis(2-chloroethoxy) Methane	EPA 625.1
111.160	011	Bis(2-chloroethyl) Ether	EPA 625.1
111.160	012	Bis(2-Chloroisopropyl) ether	EPA 625.1
111.160	013	Bis(2-ethylhexyl)phthalate	EPA 625.1
111.160	014	4-Bromophenyl Phenyl Ether	EPA 625.1
111.160	015	Butyl Benzyl Phthalate	EPA 625.1
111.160	016	2-Chloronaphthalene	EPA 625.1
111.160	017	4-Chlorophenyl Phenyl Ether	EPA 625.1
111.160	018	Chrysene	EPA 625.1
111.160	019	Dibenz(a,h)anthracene	EPA 625.1
111.160	020	3,3'-Dichlorobenzidine	EPA 625.1
111.160	021	Diethyl Phthalate	EPA 625.1
111.160	022	Dimethyl Phthalate	EPA 625.1
111.160	023	Di-n-butyl Phthalate	EPA 625.1
111.160	024	2,4-Dinitrotoluene	EPA 625.1
111.160	025	2,6-Dinitrotoluene	EPA 625.1
111.160	026	Di-n-octyl Phthalate	EPA 625.1
111.160	027	Fluoranthene	EPA 625.1
111.160	028	Fluorene	EPA 625.1
111.160	029	Hexachlorobenzene	EPA 625.1
111.160	030	Hexachlorobutadiene	EPA 625.1
111.160	031	Hexachloroethane	EPA 625.1
111.160	032	Indeno(1,2,3-c,d)pyrene	EPA 625.1
111.160	033	Isophorone	EPA 625.1
111.160	034	Naphthalene	EPA 625.1
111.160	035	Nitrobenzene	EPA 625.1
111.160	036	N-nitrosodi-n-propylamine	EPA 625.1
111.160	037	Phenanthrene	EPA 625.1
111.160	038	Pyrene	EPA 625.1
111.160	039	1,2,4-Trichlorobenzene	EPA 625.1
111.160	040	4-Chloro-3-methylphenol	EPA 625.1
111.160	041	2-Chlorophenol	EPA 625.1
111.160	042	2,4-Dichlorophenol	EPA 625.1
111.160	043	2,4-Dimethylphenol	EPA 625.1
111.160	044	2,4-Dinitrophenol	EPA 625.1
111.160	045	2-Methyl-4,6-dinitrophenol	EPA 625.1
111.160	046	2-Nitrophenol	EPA 625.1
111.160	047	4-Nitrophenol	EPA 625.1
111.160	048	Pentachlorophenol	EPA 625.1

111.160	049	Phenol	EPA 625.1
111.160	050	2,4,6-Trichlorophenol	EPA 625.1
111.160	108	N-nitrosodimethylamine	EPA 625.1
111.160	110	N-nitrosodiphenylamine	EPA 625.1
111.160	143	1,2-Diphenylhydrazine	EPA 625.1
111.160	145	Pyridine	EPA 625.1
111.160	151	2,4,5-Trichlorophenol	EPA 625.1

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B
114.010	002	Arsenic	EPA 6010 B
114.010	003	Barium	EPA 6010 B
114.010	004	Beryllium	EPA 6010 B
114.010	005	Cadmium	EPA 6010 B
114.010	006	Chromium	EPA 6010 B
114.010	007	Cobalt	EPA 6010 B
114.010	008	Copper	EPA 6010 B
114.010	009	Lead	EPA 6010 B
114.010	010	Molybdenum	EPA 6010 B
114.010	011	Nickel	EPA 6010 B
114.010	012	Selenium	EPA 6010 B
114.010	013	Silver	EPA 6010 B
114.010	014	Thallium	EPA 6010 B
114.010	015	Vanadium	EPA 6010 B
114.010	016	Zinc	EPA 6010 B
114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020
114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.103	001	Chromium VI (Hexavalent Chromium)	EPA 7196 A
114.106	001	Chromium VI (Hexavalent Chromium)	EPA 7199

114.140	001	Mercury	EPA 7470 A
114.221	001	Cyanide, Total	EPA 9012 A
114.222	001	Cyanide, Total	EPA 9014
114.240	001	Corrosivity	EPA 9040 B
114.241	001	Corrosivity	EPA 9045 C
114.250	001	Fluoride	EPA 9056
114.270	001	Fluoride	EPA 9214

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
115.021	001	TCLP Inorganics	EPA 1311
115.022	001	TCLP Extractables	EPA 1311
115.023	001	TCLP Volatiles	EPA 1311
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.030	001	Gasoline Range Organics (GRO)	EPA 8015 B
116.080	000	Volatile Organic Compounds	EPA 8260 B
116.080	120	Oxygenates	EPA 8260 B
116.100	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT GC/MS
116.110	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel Range Organics (DRO)	EPA 8015 B
117.016	001	Diesel Range Organics (DRO)	LUFT
117.110	000	Extractable Organics	EPA 8270 C
117.210	000	Organochlorine Pesticides	EPA 8081 A
117.220	000	PCBs	EPA 8082

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.010	001	Ignitability	EPA 1010
120.022	001	Ignitability	EPA 1030
120.022	001	Ignitability	EPA 1030

Field of Testing: 126 - Microbiological Methods for Ambient Water

126.003	001	Total Coliform (Enumeration)	SM 9221 B,C-2006
126.003	002	Fecal Coliform (Enumeration)	SM 9221 C,E-2006
126.003	003	E. coli (Enumeration)	SM 9221 C,F-2006
126.007	001	E. coli (Enumeration)	SM 9223 B-2004
126.009	001	Fecal Streptococci	SM 9230 B-2007
126.013	001	Enterococci	SM 9230 D-2007
126.015	001	E. coli (Enumeration)	Colilert
126.017	001	E. coli (Enumeration)	Colilert 18
126.019	001	Enterococci	Enterolert

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The NELAC Institute (TNI)
Management and Technical Requirements for Laboratories Performing Environmental Analysis
TNI Standard (EL-V1-2016-Rev 2.1) Effective December 6, 2016

1) Introduction

A. This Quality Assurance Manual is based upon the overall business and management philosophies, mission, and goals of Eurofins Calscience, LLC. ("Calscience", "the laboratory"). This manual is written to present the policies employed by the laboratory and the support departments that serve the environmental laboratory and to comply with the requirements of the National Environmental Laboratory Accreditation Program (NELAP). These policies define the "what" we do with emphasis on management's responsibilities and commitment to quality. Governing SOPs are in place within the organization, to ensure the proper execution of this policy document and are referenced throughout the document.
B. This manual is required reading for laboratory personnel. The appendices are available resources to all personnel but are not required reading for all employees. The most recent and up-to-date Quality Assurance Manual and all referenced documents are available to all laboratory personnel who work in or support the laboratory.

2) Normative References

A. Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis, Modules 1, 2 and 4, The NELAC Institute, 2016-Rev. 2.1 ("TNI 2016 V1")
B. Environmental Laboratory Sector, Volume 1: Management and technical Requirements for Laboratories Performing Environmental Analysis, Modules 1, 2, and 4, The NELAC Institute, 2009.
C. ISO/IEC 17025:2017.

3) Definitions

A. Definitions generally applicable to the laboratory are contained in Appendix 1.
B. Some specific definitions may appear in SOPs where they are used.

4) Quality Management System

4.1) Organization

A. Eurofins Calscience, LLC is a duly licensed business with its main office at 7440 Lincoln Way, Garden Grove, CA 92841-1427.
B. It is the intention of Calscience to conform to all requirements of its customers, the National Environmental Laboratory Accreditation Program (NELAP) and the current TNI Standard, the State of California SWRQCB ELA; and other State and Client Programs as accredited, certified, licensed or requested.
C. The laboratory performs its analytical and support work at its facility on Lincoln Way and at two satellite laboratory spaces in Garden Grove, CA. In addition, the laboratory maintains a Service Center in Concord, CA as well as an internal courier service. All of these facilities and services operate under the management system described in this manual. Full contact information for each is included in Appendix 3.

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D. Calscience is a stand-alone business entity that operates under the Eurofins organization. Eurofins is an organization of testing laboratories and does not engage in other types of environmental activities in the USA. There are no potential conflicts of interest due to this structure.
E. The organization, structure and work assignments ensure the following:
   1. The laboratory's managerial and technical personnel have the authority and resources needed to carry out their duties.
   2. Personnel will not be subjected to undue internal, external, commercial, financial or other pressure that could adversely affect the quality of their work. "Undue pressure" is addressed in the annual Ethics and Data Integrity Training given to all employees of the laboratory. Instructions for managing undue pressure are included in that training. See also the relevant SOP, T065 Data Integrity, current revision. Employees may report to the following, as they feel comfortable:
      a. Their Chain of Command
      b. Laboratory QA Staff
      c. The corporate Quality Director
      d. The corporate ethics hotline through Lighthouse Services (posters are placed throughout the lab)
   3. The laboratory protects confidential information and proprietary rights of its customers at all times through rules on data distribution, management of confidentiality during site visits and data security.
   4. Management and staff are expected to conduct themselves in an ethical manner at all times. Laboratory employees do not engage in activities that would compromise their ability to generate legally defensible, high quality data. This is also addressed in the Ethics and Data Integrity training given in the laboratory.
   5. The laboratory is overseen by the Business Unit Manager (BUMa). Technical operations, Support services, Quality Assurance and Customer services report to the BUMa. Additionally, QA has a "dotted line" relationship with Quality Assurance Director of Eurofins Environment Testing US. Full organizational charts detailing the management structure of Eurofins Calscience, Inc. can be found in Appendix 4. The QA Department keeps the most up to date organizational chart.
   6. This organizational chart shows the responsibility, authority and interrelationships of all personnel who manage, perform, or verify work. Through this organization, management provides adequate supervision of all employees and provides technical management with overall responsibility for the data produced in the laboratory.
   7. The laboratory has a designated Quality Assurance (QA) Manager who, along with assigned staff, has responsibility and authority for ensuring that the management system related to quality is implemented and followed at all times. The QA Manager has direct access to the highest level of management in the local company. In addition, the QA Manager has support from the Eurofins Environment Testing Corporate Quality Director.
   8. The laboratory appoints deputies for key personnel. These are included in a memo detailing Key Personnel Alternates that is updated regularly by the Laboratory Director and posted, among other places, outside the quality offices. Deputies are assigned for the following:
      a. Business Unit Manager
      b. Laboratory Director
      c. Quality Assurance Manager and other quality personnel
      d. Operations Manager
      e. Health and Safety Manager
      f. IT Manager

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g. All Project Management Personnel
h. All Technical Group Leaders

9. The laboratory ensures that personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the objectives of the management system. This is mostly accomplished through initial and ongoing training, though additional communications may be used from time to time.

F. Top management ensures that appropriate communication processes are established with the laboratory and communication takes place regarding the effectiveness of the management system.
1. The laboratory uses a number of formal and informal mechanisms to provide this type of communication.
2. Meetings are held on a daily basis with operations management, quality assurance and project management personnel. While the primary purpose of these meetings is status updates, the venue is used to provide updates on management system issues, projects, technical issues, as well as training on a wide range of topics, including the management system. Group leaders are charged to carry information from these meetings to personnel in their groups.
3. Training sessions are held as necessary to meet requirements for annual ethics, data integrity and computer security awareness as well as other important topics.
4. Laboratory management holds quarterly meetings with all staff to provide updates on laboratory status, goals, and issues important to personnel, including the management system.

G. The Quality Assurance Manager and quality staff are empowered and responsible for the following:
1. Serve as the focal point for QA/QC and be responsible for the oversight and/or review of quality control data;
2. Have functions independent from laboratory operations for which they have quality assurance oversight;
3. Be able to evaluate data objectively and perform assessments without outside (e.g., managerial) influence;
4. Have documented training and/or experience in QA/QC procedures and the laboratory's quality system;
5. Have a general knowledge of the analytical methods for which data review is performed;
6. Maintain the currency of the quality assurance manual and review it at least annually
7. Arrange for or conduct internal audits as per Section 4.14 annually;
8. Notify laboratory management of deficiencies in the quality system;
9. Monitor corrective actions;
10. Implement, maintain and improve the management system using audit results, control charts, proficiency testing results, data analysis, corrective and preventive actions, customer feedback, and management reviews to observe for possible trends; and
11. Stop work if the system is deemed to be out of control.

H. The Laboratory Director, Operations Manager, technical Group Leaders and their designees:
1. Are members of the staff who exercise actual day-to-day supervision of laboratory operations for the appropriate fields of accreditation and reporting of results;
2. Are experienced in the fields of accreditation for which the laboratory is accredited;
3. Have duties that include monitoring standards of performance in quality control and quality assurance, and monitoring the validity of the analyses performed and data generated in the laboratory to assure reliable data.
4. If absent for a period of time exceeding fifteen (15) consecutive calendar days, must designate another full-time staff member meeting the qualifications of the technical manager(s) to

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temporarily perform this function. If this absence exceeds thirty-five (35) consecutive calendar days, the primary accreditation body must be notified in writing;

5. Meet the qualification requirements of the standard.
   a. Have a bachelor's degree in the chemical, environmental, biological sciences, physical sciences, or engineering, with at least 24 college semester hours of chemistry.
   b. Have at least two years of experience in the environmental analysis of representative inorganic and organic analytes for which the laboratory is accredited.
   c. Other options are available and are fully described in the standard (TNI 2009/2016 V1M2, Section 5.2.6.1)

I. All personnel in these positions are full-time personnel who do not work in other accredited laboratories.

4.2) Management

A. Beginning with this quality assurance manual, the laboratory has established a management system appropriate to its activities. The system is described in this quality assurance manual, which includes the laboratory policies and includes or references descriptions of its systems and programs and its procedures and instructions.
   1. The management system is designed to assure the quality of the laboratory's tests are known and documented. Further, the system describes how these documents are made available to laboratory personnel and requires that personnel understand and implement the requirements contained in them. All copies of management system documentation are provided in English to accreditation bodies.
   2. The system is designed to support the Calscience Mission Statement: Calscience strives to be the leading full-service environmental testing laboratory in the Western United States by having unsurpassed capacity, exceptional customer service, continual quality improvement and consistently superior TAT.

B. Management's Quality Policy Statement
   1. Calscience is committed to providing its customers with environmental data that is reliable, defensible, and of known and documented quality. We continually strive to meet our customer's requirements and exceed their expectations.
   2. This Quality Assurance Manual and related documentation describes the policies and procedures used to meet that commitment. The Manual is designed to meet the Standards used in the NELAP, the State of California ELA, and other government and customer requirements. Laboratory management is committed to the quality improvement processes described in these standards and to providing the resources to ensure laboratory personnel can honor that commitment.
   3. Laboratory personnel whose responsibilities include any aspect of testing activities are required to familiarize themselves with all of the quality documentation associated with their job function and to implement the policies and procedures described in that documentation into all of their work in the laboratory. Laboratory personnel acknowledge this responsibility by signing the Quality Policy contained in the Employee Handbook.
   4. Management reviews this Quality Policy and the objectives listed below during the annual Management Review. The signatures of management personnel on this Quality Assurance Manual indicate their concurrence and support of this Policy.

C. Quality Objectives
   1. Laboratory Management Personnel

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a. Commit to a quality improvement approach to management that focuses on problem solving through system improvement.
b. Provide the resources necessary to allow laboratory personnel to successfully meet customer requirements while maintaining all quality standards.
c. Provide a work environment that ensures accessibility to all levels of management and encourages personnel to raise questions, voice concerns, and participate in system development.

2. Laboratory Analytical Personnel
a. Perform all analyses and related tasks according to documented procedures.
b. Record all required and relevant observations completely, accurately, honestly and in "real time".
c. Respond immediately to indications of questionable data, equipment malfunctions, and quality control failures by taking appropriate actions as governed by laboratory procedures and communicating the issues to supervisory personnel.
d. Work diligently to meet client needs, including turn-around times, while always keeping quality requirements as the most important objective.

D. Top management is committed to development and implementation of the management system and to continually improving its effectiveness through consistent internal audits, management reviews, corrective and preventive action and on-going training of personnel.

E. Top management communicates to the organization the importance of meeting customer as well as statutory and regulatory requirements through the quality system as well as on-going meetings and other communications. See 4.1.F.

F. This quality assurance manual includes or references all procedures and outlines the documentation structure of the management system. The Standards under which the laboratory operates include specific requirements for the quality assurance manual and for technical SOPs, as well as for laboratory operations. The documentation system of the laboratory is designed to capture the requirements contained in these normative documents and provide them to laboratory personnel as applicable.
1. The quality assurance manual is the over-arching, primary document in the system.
2. Standard Operating Procedures are referenced by the quality assurance manual and describe how to perform required procedures.
3. Data is captured using forms that are referenced by the SOPs.

G. Quality Assurance Manager, including compliance with the Standard, are defined in this manual (See Section 4.1), in job descriptions, and where specific responsibilities are required for particular processes, in the SOPs governing those processes.

H. Top management ensures the integrity of the management system when changes are planned and implemented.
1. Changes to computer systems will be monitored and documented in OTRS. OTRS (Open-Source Ticket Request System) is an internal website that allows users and agents to document and resolve IT related problems.
2. Method changes require demonstration of capability and governing document updates prior to implementation.
3. Preventive action processes are used to develop and implement changes to the management system.

I. Additional Requirements

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1. Data Integrity-The laboratory maintains a Data Integrity Program as a part of its Ethics requirements. The program is described in Section 4.16 of this quality assurance manual and in the SOP referenced in that section.
   a. Procedures are in place for confidential reporting of data integrity issues.
   b. Management shall be informed of the need for detailed investigation.
   c. The program for detecting and deterring improper or unethical actions is described in detail in SOP-T065 and includes the following:
      i. ethics policy must be read and signed by all personnel;
      ii. initial and annual ethics training is conducted;
      iii. analysts must explain and sign off on manual changes to data; and
      iv. if instrument software is available for tracking an audit trail, it must be enabled.
2. The Quality Assurance Manager is responsible for keeping the Quality Assurance Manual current by reviewing and revising as needed annually.
3. This Quality Assurance Manual contains the following required elements:
   a. Title - "Quality Assurance Manual for Analytical Services, Eurofins Calscience, LLC";
   b. Official name and address - Eurofins Calscience, LLC; 7440 Lincoln Way, Garden Grove, CA 92841;
   c. major organizational units included in the Organizational Chart found in Appendix 4 and the effective date of this version appears on the title page.
   d. Approved Signatories-The Business Unit Manager, Laboratory Director and all project managers are authorized to sign reports. Certain Quality Assurance personnel are authorized to sign reports that are for internal use. Additionally, some project manager assistants are authorized to sign preliminary reports and final reports under certain conditions. The Quality Assurance group keeps a current list of approved signatories.
   e. The laboratory uses electronic signatures on reports for customers. The IT group collects electronic facsimiles of the authorized user's actual signature. They are stored securely and attached to the authorized user's login, where they are made available for use on reports.
   f. The objectives of the laboratory and official quality policy statement are found in section 4.2.B and C.
4. This Quality Assurance Manual contains or references the following:
   a. all maintenance, calibration and verification procedures found in associated technical and operational SOPs;
   b. major equipment inventory maintained by the Facilities Manager, reference measurement standards obtained from a list of certified vendors maintained by QA, and facilities and services obtained from a list maintained by Operations are used by the laboratory in conducting tests;
   c. verification practices include proficiency testing and internal QC schemes found in Internal Quality Control Checks SOP, current version, and use of certified reference materials from the certified vendor list maintained by QA;
   d. procedures for reporting analytical results found in various operational SOPs including current versions of T006 - Detection Limits, T009 - Sig Figs and Rounding, T012 - Electronic Transmission of Test Results, T015 - Correction/Prevention of Errors in Test Records, T017 - Electronic Data Capture and Reporting, T026 - Data Qualifiers, T040 - Electronic Data Deliverables, and T063 - Laboratory Information Management System;
   e. organization and management structure of the laboratory, place in parent organization and organization charts included in Section 4.1 and Appendix 4 of this Quality Manual;

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f. procedures to ensure that records required in the most current TNI 2009/2016 Standard are retained, procedures for control and maintenance of documentation through systems that ensure all SOPs, manuals, or documents indicate the time period that the procedure or document was enforced found in SOP-T002 - Document Control, current version;
g. job descriptions of key staff and reference to job descriptions of other staff contained in Appendix 2 of this Quality Manual;
h. procedures for achieving traceability of measurements found in TNI Traceability Presentation PowerPoint required for all employees and presented to new hires quarterly and various SOPs including current revisions of T107 - Reagents and Chemicals, T043 - Support Equipment, T003 - Standards and Reagents, T041 - Electronic Data, T063 - LIMS, T064 - Sample Container Prep, T100 - Sample Receipt, etc.;
i. laboratory's lists of approved methods included on the applicable scopes of accreditation, which are available electronically in the quality department files;
j. procedures for ensuring that the laboratory reviews all new work to ensure it has the appropriate resources before beginning that work found in SOP T062 - Project Management and Analytical Report Review, Section - Project Development;
k. procedures for handling samples contained in SOP-T100, current revision;
l. procedures for feedback and corrective action when testing discrepancies are found or deviations from documented policies and procedures occur covered in SOP-T022 - Corrective/Preventive Actions as well as Annual Ethics and Data Integrity Training and Using eJIRA PowerPoint presentations;
m. policies for permitting departures from documented policies and procedures or from standard specifications defined in analytical SOPs when outliers do not appear to be systemic and are handled using data qualifiers or narratives as well as SOP-T026 - Qualifiers or handled through client-specific Quality Assurance Plans that are agreed upon and documented prior to any work being performed, which are stored electronically by the QA Department;
n. procedures for dealing with complaints included in SOP-T018 - Handling of Inquiries and Complaints, current version and section 4.8 of this QAM;
o. procedures for protecting confidentiality (including national security concerns), and proprietary information presented in Annual Ethics and Data Integrity Training and QAM section 4.7 - Service to the Client;
p. procedures for audits and data review found in QAM Section 4.14, SOP-T020 - Internal Quality Control Checks, SOP-T028 - Internal Audits, and SOP-T062 - Project Management and Analytical Report Review includes;
    i. procedures for audits and data reviews identifying what records are included in the review and indicated on audit and/or review checklists;
    ii. internal data reviews consisting of a 3-tiered system of verification that includes 100% review by the analyst, 100% verification review by a technically qualified supervisor or data review specialist, and a final administrative review performed by Project Management. The analyst and verification review fulfills the following objectives:
        1. determines whether the results meet the lab specific quality parameters;
        2. verifies consistency with project specific criteria, such as those found in a Quality Assurance Project Plan;
        3. ensures the appropriate sample preparatory and analytical SOPs and methods were followed and that chain of custody and holding time requirements were met;
        4. confirms all calibration and quality control requirements were met;

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5. checks for complete qualification of anomalous results and corrections;

iii. while the final administrative review verifies that previous reviews were properly recorded and the final data package is complete;

iv. additionally, select clients require an additional review of 10% of data packages by the Quality Manager or designee for technical completeness and accuracy that may be completed after the report has been delivered to the client and if any issues are found, the client must be notified within 15 business days of discovery;

q. electronic audit trail functions are turned on at all times if available, and if the instrument does not have an audit trail, procedures are in place to guarantee the integrity of the data that can be found in SOP-T041 - Electronic Data Management;

r. notes procedures are in place to ensure personnel are adequately experienced in their perspective positions and receive any needed training, found in section 5.2.B of this Quality Manual;

s. a policy addressing the use of unique electronic signatures found above in section 4.2.I.3. of this Quality Manual;

t. procedures for procurement of standards contained in section 4.6 of this Quality Manual and SOP-T019 - Requisitions of Supplies;

u. procedures for data management including validation, verification, and purging of electronic data documented in QAM section 5.4.G and SOPs T067 - Software System Management and T017 - Electronic Data Capture and Reporting;

v. procedures for manual entry of data and verification and records of the accuracy of manually entered data found in QAD-0028 - Manual Entry of Data in LIMS;

w. procedures for making changes to electronic data including hard copy in that both versions of the data are retained and all changes to electronic data that affect data quality are recorded in instrument audit trails where available and;

x. procedures for how electronic data are processed, maintained and reported contained in SOP -T017 - Electronic Data Capture and Reporting;

y. procedures found in SOPs T020 - Internal Quality Control Checks and T062 - Project Management and Analytical Report Review ensure that data review includes all quality-related steps in the analytical process such as sample preparation, dilution calculations, evaluation of chromatography, and spectral interpretations; and records of the review accompany the electronic report, which is archived and available for review;

z. A list of current certifications and accreditations and their associated documented scope and expiration dates can be found on the Eurofins Calscience website.

aa. Calscience Chemical Hygiene Plan and Waste Management practices contained in SOP-T005 - Disposal of Laboratory Samples and Wastes.

5. SOPs are maintained that accurately reflect current laboratory activities, such as assessing data integrity, corrective actions, customer complaints, and all methods.

a. These documents may be equipment manuals or internally written documents with enough detail that someone qualified to reproduce the procedures used to generate the test results.

b. Relevant SOPs are readily available to pertinent staff.

c. Each SOP clearly indicates the effective date, the revision number and the signature (or equivalent).

d. Documents that contain sufficient information to be used as written do not need to be revised if selected options are included.

e. The laboratory has an SOP for each accredited analyte or method.

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f. An SOP may be a copy of a published or referenced method. If modifications are made where a method provides insufficient detail, the changes are clearly described.
   i. Each SOP includes or references the 23 elements listed in TNI section 4.2.8.5.f) with the added DoD sections from QSM 5.1 Section 4.2.8.5. where applicable as indicated in Technical and Non-Technical SOP templates and SOP Preparation, Review, and Revision.

4.3) Document Control

A. General
   1. The laboratory has established and maintains procedures to control all documents that form part of its management system (internally generated or from external sources), such as regulations, standards, other normative documents, test and/or calibration methods, as well as drawings, software, specifications, instructions and manuals. The procedures are detailed in Calscience SOPs, Document Control and SOP Preparation, Review, and Revision. The former document details the overall document control program while the latter provides specific instructions and templates for writing Standard Operating Procedures and related documents.

B. Document Approval and Issue
   1. All documents issued to personnel in the laboratory as part of the management system are reviewed and approved according to the procedure in SOP Preparation, Review, and Revision.
   2. All documents issued to personnel in the laboratory as part of the management system are approved by appropriate management prior to use.
      a. The Quality Assurance Manual, which must be approved by the Business Unit Manager, Quality Assurance Manager, and Operations Manager.
      b. Documents applicable to management, quality, and resources of the laboratory must be approved by the Group Leader (as applicable) and the QA Manager. In some cases, only the QA Manager will be required to approve the document.
      c. Documents applicable to a specific laboratory production or support group must be approved by the Group Leader (as applicable) and the assigned QA member (or QA Manager). Exceptions may be made for some analyst aids (such as posted Linear Range Summaries, which must only be approved by the group leader.
      d. Instrument manuals are tacitly approved for use through the purchase of the instrument and are kept in the laboratory near the instrument or in a designated area in the East QA Office.
   3. Master lists are used to identify the current revision status and distribution of documents in the management system. See the Document Control SOP for further information.
   4. The procedure(s) adopted ensure the following:
      a. Authorized editions of appropriate documents are available at all locations where operations essential to the effective functioning of the laboratory are performed.
         i. Controlled hard copies may be maintained in binders in laboratory areas.
         ii. Electronic copies are available to be viewed on the company intranet.
      b. Documents are periodically reviewed and, where necessary, revised to ensure continuing suitability and compliance with applicable requirements.
         i. This Quality Assurance Manual will be reviewed at least annually.
         ii. Method SOPs are reviewed every two years.
         iii. Other documents written internally will be reviewed periodically.
         iv. External documents that may change are verified every two years.
         v. External documents that do not change, such as manufacturers' instrument manuals, are not reviewed.

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c. Invalid or obsolete documents are promptly removed from all points of issue or use to prevent unintended use.
d. All documents removed from use are shredded with the exception of the master copy, which is marked "Obsolete" and placed in archive. Electronic documents are removed from the active directory and placed into a document archive file.
e. When a new document is published, appropriate personnel are notified through email. Group Leaders are responsible for ensuring their employees receive the notification.
f. Records of reviews shall be kept according to the SOP Preparation, Review, and Revision.

5. Management system documents generated by the laboratory are uniquely identified and include any document providing instructions to laboratory personnel. The identification system is detailed in the Document Control SOP.

C. Document Changes
1. Changes to documents are reviewed and approved by the same laboratory positions as approved the original document, or their designee. See Section 4.3.b above. The requirements and specifics, including specific responsibilities, are included in the Document Control SOP.
2. Altered or new text, when practical, is identified by the use highlighted, yellow font in the finished version of the document. Use of a highlighted font is considered not practical when a significant rewrite of a document is performed.
3. Amendment of documents by hand is not allowed.
4. Changes in documents maintained in electronic systems are identical to changes in hard-copy documents. See the Document Control SOP for further information.

4.4) Review of Requests, Tenders and Contracts

A. The laboratory has established and maintains procedures for the review of requests, tenders and contracts. The policies and procedures adopted for these reviews leading to a contract are intended to ensure the following:
1. The requirements, including the methods to be used, are adequately defined, documented and understood.
2. The laboratory has the capability and resources to meet the requirements.
3. The appropriate test and/or calibration method is selected and is capable of meeting the customers' requirements. Any deviations from the published test method must be communicated to the customer. See Section 5.4.A.5.
4. Any differences between the request or tender and the contract must be resolved before any work commences. Each contract must be acceptable both to the laboratory and to the customer.
5. A contract may be any written or oral agreement to provide a customer with testing services.

B. Records of reviews, including any significant changes, are maintained. Records are also maintained of pertinent discussions with a customer relating to the customer's requirements or the results of the work during the period of execution of the contract. A more detailed explanation of the processes used to meet these requirements are contained in the Calscience SOP- Business Development, current version.
1. The method of recording the review depends on the type of review required.
2. For large sample contracts, the client usually contacts the laboratory prior to bringing samples to the laboratory. Any telephone conversations will be confirmed by e-mail to the client stating the expected samples, the methods that will be used, etc. These electronic communications are maintained as a record of the review. In addition, checklists are developed for review of RFPs

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and associated project plans or sampling and analysis plans (SAPs). For ongoing projects, this review only needs to be performed at the outset and if any changes are made.

3. For walk-in clients, a chain of custody is required. If clients do not bring one in with their samples, the laboratory provides one and requests that it be filled out. The laboratory reviews the COC as part of the login process and ensures the specific methods to be used are listed. A laboratory representative signs the COC and provides a copy to the client. This becomes the record of the review.
4. If samples are shipped in without prior notice, the same procedures as for walk-in clients are followed, but the copy of the COC is provided to the client by mail or electronic mail.

C. The review must also cover any work that is subcontracted by the laboratory. Subcontracting is detailed in the Section 4.5 of this Quality Assurance Manual.

D. The customer must be informed of any deviation from the contract. Usually, this communication is made by electronic mail. If made by other means, e.g., telephone call, e-mail confirmation will be performed to provide a written record.

E. If a contract needs to be amended after work has commenced, the same contract review process must be repeated and any amendments are communicated to all affected personnel.

4.5) Subcontracting of Environmental Tests

A. When the laboratory subcontracts work, whether because of unforeseen reasons (e.g. workload, need for further expertise or temporary incapacity) or on a continuing basis (e.g. through permanent subcontracting, agency or franchising arrangements), this work shall be placed with a competent subcontractor. A competent subcontractor is one that holds an appropriate accreditation for the work in question

1. Work requiring NELAP accreditation must be placed with a NELAP-accredited laboratory.
2. Work requiring drinking water certification must be placed with a certified drinking water laboratory.
3. Work requiring DoD accreditation must be placed with a DoD-accredited laboratory. Additionally, the sub-contract must have project-specific approval by the DoD customer before samples are analyzed.

B. Proper accreditation is confirmed by initial and then by at least annual review of the subcontract laboratory's accreditation certificate(s). Additionally, Calscience sends instructions with each subcontracted job requiring the subcontract laboratory to notify Calscience of the following:

1. Any changes or loss of accreditation or certification for the applicable analyses,
2. Any analyses for which the laboratory has had unacceptable PT results that are not able to be addressed through corrective action, and
3. Need to further subcontract the sample analyses to a different subcontracting laboratory, including any "in-network" laboratory operating under a different accreditation or certification.

C. The laboratory advises the customer of the arrangement in writing and, when appropriate, gains the approval of the customer, preferably in writing. Personnel from Calscience's Project Management group are tasked with management of subcontracting.

1. In the case of large contract work, notification is done as part of the contracting procedure described in the previous section. (Section 4.4)
2. In the case of walk-in or other individual lot type of work, the need to subcontract will be included on the COC that is copied and given to the customer or in an e-mail to the customer. If by e-mail, it is the project manager's responsibility to maintain the e-mail as a record of notification.

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3. In some cases, customers may give a standing order to subcontract their samples. Records of such an order must be maintained by the project manager.

D. The laboratory is responsible to the customer for the subcontractor's work, except in the case where the customer or a regulatory authority specifies which subcontractor is to be used.

E. The Project Management group maintains a list of all subcontractors that it uses for tests and a record of having reviewed the appropriate accreditation certificate(s) for the tests that are subcontracted.

F. The laboratory performing the subcontracted work is indicated in the final report. The laboratory will make a copy of the subcontractor's report available to the client when requested.

G. Procedure:
1. The project manager generates a separate chain of custody to accompany the subcontracted samples to the designated laboratory. In some instances, the client will deliver samples directly to the subcontract lab due logistics such as short holding times.
2. The PM gathers the sample containers to be shipped and places them in a designated area in the sample receiving walk-in cooler. If samples are required to be split, PM personnel ensure that the proper splits are prepared.
3. PM or sample management personnel attach a sheet to the CoC noting the requirements listed in 4.5.B above for a new subcontract lab.
4. Sample management personnel load the cooler and ship the samples to the subcontract laboratory.

4.6) Purchasing Services and Supplies

A. The laboratory has a policy and procedure(s) for the selection and purchasing of services and supplies it uses that affect the quality of the tests. The policy of the laboratory is to purchase items that will be of sufficient quality to complete testing in compliance and to not adversely affect the processes. Procedures exist for the purchase, reception and storage of reagents and laboratory consumable materials relevant for the tests as described below.

B. The laboratory ensures that purchased supplies and reagents and consumable materials that affect the quality of analyses are not used until they have been inspected or otherwise verified as complying with standard specifications or requirements defined in the methods for the analyses concerned. These services and supplies used are selected to comply with specified requirements. Records of actions taken to check compliance are maintained.
1. In general, supplies, reagents and consumable materials are purchased so that no additional testing is required prior to use. In this case, the initials of the person receiving the material state that the correct material was received, based on the ordering information, and it is, therefore, compliant. The following information is recorded upon receipt:
   a. Date of receipt, expiration date, source, lot or serial number, and calibration and verification records.
2. In cases where there is no history with a vendor or where a particular supply has been shown to require testing, the testing is performed and records of the results tied to the lot of material tested, are maintained by the Group Leader where the supplies are used.
3. Reagents and standards used in analysis have some more specific requirements for inspection and testing. These requirements are included in the Calscience SOP T003, Standards and Reagents, current version.
4. Equipment that may affect quality is calibrated or otherwise demonstrated to be suitable prior to use. Requirements and records are maintained as described in the related technical documents; such as method SOPs, support equipment SOPs, etc.

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C. Purchasing documents for items affecting the quality of laboratory output are required to contain data describing the services and supplies ordered. Review and approval for technical content is performed prior to release. The manner in which this is performed depends on the type of supply or service.
   1. Many routine consumable supplies are included in a stockroom supply contract. The specific items to be stocked are approved by the Group Leader who prepares the list for their area on an annual basis.
   2. Items such as solvents and acids are ordered in bulk after consultation with Group Leaders. Specific grades are specified in the Calscience SOP T003, Standards and Reagents.
   3. Large equipment purchases are approved by laboratory (technical) management or corporate technical areas.
   4. Other supplies or services are approved on an individual basis by Group Leaders or designees as part of their sign-off in the routine ordering process.

D. The laboratory evaluates suppliers of critical consumables, supplies and services that affect the quality of testing and calibration, and maintains records of these evaluations and list those approved.
   1. Large supply houses, such as Fisher Scientific and VWR, supplying consumable materials that do not require traceability are considered to be approved for use unless proven otherwise.
   2. Vendors providing calibration services and reference materials used for calibration must be able to provide certificates of accreditation for the specific services or materials provided through an internationally-recognized ISO Accreditation Body and must be able to provide endorsed certificates of calibration under the appropriate ISO or national standard in order to be considered approved. Where accredited reference materials are not available, other requirements apply. See the Calscience SOPs T003, Reagents and Standards, T043, Support Equipment, and T069, Thermometer Verification and Temperature Monitoring, current versions, for further information.
   3. Consultants are approved based on evaluation of their work history and, if deemed necessary by the Laboratory Director or designee, by reference.
   4. The corporate purchasing system does not include technical vendor approval. Calscience maintains a list of approved vendors in the Laboratory Operations office.

4.7) Service to the Client

A. The laboratory is willing to cooperate with customers or their representatives in clarifying the customer's request and in monitoring the laboratory's performance in relation to the work performed, provided that the laboratory can ensure confidentiality to other customers.
   1. The laboratory will provide the customer or the customer's representative reasonable access to relevant areas of the laboratory for the witnessing of tests performed for the customer, provided this can be done while ensuring confidentiality to other customers.
   2. Customers wishing to perform on-site audits of the laboratory must commit to maintaining confidentiality. The laboratory maintains an SOP and confidentiality agreement for external audits, Calscience SOP Customer and Regulatory Audits, T-027, current version.
      Note: Assessors representing State and Third Party Accreditation Bodies or similar agencies bound by their own confidentiality policies are not included under this clause.
   3. If requested, the laboratory will help with preparation, packaging, and dispatch of samples needed by the customer for verification purposes.
   4. The laboratory will take other such reasonable actions requested by the customer.

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B. The laboratory seeks feedback, both positive and negative, from its customers. The feedback is used and analyzed to improve the management system, testing and calibration activities and customer service.
   1. Feedback is solicited with each electronic report sent to the customer.
   2. Feedback is also solicited on an annual survey coordinated through Eurofins corporate office. The project management group provides a list of customers to the corporate office, which sends surveys to selected customers on the list. Results are compiled and returned to the laboratory.
   3. Feedback collected is included for review in the annual Management Review.

4.8) Complaints

A. The laboratory has a policy and procedure for the resolution of complaints received from customers or other parties. Records are maintained of all complaints and of the investigations and corrective actions taken by the laboratory.

B. All complaints must be recorded and investigated at least sufficiently enough to determine whether they are with or without merit.
   1. Complaints are recorded in the eJIRA system by the person who receives the complaint. The "issue" screen is filled out down through the "Description" section of the screen.
   2. That individual either investigates the complaint or assigns the investigation to another individual using the eJIRA system.

C. Complaints are initially evaluated as with merit, e.g., complaints about missed turn-around times or results that are found to have been reported erroneously, or as without merit, e.g., complaints about results that, while not desired, are in fact correct or about pricing that was previously accepted.
   1. Record the investigation in the "Investigation" field
   2. Conclude that that investigation is with merit or without merit.

D. Complaints that are found to be with merit are placed into the corrective action system for disposition. In eJIRA, an ICAR is created, the issues are further investigated, root cause is determined, actions are taken and all of these steps are recorded as described in the corrective action procedures.

4.9) Control of Nonconforming Environmental Testing Work

A. The laboratory has a policy and procedures that must be implemented when any aspect of its testing work, or the results of this work, do not conform to its own procedures or the agreed requirements of the customer. The policy of the laboratory is that non-conforming work must be addressed as defined below or in pertinent SOPs so that the needs of the customer are met. Examples of places non-conforming work could occur include customer complaints, quality control, instrument calibration, checking of consumable materials, staff observations or supervision, test report checking, management reviews and internal or external audits.
   1. The responsibilities and authorities for the management of nonconforming work are as follows.
      a. All laboratory personnel are responsible for taking appropriate action when non-conforming work is identified, including notification of the Laboratory Director, if needed. In many cases, the appropriate action is defined in the analytical SOPs.
      b. All personnel may stop work when non-conforming work is identified, but the Group Leader, Operations Manager, Laboratory Director, QA representative or QA manager must be notified of a stoppage as soon as is feasible.
      c. The Laboratory Director, QA Manager, Operations Manager or their designees, are authorized to recall work or withhold analytical reports, if necessary.

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2. An evaluation of the significance of the nonconforming work is made. Exceptions are first evaluated by the analyst or other personnel performing the work and their group leader.
3. Correction is taken immediately, together with any decision about the acceptability of the nonconforming work. "Corrections" are things done to continue working, report the data, and fix the immediate problem. Note that this is different than corrective action, which is described in Section 4.11.
4. Where necessary, the customer is notified and work is recalled. The responsibility for authorizing the resumption of work given to the Laboratory Director, or designee, in consultation with the QA manager and following the review of root cause(s) and corrective action.

B. Where the evaluation indicates that the nonconforming work could recur or that there is doubt about the compliance of the laboratory's operations with its own policies and procedures, the corrective action procedures given in 4.11 shall be promptly followed.

4.10) Improvement

A. The laboratory strives to continually improve the effectiveness of its management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.
B. Personnel are encouraged to bring to the attention of management items that may improve the functioning of the laboratory and its management system.
C. Improvements must be vetted and follow the change control procedures used in the laboratory to ensure continuing compliance with policies, Standards, regulations, methods, etc.

4.11) Corrective Action

A. General
1. The laboratory policy is to take appropriate corrective action whenever departures from the laboratory's policies and procedures are identified in the management system or the laboratory's technical operations. This is done using the procedures described below. For quality control outliers that do not appear to be systematic, appropriate actions are defined in the analytical SOPs and thus formal corrective action process is not required.
2. A non-conformance with the management system or with the technical operations of the laboratory may be identified through a variety of activities, such as control of nonconforming work, internal or external audits, proficiency test failures, management reviews, and feedback from customers and from staff observations.
3. All personnel in the laboratory are responsible to initiate corrective action when indicated by SOPs, observance of departures from documented systems, or simply good scientific judgment or common sense. When bench analysts believe corrective action is needed, they must notify their group leader as soon as possible so the group leader can review and assign responsibilities.
4. The eJira system is used to record all steps of the corrective action process.
5. The issue must be defined with adequate detail to allow further investigation. Typically, the important elements to include are: what event(s) occurred, in what process did the event(s) occur, who witnessed the event(s) or performed the process, when (date/time) did the event(s) occur, where did the event(s) occur, what other processes were or may be impacted. Record this information in the "Description" section of the eJira system.
6. Once the problem or failure is defined, responsibility for investigation is assigned to one or more laboratory personnel by the Group Leader, Operations Director, Laboratory Director, or

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Quality Assurance personnel. The eJira system sends an email to those assigned to notify them of the responsibility.

7. If sample data are affected, provide as much information as possible about which data and how they were affected in the "Impact on Sample Data" section of the eJira system.

B. Cause Analysis

1. For failures that appear to be systematic, the procedure for corrective action starts with an investigation to determine the root cause(s) of the problem. Cause analysis is key to the corrective action procedure.
2. Root cause analysis is the most challenging aspect of the corrective action process. When correctly applied, root cause analysis leads to more effective solutions, continuous improvement, and a reduced likelihood of further deficiencies. In some cases, the root cause is singular and easily discerned. In other cases, determination of the root cause or causes may require more effort to identify. For this reason, there is no single 'recipe' that can be followed. There is no singe procedure that will be applicable to all scenarios, but there are guiding principles, the most important of which is addressing the question: "Why did this deficiency occur?"
3. Root Cause Analysis seeks to identify the origin of a problem. It assumes that systems and events are interrelated. One event leads to another, which leads to another. By tracing back these actions, you can discover the original source of the problem.
4. Adequate data must be collected to allow effective Root Cause Analysis. In addition to the information required in the definition of the problem, investigations must also attempt to determine the duration, frequency, and/or pervasiveness of the problem and identify any other areas where the same or similar problems could occur.
5. Root causes are specific underlying causes that can be reasonably identified, that management has control to fix and for which effective recommendations for preventing recurrences can be generated.
6. Potential causes could include, but are not limited to, issues related to customer requirements, sample matrix, methods and procedures, staff skills and training, consumables, equipment calibration and maintenance, environmental conditions.
7. Record the Root Cause(s) determined in detail in eJira Section "Detailed Explanation of the Root Cause". At the same time, select the best option in the "Root Cause Category" drop down. This is used for category tracking purposes. If more than one root cause is identified, choose the category that has a greater impact on the laboratory.

C. Selection and Implementation of Corrective Actions

1. If possible, generate several potential solutions to the root cause(s) of the problem.
2. Rank the potential solutions according to their likelihood of eliminating the problem, preventing its recurrence, the cost vs benefit, and the risk of unintended negative impacts.
3. Select one or more actions appropriate to the magnitude of the problem and the risk of recurrence.
4. List the potential corrective action(s) and note those selected for implementation in the "Corrective Action Plan" section in the eJira.
5. Assign personnel responsible for implementation in eJira. The system will email the person(s) assigned to notify them of the responsibility.
6. Assign a completion date for implementation. Standard completion time is targeted at two weeks, but this may not be appropriate and may be changed depending on the nature of the actions and the needs of the laboratory and its customers.

D. Monitoring of Corrective Actions

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1. Routine monitoring of corrective actions is combined with internal auditing. When ICARs are closed by a member of QA, that person will enter the issue into the "QA Issue Follow Ups" Excel. Monthly, these issues will be checked to ensure activities are proceeding in a timely way and implemented corrective actions appear to be effective.
2. Additionally, during preparation for internal audits, the eJira system is queried for corrective actions related to the area to be audited. Verification of the continued effectiveness of these corrective actions are then included in the scope of the internal audit. Records of the verification are maintained in the audit record.
3. Avoidance of corrective action accepted by DoD ELAP may result is loss of accreditation and as a result work may be discontinued until implementation is verified by the accreditation body.

E. Additional Audits--Where the review of corrective actions shows clusters of similar root causes, or where monitoring of implementation of corrective actions shows continued or significant non-conformances, the laboratory ensures that the appropriate areas of activity are audited in accordance with 4.14 as soon as possible.

4.12) Preventive Action

A. Needed improvements and potential sources of nonconformities, either technical or concerning the management system, must be identified. When improvement opportunities are identified or if preventive action is required, action plans are developed, implemented and monitored to reduce the likelihood of the occurrence of such nonconformities and to take advantage of the opportunities for improvement.

B. As noted in the Standard, preventive action is a pro-active process to identify opportunities for improvement rather than a reaction to the identification of problems or complaints. Performing appropriate preventive action requires a mindset of looking at laboratory operations with an eye toward seeing what could go wrong. Often, this will be based on what types of problems have been solved in the past. Preventive actions may come as a result of the management review process or through attempts to improve the efficiency of the laboratory, including LEAN initiatives.

C. The preventive action process is as follows
   1. Identify the needed preventive action
   2. Develop an action plan to implement the action
   3. Implement the action, with changes as necessary
   4. Monitor the results of the action to verify that the action taken is achieving the desired results and has not caused unanticipated negative impacts

D. Preventive actions should be recorded. Unless another mechanism is indicated, such as the Management of Change (MOC) system or LEAN records, use the eJira system. Identification of a root cause is not part of the preventive action system. Fields in the eJira system relating to root cause should be listed as "NA".

4.13) Control of Records

A. General
   1. The laboratory has established and maintains procedures for identification, collection, indexing, access, filing, storage, maintenance and disposal of quality and technical records. Quality records maintained include reports from internal audits and management reviews as well as records of corrective and preventive actions.
   2. All records must be legible and stored in such a way that they are readily retrievable. Calscience maintains records in both hard copy and electronic formats. Both types

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of records must be stored so as to prevent damage and deterioration. All records are maintained for a minimum of five years after last use.
3. All records are held secure and in confidence.
4. The laboratory maintains procedures to protect and back up electronic records and to prevent unauthorized amendments to these records.

B. Technical records
1. The laboratory is required to retain records of original observations, derived data and sufficient information to establish an audit trail, calibration records, staff records and a copy of each analytical report issued, for the time period defined above or longer, if required by the customer. The records for each test or calibration must contain sufficient information to facilitate, if possible, identification of factors affecting the uncertainty and to enable the test or calibration to be repeated under conditions as close as possible to the original. The records must include the identity of personnel responsible for the sampling, performance of each test and/or calibration and checking of results.
2. Observations, data and calculations must be recorded at the time they are made and must be identifiable to the specific task. For example, it is not acceptable to record a number without identifying what the number means.
3. When mistakes occur in records, each mistake shall be crossed out with a single line; not erased, made illegible or deleted; and the correct value entered alongside. All alterations to records shall be dated and signed or initialed by the person making the correction or addition, including handwritten notes added to electronic information. Additionally, corrections due to reasons other than transcription errors must specify the reason for the correction. In the case of records stored electronically, equivalent measures shall be taken to avoid loss or change of original data.

C. Additional Requirements
1. The laboratory's record keeping system is designed to allow the history of the sample and associated data to be readily understood through the documentation. This system must produce unequivocal, accurate records that document all laboratory activities such as laboratory facilities, equipment, analytical methods, and related laboratory activities, such as sample receipt, sample preparation, or data verification, and inter-laboratory transfers of samples and/or extracts.
2. Records are made available to the accreditation body. Records concerning a customer's samples will be made available to that customer if it can be done without compromising the confidentiality of other customer's data.
3. Records that are stored only on electronic media must be supported by the hardware and software necessary for their retrieval for the full retention time required for the record type, typically 5 years.
4. Access to archived information must be documented with an access log. Electronic access is tracked through the electronic storage systems. Hard copy archive access is documented with a log.
5. All information necessary for the historical reconstruction of data shall be maintained by the laboratory, including the items listed below. Instructions for how each item is maintained are found in the SOPs governing those activities and in the technical SOPs for each method.
   a. All raw data, whether hard copy or electronic, for calibrations, samples and quality control measures, including analysts' worksheets and data output records (chromatograms, strip charts, and other instrument response readout records).

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b. A written description or reference to the specific method used, which includes a description of the specific computational steps used to translate parametric observations into a reportable analytical value.
c. The laboratory sample ID code.
d. The date of analysis.
e. The time of analysis is required if the holding time is seventy-two (72) hours or less, or when time critical steps are included in the analysis (e.g., extractions and incubations).
f. Instrumentation identification and instrument operating conditions/parameters (or reference to such data).
g. All manual calculations.
h. Analyst's or operator's initials/signature or electronic identification.
i. Sample preparation including cleanup, separation protocols, volumes, weights, instrument printouts, meter readings, calculations, and reagents.
j. Test results.
k. Standard and reagent origin, receipt, preparation and use.
l. Calibration criteria, frequency and acceptance criteria.
m. Data and statistical calculations, review, confirmation, interpretation, assessment and reporting conventions.
n. Quality control protocols and assessment.
o. Electronic data security, software documentation and verification, software and hardware audits, bakcups, and records of any changes to automated data entries.
p. Method performance criteria, quality control requirements.
q. Proficiency test results.
r. Records of Demonstration of capability.
s. Records of identification numbers for all individuals responsible for signing laboratory records.

6. All generated data, except those that are generated by automated data collection systems, are recorded legibly in permanent ink with corrections dated and initials as well as accompanied by the reason for the correction if other than transcription error.
7. If the laboratory transfers ownership or goes out of business, Calscience will ensure that the records are maintained or transferred according to customer instruction.
   a. Upon ownership transfer, record retention requirements shall be addressed in the ownership transfer agreement and the responsibility for maintaining archives will be clearly established. In cases of bankruptcy, appropriate regulatory and state legal requirements concerning laboratory records will be followed.
   b. If the laboratory goes out of business, all records will revert to the control of the client or regulatory agency, as applicable. As much notice as possible will be given to clients and the accrediting bodies who have worked with the laboratory during the previous 5 years of such action.

D. Analytical Record-Keeping System Design
1. Analyses in the laboratory are either performed on analytical instrumentation that provides the required records electronically, usually using vendor-supplied software, or there is an analytical "bench sheet" designed for the analysis to capture all required information.
2. Where electronic systems do not capture all of the required information, they may be augmented with a bench sheet or batch sheet to provide information missing from the electronic files.

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3. Some of the required analytical information is recorded on the "worksheet", a collection of sample tracking information printed for each sample group at log-in and carried through the laboratory process with the samples.
4. Hard copy notebooks in use are permanently bound with unique serial number tag to prevent removal or addition of pages, have prenumbered pages, are initialed and dated by the responsible person with entries in chronological order, each section closed with initials and date.
5. Signature log: The laboratory keeps a log of each employee's name, signature and initials. The laboratory also assigns each employee a numerical "Analyst ID". Technical personnel generally use this number rather than their signature or initials on analytical records. The log is kept on file in the QA offices.

4.14) Internal Audits

A. The laboratory periodically, and in accordance with a predetermined schedule and procedure, conducts internal audits of its activities to verify that its operations continue to comply with the requirements of the management system and with all applicable Standards. The internal audit program addresses all elements of the management system and laboratory process. Additional detail on auditing requirements and qualification of internal auditors is found in the Calscience SOP Internal Audit Procedures, T028, current revision.
   1. It is the responsibility of the Quality Assurance Manager to plan and organize audits as required by the schedule and requested by management. Audits are performed so that the entire management system is audited annually.
   2. Internal audits are performed by trained and qualified personnel who are independent of the activity to be audited.
   3. Checklists are used to assist the audit procedure. This ensures that there is documentation of what items were checked and what the results of the checks were.

B. If audit findings cast doubt on the correctness or validity of calibrations or analytical results, immediate corrective action must be taken. Deficiencies discovered during the auditing process are rectified and documented using the corrective action process described in Section 4.11 of this manual. Records are maintained in the eJira system.

C. The area of activity audited, the audit findings and corrective actions that arise from them are recorded in an audit report.

D. Follow-up audit activities verify and record the implementation and effectiveness of the corrective action taken. Follow up is a part of the corrective action procedure and is documented in the corrective action system.

E. Additional Items
   1. If the laboratory identifies events that cast doubt on the validity of test results, the laboratory is required to notify clients with affected data within seven calendar days of the discovery. Notification must be recorded in the eJira system.
   2. The laboratory management must ensure that these actions taken as a result of internal audits are discharged within the agreed time frame.

4.15) Management Review

A. The Laboratory Management is responsible for performing an annual management review of the laboratory. The focus of the management review is on the sufficiency of the Quality Assurance Manual and system to meet the standards of NELAP.

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1. The review is performed in multiple stages. First, the quality department personnel and the BUMa collect information to fill out the Eurofins Environment form "Management Review Meeting Agenda".
2. Then, a local meeting is held with the BUMa, the quality department staff, the production manager and other parties as decided by the BUMa.
3. The output of the meeting is the completed "Management Review Meeting Agenda" form with proposed action items.
4. The final step is for the BUMa and the quality staff to review the information and proposed action items with the President of Eurofins Environmental Testing US and the Corporate Quality Director to finalize action items.

B. The review will include but is not limited to the following items:
1. The suitability of policies and procedures, including data integrity procedures
2. Results of the annual assessment
3. Results of proficiency testing samples
4. Corrective and preventive actions
5. Results of any external assessments, e.g., certification assessments
6. Any changes in the volume or type of work, particularly anticipated changes
7. Review of client complaints or other client feedback
8. Any other relevant factors, such as quality control activities, resources, and staff training.

C. A record of the discussions included in the review will be kept on file in the laboratory.
1. The record must include determinations as to whether the management system is meeting the needs of the laboratory and where improvements will be made.
2. Action items resulting from the review will be entered into the eJira system, where they will be assigned to specific personnel and given a timeline for implementation.

4.16) Data Integrity

A. It is the policy of the laboratory to produce data which are sound, correct and complete. The laboratory maintains a documented data integrity system which is reviewed annually and approved by management. The program in place in the laboratory includes the following elements which are detailed in the Calscience SOP T065, Data Integrity, current version.
1. Data Integrity Training
2. Documentation signed by each employee
3. In-depth, periodic monitoring of data integrity
4. Documentation of data integrity procedures.

B. Laboratory management will uphold the spirit of the laboratory's data integrity program and will work to effectively implement the requirements of these procedures.

C. Employees undergo Data Integrity training and sign statements that they agree to abide by the requirements of the Data Integrity Program at orientation and annually.

D. The laboratory maintains a no-fault reporting policy for data integrity issues.

E. If a report is received of a potential violation of the laboratory's data integrity procedures or if the laboratory's auditing program reveals evidence of inappropriate actions or vulnerabilities related to data integrity, further review is required. All investigations will be handled in a confidential manner until such time as a follow-up evaluation, full investigation, or other appropriate actions have been completed and the issues clarified.

F. All investigations that result in finding of inappropriate activity must be recorded and the records must include any disciplinary actions involved, corrective actions taken, and all notifications of clients. All records must be kept for at least five years.

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5) Technical Requirements

5.1) General Information

A. Many factors determine the correctness and reliability of the tests performed by a laboratory including human factors, accommodation and environmental conditions, test and calibration methods and method validation, equipment, measurement traceability, sampling, handling of test items, as well as others.

B. The extent to which the factors contribute to the total uncertainty of measurement differs considerably between different types of test. The laboratory takes these factors into consideration in developing test methods and procedures, in training and qualifying personnel and in the selection and calibration of the equipment it uses.

5.2) Personnel

A. The laboratory management must ensure the competence of all who operate specific equipment, perform tests, evaluate results, and sign test reports. When using staff in training, appropriate supervision must be provided. Personnel performing specific tasks are qualified on the basis of appropriate education, training, experience and/or demonstrated skills, as required.

B. The management of the laboratory formulates goals with respect to the education, training and skills of the laboratory personnel. The laboratory policy and procedures for identifying training needs and providing training of personnel are outlined below. The training program is intended to be relevant to the present and anticipated tasks of the laboratory. The overall goals of the training program are to ensure that all personnel have the skills to perform their work in compliance with the management system and the Standard, are trained in the parts of the management system that affect their specific job, and have demonstrated competency to perform the tests, parts of tests or other functions for which they are responsible. Details of the training program, including records requirements, are contained in the Calscience SOP Employee Training, T010 (current version).

1. Training needs are identified through evaluation of current skills by management. Initially, individuals are trained to perform specific methods or support procedures as defined by their initial job description. After initial training in specific job functions, annual evaluations include identification of other training needs. Training on basic laboratory techniques is performed along with method training that uses those techniques.
2. Initial training is designed to provide a new employee with the information required to perform their job in compliance with the overall management system. Additional training needs are determined during employee evaluations and may include additional method training, training in additional tasks such as sample management, refresher training, or, in some cases, retraining on particular parts of the management system.
3. Training effectiveness is evaluated initially through observation of the employee's performance of tasks and/or through evaluations of Demonstrations of Capability. Continuing evaluations are made through additional observation, through evaluation of quality control data and proficiency testing data as well as review of reports and records generated by the employee in the performance of their duties.
4. The laboratory routinely uses personnel who are employed by the laboratory. However, new employees are often brought in through a temporary agency and may be converted to full-time company employees after a trial period. Regardless of whether company employees or contracted personnel are used, the laboratory ensures that such personnel are supervised and competent and that they work in accordance with the laboratory's management system.

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C. The laboratory maintains current job descriptions for managerial, technical and key support personnel involved in tests and/or calibrations. Minimum job descriptions (as required by the Standard) for key managerial personnel are found in Appendix 2 of this Quality Manual. Job descriptions for analytical ("bench") personnel are maintained by the Operations Manager and/or Group Leaders. Information in job description may include, for example, the following items.
   1. Responsibilities with respect to performing tests.
   2. Responsibilities with respect to the planning of tests and evaluation of results
   3. Responsibilities with respect to method modification and development and validation of new methods
   4. Expertise and experience required
   5. Qualifications and any required training programs
   6. Managerial duties.

D. Laboratory management authorizes specific personnel to perform particular types of sampling and testing, to issue test reports, and to operate particular types of equipment. The laboratory maintains records of the relevant authorization(s), competence, educational and professional qualifications, training, skills and experience of all technical personnel, including contracted personnel. This information is maintained by the QA office and kept readily available. It must include the date on which authorization and/or competence is confirmed.
   1. Authorization to perform tests is given by the approval of the Initial Demonstration of Capability. Authorization to operate specific types of equipment is included with the method authorization that uses that equipment.
   2. Each analyst must demonstrate capability for each test method used in the laboratory initially, prior to reporting samples using the method, and on an annual basis thereafter. Records of these demonstrations must be maintained.
   3. For processes that do not include an analytical method, authorization is indicated by one of several methods:
      a. For processes that require specific LIMS or other electronic permissions, the authorization is indicated by the supervisor's e-mail to QA requesting that the permission be given to the employee.
      b. For analytical processes that do not lend themselves to a demonstration of capability, authorization is indicated through inclusion by the supervisor of the method on the employee's "Method Proficiency List and Demonstration of Capability Certification Statement" form along with the record of having read and understood the governing SOP(s).
   4. This laboratory does not offer opinions or interpretations, so there is no authorization procedure for them.
   5. All records of training are included in the employees' training files.

E. Group Leader (Technical Managers) qualifications
   1. Any Group Leader involved in chemical analysis must have a bachelor's degree in a chemical, environmental, biological science, physical science or engineering, with at least 24 college semester credit hours in chemistry and at least 2 years of experience in the environmental analysis of inorganic and organic analytes for which the lab maintains accreditation. A master's or doctoral degree in one of thee disciplines can be substituted for one year of experience.
   2. Any Group Leader limited to inorganic chemical analysis, other than metals, must have an associate's degree in a chemical, physical or environmental science or 2 years of equivalent college education with at least 16 college semester credit hours in chemistry and must have at least 2 years of experience performing such analysis.

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3. Group leaders are responsible for ensuring that training requirements are met for assigned personnel, and
4. Ensuring that training records are maintained and up to date for assigned personnel.

F. Data Integrity Training
1. Data integrity training is required as a part of the initial new employee orientation and annually thereafter.
2. The Data Integrity Program, including training requirements, is described in Section 4.16 above and in the SOP referenced there.

5.3) Accommodation and Environmental Conditions

A. The laboratory facilities for testing, including but not limited to energy sources, lighting and environmental conditions, must facilitate correct performance of the tests. The laboratory will ensure that the environmental conditions do not invalidate the results or adversely affect the required quality of any measurement. The technical requirements for accommodation and environmental conditions that can affect the results of test and calibration are required to be documented.

B. Most of the laboratory is amenable to normal industrial building controls. There are few areas in the laboratory where temperature requirements are prescribed. Where test methods make specific requirements, these are incorporated into the testing areas. Tests are stopped when these conditions are unable to be met. The following environmental conditions are considered essential to obtaining accurate results

C. Leaching tumblers (e.g., TCLP) are kept in a room that is controlled and monitored during tumbling and meets the requirements of the test methods.
1. Biomonitoring (Whole Effluent Toxicity Testing, "WETT") is performed in a room that is controlled and monitored during testing to meet the requirements of the test methods.

D. The laboratory maintains an effective separation between areas in which there are incompatible activities. Measures are taken to prevent cross-contamination.
1. Volatile organic analyses and air analyses are performed in a building that is separated from the main building, where organic extractions and semivolatile organic analyses are performed.
2. Other analyses with a potential for cross-contamination from preparation (e.g., metals) are performed in separate rooms.

E. Laboratory access is controlled. Only authorized individuals are allowed in the laboratory area. Guests may be allowed in the laboratory only with an authorized escort. Detailed protocols for managing customer visits and external audits are included in the Calscience SOP Customer and Regulatory Audits, T-027, current version.
1. Customer information must be kept confidential when visitors are in the laboratory area. Do not allow visitors, particularly customers, to view worksheets from other customers' samples.
2. Do not leave visitors unescorted in the laboratory areas.

F. Laboratory personnel are required to practice appropriate good housekeeping.
1. In general, no specific laboratory protocols are required for the types of analyses performed at Calscience. Where specific protocols are required for specific tests, they are documented in the applicable test method SOPs.
2. The laboratory LEAN program seeks to minimize clutter while maximizing accessibility of appropriate apparatus, reagents, and standards. Laboratory personnel are required to maintain their work spaces as indicated in the LEAN 5S Standards.

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3. The laboratory employs a contractor to provide basic custodial services. The contractor has been instructed to not use cleaning chemicals in the areas where volatile organic analyses are performed.

5.4) Environmental Methods and Method Validation

A. The laboratory is required to use appropriate methods and procedures for all tests within its scope and all calibrations and verifications of equipment.
   1. These include sampling, handling, transport, storage and preparation of samples to be analyzed and, where appropriate, an estimation of the measurement uncertainty as well as statistical techniques for analysis of quality control data.
   2. The laboratory has instructions on the use and operation of all relevant equipment, and on the handling and preparation of samples for analysis, or both, where the absence of such instructions could jeopardize the results of tests and/or calibrations.
      a. These instructions are included in the laboratory's SOPs for specific methods and in the instrument manufacturer's manuals.
      b. Additional instructions may be included in SOPs specific to a particular task or instrument.
   3. All instructions, standards, manuals and reference data relevant to the work of the laboratory are required to be kept up to date and made readily available to personnel (see 4.3). Deviation from test and calibration methods may occur only if the deviation has been documented, technically justified, authorized, and accepted by the customer.
   4. The laboratory maintains specific SOPs for each environmental test method used in the laboratory.
   5. Deviations from the published method are listed in a specific section in the SOP along with their technical justification. Data supporting the validity of listed deviations, if required, is kept on file in the laboratory. Listed deviations are collated by the QA department and then provided to project management.

B. The laboratory must ensure it uses test methods, including methods for sampling, which meet the needs of the customer and which are appropriate for the tests and/or calibrations it undertakes.
   1. Methods published in international, regional or national standards are preferably used.
      a. Sources include methods that have been published either in international, regional or national standards, or by reputable technical organizations, or in relevant scientific texts or journals, or as specified by the manufacturer of the equipment. Specific sources of methods used at Calscience include the EPA, Standard Methods for the Examination of Water and Wastewater, ASTM, the State of California and local municipalities, and scientific journals.
      b. The laboratory must use the latest valid edition of a standard unless it is not appropriate or possible to do so. Note: Some accreditations and some contracts held by the laboratory require the use of earlier editions of methods.
      c. When necessary, the method is supplemented with additional details to ensure consistent application.
   2. When the customer does not specify the method to be used, the laboratory selects what it deems the most appropriate method.
   3. Laboratory-developed methods or methods adopted by the laboratory may also be used if they are appropriate for the intended use and if they are validated. The customer must be informed as to the method chosen. See clause 5.4.C below.
   4. The laboratory is required to confirm that it can properly operate standard methods before introducing the tests or calibrations. If the standard method changes, in such a way that the detection system, the chemistry, or the sensitivity of the method may be affected, the

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confirmation must be repeated. This is accomplished by performing a Demonstration of Capability and, where applicable, a determination of detection limits study.

5. The laboratory must inform the customer when the method proposed by the customer is considered to be inappropriate or out of date.
6. All customer notifications are performed as part of the request, tenders, and contracts procedure. (See Section 4.4)

C. Laboratory-Developed methods. It is not likely that the laboratory will develop any in-house methods. If the need arises, the laboratory will develop validation plans in line with the requirements of the Standards.

D. Non-Standard methods, if used, will be validated using the procedures included in the Calscience SOP Method Validation and Demonstration of Analytical Capability, T046, current version.

E. Validation of the implementation of analytical methods will be performed using the procedures included in the Calscience SOP Method Validation and Demonstration of Analytical Capability T046, current version.

F. Estimation of Analytical Uncertainty

1. The laboratory maintains procedures for determining the uncertainty associated with analysis. Determination of total uncertainty, including sampling, transport, etc. is beyond the scope of the laboratory and will not be determined.
   a. The exact nature of some test methods may preclude rigorous, statistically valid estimation of analytical uncertainty. In these cases the laboratory will attempt to identify all components of analytical uncertainty and make a reasonable estimation and shall ensure that the form of data reporting does not give a wrong impression of the uncertainty. A reasonable estimation is based on knowledge of method performance and previous experience. When estimating the analytical uncertainty, all uncertainty components which are of importance in the given situation must be taken into account.
   b. In those cases where a well-recognized test method specifies limits to the values of the major source of uncertainty of measurement and specifies the form of presentation of calculated results, the laboratory is considered to have satisfied the requirements on analytical uncertainty by following the test method and reporting instructions.
   c. The laboratory is only responsible for estimating the portion of measurement uncertainty that is under its control. As stated in Section 5.10.C.1.c, test reports will include a statement of the estimated analytical uncertainty only when required by the customer.
2. Analytical uncertainty will not be routinely reported to the customer. Uncertainty will only be reported when requested by the customer or when the uncertainty affects compliance to a specification limit, if known by the laboratory. The laboratory uses no methods where the uncertainty is routinely relevant to the validity or application of the test results.
   a. If a project requires analytical uncertainty to be reported, the laboratory shall report the estimated uncertainty based on project-specific procedures or, if not available, an internal procedure based on results of Laboratory Control Samples will be used.
   b. The estimated analytical uncertainty can be expressed as a range (±) around the reported analytical results at a specified confidence level. A laboratory may report the in-house, statistically-derived LCS control limits based on historical LCS recovery data as an estimate of the minimum laboratory contribution to analytical uncertainty at a 99% confidence level.
3. For testing laboratories, the laboratory shall ensure that the equipment used can provide the analytical portion of measurement uncertainty needed by the customer.

G. Control of Data

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1. Calculations and data transfers shall be subject to appropriate checks in a systematic manner.
2. When computers or automated equipment are used for the acquisition, processing, recording, reporting, storage or retrieval of test or calibration data, the laboratory ensures that:
   a. Computer software developed by the user is documented in sufficient detail and is suitably validated as being adequate for use;
   b. Procedures are established and implemented for protecting the data; such procedures shall include, but not be limited to, integrity and confidentiality of data entry or collection, data storage, data transmission and data processing;
   c. Computers and automated equipment are maintained to ensure proper functioning and are provided with the environmental and operating conditions necessary to maintain the integrity of test and calibration data.
   d. Commercial off-the-shelf software (e.g. word processing, database and statistical programs) in general use within their designed application range may be considered to be sufficiently validated. However, laboratory software configuration/ modifications should be validated as in 5.4.G.2.a.
   e. User names and passwords are required for all information system access. Passwords are changed at least every six months.
   f. Employees are trained at hiring and annually thereafter on computer security awareness. This training is combined with Ethics and Data Integrity Training for ease of implementation.
   g. The Quality Assurance Manager or designee is responsible for annual inspection of the LIMS. At a minimum, archived reports are compared to re-generated reports to verify data and calculation integrity. Records are kept and laboratory management is notified of any problems identified and any corrective actions taken.
   h. If the laboratory develops information systems that allow electronic customer interaction, the laboratory must also develop a procedure to provide prior notification to customers of software or hardware changes that will adversely affect customer electronic data.
3. The validation procedures for computer software vary depending on the source and use.
   a. Instrument software provided by the instrument vendor or by a recognized third-party vendor is considered to be validated by the vendor under the NELAP standard, but calculation algorithms are required to be validated under the DoD ELAP. Specific configurations installed by the vendor are also considered validated unless changed significantly by the laboratory.
   b. Office software applications such as Word and Excel are considered to be validated by the vendor, including specific functions included in those applications.
   c. Any software applications designed in the laboratory must be validated by the laboratory, including spreadsheets used to perform quality-critical calculations. See the next section for specific validation requirements.
   d. All software, including user-defined software such as spreadsheet applications must be protected from unauthorized changes. Calculation cells in spreadsheets must be locked to prevent alterations of the formulae.
4. Some analyses and processes in the laboratory have spreadsheets that have been designed to perform the calculations necessary to generate the reportable results. All spreadsheets created for the laboratory will be validated for use prior to implementation. Vendor software that requires validation will also be validated using one of these methods.
5. One method of validation consists of a manual confirmation of the calculations performed by the spreadsheet. This verification will be kept on file in the laboratory.

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a. Other methods of validation may include comparison of data generated by the old validated sheet to the data generated by the new sheet, or comparison of a set of new software calculations against calculations of the same data from the old, validated software.
b. Validation is only required when changes are made to calculation cells but not when changes are made to cells that look up sample description data (non-numerical) in LIMS, or when the changes are purely cosmetic (font, column width etc).

5.5) Equipment

A. The laboratory is furnished with all items of sampling, measurement and test equipment required for the correct performance of the tests and/or calibrations (including sampling, preparation of test and/or calibration items, processing and analysis of test and/or calibration data). The laboratory does not use equipment that is outside its permanent control.
B. Equipment and its software used for testing, calibration, and sampling are capable of achieving the accuracy required and procedures ensure that the equipment complies with specifications relevant to the tests and/or calibrations concerned.
   1. Calibration programs are established for key quantities or values of the instruments where these properties have a significant effect on the results. General equipment requirements are described in this section. Specific requirements are described in pertinent SOPs.
      a. Calibration of analytical instrumentation is generally described in the Calscience SOP Internal Quality Control Checks, T020, current version. Specific requirements are contained in the test method SOPs governing the equipment.
      b. Calibration and verification of support equipment is described in Calscience SOP Support Equipment Calibration, Verification, and Monitoring, T043, current version.
   2. Before being placed into service, equipment (including that used for sampling) must be calibrated or checked to establish that it meets the laboratory's specification requirements and complies with the relevant standard specifications. It shall be checked and/or calibrated before use as required by the analytical methods or the SOPs.
C. Equipment is operated only by authorized personnel. Up-to-date instructions on the use and maintenance of equipment (including any relevant manuals provided by the manufacturer of the equipment) are readily available for use by the appropriate laboratory personnel. See the Routine Instrument Maintenance SOP, current version, Support Equipment Calibration, Verification, and Monitoring, T043, current version, instrument manuals or the specific test method SOPs for these instructions.
D. Each item of equipment and its software used for testing and significant to the result is, when practical, uniquely identified.
E. Records are maintained of each item of equipment and its software significant to the tests performed. The records shall include at least the following:
   1. the identity of the item of equipment and its software;
   2. the manufacturer's name, type identification, and serial number or other unique identification;
   3. checks that equipment complies with the specification (see 5.5.2);
   4. the current location, where appropriate;
   5. the manufacturer's instructions, if available, or reference to their location;
   6. dates, results and copies of reports and certificates of all calibrations, adjustments, acceptance criteria, and the due date of next calibration;
   7. the maintenance plan, where appropriate, and maintenance carried out to date;
   8. any damage, malfunction, modification or repair to the equipment.

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9. Items 1, 2 and 4 are kept in spreadsheets by the QA Department. Items required in item 5 are kept in the QA Department. Maintenance plans are kept in the Routine Instrument Maintenance SOP, current version. Records of calibration/verification of analytical equipment are kept in the analytical data. Records of calibration/verification of support equipment are kept by the QA Department. Records of maintenance are kept in maintenance logs with the equipment.

F. The laboratory has procedures for safe handling, transport, storage, use and planned maintenance of measuring equipment to ensure proper functioning and in order to prevent contamination or deterioration. Additional procedures may be necessary when measuring equipment is used outside the permanent laboratory for tests, calibrations or sampling. See the Routine Instrument Maintenance SOP, current version, Support Equipment Calibration, Verification, and Monitoring, T043, current version, or the specific test method SOPs for these instructions.

G. Equipment that has been subjected to overloading or mishandling, gives suspect results, or has been shown to be defective or outside specified limits, must be taken out of service.
   1. The equipment is isolated to prevent its use or clearly labeled or marked as being out of service until it has been repaired and shown by calibration or test to perform correctly. The laboratory has "Out of Service" signs available to place on instrumentation and requirements to include the out of service notification in logbooks associated with the equipment.
   2. The laboratory must examine the effect of the defect or departure from specified limits on previous tests and/or calibrations and institute the "Control of nonconforming work" procedure (see 4.9). This is particularly important if support equipment is found to be out of tolerance during routine calibration cycles or if analytical equipment or reporting systems are found to have errors that may have been missed when used to generate earlier data.

H. Whenever possible, all equipment under the control of the laboratory and requiring calibration shall be labeled, coded or otherwise identified to indicate the status of calibration, including the date when last calibrated and the date or expiration criteria when recalibration is due.
   1. Support equipment is labeled with its calibration status whenever possible.
   2. Analytical instrumentation is calibrated according to test method requirements and requires some sort of calibration or calibration verification with every use. Therefore, the calibration status is generally maintained in and inferred from the instrument data.

I. When, for whatever reason, equipment goes outside the direct control of the laboratory, the laboratory shall ensure that the function and calibration status of the equipment are checked and shown to be satisfactory before the equipment is returned to service.
   1. Analytical Instrumentation must pass method calibration requirements prior to return to use. If the instrumentation has been subject to repairs or alterations, new detection limit studies and an IDOC may be required. When in doubt, check with QA personnel.
   2. Support equipment must be calibrated or verified as required before use.
   3. Calibration Standards, such as Class 2 weights and traceable thermometers require verification upon return from calibration. See the Calscience SOP Support Equipment Calibration, Verification, and Monitoring, T043, and Calscience SOP Thermometer Verification and Temperature Monitoring, T068, current versions, for more information.

J. When intermediate checks are needed to maintain confidence in the calibration status of the equipment, these checks are carried out according to the procedures in the governing SOPs.

K. Where calibrations give rise to a set of correction factors, the laboratory procedures ensure that copies (e.g. in computer software, on calibration records, etc.) are correctly updated.
   1. Interelement correction factors used in metals analysis, for example, must be updated through the software and saved appropriately.

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2. Correction factors used on thermometers, for example, are listed on the thermometer.

L. Test and calibration equipment, including both hardware and software, must be safeguarded from adjustments which would invalidate the test and/or calibration results.

M. Support Equipment
1. In addition to analytical instruments, requirements for calibration apply to all devices that may not be the actual test instrument, but are necessary to support laboratory operations. These include, but are not limited to; balances, ovens, refrigerators, freezers, incubators, water baths, temperature measuring devices (including thermometers and thermistors), thermal/pressure sample preparation devices and volumetric dispensing devices (such as Eppendorf® or automatic dilutor/dispensing devices), if quantitative results are dependent on their accuracy, as in standard preparation and dispensing or dilution into a specified volume. Detailed requirements and procedures are contained in the Calscience SOP Support Equipment Calibration, Verification, and Monitoring, T043, and Calscience SOP Thermometer Verification and Temperature Monitoring, T068, current versions.
   a. All support equipment shall be maintained in proper working order. The records of all repair and maintenance activities, including service calls, shall be kept.
   b. All support equipment must be calibrated or verified at least annually, using references traceable to a recognized National Metrology Institute, such as NIST, when available, and bracketing the range of use.
   c. The results of such calibration or verification are required to be within the specifications required of the application for which this equipment is used or the equipment is removed from service until repaired.
   d. The laboratory must maintain records of established correction factors arising from these calibrations or verifications to correct all measurements.
   e. Raw data records are retained to document equipment performance.
   f. On each day the equipment is used, balances, ovens, refrigerators, freezers and water baths shall be checked and the results recorded. The acceptability for use or continued use is set according to the needs of the analysis or application for which the equipment is being used.
   g. Volumetric dispensing devices (except Class A glassware and glass microliter syringes) used for quality-affecting measurements are checked for accuracy on a quarterly basis.

N. Instrument Calibration
1. Calibration of analytical instrumentation is addressed in general in the Calscience SOP Internal Quality Control Checks, T020, current version.
2. Specifics of instrument calibration, including acceptance criteria, are contained in the technical SOP governing the analysis.

5.6) Measurement Traceability

A. All equipment used for tests and/or calibrations, including equipment for subsidiary measurements (e.g. for environmental conditions) having a significant effect on the accuracy or validity of the result of the test, calibration or sampling shall be calibrated before being put into service. The laboratory's program and procedures for the calibration of its equipment as well as traceability of standards and reagents is described in this section.

B. Measuring and test equipment with measuring functions used must be calibrated on at least an annual basis. Whenever possible, calibration is performed using reference standards or reference materials that are traceable to a national standard or other standard acceptable to the NELAP, DoD or customer, as applicable, unless it has been established that the associated contribution from the calibration contributes little to the total uncertainty of the test result. When this situation arises,

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the laboratory ensures that the equipment used can provide the uncertainty of measurement needed.

C. Reference Standards and Reference Materials
   1. Reference Standards –The laboratory has a program and procedure for the calibration of its reference standards. Reference standards, such as weights used for checking balances and reference thermometers, must be calibrated by a calibration laboratory accredited to ISO 17025 for the particular calibration provided. Reference standards of measurement held by the laboratory are used for calibration or verification only and for no other purpose. The specifics of the calibration program are contained in the Calscience SOP Support Equipment Calibration, Verification, and Monitoring, T043, and Calscience SOP Thermometer Verification and Temperature Monitoring, T068, current versions.
   2. Reference Materials – Reference materials, where possible, are traceable to SI units of measurement, to certified reference materials, or to national or international standard reference materials. Internal reference materials are checked as far as is technically and economically practicable.
   3. Intermediate Checks – Checks needed to maintain confidence in the calibration status of reference, primary, transfer or working standards and reference materials are carried out according to procedures and schedules defined in the appropriate technical SOPs.
   4. The laboratory shall have procedures for safe handling, transport, storage and use of reference standards and reference materials in order to prevent contamination or deterioration and in order to protect their integrity.
   5. The laboratory provides evidence of correlation of results by participation in a program of proficiency testing through PT providers that provide traceability to a national standard.

D. Documentation and Labeling of Standards, Reagents, and Reference Materials -- Documented procedures are in place for the purchase, receipt and storage of consumable materials used for the technical operations of the laboratory.
   1. The laboratory retains records for all standards, reagents, reference materials, and media, including the manufacturer/vendor, the manufacturer's Certificate of Analysis or purity (if available), the date of receipt, and recommended storage conditions.
   2. For original containers, if an expiration date is provided by the manufacturer or vendor it shall be recorded on the container. If an expiration date is not provided by the manufacturer or vendor it is not required.
   3. Records are maintained on standard, reference material, and reagent preparation. These records shall indicate traceability to purchased stocks or neat compounds, reference to the method of preparation, date of preparation, expiration date and preparer's initials.
   4. All containers of prepared standards, reference materials, and reagents are labeled with a unique identifier and expiration date.
   5. Procedures are in place to ensure prepared reagents meet the requirements of the method.
   6. Standards, reference materials, and reagents shall not be used after their expiration dates unless their reliability is verified by the laboratory.

5.7) Sampling

A. The laboratory performs some sampling for customers, virtually all of it related to wastewater treatment. Additionally, the laboratory performs subsampling of samples provided by customers to provide aliquots for specific analyses.
   1. For external sampling, the procedures are described in detail in the Calscience SOP Industrial Wastewater Sampling, T101, current version. Customers provide sampling plans to the

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laboratory. The SOP describes the specifics of the processes and factors to be controlled or monitored.

2. Subsampling, as in obtaining a representative sample for analysis from a sample container, is described in technical SOPs that deal with sample preparation.

B. Where the customer requires deviations, additions or exclusions from the documented sampling procedure, these are recorded in detail with the appropriate sampling data and are included in all documents containing test and/or calibration results, and are communicated to the appropriate personnel.

C. The laboratory maintains procedures for recording relevant data and operations relating to sampling that forms part of the testing or calibration that is undertaken. These records include the sampling procedure used, the identification of the sampler, environmental conditions (if relevant) and diagrams or other equivalent means to identify the sampling location as necessary and, if appropriate, the statistics the sampling procedures are based upon.

D. Sampling records for external sampling include the date and time of sampling and any deviations from the sampling procedures that were requested or required.

5.8) Handling Samples and Test Items

A. The laboratory has procedures for the transportation, receipt, handling, protection, storage, retention and/or disposal of test and/or calibration items, including all provisions necessary to protect the integrity of the test or calibration item, and to protect the interests of the laboratory and the customer. The procedures used to meet the requirements of this section are included in the Calscience SOP Sample Receipt and Log-in Procedures, T100, current version.

B. The laboratory has a system for identifying test and/or calibration items. The identification shall be retained throughout the life of the item in the laboratory. The system is designed and operated so as to ensure that items cannot be confused physically or when referred to in records or other documents. The system accommodates a sub-division of groups of items and the transfer of items within and from the laboratory, including all samples, sub-samples, preservations, sample containers, tests, and subsequent extracts and/or digestates.

1. The system generates a laboratory code, which maintains an unequivocal link with the unique field ID code assigned to each sample.
2. The laboratory ID code is placed as a durable label on the sample container.
3. The laboratory ID code is entered into LIMS and is the link that associates the sample with related laboratory activities such as sample preparation.

C. Upon receipt of the test or calibration item, abnormalities or departures from normal or specified conditions, as described in the test or calibration method, shall be recorded. When there is doubt as to the suitability of an item for test or calibration, or when an item does not conform to the description provided, or the test or calibration required is not specified in sufficient detail, the laboratory consults the customer for further instructions before proceeding and shall record the discussion.

1. The laboratory maintains procedures to be used when samples show signs of damage, contamination, inadequate preservation, or other exceptions to the sample receipt policy.
2. If the sample does not meet the sample receipt acceptance criteria listed, sample receiving personnel notify the appropriate project manager of the exceptions or questions, who, in turn, confer with the customer. The laboratory shall either:
   a. Retain correspondence and/or records of conversations concerning the final disposition of rejected samples; or,

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b. Fully document any decision to proceed with the analysis of samples not meeting acceptance criteria.
c. The condition of these samples shall be noted on the chain of custody or transmittal form and in LIMS.
d. The analysis data shall be appropriately qualified on the final report.

D. The laboratory has procedures and appropriate facilities for avoiding deterioration, loss or damage to the test or calibration item during storage, handling and preparation. Handling instructions provided with the item shall be followed. When items have to be stored or conditioned under specified environmental conditions, these conditions shall be maintained, monitored and recorded. These procedures are contained in the Calscience SOP Sample Receipt and Log-in Procedures, T100, current version.
Note: Calscience does not provide secure, legal chain-of-custody procedures.

E. Additional Requirements – Sample Receipt Protocols
1. The laboratory has implemented procedures for verifying and documenting preservation.
2. The laboratory uses LIMS to create a permanent chronological record to document receipt of all sample containers. This record contains the following required information:
   a. Client/project name,
   b. Date and time of laboratory receipt,
   c. Unique laboratory ID code, and,
   d. The identification of the person making the entries.
3. During the login process, the following information shall be unequivocally linked to the log record using the LIMS.
   a. The field ID code, which identifies each sample, shall be linked to the laboratory ID code in the sample receipt log.
   b. The date and time of sample collection shall be linked to the sample and to the date and time of receipt in the laboratory.
   c. The requested analyses (including applicable approved method numbers), linked to the laboratory ID code.
   d. Any comments resulting from inspection for sample rejection shall be linked to the laboratory ID code.
4. All documentation, such as memos, chain of custody, or transmittal forms that are transmitted to the laboratory by the sample transmitter, is retained.
5. A complete chain of custody record form, if utilized, is maintained to document transfer of the sample to the laboratory.
   a. For most samples, once the sample is inside the laboratory and the receiving process is completed, sample movement within the laboratory is not recorded, but can be inferred from documentation of analytical processes.
   b. An internal chain-of-custody is available upon customer request.

F. The laboratory has a written sample acceptance policy, which is available to customers of the laboratory and other sampling personnel. This policy requires the following information be provided with each sample. The policy is included as an appendix in the Calscience SOP Sample Receipt and Log-in Procedures, T100, current version.
1. Proper, full, and complete documentation, which includes sample identification; the location, date and time of collection; collector's name, preservation type, sample type and any special remarks concerning the sample;

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2. Proper sample labeling to include unique identification and a labeling system for the samples with requirements concerning the durability of the labels (water resistant) and the use of indelible ink;
3. Use of appropriate sample containers;
4. Adherence to specified holding times;
5. Sufficient sample volume to perform the necessary tests;

G. Additional Requirements – Sample Storage and Disposal
1. Samples shall be stored according to the conditions specified by preservation protocols. For most samples, this means that samples are refrigerated.
   a. Samples that require thermal preservation shall be stored under refrigeration that is +/- 2°C of the specified preservation temperature unless regulatory or method specific criteria exist. For samples with a specified storage temperature of 4°C, storage at a temperature above the freezing point of water to 6°C shall be acceptable.
   b. In practice, most samples are kept in the refrigerators for ease of retrieval.
   c. Samples must be stored away from all standards, reagents, and food. Samples must be stored in such a manner to prevent cross contamination.
2. Sample fractions, extracts, leachates and other sample preparation products are stored according to specifications in the method and the requirements listed above.
3. The laboratory addresses disposal of samples, digestates, leachates and extracts and other sample preparation products in SOP T005, Disposal of Laboratory Samples and Wastes.

5.9) Quality Control for Environmental Testing

A. The laboratory has implemented quality control procedures for monitoring the validity of tests and calibrations undertaken. The resulting data are recorded in such a way that trends are detectable and, where possible, statistical techniques are applied to the reviewing of the results. This monitoring is planned and reviewed and includes, but may not be limited to, the following:
1. regular use of certified reference materials and/or internal quality control using secondary reference materials;
2. participation in proficiency-testing programs;
3. replicate testing;
4. retesting or recalibration of retained items;
5. correlation of results for different characteristics of an item.

B. Quality control data are analyzed as soon as is feasible after analysis and, where they are found to be outside pre-defined criteria, planned action is taken to correct the problem and to prevent incorrect results from being reported.

C. Essential Quality Control Procedures
1. The laboratory has written protocols in place to monitor the following quality controls. The specific controls and their evaluations are contained in Calscience SOP T020, Internal Quality Control Checks, current version, and in the appropriate test method SOPs. These SOPs shall assure that the applicable principles are addressed:
   a. positive and negative controls, as applicable to the test type, to monitor tests such as blanks, LCSs, and matrix spikes;
   b. tests to define the variability and/or repeatability of the laboratory results such as replicates, laboratory duplicates, and spiked duplicates;
   c. measures to assure the accuracy of the method including calibration and/or continuing calibrations, use of certified reference materials, proficiency test samples, or other measures;

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d. measures to evaluate method capability, such as limit of detection and limit of quantitation or range of applicability such as linearity;
e. selection of appropriate formulae to reduce raw data to final results such as regression analysis, comparison to internal/external standard calculations, and statistical analyses;
f. selection and use of reagents and standards of appropriate quality;
g. measures to assure the selectivity of the test for its intended purpose; and
h. measures to assure constant and consistent test conditions (both instrumental and environmental) where required by the method such as temperature, humidity, light or specific instrument conditions.

2. All quality control measures are assessed and evaluated on an on-going basis and quality control acceptance criteria are used.
3. The laboratory has procedures for the development of acceptance/rejection criteria where no method or regulatory criteria exist.
4. The quality control protocols specified by the laboratory's SOP shall be followed. The laboratory ensures that the essential standards outlined in the Technical Module of the Standards (TNI or DOD V1M4, as applicable) or mandated methods or regulations (whichever are more stringent) are incorporated into their test method SOPs. When it is not apparent which is more stringent, the QC in the mandated method or regulations is to be followed.

D. Instruments are calibrated as described in Section 5.5 of this QAM and detailed in Calscience SOP T020, Internal Quality Control Checks, current version, and the laboratory method SOPs.
E. Batch QC samples are prepared with each preparation batch prepared in the laboratory. A preparation batch is a batch of samples of the same quality system matrix not to exceed a total of 20 field samples. QC samples are not counted as part of the twenty. Unless otherwise specified and justified in the test method SOP, the following QC samples are required. The test method SOP may reduce or increase this requirement.
1. Each batch must contain, where applicable; a Laboratory Control Sample, a Method Blank, a Matrix Spike sample and a Matrix Spike Duplicate or Matrix Duplicate sample. The preparation and specific evaluation criteria for each of these QC sample types are detailed in the laboratory method SOPs.
2. All quality control measures must be assessed and evaluated while analyses are on-going. Laboratory personnel use bench sheets or instrument software to record all raw data. These systems include the recording and evaluating of QC data at the same time as the sample data. QC data is used to determine the usability of sample data as described later in this section.
3. Specific requirements for QC samples and their evaluation are included in the Calscience SOP T020, Internal Quality Control Checks, current version

F. Limits of Detection and Limits of Quantitation
1. The laboratory uses a combination of Limits of Detection and Limits of Quantitation ("Reporting Limits") to convey sensitivity for each analysis performed in the laboratory. Specific requirements and instructions for the determination of these limits are contained in the Calscience SOP T006, Determination of Detection Limits, current version and QAD-0018, New MDL Procedure (After the 2017 MUR).

5.10) Reporting of Results

A. General Considerations
1. The result of each environmental test must be reported accurately, clearly, unambiguously and objectively as well as in accordance with any specific instructions included in the test method.

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2. The results shall be reported in a test report and shall include all the information requested by the customer and necessary for the interpretation of the test results and all information required by the method used. This information is normally that required by 5.10.B, and 5.10.C or 5.10.D, below.
3. Instructions for generating test reports are located in the Calscience SOP-T063, LIMS, current revision. See also SOP-T009, Significant Figures, Rounding, and Reporting of Results; SOP-T025, Reporting of Tentatively Identified Compounds (TICs); and T-026, Reporting of Data Qualifiers.

B. Test Reports
1. Each test report shall include at least the following information. An exception is taken when "Preliminary Results" are provided to meet customer's rush turn-around time requests. Preliminary reports are labeled as such on the cover and are always followed by the complete final report.
   a. A Title. This laboratory titles its reports "Analytical Report"
   b. The name and address of the laboratory;
   c. The Work Order number is the unique identification of the test report. It is displayed on each page in order to ensure that the page is recognized as a part of the test report. Report pages are numbered as 1 of n, where "n" is the total number of pages.
   d. The name and address of the customer;
   e. identification of the test method used;
   f. description of, the condition of, and unambiguous identification of the samples tested;
   g. the date of receipt of the samples where this is critical to the validity and application of the results (See 5.10.K below), and the date(s) of performance of the analysis or different analytical steps, as applicable;
   h. reference to the sampling plan and procedures used by the laboratory or other bodies where these are relevant to the validity or application of the results (this is rare in this laboratory);
   i. the analytical results with the units of measurement;
2. the name(s), function(s) and signature(s) or equivalent identification of person(s) authorizing the test report or calibration certificate;
   a. where relevant, a statement to the effect that the results relate only to the samples tested;
   b. a statement specifying that the client is specifically prohibited from making material changes to the report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise.

C. Test Reports
1. In addition to the requirements listed in 5.10.B, test reports shall, where necessary for the interpretation of the test results, include the following:
   a. Deviations from, additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions;
   b. Where relevant, a statement of compliance/non-compliance with requirements and/or specifications;
   c. Where applicable, a statement on the estimated uncertainty of measurement. (Note: estimation of uncertainty in measurement is addressed in Section 5.6 of this document); information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a customer's instruction so requires, or when the uncertainty affects compliance to a specification limit;
   d. Additional information which may be required by specific methods, customers or groups of customers.

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2. In addition to the requirements listed in 5.10.B and 5.10.C.1, test reports containing the results of sampling shall include the following, where necessary for the interpretation of test results:
   a. The date of sampling.
   b. The customer's reference to the sampling site and other information as noted on the Chain of Custody.
   c. Any details of conditions during sampling or any deviations, additions or exclusions from the specified sampling plan.

D. The TNI standard notes that the section in ISO 17025 regarding Calibration Certificates (ISO/IEC 17025:2005(E), Clause 5.10.4) does not apply to environmental testing activities.
E. The laboratory does not offer opinions or interpretations of the data reported.
F. When the analytical report contains results of tests performed by subcontractors, these results are clearly identified. The subcontractor must report the results either in writing or electronically.
G. Electronic transmission of results
   1. In the case of transmission of test or calibration results by telephone, e-mail, facsimile or other electronic or electromagnetic means, the requirements of this section (see also Section 5.4.G) shall be met.
   2. Most reports are submitted by electronic mail to the person requesting the analysis. Results may not be submitted to any other entities without the approval of the original requestor. A record of this approval must be maintained by the laboratory.
   3. Electronic mail transmissions are accompanied by statements regarding confidentiality and privacy of information.
H. Format of reports The format of the reports is designed to accommodate each type of test carried out and to minimize the possibility of misunderstanding or misuse.
I. Amendments to test reports and calibration certificates,
   1. When required, amendments are made by regenerating the entire report. Amended reports are labeled on the cover as "Supplemental Report #" where "#" is a sequential number, starting with 1. The Work Order number is also listed and the electronic file name is incremented with "_s#" to clearly identify the revision.
   2. Such amendments are designed to meet all the requirements of this International Standard.
J. While rare, it is possible that Calscience may be requested to produce abbreviated report at some times. If the request arises, Calscience will maintain all of the information that would be required for the full report.
K. Additional Requirements
   1. Reports must also include the following information, when applicable.
      a. Time of sample preparation and/or analysis if the required holding time for either activity is less than or equal to seventy-two (72) hours.
      b. Results that are reported on a basis other than as received (e. g., dry weight).
      c. Any non-accredited tests shall be clearly identified as such to the client when claims of accreditation to this Standard are made in the analytical report or in the supporting electronic or hardcopy deliverables.
      d. Clear identification of numerical results with values outside the calibration range.

6) Appendices

A. Appendix 1 -- Definitions
B. Appendix 2 -- Job Descriptions of Key Personnel
C. Appendix 3 -- List of Physical Locations
D. Appendix 4 -- Organizational Chart

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Version history

Version	Approval	Revision information
7	28.DEC.2018	
8	19.FEB.2019	Updated DoD sections to QSM v5.1. Inserted missing sections from TNI EL-V1-2009.
8.1	01.JUL.2020	

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CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Interim

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins Calscience, LLC

7440 Lincoln Way

Garden Grove, CA 92841-1427

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2944**

Expiration Date: **9/30/2021**

Effective Date: **10/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Eurofins Calscience, LLC

7440 Lincoln Way
Garden Grove, CA 92841-1427
Phone: 7148955494

Certificate No. **2944**
Expiration Date **9/30/2021**
INTERIM

Field of Testing: 102 - Inorganic Chemistry of Drinking Water			
102.040	003	Chlorate	EPA 300.1
102.045	001	Perchlorate	EPA 314.0
102.047	001	Perchlorate	EPA 331.0
102.264	001	Organic Carbon-Total (TOC)	SM 5310 D-2000
102.265	001	Dissolved Organic Carbon (DOC)	SM 5310 D-2000
Field of Testing: 103 - Toxic Chemical Elements of Drinking Water			
103.140	019	Strontium	EPA 200.8
Field of Testing: 104 - Volatile Organic Chemistry of Drinking Water			
104.030	001	1,2-Dibromoethane (EDB)	EPA 504.1
104.030	002	1,2-Dibromo-3-chloropropane (DBCP)	EPA 504.1
104.035	001	1,2,3-Trichloropropane (TCP)	SRL 524M-TCP
104.040	001	Benzene	EPA 524.2
104.040	007	n-Butylbenzene	EPA 524.2
104.040	008	sec-Butylbenzene	EPA 524.2
104.040	009	tert-Butylbenzene	EPA 524.2
104.040	010	Carbon Tetrachloride	EPA 524.2
104.040	011	Chlorobenzene	EPA 524.2
104.040	015	2-Chlorotoluene	EPA 524.2
104.040	016	4-Chlorotoluene	EPA 524.2
104.040	019	1,3-Dichlorobenzene	EPA 524.2
104.040	020	1,2-Dichlorobenzene	EPA 524.2
104.040	021	1,4-Dichlorobenzene	EPA 524.2
104.040	022	Dichlorodifluoromethane	EPA 524.2
104.040	023	1,1-Dichloroethane	EPA 524.2
104.040	024	1,2-Dichloroethane	EPA 524.2
104.040	025	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 524.2
104.040	026	cis-1,2-Dichloroethylene (cis 1,2 Dichloroethene)	EPA 524.2
104.040	027	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 524.2
104.040	028	Dichloromethane (Methylene Chloride)	EPA 524.2
104.040	029	1,2-Dichloropropane	EPA 524.2
104.040	033	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 524.2
104.040	034	trans-1,3-Dichloropropylene (trans-1,3 Dichloropropene)	EPA 524.2
104.040	035	Ethylbenzene	EPA 524.2

104.040	037	Isopropylbenzene	EPA 524.2
104.040	039	Naphthalene	EPA 524.2
104.040	041	N-propylbenzene	EPA 524.2
104.040	042	Styrene	EPA 524.2
104.040	043	1,1,1,2-Tetrachloroethane	EPA 524.2
104.040	044	1,1,2,2-Tetrachloroethane	EPA 524.2
104.040	045	Tetrachloroethylene (Tetrachloroethene)	EPA 524.2
104.040	046	Toluene	EPA 524.2
104.040	047	1,2,3-Trichlorobenzene	EPA 524.2
104.040	048	1,2,4-Trichlorobenzene	EPA 524.2
104.040	049	1,1,1-Trichloroethane	EPA 524.2
104.040	050	1,1,2-Trichloroethane	EPA 524.2
104.040	051	Trichloroethylene (Trichloroethene)	EPA 524.2
104.040	052	Trichlorofluoromethane	EPA 524.2
104.040	054	1,2,4-Trimethylbenzene	EPA 524.2
104.040	055	1,3,5-Trimethylbenzene	EPA 524.2
104.040	056	Vinyl Chloride	EPA 524.2
104.040	059	o-Xylene	EPA 524.2
104.040	063	m+p-Xylene	EPA 524.2
104.045	001	Bromodichloromethane	EPA 524.2
104.045	002	Bromoform	EPA 524.2
104.045	003	Chloroform	EPA 524.2
104.045	004	Dibromochloromethane (Chlorodibromomethane)	EPA 524.2
104.050	002	Methyl tert-butyl Ether (MTBE)	EPA 524.2
104.050	003	tert-Amyl Methyl Ether (TAME)	EPA 524.2
104.050	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.2
104.050	005	Trichlorotrifluoroethane (Freon 113)	EPA 524.2
104.050	006	tert-Butyl Alcohol (TBA)	EPA 524.2

Field of Testing: 105 - Semi-volatile Organic Chemistry of Drinking Water

105.085	001	1,4-Dioxane	EPA 522

Field of Testing: 108 - Inorganic Constituents in Non-Potable Water

108.001	001	Specific Conductance	EPA 120.1 (1982 Rev.1.0)
108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)
108.013	003	Phosphorus,Total	EPA 200.7 (1994 Rev. 4.4)
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)
108.013	005	Silica, Dissolved	EPA 200.7 (1994 Rev. 4.4)
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)
108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)
108.015	005	Sodium	EPA 200.8 (1994 Rev. 5.4)

108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	005	Nitrate-Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	007	Phosphate,Ortho (as P)	EPA 300.0 (1993 Rev. 2.1)
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)
108.025	001	Ammonia (as N)	EPA 350.1 (1993 Rev. 2.0)
108.029	001	Kjeldahl Nitrogen,Total (as N)	EPA 351.2 (1993 Rev. 2.0)
108.035	001	Phosphate,Ortho (as P)	EPA 365.1 (1993 Rev. 2.0)
108.035	002	Phosphorus,Total	EPA 365.1 (1993 Rev. 2.0)
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)
108.047	001	Phenols, Total	EPA 420.1 (1978 Rev. 1.0)
108.053	001	Oil & Grease Total	EPA 1664 A
108.055	001	Color	SM 2120 B-2011
108.059	001	Turbidity	SM 2130 B-2011
108.063	001	Alkalinity	SM 2320 B-2011
108.065	001	Hardness (Calculation)	SM 2340 B-2011
108.067	001	Hardness	SM 2340 C-2011
108.069	001	Specific Conductance	SM 2510 B-2011
108.071	001	Residue, Total	SM 2540 B-2011
108.073	001	Residue, Filterable TDS	SM 2540 C-2011
108.075	001	Residue, Non-filterable TSS	SM 2540 D-2011
108.077	001	Residue, Volatile	SM 2540 E-2011
108.079	001	Residue, Settleable	SM 2540 F-2011
108.109	001	Chlorine, Total Residual	SM 4500-Cl F-2011
108.117	001	Chloride	SM 4500-Chloride C-2011
108.125	001	Cyanide, Total	SM 4500-CN E-2011
108.131	001	Fluoride	SM 4500-F C-2011
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011
108.139	001	Ammonia (as N)	SM 4500-NH3 C-2011
108.139	002	Kjeldahl Nitrogen,Total (as N)	SM 4500-NH3 C-2011
108.140	001	Ammonia (as N)	SM 4500-NH3 D-2011
108.153	001	Nitrite (as N)	SM 4500-NO2 B-2011
108.157	001	Nitrate-Nitrite (as N)	SM 4500-NO3 E-2011
108.157	002	Nitrite (as N)	SM 4500-NO3 E-2011
108.173	001	Oxygen, Dissolved	SM 4500-O G-2011
108.175	001	Phosphate,Ortho (as P)	SM 4500-P E-2011
108.175	002	Phosphorus,Total	SM 4500-P E-2011
108.201	001	Sulfide (as S)	SM 4500-S D-2011
108.207	001	Biochemical Oxygen Demand	SM 5210 B-2011

108.207	002	Carbonaceous BOD	SM 5210 B-2011
108.219	001	Organic Carbon-Total (TOC)	SM 5310 D-2011
108.225	001	Surfactants	SM 5540 C-2011

Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water

109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)
109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)
109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)
109.625	006	Boron	EPA 200.8 (1994 Rev. 5.4)
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)

109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)
109.629	001	Chromium VI (Hexavalent Chromium)	EPA 218.6 (1994 Rev. 3.3)
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)
109.693	001	Iron	SM 3500-Fe B-2011

Field of Testing: 110 - Volatile Organic Constituents in Non-Potable Water

110.020	001	Benzene	EPA 602
110.020	006	Ethylbenzene	EPA 602
110.020	007	Toluene	EPA 602
110.040	001	Acetone	EPA 624.1
110.040	003	Acrolein	EPA 624.1
110.040	004	Acrylonitrile	EPA 624.1
110.040	005	Benzene	EPA 624.1
110.040	006	Bromodichloromethane	EPA 624.1
110.040	007	Bromoform	EPA 624.1
110.040	008	Bromomethane (Methyl Bromide)	EPA 624.1
110.040	009	tert-Butyl Alcohol (TBA)	EPA 624.1
110.040	010	Carbon Tetrachloride	EPA 624.1
110.040	011	Chlorobenzene	EPA 624.1
110.040	012	Chloroethane	EPA 624.1
110.040	013	2-Chloroethyl vinyl Ether	EPA 624.1
110.040	014	Chloroform	EPA 624.1
110.040	015	Chloromethane (Methyl Chloride)	EPA 624.1
110.040	016	Dibromochloromethane (Chlorodibromomethane)	EPA 624.1
110.040	017	1,2-Dichlorobenzene	EPA 624.1
110.040	018	1,3-Dichlorobenzene	EPA 624.1
110.040	019	1,4-Dichlorobenzene	EPA 624.1
110.040	020	1,1-Dichloroethane	EPA 624.1
110.040	021	1,2-Dichloroethane	EPA 624.1
110.040	022	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 624.1
110.040	023	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 624.1
110.040	024	1,2-Dichloropropane	EPA 624.1
110.040	025	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 624.1
110.040	026	trans-1,3-Dichloropropylene (trans-1,3 Dichloropropene)	EPA 624.1
110.040	029	Ethylbenzene	EPA 624.1
110.040	031	Methylene Chloride (Dichloromethane)	EPA 624.1
110.040	032	4-Methyl-2-pentanone (MIBK)	EPA 624.1
110.040	034	1,1,2,2-Tetrachloroethane	EPA 624.1

110.040	035	Tetrachloroethylene (Tetrachloroethene)	EPA 624.1
110.040	037	Toluene	EPA 624.1
110.040	038	1,1,1-Trichloroethane	EPA 624.1
110.040	039	1,1,2-Trichloroethane	EPA 624.1
110.040	040	Trichloroethylene (Trichloroethene)	EPA 624.1
110.040	041	Vinyl Chloride	EPA 624.1
110.040	043	o-Xylene	EPA 624.1
110.040	045	Trichlorofluoromethane	EPA 624.1
110.040	046	m+p-Xylene	EPA 624.1
110.040	047	2-Butanone (MEK)	EPA 624.1

Field of Testing: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.055	001	Aldrin	EPA 608.3
111.055	002	alpha-BHC	EPA 608.3
111.055	003	beta-BHC	EPA 608.3
111.055	004	delta-BHC	EPA 608.3
111.055	005	gamma-BHC (Lindane)	EPA 608.3
111.055	006	Chlordane	EPA 608.3
111.055	007	4,4'-DDD	EPA 608.3
111.055	008	4,4'-DDE	EPA 608.3
111.055	009	4,4'-DDT	EPA 608.3
111.055	010	Dieldrin	EPA 608.3
111.055	011	Endosulfan I	EPA 608.3
111.055	012	Endosulfan II	EPA 608.3
111.055	013	Endosulfan Sulfate	EPA 608.3
111.055	014	Endrin	EPA 608.3
111.055	015	Endrin Aldehyde	EPA 608.3
111.055	016	Heptachlor	EPA 608.3
111.055	017	Heptachlor Epoxide	EPA 608.3
111.055	019	PCB-1016	EPA 608.3
111.055	020	PCB-1221	EPA 608.3
111.055	021	PCB-1232	EPA 608.3
111.055	022	PCB-1242	EPA 608.3
111.055	023	PCB-1248	EPA 608.3
111.055	024	PCB-1254	EPA 608.3
111.055	025	PCB-1260	EPA 608.3
111.055	046	Methoxychlor	EPA 608.3
111.055	060	Toxaphene	EPA 608.3
111.070	001	Acenaphthene	EPA 610
111.070	002	Acenaphthylene	EPA 610
111.070	003	Anthracene	EPA 610
111.070	004	Benzo(a)anthracene	EPA 610
111.070	005	Benzo(a)pyrene	EPA 610

111.070	006	Benzo(b)fluoranthene	EPA 610
111.070	007	Benzo(g,h,i)perylene	EPA 610
111.070	008	Benzo(k)fluoranthene	EPA 610
111.070	009	Chrysene	EPA 610
111.070	010	Dibenzo(a,h)anthracene	EPA 610
111.070	011	Fluoranthene	EPA 610
111.070	012	Fluorene	EPA 610
111.070	013	Indeno(1,2,3-c,d)pyrene	EPA 610
111.070	014	Naphthalene	EPA 610
111.070	015	Phenanthrene	EPA 610
111.070	016	Pyrene	EPA 610
111.160	001	Acenaphthene	EPA 625.1
111.160	002	Acenaphthylene	EPA 625.1
111.160	003	Anthracene	EPA 625.1
111.160	004	Benzidine	EPA 625.1
111.160	005	Benzo(a)anthracene	EPA 625.1
111.160	006	Benzo(a)pyrene	EPA 625.1
111.160	007	Benzo(b)fluoranthene	EPA 625.1
111.160	008	Benzo(g,h,i)perylene	EPA 625.1
111.160	009	Benzo(k)fluoranthene	EPA 625.1
111.160	010	Bis(2-chloroethoxy) Methane	EPA 625.1
111.160	011	Bis(2-chloroethyl) Ether	EPA 625.1
111.160	012	Bis(2-chloroisopropyl) Ether	EPA 625.1
111.160	013	Bis(2-ethylhexyl)phthalate	EPA 625.1
111.160	014	4-Bromophenyl Phenyl Ether	EPA 625.1
111.160	015	Butyl Benzyl Phthalate	EPA 625.1
111.160	016	2-Chloronaphthalene	EPA 625.1
111.160	017	4-Chlorophenyl Phenyl Ether	EPA 625.1
111.160	018	Chrysene	EPA 625.1
111.160	019	Dibenzo(a,h)anthracene	EPA 625.1
111.160	020	3,3'-Dichlorobenzidine	EPA 625.1
111.160	021	Diethyl Phthalate	EPA 625.1
111.160	022	Dimethyl Phthalate	EPA 625.1
111.160	023	Di-n-butyl Phthalate	EPA 625.1
111.160	024	2,4-Dinitrotoluene	EPA 625.1
111.160	025	2,6-Dinitrotoluene	EPA 625.1
111.160	026	Di-n-octyl Phthalate	EPA 625.1
111.160	027	Fluoranthene	EPA 625.1
111.160	028	Fluorene	EPA 625.1
111.160	029	Hexachlorobenzene	EPA 625.1
111.160	030	Hexachlorobutadiene	EPA 625.1
111.160	031	Hexachloroethane	EPA 625.1

111.160	032	Indeno(1,2,3-c,d)pyrene	EPA 625.1
111.160	033	Isophorone	EPA 625.1
111.160	034	Naphthalene	EPA 625.1
111.160	035	Nitrobenzene	EPA 625.1
111.160	036	N-nitrosodi-n-propylamine	EPA 625.1
111.160	037	Phenanthrene	EPA 625.1
111.160	038	Pyrene	EPA 625.1
111.160	039	1,2,4-Trichlorobenzene	EPA 625.1
111.160	040	4-Chloro-3-methylphenol	EPA 625.1
111.160	041	2-Chlorophenol	EPA 625.1
111.160	042	2,4-Dichlorophenol	EPA 625.1
111.160	043	2,4-Dimethylphenol	EPA 625.1
111.160	044	2,4-Dinitrophenol	EPA 625.1
111.160	045	2-Methyl-4,6-dinitrophenol	EPA 625.1
111.160	046	2-Nitrophenol	EPA 625.1
111.160	047	4-Nitrophenol	EPA 625.1
111.160	048	Pentachlorophenol	EPA 625.1
111.160	049	Phenol	EPA 625.1
111.160	050	2,4,6-Trichlorophenol	EPA 625.1
111.160	098	Hexachlorocyclopentadiene	EPA 625.1
111.160	108	N-nitrosodimethylamine	EPA 625.1
111.160	110	N-nitrosodiphenylamine	EPA 625.1
111.160	140	Carbazole	EPA 625.1
111.160	141	o-Cresol	EPA 625.1
111.160	143	1,2-Diphenylhydrazine	EPA 625.1
111.160	145	Pyridine	EPA 625.1
111.260	041	N-nitrosodimethylamine	EPA 1625 B

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B
114.010	002	Arsenic	EPA 6010 B
114.010	003	Barium	EPA 6010 B
114.010	004	Beryllium	EPA 6010 B
114.010	005	Cadmium	EPA 6010 B
114.010	006	Chromium	EPA 6010 B
114.010	007	Cobalt	EPA 6010 B
114.010	008	Copper	EPA 6010 B
114.010	009	Lead	EPA 6010 B
114.010	010	Molybdenum	EPA 6010 B
114.010	011	Nickel	EPA 6010 B
114.010	012	Selenium	EPA 6010 B
114.010	013	Silver	EPA 6010 B
114.010	014	Thallium	EPA 6010 B

114.010	015	Vanadium	EPA 6010 B	
114.010	016	Zinc	EPA 6010 B	
114.020	001	Antimony	EPA 6020	
114.020	002	Arsenic	EPA 6020	
114.020	003	Barium	EPA 6020	
114.020	004	Beryllium	EPA 6020	
114.020	005	Cadmium	EPA 6020	
114.020	006	Chromium	EPA 6020	
114.020	007	Cobalt	EPA 6020	
114.020	008	Copper	EPA 6020	
114.020	009	Lead	EPA 6020	
114.020	010	Molybdenum	EPA 6020	
114.020	011	Nickel	EPA 6020	
114.020	012	Selenium	EPA 6020	
114.020	013	Silver	EPA 6020	
114.020	014	Thallium	EPA 6020	
114.020	015	Vanadium	EPA 6020	
114.020	016	Zinc	EPA 6020	
114.103	001	Chromium VI (Hexavalent Chromium)	EPA 7196 A	
114.106	001	Chromium VI (Hexavalent Chromium)	EPA 7199	
114.140	001	Mercury	EPA 7470 A	Aqueous Only
114.141	001	Mercury	EPA 7471 A	
114.222	001	Cyanide, Total	EPA 9014	
114.241	001	Corrosivity - pH Determination	EPA 9045 C	
114.250	001	Fluoride	EPA 9056	
114.280	001	Organic Lead	HML 939-M	

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311	
115.021	001	TCLP Inorganics	EPA 1311	
115.022	001	TCLP Extractables	EPA 1311	
115.023	001	TCLP Volatiles	EPA 1311	
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II	
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312	

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.020	030	Nonhalogenated Volatiles	EPA 8015 B	
116.030	001	Gasoline Range Organics (GRO)	EPA 8015 B	
116.040	041	Methyl tert-butyl Ether (MTBE)	EPA 8021 B	
116.040	061	Aromatic Volatiles	EPA 8021 B	
116.040	062	BTEX	EPA 8021 B	
116.080	000	Volatile Organic Compounds	EPA 8260 B	
116.080	120	Oxygenates	EPA 8260 B	
116.100	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT GC/MS	

116.100	010	BTEX and MTBE	LUFT GC/MS
116.110	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel Range Organics (DRO)	EPA 8015 B
117.016	001	Diesel Range Organics (DRO)	LUFT
117.110	000	Extractable Organics	EPA 8270 C
117.140	000	Polynuclear Aromatic Hydrocarbons	EPA 8310
117.170	000	Nitroaromatics and Nitramines	EPA 8330
117.171	000	Nitroaromatics and Nitramines	EPA 8330 A
117.210	000	Organochlorine Pesticides	EPA 8081 A
117.220	000	PCBs	EPA 8082
117.240	000	Organophosphorus Pesticides	EPA 8141 A
117.250	000	Chlorinated Herbicides	EPA 8151 A

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.040	001	Reactive Cyanide	Section 7.3 SW-846
120.050	001	Reactive Sulfide	Section 7.3 SW-846
120.080	001	Corrosivity - pH Determination	EPA 9045 C

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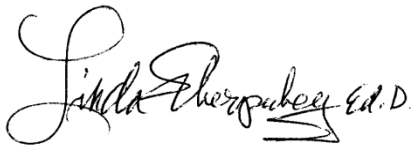

2020-04-01

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2020-04-01

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19.3	Laboratory Methods Manual	V1M2 Sec. 4.2.8.5 2016 V1M2 Sec. 5.4.4.2		6.2.3	82
19.4	Selection of Methods	V1M2 Secs. 4.13.3; 5.4.1; 5.4.2; 5.4.3; 5.4.4 V1M4 Secs. 1.4; 1.5.1; 1.6.1; 1.6.2; 1.6.2.1; 1.6.2.2	5.4.1; 5.4.2; 5.4.3; 5.4.4; 5.4.5.1; 5.4.5.2; 5.4.5.3	7.2.1.2; 7.2.1.3; 7.2.1.4 to 7.2.1.7; 7.2.2.1 to 7.2.2.7	83
19.5	Laboratory Developed Methods and Non-Standard Methods	V1M2 Sec. 5.4.2 2016 V1M2 Secs. 5.4.4.1; 5.4.4.2 V1M4 Sec. 1.5.1	5.4.2; 5.4.4; 5.4.5.2; 5.4.5.3	7.2.1.2; 7.2.1.4 to 7.2.1.7; 7.2.2.1; 7.2.2.3; 8.2.5	86
19.6	Validation of Methods	V1M2 Sec. 5.4.2 2016 V1M2 Sec. 5.4.5.4 V1M4 Secs. 1.5.1; 1.5.2; 1.5.2.1; 1.5.2.2; 1.5.3	5.4.2; 5.4.4; 5.4.5.2; 5.4.5.3	7.2.1.2 to 7.2.1.6; 7.2.2.1 to 7.2.2.4	86
19.7	Method Detection Limit (MDL) / Limit of Detection (LOD)	V1M2 Sec. 5.9.3 V1M4 Secs. 1.5.2; 1.5.2.1; 1.5.2.2	5.4.5.3	7.2.2.3	88
19.8	Verification of Detection Limits	V1M2 Sec. 5.9.3			88
19.9	Instrument Detection Limits (IDL)	V1M2 Sec. 5.9.3 V1M4 Sec. 1.5.2.1			88
19.10	Limit of Quantitation	V1M2 Sec. 5.9.3 V1M4 Sec. 1.5.2.2			89
19.11	Retention Time Windows	V1M2 Sec. 5.9.3 V1M4 Secs. 1.5.4 2009 V1M4 Sec. 1.7.3.6 2016 V1M4 Sec. 1.7.2.6			89
19.12	Evaluation of Selectivity	V1M2 Sec. 5.9.3 V1M4 Secs. 1.5.4 2009 V1M4 Sec. 1.7.3.6 2016 V1M4 Sec. 1.7.2.6			89
19.13	Estimation of Uncertainty of Measurement	V1M2 Secs. 5.1.1; 5.1.2; 5.4.6	5.1.1; 5.1.2; 5.4.6.1; 5.4.6.2; 5.4.6.3	7.6.1; 7.6.2; 7.6.3	89
19.14	Sample Reanalysis Guidelines	V1M2 Sec 5.9.1	5.9.1		90

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REFERENCED CORPORATE SOPs AND POLICIES

SOP / Policy Reference	Title
CA-C-S-001	Work Sharing Process
CA-I-P-002	Electronic Reporting and Signature Policy
CA-L-P-002	Contract Compliance Policy
CA-Q-M-002	Corporate Quality Management Plan
CA-Q-QM-001	Policy on Tentatively Identified Compounds (TICs) – GC/MS Analysis
CA-Q-S-001	Acid and Solvent Lot Testing and Approval Program
CA-Q-S-002	Manual Integrations
CA-Q-S-006	Detection and Quantitation Limits
CA-Q-S-009	Root Cause Analysis
CA-T-P-001	Qualified Products List
CW-E-M-001	Corporate Environmental Health & Safety Manual
CW-F-P-002	Company-Wide Authorization Matrix
CW-F-P-004	Procurement and Contracts Policy

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SOP / Policy Reference	Title
CW-F-S-007	Fixed Asset Acquisition, Retention and Safeguarding
CW-I-M-001	IT Change Control Procedure Manual
CW-L-P-001	Records Retention Policy
CW-L-P-004	Ethics Policy
CW-L-S-002	Internal Investigation
CW-L-S-004	Subcontracting
CW-Q-S-001	Corporate Document Control and Archiving
CW-Q-S-002	Writing a Standard Operating Procedure (SOPs)
CW-Q-S-003	Internal Auditing
CW-Q-S-004	Management Systems Review
CW-Q-S-005	Data Recall Process

REFERENCED LABORATORY SOPs

SOP Reference	Title
IR-QA-DOC	Document Control and Review
IR-QA-CNTRLLIM	Control Charts and Statistical Process Control
IR-QA-ARCH	Record Archiving
IR-IT-COMPUSEC	Computer Security and Software Maintenance
IR-QA-BAL	Balance Calibration, Verification and Documentation
IR-QA-THERMA	Thermometer Calibration, Temperature Monitoring, and Documentation
IR-QA-PIPET	Pipette, Syringe, and Dispenser Calibration
IR-QA-TRAIN	Training and Documentation
IR-QA-LOTTEST	Container and Reagent Verification by Lot Testing
IR-QA-STDCNTRL	Reagent and Standard Preparation, Control and Documentation
IR-SC-FIELD	Field Sampling and Testing
IR-QA-SUBSAMP	Subsampling, Compositing and Homogenization
IR-SC-LOGIN	Sample Login
IR-EHS-WASTE	Hazardous Waste Disposal

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SECTION 3. INTRODUCTION, SCOPE AND APPLICABILITY

3.1 Introduction and Compliance References

Eurofins Calscience Irvine's Quality Assurance Manual (QAM) is a document prepared to define the overall policies, organization objectives and functional responsibilities for achieving Eurofins' data quality goals. The laboratory maintains a local perspective in its scope of services and client relations and maintains a national perspective in terms of quality.

The QAM has been prepared to assure compliance with The NELAC Institute (TNI) Standard, dated 2009, Volume 1 Modules 2 and 4, and ISO/IEC Guide 17025:2017. In addition, the policies and procedures outlined in this manual are compliant with Eurofins Environment Testing America's Corporate Quality Management Plan (CQMP) and the various accreditation and certification programs listed in Appendix 3. The CQMP provides a summary of Eurofins' quality and data integrity system. It contains requirements and general guidelines under which all Eurofins facilities shall conduct their operations.

The QAM has been prepared to be consistent with the requirements of the following documents:

- ANSI/ASQC, E4-1994, "Specifications and Guidelines for Quality Management Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995, or most recent version).
- "EPA Requirements for Quality Management Programs" (QA/R-2) (EPA/240/B-01/002, May 31, 2006).
- EPA 600/4-88/039, *Methods for the Determination of Organic Compounds in Drinking Water,* EPA, Revised July 1991.
- EPA 600/R-95/131, *Methods for the Determination of Organic Compounds in Drinking Water,* Supplement III, EPA, August 1995.
- EPA 600/4-79-019, *Handbook for Analytical Quality Control in Water and Wastewater Laboratories,* EPA, March 1979.
- *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, September 1986, Final Update I, July 1992, Final Update IIA, August 1993, Final Update II, September 1994; Final Update IIB, January 1995; Final Update III, December 1996; Final Update IV, January 2008; Final Update V, August 2015.*
- Federal Register, 40 CFR Parts 136, 141, 172, 173, 178, 179 and 261.
- *Manual for the Certification of Laboratories Analyzing Drinking Water (EPA 815-R-05-004, January 2005).*
- *Statement of Work for Inorganics & Organics Analysis, SOM and ISM, current versions, USEPA Contract Laboratory Program Multi-media, Multi-concentration.*
- APHA, *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 19th, 20th, 21st, 22nd and on-line Editions.
- Toxic Substances Control Act (TSCA).

3.2 Terms and Definitions

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A Quality Assurance Program is a company-wide system designed to ensure that data produced by the laboratory conforms to the standards set by state and/or federal regulations. The program functions at the management level through company goals and management policies, and at the analytical level through Standard Operating Procedures (SOPs) and quality control. The Eurofins program is designed to minimize systematic error, encourage constructive, documented problem solving, and provide a framework for continuous improvement within the organization.

Refer to Appendix 2 for the Glossary/Acronyms.

3.3 Scope / Fields of Testing

The laboratory analyzes a broad range of environmental and industrial samples. Sample matrices vary among air, drinking water, effluent water, groundwater, hazardous waste, sludge and soils. The Quality Assurance Program contains specific procedures and methods to test samples of differing matrices for chemical and physical parameters. The Program also contains guidelines on maintaining documentation of analytical processes, reviewing results, servicing clients and tracking samples through the laboratory. The technical and service requirements of all analytical requests are thoroughly evaluated before commitments are made to accept the work. Measurements are made using published reference methods or methods developed and validated by the laboratory.

The methods covered by this manual include the most frequently requested methodologies needed to provide analytical services in the United States and its territories. The specific list of test methods used by the laboratory can be found in the laboratory's network shared folder Irvine-QA. The approach of this manual is to define the minimum level of quality assurance and quality control necessary to meet these requirements. All methods performed by the laboratory shall meet these criteria as appropriate. In some instances, quality assurance project plans (QAPPs), project specific data quality objectives (DQOs) or local regulations may require criteria other than those contained in this manual. In these cases, the laboratory will abide by the requested criteria following review and acceptance of the requirements by the Laboratory Director and the Quality Assurance (QA) Manager. In some cases, QAPPs and DQOs may specify less stringent requirements. The Laboratory Director and the QA Manager must determine if it is in the lab's best interest to follow the less stringent requirements.

3.4 Management of the Manual

3.4.1 Review Process

The template on which this manual is based is reviewed annually by Corporate Quality Management Personnel to assure that it remains in compliance with Section 3.1. This manual itself is reviewed annually by senior laboratory management to assure that it reflects current practices and meets the requirements of the laboratory's clients and regulators as well as the CQMP. Occasionally, the manual may need changes in order to meet new or changing regulations and operations. The QA Manager will review the changes in the normal course of business and incorporate changes into revised sections of the document. All updates will be reviewed by the senior laboratory management staff. The laboratory updates and approves such changes according to our Document Control and Review procedures (refer to SOP No. IR-QA-DOC).

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SECTION 4. MANAGEMENT REQUIREMENTS

4.1 Overview

Eurofins Calscience Irvine is a local operating unit of Eurofins Calscience LLC, a business unit of Eurofins Environment Testing America. The organizational structure, responsibilities and authorities of the corporate staff of Eurofins Environment Testing America are presented in the CQMP. The laboratory has day-to-day independent operational authority overseen by corporate officers and Business Unit President. The laboratory operational and support staff work under the direction of the Laboratory Director. The organizational structure for both Corporate & Eurofins Calscience Irvine is presented in Figure 4-1.

4.2 Roles and Responsibilities

In order for the Quality Assurance Program to function properly, all members of the staff must clearly understand and meet their individual responsibilities as they relate to the quality program. The following descriptions briefly define each role in its relationship to the Quality Assurance Program.

4.2.1 Additional Requirements for Laboratories

The responsibility for quality resides with every employee of the laboratory. All employees have access to the QAM, are trained to this manual, and are responsible for upholding the standards therein. Each person carries out his/her daily tasks impartially and in a manner consistent with the goals and in accordance with the procedures in this manual and the laboratory's SOPs. Role descriptions for Corporate personnel are defined in the CQMP. This manual is specific to the operations of Eurofins Calscience Irvine laboratory.

4.2.2 Business Unit President

The Business Unit President represents Eurofins Calscience Irvine to the Eurofins US and Global Corporate entities. The Business Unit President ensures that Eurofins Calscience Irvine's financial and production performance meets assigned metrics, determines need for capital and employee resources and allocates as appropriate, serves as the legal representative for the laboratory, and is responsible for yearly budget and overruns. The Business Unit President is also the point person for major new initiatives. The Business Unit President reports directly to the President of West Coast/South East Regions and Drinking Water Services.

4.2.3 Vice President of Quality and Environmental Health and Safety (VP-QA/EHS)

The Vice President (VP) of QA/EHS reports directly to the Eurofins Senior Vice President. With the aid of the corporate officers, Laboratory Directors, Quality Directors, Safety Managers, EH&S Coordinators and QA Managers, the VP-QA/EHS has the responsibility for the establishment, general overview and Corporate maintenance of the Quality Assurance and EH&S Programs within Eurofins Environment Testing America. Additional responsibilities include:

- Review of QA/QC and EHS aspects of Corporate SOPs & Policies, national projects and expansions or changes in services.

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- Work with various organizations outside of Eurofins to further the development of quality standards and represent Eurofins at various trade meetings.
- Prepare monthly reports for quality and EH&S metrics across the analytical laboratories and a summary of any quality and EH&S related initiatives and issues.
- With the assistance of the Corporate Senior Management Teams and the EHS Managers, development and implementation of the Eurofins Environmental, Health and Safety Program.

4.2.4 Quality Compliance Director

The Quality Compliance Director reports to the VP-QA/EHS. The Quality Compliance Director has QA oversight of laboratories; monitors and communicates DoD/DoE requirements; develops corporate tools for ensuring and improving compliance; develops corporate assessment tools; identifies common laboratory weaknesses; and monitors corrective action closures. Together with the Quality Assessment Director, Quality Systems Director and the VP-QA/EHS, the Quality Compliance Director has the responsibility for the establishment, general overview and maintenance of the Analytical Quality Assurance Program within Eurofins Environment Testing America.

4.2.5 Quality Systems Director

The Quality Systems Director reports to the VP-QA/EHS. The Quality Systems Director has QA oversight of laboratories; develops quality policies, procedures and management tools; monitors and communicates regulatory and certification requirements; identifies common laboratory weaknesses; and monitors corrective action closures. Together with the Quality Assessment Director, Quality Compliance Director and the VP-QA/EHS, the Quality Systems Director has the responsibility for the establishment, general overview and maintenance of the Analytical Quality Assurance Program within Eurofins Environment Testing America.

4.2.6 Quality Information Manager

The Quality Information Manager is responsible for managing all company official documents (e.g., Policies, Procedures, Work Instructions), the company's accreditation database, intranet websites, external laboratory subcontracting, regulatory limits for clients on the company's Total Access website; internal and external client support for various company groups (e.g., Client Services, EH&S, Legal, IT, Sales) for both quality and operational functions. The Quality Information Manager reports to the VP-QA/EHS; and works alongside the Quality Assessment, Quality Compliance and Quality System Directors and EHS Managers to support both the Analytical Quality Assurance and EHS Programs within Eurofins Environment Testing America.

4.2.7 Technical Services Director

The Technical Services Director is responsible for establishing, implementing and communicating Eurofins' Analytical Business' Technical Policies, SOPs, and Manuals. Other responsibilities include conducting technical assessments as required, acting as a technical resource in national contracts review, coordinating new technologies, establishing best practices, advising staff on technology advances, innovations, and applications.

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4.2.8 Environmental Health and Safety Managers (Corporate)

The EHS Managers report directly to the VP-QA/EHS. The EHS Managers are responsible for the development and implementation of the Eurofins Environmental, Health and Safety program. Responsibilities include:

- Consolidation and tracking all safety and health-related information and reports for the company, and managing compliance activities for Eurofins locations.
- Coordination/preparation of the corporate Environmental, Health and Safety Manual Template that is used by each laboratory to prepare its own laboratory-specific Safety Manual/ CHP.
- Preparation of information and training materials for laboratory EHS Coordinators.
- Assistance in the coordination of employee exposure and medical monitoring programs to insure compliance with applicable safety and health regulations.
- Serving as Department of Transportation (D.O.T.) focal point and providing technical assistance to location management.
- Serving as Hazardous Waste Management main contact and providing technical assistance to location management.

4.2.9 Laboratory Director

Eurofins Calscience Irvine's Laboratory Director is responsible for the overall quality, safety, financial, technical, human resource and service performance of the whole laboratory and reports to the Business Unit President. The Laboratory Director is also responsible for any service centers connected with their laboratory that perform analytical tests, such as short holding time analyses for pH. The Laboratory Director provides the resources necessary to implement and maintain an effective and comprehensive Quality Assurance and Data Integrity Program.

Specific responsibilities include, but are not limited to:

- Provide one or more technical managers for the appropriate fields of testing. If the Technical Manager is absent for a period of time exceeding 15 consecutive calendar days, the Laboratory Director must designate another full time staff member meeting the qualifications of the Technical Manager to temporarily perform this function. If the absence exceeds 35 consecutive calendar days, the primary accrediting authority must be notified in writing.
- Ensure that all analysts and supervisors have the appropriate education and training to properly carry out the duties assigned to them and ensure that this training has been documented.
- Ensure that personnel are free from any commercial, financial and other undue pressures which might adversely affect the quality of their work.
- Ensure Eurofins' human resource policies are adhered to and maintained.
- Ensure that sufficient numbers of qualified personnel are employed to supervise and perform the work of the laboratory.

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- Ensure that appropriate corrective actions are taken to address analyses identified as requiring such actions by internal and external performance or procedural audits. Procedures that do not meet the standards set forth in the QAM or laboratory SOPs may be temporarily suspended by the Laboratory Director.
- Review and approve all SOPs prior to their implementation and ensures all approved SOPs are implemented and adhered to.
- Pursue and maintain appropriate laboratory certification and contract approvals. Support ISO 17025 requirements.
- Ensure client specific reporting and quality control requirements are met.
- Captain the management team, consisting of the QA Manager and the Technical Managers as direct reports.
- Evaluate the level of internal/external non-conformances for all departments.
- Continuously evaluate production capacity and improve capacity utilization.
- Continuously evaluate turnaround time and address any problems that may hinder meeting the required and committed turnaround time from the various departments.
- Develop and improve the training of all analysts in cooperation with the Technical Manager and QA Manager and in compliance with regulatory requirements.
- Ensure that scheduled instrument maintenance is completed.
- Manage efficient utilization of supplies.
- Constantly monitor and modify the processing of samples through the departments.

4.2.10 Quality Assurance (QA) Manager or Designee

The QA Manager has responsibility and authority to ensure the continuous implementation of the quality system at the laboratory where they work. The QA Manager is also responsible for any service centers connected with their laboratory that perform analytical tests, such as short holding time analyses for pH.

The QA Manager reports directly to the Laboratory Director and their Corporate Quality Director. This position is able to evaluate data objectively and perform assessments without outside (e.g., managerial) influence. Corporate QA may be used as a resource in dealing with regulatory requirements, certifications and other quality assurance related items. The QA Manager also directs the activities of the QA officers.

Specific responsibilities include, but are not limited to:

- Serve as the focal point for QA/QC in the laboratory.
- Have functions independent from laboratory operations for which he/she has quality assurance oversight.
- Have documented training and/or experience in QA/QC procedures and the laboratory's Quality System.

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- Have a general knowledge of the analytical test methods for which data audit/review is performed (and/or have the means of getting this information when needed).
- Arrange for or conduct internal audits on quality systems and the technical operation.
- Notify the laboratory management of deficiencies in the quality system and ensure corrective action is taken. Procedures that do not meet the standards set forth in the QAM or laboratory SOPs shall be investigated following procedures outlined in Section 12 and if deemed necessary may be temporarily suspended during the investigation.
- Maintain and update the Quality Assurance Manual (QAM).
- Monitor and evaluate laboratory certifications; schedule proficiency testing samples.
- Monitor and communicate regulatory changes that may affect the laboratory to the management.
- Train and advise the laboratory staff on quality assurance/quality control procedures that are pertinent to their daily activities.
- Maintain records of all ethics-related training, including the type and proof of attendance.
- Maintain, improve, and evaluate the corrective action database and the corrective and preventive action systems.
- Objectively monitor standards of performance in quality control and quality assurance without outside (e.g., managerial) influence.
- Coordinate document control of SOPs, MDLs, control limits, and miscellaneous forms and information.
- Performing technical data audits and method audits to ensure consistency and compliance with regulatory requirements.
- Review external audit reports and data validation requests.
- Follow-up with audits to ensure regulatory and/or client QAPP requirements are met.
- Establish reporting schedule and prepare various quality reports for the Laboratory Director, clients and/or Corporate QA.
- Develop suggestions and recommendations to improve quality systems.
- Research current state and federal requirements and guidelines.
- Captain the QA team to enable communication and to distribute duties and responsibilities.
- Communicate and monitor standards of performance to ensure that systems are in place to produce the level of quality as defined in this document.
- Evaluate the thoroughness and effectiveness of training.
- Ensure compliance with ISO 17025.

4.2.11 Technical Manager (i.e., Department Manager) or Designee

The Technical Managers report directly to the Laboratory Director. The Technical Managers (i.e., Department Managers) are accountable for all analyses and analysts under their

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experienced supervision and for compliance with the ISO 17025:2017 Standard. The scope of responsibility ranges from the new-hire process and existing technology through the ongoing training and development programs for existing analysts and new instrumentation.

Specific responsibilities include, but are not limited to:

- Exercise day-to-day supervision of laboratory operations for the appropriate field of accreditation and reporting of results. Coordinate, write, and review the preparation of all test method SOPs with regard to quality, integrity, regulatory and optimum and efficient production techniques, and subsequent analyst training and interpretation of the SOPs for implementation and unusual project samples. Ensures that the SOPs are properly managed and adhered to at the bench. Develop standard costing of SOPs to include supplies, labor, overhead, and capacity (design vs. demonstrated versus first-run yield) utilization.
- Review and approve, with input from the QA Manager, proposals from marketing, in accordance with an established procedure for the review of requests and contracts. This procedure addresses the adequate definition of methods to be used for analysis and any limitations, the laboratory's capability and resources, and the client's expectations. Differences are resolved before the contract is signed and work begins. A system documenting any significant changes is maintained, as well as pertinent discussions with the client regarding their requirements or the results of the analyses during the performance of the contract. All work subcontracted by the laboratory must be approved by the client. Any deviations from the contract must be disclosed to the client. Once the work has begun, any amendments to the contract must be discussed with the client and so documented.
- Monitor the validity of the analyses performed and data generated in the laboratory. This activity begins with reviewing and supporting all new business contracts, ensuring data quality, analyzing internal and external non-conformances to identify root cause issues and implementing the resulting corrective and preventive actions, facilitating the data review process (training, development, and accountability at the bench), and providing technical and troubleshooting expertise on routine and unusual or complex problems.
- Provide training and development programs to applicable laboratory staff as new hires and, subsequently, on a scheduled basis. Training includes instruction on calculations, instrumentation management, troubleshooting and preventive maintenance.
- Enhance efficiency and improve quality through technical advances and improved LIMS utilization. Perform capital forecasting and instrument life cycle planning for second generation methods and instruments as well as asset inventory management.
- Coordinate sample management from "cradle to grave," and ensure no time is lost in locating samples.
- Schedule all QA/QC related requirements for compliance, e.g., MDLs, etc.
- Captain department personnel to communicate quality, technical, personnel, and instrumental issues for a consistent team approach.
- Coordinate audit responses with the QA Manager.
- Ensure compliance with ISO 17025.

4.2.12 Hazardous Waste Coordinator

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The Hazardous Waste Coordinator reports directly to the Laboratory Director.

Specific responsibilities include, but are not limited to:

- Stay current with the hazardous waste regulations.
- Continue training on hazardous waste issues.
- Review and update annually the Hazardous Waste Contingency Plan in the Environmental Health & Safety Manual.
- Audit the staff with regard to compliance with the Hazardous Waste Contingency Plan.
- Contact the hazardous waste subcontractors for review of procedures and opportunities for minimization of waste.

4.2.13 Supervisors

Supervisors report to the Technical Managers.

Specific responsibilities include, but are not limited to:

- Ensure that analysts in their department adhere to applicable SOPs and the QA Manual. They perform frequent SOP and QA Manual review to determine if analysts are in compliance and if new, modified, and optimized measures are feasible and should be added to these documents.
- Participate in the selection, training (as documented in Section 8.1), development of performance objectives and standards of performance, appraisal (measurement of objectives), scheduling, counseling, discipline, and motivation of analysts, and document these activities in accordance with systems developed by the QA and Personnel Departments. Evaluate staffing sufficiency and overtime needs. Conduct trainings consisting of familiarization with SOP, QC, safety, and computer systems.
- Encourage the development of analysts to become cross-trained in various methods and/or operate multiple instruments efficiently while performing maintenance and documentation, self-supervise, and function as a department team.
- Provide guidance to analysts in resolving problems encountered daily during sample preparation/analysis in conjunction with the Technical Manager and/or QA Manager. Each is responsible for 100% of the data review and documentation, non-conformance and CPAR issues, the timely and accurate completion of performance evaluation samples and MDLs, for his/her department.
- Ensure all logbooks are maintained, current, and properly labeled or archived.
- Report all non-conformance conditions to the QA Manager, Technical Manager, and/or Laboratory Director.
- Ensure that preventive maintenance is performed on instrumentation as detailed in the QA Manual or SOPs. Develop and implement a system for preventive maintenance, troubleshooting, and repairing or arranging for repair of instruments.

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- Maintain adequate and valid inventory of reagents, standards, spare parts, and other relevant resources required to perform daily analysis.
- Achieve optimum turnaround time on analyses and compliance with holding times.
- Conduct efficiency and cost control evaluations on an ongoing basis to determine optimization of labor, supplies, overtime, first-run yield, capacity (designed vs. demonstrated), second- and third-generation production techniques/instruments, and long-term needs for budgetary planning.
- Develop, implement, and enhance calibration programs.
- Provide written responses to external and internal audit issues.

4.2.14 Laboratory Analysts

Laboratory analysts are responsible for conducting analysis and performing all tasks assigned to them by the group leader or supervisor.

Specific responsibilities include, but are not limited to:

- Perform analyses by adhering to analytical and quality control protocols prescribed by current SOPs, this QA Manual, and project-specific plans honestly, accurately, timely, safely, and in the most cost-effective manner.
- Document standard and sample preparation, instrument calibration and maintenance, data calculations, sample matrix effects, and any observed non-conformance on worklists, benchsheets, lab notebooks and/or the Non-Conformance Database.
- Report all non-conformance situations, instrument problems, matrix problems and QC failures, which might affect the reliability of the data, to their supervisor, the Technical Manager, and/or the QA Manager or member of QA staff.
- Perform 100% review of the data generated prior to entering and submitting for secondary level review.
- Suggest method improvements to their supervisor, the Technical Manager, and the QA Manager. These improvements, if approved, will be incorporated. Ideas for the optimum performance of their assigned area, for example, through the proper cleaning and maintenance of the assigned instruments and equipment, are encouraged.
- Work cohesively as a team in their department to achieve the goals of accurate results, optimum turnaround time, cost effectiveness, cleanliness, complete documentation, and personal knowledge of environmental analysis.
- Work Cell: A “work cell” is considered to be all those individuals who see a sample through the complete process of preparation, extraction, and analysis. To ensure that the entire preparation, extraction, and analysis process is completed by a group of capable individuals, the laboratory shall ensure that each member of the work cell (including a new member entering an already existing work cell) demonstrates capability in his/her area of responsibility in the sequence. Even though the work cell operates as a “team,” the demonstration of capability at each individual step in the sequence, as performed by each individual analyst/team member, remains of utmost importance. A work cell may NOT be defined as a group of analysts who perform the same step in the same process (for

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example, extractions for Method 8270), represented by one analyst who has demonstrated capability for that step.

4.2.15 Safety Officer or EHS Coordinator

The Safety Officer reports to the Laboratory Director and ensures that systems are maintained for the safe operation of the laboratory.

Specific responsibilities include, but are not limited to:

- Conduct ongoing, necessary safety training and conduct new employee safety orientation.
- Assist in developing and maintaining the Chemical Hygiene/Safety Manual.
- Administer dispersal of all Safety Data Sheet (SDS) information.
- Perform regular chemical hygiene and housekeeping instruction.
- Give instruction on proper labeling and practice.
- Serve as chairman of the laboratory safety committee.
- Provide and train personnel on protective equipment.
- Oversee the inspection and maintenance of general safety equipment – fire extinguishers, safety showers, eyewash fountains, etc. and ensure prompt repairs as needed.
- Supervise and schedule fire drills and emergency evacuation drills.
- Determine what initial and subsequent exposure monitoring, if necessary to determine potential employee exposure to chemicals used in the laboratory.
- When determined necessary, conduct exposure monitoring assessments.
- Determine when a complaint of possible over-exposure is “reasonable” and should be referred for medical consultation.
- Assist in the internal and external coordination of the medical consultation/monitoring program conducted by Eurofins’ medical consultants.

4.2.16 Sample Control/Shipping Supervisor

The Sample Control Supervisor reports to the Laboratory Director and is responsible for the daily activities within the Sample Control department.

Specific responsibilities include, but are not limited to:

- Supervise the courier scheduling, initiation of container lot testing, sample container order preparation, sample receiving and tracking, shipping, login, and other sample management activities.
- Ensure timely and correct shipment of sample containers, including proper preservatives and instructions, to clients. Maintain accurate records of sample container shipments.
- Maintain accurate records of sample container shipments.

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- Supervise the organized storage and appropriate climate control of samples.
- Ensure that all tasks performed by the department are conducted according to the requirements of the QAM, laboratory SOPs, policies, and QAPPs (if applicable).
- Perform frequent SOP reviews to ensure that current practices are consistent with the published SOP. Changes in procedures or deviations from the SOP must be immediately reported to the Operations Manager and the QA Manager for approval and update to the applicable SOP.
- Assist PMs and analysts in resolving inconsistencies and problems with samples received.
- Assist in routing workshare and subcontract analyses.
- Report nonconforming situations to the Operations Manager and the QA Manager.
- Provide written responses to external and internal audit issues.
- Identify, initiate, and implement corrective actions through root-cause analysis and investigations.

4.2.17 Project Manager (PM)

The PM reports to the Manager of Project Management (MPM) and serves as the interface between the laboratory's technical departments and clients. There is an entire staff of Project Managers that makes up the Project Management team with the overall goal of total client satisfaction.

Specific responsibilities include, but are not limited to:

- Ensure that clients receive the proper sampling supplies.
- Is accountable for response to client inquiries concerning sample status.
- Assist clients regarding the resolution of problems concerning COC.
- Ensure that client specifications, when known, are met by communicating project and quality assurance requirements to the laboratory.
- Notify the supervisors of incoming projects and sample delivery schedules.
- Is accountable to clients for communicating sample progress in daily status meeting with agreed-upon due dates.
- Discuss with client any project-related problems, resolve service issues, and coordinate technical details with the laboratory staff.
- Is responsible for staff familiarization with specific quotes, sample log-in review, and final report completeness.
- Monitor the status of all data packages in-house to ensure timely and accurate delivery of reports.
- Inform clients of data package-related problems and resolve service issues.
- Coordinate requests for sample containers and other services (data packages).

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4.2.18 Sample Archiving/Disposal Technician

The Sample Archiving/Disposal Technician reports to the Laboratory Director.

Specific responsibilities include, but are not limited to:

- Manage facility maintenance.
- Supervise the disposal of samples in accordance with the Waste Disposal SOP, the Hazardous Waste Contingency Plan in the Chemical Hygiene/Safety Manual, and the U. S. Department of Agriculture requirements.

4.3 Deputies

The following table defines who assumes the responsibilities of key personnel in their absence:

Key Personnel	Deputy
Linda Scharpenberg Laboratory Director	Elizabeth Winger President
Kathryn Chang Quality Assurance Manager	
Ilsun Kwak Volatiles Department Manager	Will Chan Volatiles Department Supervisor
Ryan Parish Semi-Volatile/Extractions Department Manager	Doina Deck Semi-Volatiles GC Department Supervisor Ligia Barbu Semi-Volatiles GCMS Department Supervisor
Adriana Schow Metals Department Manager	Brian Hong Metals Department Supervisor
Tung Nguyen Wet Chemistry Department Manager	Nicole Nickloff Wet Chemistry Department Supervisor
Roger Hoover Environmental Health and Safety Coordinator	Linda Scharpenberg Laboratory Director

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Figure 4-1. Corporate and Laboratory Organization Charts

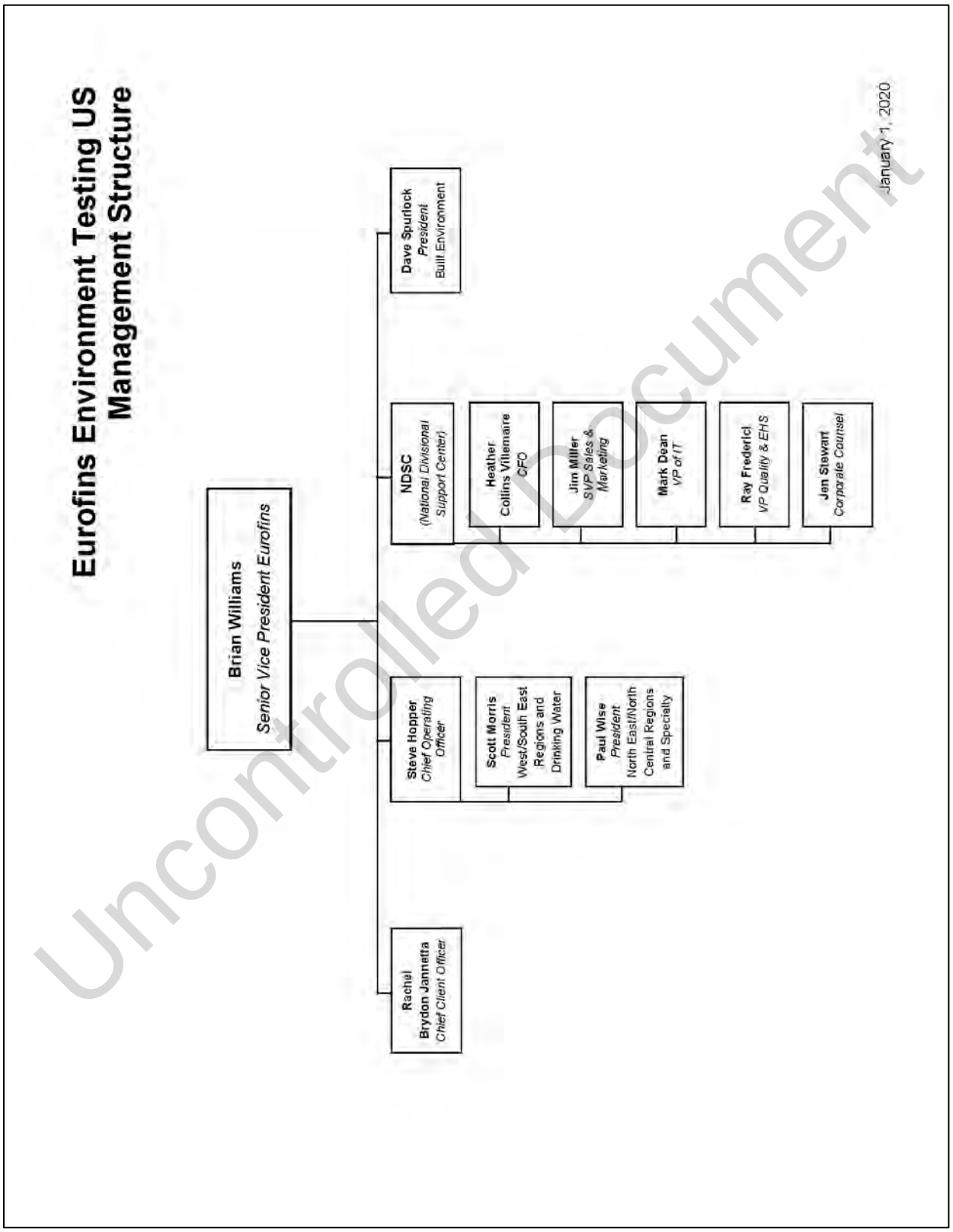

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Figure 4-1. Corporate and Laboratory Organization Charts (Cont.)

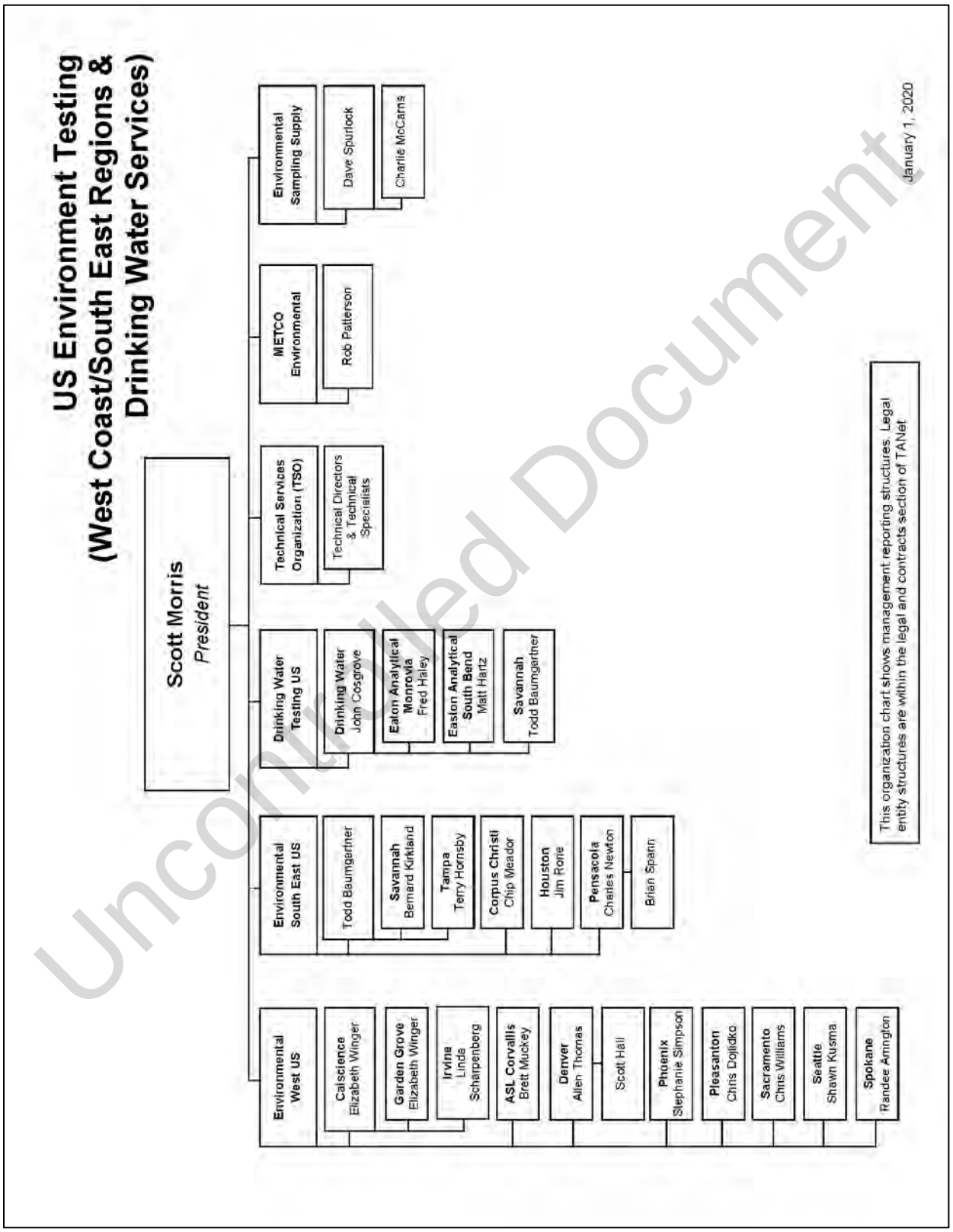
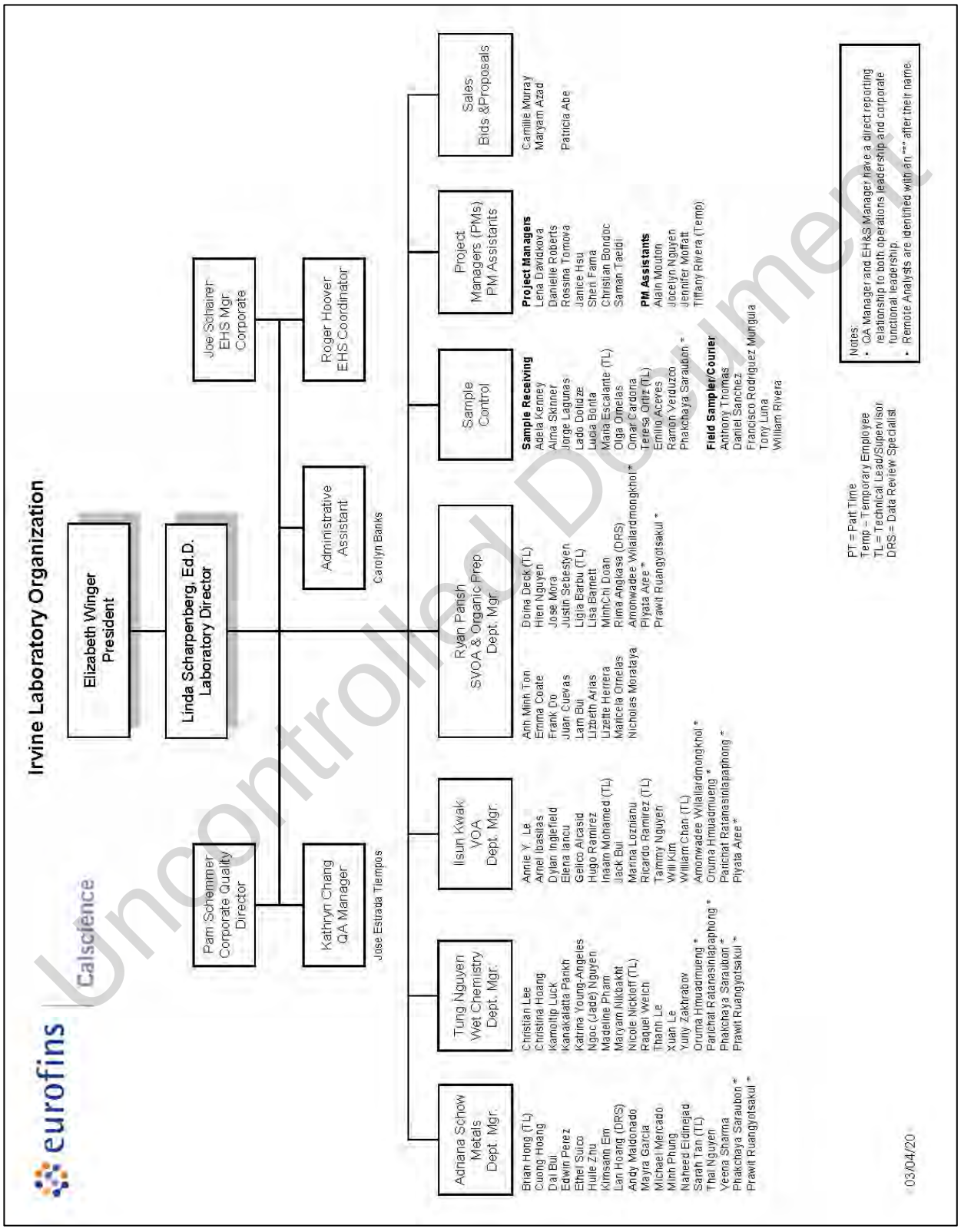


Figure 4-1. Corporate and Laboratory Organization Charts (Cont.)



SECTION 5. QUALITY SYSTEM

5.1 Quality Policy Statement

It is Eurofins Environment Testing America's Policy to:

- Provide data of known quality to its clients by adhering to approved methodologies, regulatory requirements and the QA/QC protocols.
- Effectively manage all aspects of the laboratory and business operations by the highest ethical standards.
- Continually improve systems and provide support to quality improvement efforts in laboratory, administrative and managerial activities. Eurofins recognizes that the implementation of a quality assurance program requires management's commitment and support as well as the involvement of the entire staff.
- Provide clients with the highest level of professionalism and the best service practices in the industry.
- To comply with the ISO/IEC 17025:2017 International Standard, the 2009 TNI Standard and to continually improve the effectiveness of the management system.

Every staff member at the laboratory plays an integral part in quality assurance and is held responsible and accountable for the quality of their work. It is, therefore, required that all laboratory personnel are trained and agree to comply with applicable procedures and requirements established by this document.

5.2 Ethics and Data Integrity

Eurofins Environment Testing America is committed to ensuring the integrity of its data and meeting the quality needs of its clients. The elements of Eurofins' Ethics and Data Integrity Program include:

- An Ethics Policy (Corporate Policy No. CW-L-P-004) and Employee Ethics Statements.
- Ethics and Compliance Officers (ECOs).
- A Training Program.
- Self-governance through disciplinary action for violations.
- A Confidential mechanism for anonymously reporting alleged misconduct and a means for conducting internal investigations of all alleged misconduct (Corporate SOP No. CW-L-S-002).
- Procedures and guidance for recalling data if necessary (Corporate SOP No. CW-Q-S-005).
- Effective external and internal monitoring system that includes procedures for internal audits (Section 15).
- Produce results, which are accurate and include QA/QC information that meets client pre-defined Data Quality Objectives (DQOs).
- Present services in a confidential, honest and forthright manner.

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- Provide employees with guidelines and an understanding of the Ethical and Quality Standards of our Industry.
- Provide procedures and guidance to ensure the impartiality and confidentiality of all data and customer information.
- Operate our facilities in a manner that protects the environment and the health and safety of employees and the public.
- Obey all pertinent federal, state and local laws and regulations and encourage other members of our industry to do the same.
- Educate clients as to the extent and kinds of services available.
- Assert competency only for work for which adequate personnel and equipment are available and for which adequate preparation has been made.
- Promote the status of environmental laboratories, their employees, and the value of services rendered by them.

5.3 Quality System Documentation

The laboratory's Quality System is communicated through a variety of documents.

- Quality Assurance Manual – Each laboratory has a lab-specific quality assurance manual.
- Corporate SOPs and Policies – Corporate SOPs and Policies are developed for use by all relevant laboratories. They are incorporated into the laboratory's normal SOP distribution, training and tracking system. Corporate SOPs may be general or technical.
- Work Instructions – A subset of procedural steps, tasks or forms associated with an operation of a management system (e.g., checklists, preformatted bench sheets, forms).
- Laboratory SOPs – General and Technical.
- Laboratory QA/QC Policy Memorandums.

5.3.1 Order of Precedence

In the event of a conflict or discrepancy between policies, the order of precedence is as follows:

- Corporate Quality Management Plan (CQMP)
- Corporate SOPs and Policies
- Laboratory QA/QC Policy Memorandum
- Laboratory Quality Assurance Manual (QAM)
- Laboratory SOPs and Policies
- Other (Work Instructions (WI), memos, flow charts, etc.)

Note: The laboratory has the responsibility and authority to operate in compliance with regulatory requirements of the jurisdiction in which the work is performed. Where the CQMP

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conflicts with those regulatory requirements, the regulatory requirements of the jurisdiction shall hold primacy. The laboratory's QAM shall take precedence over the CQMP in those cases.

5.4 QA/QC Objectives for the Measurement of Data

Quality Assurance (QA) and Quality Control (QC) are activities undertaken to achieve the goal of producing data that accurately characterize the sites or materials that have been sampled. Quality Assurance is generally understood to be more comprehensive than Quality Control. Quality Assurance can be defined as the integrated system of activities that ensures that a product or service meets defined standards.

Quality Control is generally understood to be limited to the analyses of samples and to be synonymous with the term *"analytical quality control"*. QC refers to the routine application of statistically based procedures to evaluate and control the accuracy of results from analytical measurements. The QC program includes procedures for estimating and controlling precision and bias and for determining reporting limits.

Request for Proposals (RFPs) and Quality Assurance Project Plans (QAPP) provide a mechanism for the client and the laboratory to discuss the data quality objectives in order to ensure that analytical services closely correspond to client needs. In order to ensure the ability of the laboratory to meet the Data Quality Objectives (DQOs) specified in the QAPP, clients are advised to allow time for the laboratory to review the QAPP before being finalized. The client is responsible for developing the QAPP; however, the laboratory will provide support to the client for developing the sections of the QAPP that concern laboratory activities.

Historically, laboratories have described their QC objectives in terms of precision, accuracy, representativeness, comparability, completeness, selectivity and sensitivity (PARCCSS).

5.4.1 Precision

The laboratory objective for precision is to meet the performance for precision demonstrated for the methods on similar samples and to meet data quality objectives of the EPA and/or other regulatory programs. Precision is defined as the degree of reproducibility of measurements under a given set of analytical conditions (exclusive of field sampling variability). Precision is documented on the basis of replicate analysis, usually duplicate or matrix spike (MS) duplicate samples.

5.4.2 Accuracy

The laboratory objective for accuracy is to meet the performance for accuracy demonstrated for the methods on similar samples and to meet data quality objectives of the EPA and/or other regulatory programs. Accuracy is defined as the degree of bias in a measurement system. Accuracy may be documented through the use of laboratory control samples (LCS) and/or MS. A statement of accuracy is expressed as an interval of acceptance recovery about the mean recovery.

5.4.3 Representativeness

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The laboratory objective for representativeness is to provide data which is representative of the sampled medium. Representativeness is defined as the degree to which data represent a characteristic of a population or set of samples and is a measurement of both analytical and field sampling precision. The representativeness of the analytical data is a function of the procedures used in procuring and processing the samples. The representativeness can be documented by the relative percent difference between separately procured, but otherwise identical samples or sample aliquots.

The representativeness of the data from the sampling sites depends on both the sampling procedures and the analytical procedures. The laboratory may provide guidance to the client regarding proper sampling and handling methods in order to assure the integrity of the samples.

5.4.4 Comparability

The comparability objective is to provide analytical data for which the accuracy, precision, representativeness and reporting limit statistics are similar to these quality indicators generated by other laboratories for similar samples, and data generated by the laboratory over time.

The comparability objective is documented by inter-laboratory studies carried out by regulatory agencies or carried out for specific projects or contracts, by comparison of periodically generated statements of accuracy, precision and reporting limits with those of other laboratories.

5.4.5 Completeness

The completeness objective for data is 90% (or as specified by a particular project), expressed as the ratio of the valid data to the total data over the course of the project. Data will be considered valid if they are adequate for their intended use. Data usability will be defined in a QAPP, project scope or regulatory requirement. Data validation is the process for reviewing data to determine its usability and completeness. If the completeness objective is not met, actions will be taken internally and with the data user to improve performance. This may take the form of an audit to evaluate the methodology and procedures as possible sources for the difficulty or may result in a recommendation to use a different method.

5.4.6 Selectivity

Selectivity is defined as: The capability of a test method or instrument to respond to a target substance or constituent in the presence of non-target substances. Target analytes are separated from non-target constituents and subsequently identified/detected through one or more of the following, depending on the analytical method: extractions (separation), digestions (separation), interelement corrections (separation), use of matrix modifiers (separation), specific retention times (separation and identification), confirmations with different columns or detectors (separation and identification), specific wavelengths (identification), specific mass spectra (identification), and specific electrodes (separation and identification).

5.4.7 Sensitivity

Sensitivity refers to the amount of analyte necessary to produce a detector response that can be reliably detected (above the Method Detection Limit) or quantified (above the Reporting Limit).

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5.5 Criteria for Quality Indicators

The laboratory maintains tables, housed in the LIMS that summarize the precision and accuracy acceptability limits for performed analyses. This summary includes an effective date, is updated each time new limits are generated and are managed by the laboratory's QA department. Unless otherwise noted, limits within these tables are laboratory generated. Some acceptability limits are derived from US EPA methods when they are required. Where US EPA method limits are not required, the laboratory has developed limits from evaluation of data from similar matrices. Criteria for development of control limits is contained in Section 24 and the laboratory SOP No. IR-QA-CNTRLLIM.

5.6 Statistical Quality Control

Statistically-derived precision and accuracy limits are required by selected methods (such as SW-846) and programs. The laboratory routinely utilizes statistically-derived limits to evaluate method performance and determine when corrective action is appropriate. The analysts use the current limits entered into the Laboratory Information Management System (LIMS). The Quality Assurance department maintains an archive of all limits used within the laboratory. If a method defines the QC limits, the method limits are used.

If a method requires the generation of historical limits, the lab develops such limits from recent data in the QC database of the LIMS following the guidelines described in Section 24. All calculations and limits are documented and dated when approved and effective. On occasion, a client requests contract-specified limits for a specific project.

Current QC limits are entered and maintained in the LIMS analyte database. As sample results and the related QC are entered into LIMS, the sample QC values are compared with the limits in LIMS to determine if they are within the acceptable range. The analyst then evaluates if the sample needs to be rerun or re-extracted/rerun or if a comment should be added to the report explaining the reason for the QC outlier.

5.6.1 QC Charts

When QC limits are calculated, QC charts are generated showing warning and control limits for the purpose of evaluating trends. The QA Manager evaluates these to determine if adjustments need to be made or for corrective actions to methods. All findings are documented and kept on file. Refer to the laboratory SOP No. IR-QA-CNTRLLIM for more details regarding generation of control limits and development of control charts.

5.7 Quality System Metrics

In addition to the QC parameters discussed above, the entire Quality System is evaluated on a monthly basis through the use of specific metrics (refer to Section 16). These metrics are used to drive continuous improvement in the laboratory's Quality System.

SECTION 6. DOCUMENT CONTROL

6.1 Overview

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The QA Department is responsible for the control of documents used in the laboratory to ensure that approved, up-to-date documents are in circulation and out-of-date (obsolete) documents are archived or destroyed. The following documents, at a minimum, must be controlled:

- Laboratory Quality Assurance Manual
- Laboratory Standard Operating Procedures (SOP)
- Laboratory Policies
- Work Instructions and Forms
- Corporate Policies and Procedures

The Corporate Quality Department posts Corporate Manuals, SOPs, Policies, Work Instructions, White Papers and Training Materials on the company intranet site. These Corporate documents are only considered controlled when they are read on the intranet site. Printed copies are considered uncontrolled unless the laboratory physically distributes them as controlled documents. A detailed description of the procedure for issuing, authorizing, controlling, distributing, and archiving Corporate documents is found in Corporate SOP No. CW-Q-S-001, Corporate Document Control and Archiving. The laboratory's internal document control procedure is defined in the laboratory SOP No. IR-QA-DOC.

The laboratory QA Department also maintains access to various references and document sources integral to the operation of the laboratory. This includes reference methods and regulations. Instrument manuals (hard or electronic copies) are also maintained by the laboratory.

The laboratory maintains control of records for raw analytical data and supporting records such as audit reports and responses, logbooks, standard logs, training files, MDL studies, Proficiency Testing (PT) studies, certifications and related correspondence, and corrective action reports. Raw analytical data consists of bound logbooks, instrument printouts, any other notes, magnetic media, electronic data and final reports.

6.2 Document Approval and Issue

The pertinent elements of a document control system for each document include a unique document title and number, pagination, the total number of pages of the item or an 'end of document' page, the effective date, revision number and the laboratory's name. The QA personnel are responsible for the maintenance of this system.

Controlled documents are authorized by the QA Department. In order to develop a new document, a responsible manager submits an electronic draft to the QA Department for suggestions and approval before use. Upon approval, QA personnel add the identifying version information to the document and retains that document as the official document on file. That document is then provided to all applicable operational units. Controlled documents are identified as such and records of their distribution are kept by the QA Department. Document control may be achieved by either electronic or hardcopy distribution.

The QA Department maintains a list of the official versions of controlled documents.

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Quality System Policies and Procedures will be reviewed at a minimum of every two years and revised as appropriate. Quality System Policies and Procedures that affect Drinking Water projects will be reviewed annually and revised as appropriate. Changes to documents occur when a procedural change warrants.

6.3 Procedures for Document Control Policy

For changes to the QA Manual, refer to the procedure outlined in Section 3.4 of this manual. Uncontrolled copies must not be used within the laboratory. Previous revisions and back-up data are stored by the QA department. Electronic copies are stored on the Public server in the QA folder (or define location) for the applicable revision.

For changes to SOPs, refer to Corporate SOP No. CW-Q-S-002, Writing a Standard Operating Procedure SOP and the laboratory SOP No. IR-QA-DOC. The SOPs identified above also defines the process of changes to SOPs.

Forms, worksheets, work instructions and information are organized in the file cabinet of the QA department. Electronic versions are kept in the network shared folder Irvine-QA. The procedure for the care of these documents is in the laboratory SOP No. IR-QA-DOC.

6.4 Obsolete Documents

All invalid or obsolete documents are removed, or otherwise prevented from unintended use. The laboratory has specific procedures as described above to accomplish this. In general, obsolete documents are collected from employees according to distribution lists and are marked obsolete on the cover or destroyed. At least one copy of the obsolete document is archived according to the laboratory SOP No. IR-QA-ARCH.

SECTION 7. SERVICE TO THE CLIENT

7.1 Overview

The laboratory has established procedures for the review of work requests and contracts, oral or written. The procedures include evaluation of the laboratory's capability and resources to meet the contract's requirements within the requested time period. All requirements, including the methods to be used, must be adequately defined, documented and understood. For many environmental sampling and analysis programs, testing design is site or program specific and does not necessarily fit into a standard laboratory service or product. It is the laboratory's intent to provide both standard and customized environmental laboratory services to our clients.

A thorough review of technical and QC requirements contained in contracts is performed to ensure project success. The appropriateness of requested methods, and the lab's capability to perform them must be established. Projects, proposals and contracts are reviewed for adequately defined requirements and the laboratory's capability to meet those requirements. Alternate test methods that are capable of meeting the clients' requirements may be proposed by the lab. A review of the lab's capability to analyze non-routine analytes is also part of this review process.

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All projects, proposals and contracts are reviewed for the client's requirements in terms of compound lists, test methodology requested, sensitivity (detection and reporting levels), accuracy, and precision requirements (% Recovery and RPD). The reviewer ensures that the laboratory's test methods are suitable to achieve these requirements and that the laboratory holds the appropriate certifications and approvals to perform the work. The laboratory and any potential subcontract laboratories must be certified, as required, for all proposed tests.

The laboratory must determine if it has the necessary physical, personnel and information resources to meet the contract, and if the personnel have the expertise needed to perform the testing requested. Each proposal is checked for its impact on the capacity of the laboratory's equipment and personnel. As part of the review, the proposed turnaround time will be checked for feasibility.

Electronic or hard copy deliverable requirements are evaluated against the laboratory's capacity for production of the documentation.

If the laboratory cannot provide all services but intends to subcontract such services, whether to another Eurofins Environment Testing America facility or to an outside firm, this will be documented and discussed with the client prior to contract approval. (Refer to Section 8 for Subcontracting Procedures.)

The laboratory informs the client of the results of the review if it indicates any potential conflict, deficiency, lack of accreditation, or inability of the lab to complete the work satisfactorily. Any discrepancy between the client's requirements and the laboratory's capability to meet those requirements is resolved in writing before acceptance of the contract. It is necessary that the contract be acceptable to both the laboratory and the client. Amendments initiated by the client and/or Eurofins, are documented in writing.

All contracts, QAPPs, Sampling and Analysis Plans (SAPs), contract amendments, and documented communications become part of the project record.

The same contract review process used for the initial review is repeated when there are amendments to the original contract by the client, and the participating personnel are informed of the changes.

7.2 Review Sequence and Key Personnel

Appropriate personnel will review the work request at each stage of evaluation.

For routine projects and other simple tasks, a review by the Project Manager (PM) is considered adequate. The PM confirms that the laboratory has any required certifications, that it can meet the clients' data quality and reporting requirements and that the laboratory has the capacity to meet the clients' turn around needs. It is recommended that, where there is a sales person assigned to the account, an attempt should be made to contact that sales person to inform them of the incoming samples.

For new, complex or large projects, the proposed contract is given to the Client Relationship Manager or Proposal Team, who will decide which laboratory will receive the work based on the scope of work and other requirements, including certification, testing methodology, and

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available capacity to perform the work. The contract review process is outlined in Eurofins Environment Testing America's Corporate SOP No. CA-L-P-002, Contract Compliance Policy.

This review encompasses all facets of the operation. The scope of work is distributed to the appropriate personnel, as needed based on scope of contract, to evaluate all of the requirements shown above (not necessarily in the order below):

- Contract Administrator
- VP of Operations
- Laboratory Manager of Project Management
- Laboratory Project Manager
- Laboratory and/or Corporate Technical Managers
- Laboratory and/or Corporate Information Technology Managers
- Account Executives
- Laboratory and/or Corporate Quality
- Laboratory and/or Corporate Environmental Health and Safety Managers/Directors
- The Laboratory Director reviews the formal laboratory quote and makes final acceptance for their facility.

The Sales Director, Contract Administrator, Account Executive or Proposal Coordinator then submits the final proposal to the client.

In the event that one of the above personnel is not available to review the contract, his or her back-up will fulfill the review requirements.

7.3 Documentation

The Contracts Department maintains copies of all signed contracts. A copy is also maintained by the assigned Laboratory Project Manager.

Appropriate records are maintained for every contract or work request. All stages of the contract review process are documented and include records of any significant changes. These records are kept on file with the assigned laboratory Project Manager.

The contract will be distributed to and maintained by the appropriate sales/marketing personnel and the Account Executive. A copy of the contract and formal quote will be filed with the laboratory Project Manager and the Laboratory Director.

Records are maintained of pertinent discussions with a client relating to the client's requirements or the results of the work during the period of execution of the contract. The Project Manager keeps a phone log or e-mail documentation of conversations with the client. This documentation is kept on file and become part of the project records.

7.3.1 Project-Specific Quality Planning

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Communication of contract specific technical and QC criteria is an essential activity in ensuring the success of site specific testing programs. To achieve this goal, a PM is assigned to each client. It is the PM's responsibility to ensure that project-specific technical and QC requirements are effectively evaluated and communicated to the laboratory personnel before and during the project. QA department involvement may be needed to assist in the evaluation of custom QC requirements.

PM's are the primary client contact and they ensure resources are available to meet project requirements. Although PM's do not have direct reports or staff in production, they coordinate opportunities and work with laboratory management and supervisory staff to ensure available resources are sufficient to perform work for the client's project. Project Management is positioned between the client and laboratory resources.

Prior to work on a new project, the dissemination of project information and/or project opening meetings may occur to discuss schedules and unique aspects of the project. Items to be discussed may include the project technical profile, turnaround times, holding times, methods, analyte lists, reporting limits, deliverables, sample hazards, or other special requirements. The PM introduces new projects to the laboratory staff through project kick-off meetings or to the supervisory staff during production meetings. These meetings provide direction to the laboratory staff in order to maximize production and client satisfaction, while maintaining quality. In addition, project notes may be associated with each sample batch as a reminder upon sample receipt and analytical processing.

During the project, any change that may occur within an active project is agreed upon between the client/regulatory agency and the PM/laboratory. These changes (e.g., use of a non-standard method or modification of a method) and approvals must be documented prior to implementation. Documentation pertains to any document, e.g., letter, e-mail, variance, contract addendum, which has been signed by both parties.

Such changes are also communicated to the laboratory during production meetings. Such changes are updated to the project notes or work instructions and are introduced to the managers at these meetings. The laboratory staff is then introduced to the modified requirements via the PM or the individual laboratory Technical Manager. After the modification is implemented into the laboratory process, documentation of the modification is made in the case narrative of the data report(s).

The laboratory strongly encourages client visits to the laboratory and for formal/informal information sharing session with employees in order to effectively communicate ongoing client needs as well as project specific details for customized testing programs.

7.4 Special Services

The laboratory cooperates with clients and their representatives to monitor the laboratory's performance in relation to work performed for the client. It is the laboratory's goal to meet all client requirements in addition to statutory and regulatory requirements. The laboratory has procedures to ensure confidentiality to clients (Sections 15 and 25).

The laboratory's standard procedures for reporting data are described in Section 25. Special services are also available and provided upon request. These services include:

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- Reasonable access for our clients or their representatives to the relevant areas of the laboratory for the witnessing of tests performed for the client.
- Assist client-specified third party data validators as specified in the client's contract.
- Supplemental information pertaining to the analysis of their samples.

Note: An additional charge may apply for additional data/information that was not requested prior to the time of sample analysis or previously agreed upon.

When the client requests a statement of conformity to a specification or standard based on the analysis performed by the laboratory (e.g., pass/fail, in-tolerance/out-of-tolerance), the decision rule shall be clearly defined. Unless inherent in the requested specification or standard, the decision rule selected shall be communicated to the client. Associated reporting requirements are addressed in Section 25.2.18.

7.5 Client Communication

Project Managers are the primary communication link to the clients. They shall inform their clients of any delays in project completion as well as any non-conformances in either sample receipt or sample analysis. Project Management will maintain ongoing client communication throughout the entire client project.

Technical Managers are available to discuss any technical questions or concerns that the client may have.

7.6 Reporting

The laboratory works with our clients to produce any special communication reports required by the contract.

7.7 Client Surveys

The laboratory assesses both positive and negative client feedback. The results are used to improve overall laboratory quality and client service. Eurofins' Sales and Marketing teams periodically develops laboratory and client specific surveys to assess client satisfaction.

SECTION 8. SUBCONTRACTING OF TESTS

8.1 Overview

For the purpose of this quality manual, the phrase subcontract laboratory refers to a laboratory external to the Eurofins Environment Testing America laboratories. The phrase "work sharing" refers to internal transfers of samples between the Eurofins laboratories. The term outsourcing refers to the act of subcontracting tests.

When contracting with our clients, the laboratory makes commitments regarding the services to be performed and the data quality for the results to be generated. When the need arises to outsource testing for our clients because project scope, changes in laboratory capabilities, capacity or unforeseen circumstances, we must be assured that the subcontractors or work

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sharing laboratories understand the requirements and will meet the same commitments we have made to the client. Refer to Eurofins Environment Testing America's Corporate SOP's on Subcontracting Procedures (CW-L-S-004) and the Work Sharing Process (CA-C-S-001).

When outsourcing analytical services, the laboratory will assure, to the extent necessary, that the subcontract or work sharing laboratory maintains a program consistent with the requirements of this document, the requirements specified in TNI/ISO 17025 and/or the client's Quality Assurance Project Plan (QAPP). All QC guidelines specific to the client's analytical program are transmitted to the subcontractor and agreed upon before sending the samples to the subcontract facility. Additionally, work requiring accreditation will be placed with an appropriately accredited laboratory. The laboratory performing the subcontracted work will be identified in the final report, as will non-TNI accredited work where required.

Project Managers (PMs) or other responsible CSO members for the Export Lab (i.e., the Eurofins laboratory that transfers samples to another laboratory) are responsible for obtaining client approval prior to subcontracting any samples. The laboratory will advise the client of a subcontract arrangement in writing and when possible approval from the client shall be obtained and retained in the project folder.

Note: In addition to the client, some regulating agencies (e.g., USDA) or contracts require notification prior to placing such work.

8.2 Qualifying and Monitoring Subcontractors

Whenever a PM [or Account Executive (AE) or Client Relationship Manager, etc.] becomes aware of a client requirement or laboratory need where samples must be outsourced to another laboratory, the other laboratory(s) shall be selected based on the following:

- Subcontractors specified by the client – In these circumstances, the client assumes responsibility for the quality of the data generated from the use of a subcontractor.
- Subcontractors reviewed by Eurofins Environment Testing America – Firms which have been reviewed by the company and are known to meet standards for accreditations (e.g., State, TNI and DoD/DOE); technical specifications; legal and financial information.

A listing of vendors is available on the Eurofins Environment Testing America intranet site.

All Eurofins Environment Testing America laboratories are pre-qualified for work sharing provided they hold the appropriate accreditations and can adhere to the project/program requirements. Client approved is not necessary unless specifically required by the contract. In these cases, the client must provide acknowledgement that the samples can be sent to that facility (an e-mail is sufficient documentation or if acknowledgement is verbal, the date, time, and name of person providing acknowledgement must be documented). The originating laboratory is responsible for communicating all technical, quality, and deliverable requirements as well as other contract needs (Corporate SOP No. CA-C-S-001, Work Sharing Process).

8.2.1 When the potential sub-contract laboratory has not been previously approved, Account Executives or PMs may nominate a laboratory as a subcontractor based on need. The decision to nominate a laboratory must be approved by the Client Relations Manager (CRM) or Laboratory Director. The CRM or Laboratory Director

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requests that the QA Manager or PM begin the process of approving the subcontract laboratory as outlined in Corporate SOP No. CW-L-S-004, Subcontracting Procedures.

Once the appropriate accreditation and legal information is received by the laboratory, it is evaluated for acceptability and forwarded to the Corporate Quality Information Manager (QIM) for review. After the Corporate QIM reviews the documents for completeness, the information is forwarded to the Finance Department for formal signature and contracting with the laboratory. The approved vendor will be added to the approved subcontractor list on the intranet site and the finance group is concurrently notified.

The client will assume responsibility for the quality of the data generated from the use of a subcontractor they have requested the lab to use. The qualified subcontractors on the intranet site are known to meet minimal standards. Eurofins Environment Testing America does not certify laboratories. The subcontractors on our approved list can only be recommended to the extent that we would use them.

8.3 Oversight and Reporting

8.3.1 The status and performance of qualified subcontractors will be monitored by the Corporate Quality department, and includes an annual review process (see Subcontracting SOP CW-L-S-004). Any problems identified will be brought to the attention of Eurofins' Corporate Finance, Legal and Corporate Quality personnel.

- Complaints shall be investigated. Documentation of the complaint, investigation and corrective action will be maintained in the subcontractor's file on the intranet site. Complaints are posted using the Vendor Performance Report.
- Information shall be updated on the intranet when new information is received from the subcontracted laboratories.
- Subcontractors in good standing will be retained on the intranet listing. CSO personnel will notify all Eurofins Environment Testing America laboratories, Corporate Quality and Corporate Contracts if any laboratory requires removal from the intranet site. This notification will be posted on the intranet site and e-mailed to all CSO Personnel, Laboratory Directors, QA Managers and Sales Personnel.

Prior to initially sending samples to the subcontracted laboratory, the PM confirms their certification status to determine if it's current and scope-inclusive. The information is documented within the project records.

8.3.2 For continued use of a subcontractor, verification of certification is placed upon the subcontractor for the defined project. Samples are subcontracted under Chain of Custody with the program defined as 'Accreditation Required' and the following statement for verification upon sample receipt:

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing America places the ownership of method, analyte & accreditation compliance upon our 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 analytes/tests/matrix being analyzed, the

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samples must be shipped back to the Eurofins laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing America attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing America.

For Eurofins Environment Testing America laboratories, certifications can be viewed on the company's Total Access Database.

8.3.3 All subcontracted samples must be accompanied by a Eurofins Chain of Custody (COC). A copy of the original COC sent by the client must be available in LIMS for all samples workshared within Eurofins. Client COCs are only forwarded to external subcontractors when samples are shipped directly from the project site to the subcontractor lab. Under routine circumstances, client COCs are not provided to external subcontractors.

Through communication with the subcontracted laboratory, the PM monitors the status of the subcontracted analyses, facilitates successful execution of the work, and ensures the timeliness and completeness of the analytical report.

Non-TNI accredited work must be identified in the subcontractor's report as appropriate. If TNI accreditation is not required, the report does not need to include this information.

Reports submitted from subcontractor laboratories are not altered and are included in their original form in the final project report. This clearly identifies the data as being produced by a subcontractor facility. If subcontract laboratory data is incorporated into the laboratories EDD (i.e., imported), the report must explicitly indicate which lab produced the data for which methods and samples.

Note: The results submitted by a Eurofins work sharing laboratory may be transferred electronically and the results reported by the Eurofins work sharing lab are identified on the final report. The report must explicitly indicate which lab produced the data for which methods and samples. The final report must include a copy of the completed COC for all work sharing reports.

8.4 Contingency Planning

The full qualification of a subcontractor may be waved to meet emergency needs. This decision and justification must be documented in the project files, and the 'Purchase Order Terms And Conditions For Subcontracted Laboratory Services' must be sent with the samples and COC.

In the event this provision is utilized, the laboratory (e.g., PM) will be required to verify and document the applicable accreditations of the subcontractor. All other quality and accreditation requirements will still be applicable, but the subcontractor need not have signed a subcontract agreement with Eurofins Environment Testing America at this time.

The use of any emergency subcontractor will require the PM to complete a JDE New Vendor Add Form in order to process payment to the vendor and add them to TALS. This form requires the user to define the subcontractor's category/s of testing and the reason for testing.

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SECTION 9. PURCHASING SERVICES AND SUPPLIES

9.1 Overview

Evaluation and selection of suppliers and vendors is performed, in part, on the basis of the quality of their products, their ability to meet the demand for their products on a continuous and short term basis, the overall quality of their services, their past history, and competitive pricing. This is achieved through evaluation of objective evidence of quality furnished by the supplier, which can include certificates of analysis, recommendations, and proof of historical compliance with similar programs for other clients. To ensure that quality critical consumables and equipment conform to specified requirements, which may affect quality, all purchases from specific vendors are approved by a member of the supervisory or management staff. Capital expenditures are made in accordance with Eurofins' Fixed Asset Acquisition, Retention and Safeguarding, SOP No. CW-F-S-007.

Contracts will be signed in accordance with Eurofins Environment Testing America's Company-Wide Authorization Matrix Policy, Policy No. CW-F-P-002. Request for Proposals (RFP's) will be issued where more information is required from the potential vendors than just price. Process details are available in Eurofins Environment Testing America's Corporate Procurement and Contracts Policy (Policy No. CW-F-P-004). RFP's allow Eurofins to determine if a vendor is capable of meeting requirements such as supplying all of the Eurofins facilities, meeting required quality standards and adhering to necessary ethical and environmental standards. The RFP process also allows potential vendors to outline any additional capabilities they may offer.

9.2 Glassware

Glassware used for volumetric measurements must be Class A or verified for accuracy according to laboratory procedure. Pyrex (or equivalent) glass should be used where possible. For safety purposes, thick-wall glassware should be used where available.

9.3 Reagents, Standards & Supplies

Purchasing guidelines for equipment, consumables, and reagents must meet the requirements of the specific method and testing procedures for which they are being purchased. Solvents and acids are pre-tested in accordance with Eurofins Environment Testing America's Corporate SOP on Solvent & Acid Lot Testing & Approval, SOP No. CA-Q-S-001. Approval information for the solvents and acids tested under SOP CA-Q-S-001 is stored on the Eurofins SharePoint, under Solvent Approvals. A master list of all tested materials, as well as the certificates of analysis for the materials, is stored in the same location. Procedures for laboratory tested materials are outlined in the laboratory SOP No. IR-QA-LOTTEST.

9.3.1 Purchasing

Chemical reagents, solvents, glassware, and general supplies are ordered as needed to maintain sufficient quantities on hand. Materials used in the analytical process must be of a known quality. The wide variety of materials and reagents available makes it advisable to specify recommendations for the name, brand, and grade of materials to be used in any determination. This information is contained in the method SOP. The analyst completes the

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Material Request Sheet when requesting reagents, standards, or supplies. The analyst may check the item out of the on-site consignment system that contains items approved for laboratory use.
The analyst must provide the master item number (from the master item list that has been approved by the Technical Manager), item description, package size, catalogue page number, and the quantity needed. If an item being ordered is not the exact item requested, approval must be obtained from the Technical Manager prior to placing the order. The Technical Managers, Laboratory Director, or their designee place the order.

9.3.2 Receiving

It is the responsibility of the Sample Control Department to receive the shipment. It is the responsibility of the analyst who ordered the materials to document the date materials were received. Once the ordered reagents or materials are received, the analyst compares the information on the label or packaging to the original order to ensure that the purchase meets the quality level specified. This is documented through the addition of the received date and initials to the information present on the daily order log.

The supervisor or analyst verifies the lot numbers of received solvents and acids against the pre-approval lists. If a received material is listed as unapproved, or is not listed, it is sequestered and returned to the vendor. Alternatively, the laboratory may test the material for the intended use, and if it is acceptable, document the approval on the approval list. Records of any testing performed locally are maintained in the LIMS and/or network shared folder Irvine-QA.

Materials may not be released for use in the laboratory until they have been inspected, verified as suitable for use, and the inspection/verification has been documented.

Safety Data Sheets (SDSs) are available online through the Company's intranet website. Anyone may review these for relevant information on the safe handling and emergency precautions of on-site chemicals.

9.3.3 Specifications

Methods in use in the laboratory specify the grade of reagent that must be used in the procedure. If the quality of the reagent is not specified, analytical reagent grade will be used. It is the responsibility of the analyst to check the procedure carefully for the suitability of grade of reagent.

Chemicals must not be used past the manufacturer's expiration date and must not be used past the expiration time noted in a method SOP. If expiration dates are not provided, the laboratory may contact the manufacturer to determine an expiration date.

The laboratory assumes a five year expiration date on inorganic dry chemicals and solvents unless noted otherwise by the manufacturer or by the reference source method. Chemicals/solvents should not be used past the manufacturer's or SOPs expiration date unless 'verified' as outlined below.

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- An expiration date **cannot** be extended if the dry chemical/solvent is discolored or appears otherwise physically degraded. In this case, the dry chemical/solvent must be discarded.
- Expiration dates can be extended if the dry chemical/solvent is found to be satisfactory based on acceptable performance of quality control samples (Continuing Calibration Verification (CCV), Blanks, Laboratory Control Sample (LCS), etc.).
- If the dry chemical/solvent is used for the preparation of standards, the expiration dates can be extended 6 months if the dry chemical/solvent is compared to an unexpired independent source in performing the method and the performance of the dry chemical/solvent is found to be satisfactory. The comparison must show that the dry chemical/solvent meets CCV limits. The comparison studies are maintained in the LIMS and/or network shared folder Irvine-QA.

Wherever possible, standards must be traceable to national or international standards of measurement or to national or international reference materials. Records to that effect are available to the user.

Compressed gases in use are checked for pressure and secure positioning daily. To prevent a tank from going to dryness, or introducing potential impurities, the pressure should be closely watched as it decreases to approximately 15% of the original reading, at which point it should be replaced. For example, a standard sized laboratory gas cylinder containing 3,000 psig of gas should be replaced when it drops to approximately 500 psig. The quality of the gases must meet method or manufacturer specification or be of a grade that does not cause any analytical interference.

Water used in the preparation of samples, standards or reagents must have a specific conductivity of less than 1- µmho/cm (or specific resistivity of greater than 1.0 megohm-cm) at 25°C. The specific conductivity is checked and recorded daily. If the water's specific conductivity is greater than the specified limit, the Facility Manager and appropriate Technical Managers must be notified immediately in order to notify all departments, decide on cessation (based on intended use) of activities, and make arrangements for correction.

The laboratory may purchase reagent grade (or other similar quality) water for use in the laboratory. This water must be certified clean by the supplier for all target analytes or otherwise verified by the laboratory prior to use. This verification is documented.

Standard lots are verified before first time use if the laboratory switches manufacturers or has historically had a problem with the type of standard.

Purchased bottleware used for sampling must be certified clean and the certificates must be maintained. If uncertified sampling bottleware is purchased, all lots must be verified clean prior to use. This verification must be maintained.

Records of manufacturer's certification and traceability statements are maintained in files or binders in each laboratory section or uploaded to the LIMS Reagent program. These records include date of receipt, lot number (when applicable), and expiration date (when applicable). Incorporation of the item into the record indicates that the analyst has compared the new certificate with the previous one for the same purpose and that no difference is noted, unless approved and so documented by the Technical Manager or QA Manager.

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9.3.4 Storage

Reagent and chemical storage is important from the aspects of both integrity and safety. Light-sensitive reagents may be stored in brown-glass containers. Storage conditions are per the Corporate Environmental Health & Safety Manual (Corp. Doc. No. CW-E-M-001) and method SOPs or manufacturer instructions.

9.4 Purchase of Equipment / Instruments / Software

When a new piece of equipment is needed, either for additional capacity or for replacing inoperable equipment, the analyst or supervisor makes a supply request to the Technical Manager and/or the Laboratory Director. If they agree with the request, the procedures outlined in Eurofins Environment Testing America's Corporate Policy No. CA-T-P-001, Qualified Products List, are followed. A decision is made as to which piece of equipment can best satisfy the requirements. The appropriate written requests are completed and purchasing places the order.

Upon receipt of a new or used piece of equipment, an identification name is assigned and added to the equipment list. IT must also be notified so that they can synchronize the instrument for back-ups. Its capability is assessed to determine if it is adequate or not for the specific application. For instruments, a calibration curve is generated, followed by MDLs, Demonstration of Capabilities (DOCs), and other relevant criteria (refer to Section 19). For software, its operation must be deemed reliable and evidence of instrument verification must be retained by the IT Department or QA Department. Software certificates supplied by the vendors are filed with the IT Department. The manufacturer's operation manual is retained at the bench.

9.5 Services

Service to analytical instruments (except analytical balances) is performed on an as needed basis. Routine preventative maintenance is discussed in Section 20. The need for service is determined by analysts and/or Technical Managers. The service providers that perform the services are approved by the Technical Manager and the Laboratory Director.

Analytical balances are serviced and calibrated annually in accordance with SOP IR-QA-BAL. The calibration and maintenance services are performed on-site, and the balances are returned to use immediately following successful calibration. When the calibration certificates are received (usually within two weeks of the service), they are reviewed, and documentation of the review is filed with the certificates. If the calibration was unsuccessful, the balance is immediately removed from service and segregated pending either further maintenance or disposal.

Calibration services for support equipment such as thermometers, weight sets, autopipettors, etc., are obtained from vendors with current and valid ISO 17025 accreditation for calibration of the specific piece of equipment. Prior to utilizing the vendor's services, the vendor's accreditation status is verified. Once the equipment has been calibrated, the calibration certificates are reviewed by the QA department, and documentation of the review is filed with the calibration certificates. The equipment is then returned to service within the laboratory.

9.6 Suppliers

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Eurofins Environment Testing America selects vendors through a competitive proposal / bid process, strategic business alliances or negotiated vendor partnerships (contracts). This process is defined in the Procurement & Contracts Policy (Policy No. CW-F-P-004). The level of control used in the selection process is dependent on the anticipated spending amount and the potential impact on Eurofins business. Vendors that provide test and measuring equipment, solvents, standards, certified containers, instrument related service contracts or subcontract laboratory services shall be subject to more rigorous controls than vendors that provide off-the-shelf items of defined quality that meet the end use requirements. The JD Edwards purchasing system includes all suppliers/vendors that have been approved for use.

Evaluation of suppliers is accomplished by ensuring the supplier ships the product or material ordered and that the material is of the appropriate quality. This is documented by signing off on packing slips or other supply receipt documents. The purchasing documents contain the data that adequately describe the services and supplies ordered.

Any issues of vendor performance are to be reported immediately by the laboratory staff to the Corporate Purchasing Group by completing a Vendor Performance Report.

The Corporate Purchasing Group will work through the appropriate channels to gather the information required to clearly identify the problem and will contact the vendor to report the problem and to make any necessary arrangements for exchange, return authorization, credit, etc.

Suppliers are subject to re-evaluation, as deemed appropriate, through the use of Vendor Performance Reports to summarize and review to determine corrective action necessary, or service improvements required by vendors.

The laboratory has access to a listing of all approved suppliers of critical consumables, supplies and services. This information is provided through the JD Edwards purchasing system.

9.6.1 New Vendor Procedure

Eurofins Environment Testing America employees who wish to request the addition of a new vendor must complete a Vendor Add Request Form.

New vendors are evaluated based upon criteria appropriate to the products or services provided as well as their ability to provide those products and services at a competitive cost. Vendors are also evaluated to determine if there are ethical reasons or potential conflicts of interest with Eurofins employees that would make it prohibitive to do business with them as well as their financial stability. The QA Department and/or the Technical Services Director are consulted with vendor and product selection that have an impact on quality.

SECTION 10. COMPLAINTS

10.1 Overview

The laboratory considers an effective client complaint handling processes to be of significant business and strategic value. Listening to and documenting client concerns captures client knowledge that enables our operations to continually improve processes and client satisfaction.

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An effective client complaint handling process also provides assurance to the data user that the laboratory will stand behind its data, service obligations and products.

A client complaint is any expression of dissatisfaction with any aspect of our business services (e.g., communications, responsiveness, data, reports, invoicing and other functions) expressed by any party, whether received verbally or in written form. Client inquiries, complaints or noted discrepancies are documented, communicated to management, and addressed promptly and thoroughly.

The laboratory has procedures for addressing both external and internal complaints with the goal of providing satisfactory resolution to complaints in a timely and professional manner.

The nature of the complaint is identified, documented and investigated, and an appropriate action is determined and taken. In cases where a client complaint indicates that an established policy or procedure was not followed, the QA Department must evaluate whether a special audit must be conducted to assist in resolving the issue. A written confirmation or letter to the client, outlining the issue and response taken is recommended as part of the overall action taken.

The process of complaint resolution and documentation utilizes the procedures outlined in Section 12 (Corrective Actions). The laboratory utilizes the LIMS Non-Conformance Memo (NCM) program or the Incident/Corrective Action Tracker (ICAT) database, as appropriate, to document complaints and the corrective action performed.

10.2 External Complaints

An employee that receives a complaint initiates the complaint resolution process by first documenting the complaint in the TALS NCM program or the ICAT database as appropriate.

Complaints fall into two categories: correctable and non-correctable. An example of a correctable complaint would be one where a report re-issue would resolve the complaint. An example of a non-correctable complaint would be one where a client complains that their data was repeatedly late. Non-correctable complaints shall be reviewed for preventive action measures to reduce the likelihood of future occurrence and mitigation of client impact.

The general steps in the complaint handling process are:

- Receiving and Documenting Complaints
- Acknowledging receipt of complaint, whenever possible
- Complaint Investigation and Service Recovery
- Process Improvement

The laboratory shall inform the initiator of the complaint of the results of the investigation and the corrective action taken, if any.

10.3 Internal Complaints

Internal complaints include, but are not limited to: errors and non-conformances, training issues, internal audit findings, and deviations from methods. Corrective actions may be initiated

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by any staff member who observes a nonconformance and shall follow the procedures outlined in Section 12. In addition, Corporate Management, Sales and Marketing and IT may initiate a complaint by contacting the laboratory or through the corrective action system described in Section 12.

10.4 Management Review

The number and nature of client complaints is reported by the QA Manager to the Laboratory Director and Quality Director in the QA Monthly report. Monitoring and addressing the overall level and nature of client complaints and the effectiveness of the solutions is part of the Annual Management Systems Review (Section 16).

SECTION 11. CONTROL OF NON-CONFORMING WORK

11.1 Overview

When data discrepancies are discovered or deviations and departures from laboratory SOPs, policies and/or client requests have occurred, corrective action is taken immediately. First, the laboratory evaluates the significance of the nonconforming work. Then, a corrective action plan is initiated based on the outcome of the evaluation. If it is determined that the nonconforming work is an isolated incident, the plan could be as simple as adding a qualifier to the final results and/or making a notation in the case narrative. If it is determined that the nonconforming work is a systematic or improper practices issue, the corrective action plan could include a more in depth investigation and a possible suspension of an analytical method. In all cases, the actions taken are documented using the laboratory's corrective action system (refer to Section 12).

Due to the frequently unique nature of environmental samples, sometimes departures from documented policies and procedures are needed. When an analyst encounters such a situation, the problem is presented to the Supervisor or Technical Manager for resolution. The Supervisor or Technical Manager may elect to discuss it with the QA Manager and the Corporate Quality or Technical Director. Depending on the nature of the departure, the Laboratory Director or the PM may contact the client to decide on a logical course of action. Once an approach is agreed upon, the analyst documents it using the laboratories corrective action system described in Section 12. This information can then be supplied to the client in the form of a footnote or a case narrative with the report.

Project Management may encounter situations where a client may request that a special procedure be applied to a sample that is not standard laboratory practice. Based on a technical evaluation, the laboratory may accept or opt to reject the request based on technical or ethical merit. An example might be the need to report a compound that the laboratory does not normally report. The laboratory would not have validated the method for this compound following the procedures in Section 19. The client may request that the compound be reported based only on the calibration. Such a request would need to be approved by the Technical Manager and QA Manager, documented and included in the project folder. Deviations **must** also be noted on the final report with a statement that the compound is not reported in compliance with TNI (or the analytical method) requirements and the reason. Data being reported to a non-TNI state would need to note the change made to how the method is normally run.

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11.2 Responsibilities and Authorities

Under certain circumstances, the Laboratory Director, a Technical Manager, or a member of the QA team may authorize departures from documented procedures or policies. The departures may be a result of procedural changes due to the nature of the sample; a one-time procedure for a client; QC failures with insufficient sample to reanalyze, etc. In most cases, the client will be informed of the departure prior to the reporting of the data. Any departures must be well documented using the laboratory's corrective action procedures. This information may also be documented in logbooks and/or data review checklists as appropriate. Any impacted data must be referenced in a case narrative and/or flagged with an appropriate data qualifier.

Any misrepresentation or possible misrepresentation of analytical data discovered by any laboratory staff member must be reported to facility Senior Management within 24-hours. The Senior Management staff is comprised of the Laboratory Director, the QA Manager, and the Technical Managers. The reporting of issues involving alleged violations of the company's Data Integrity or Manual Integration procedures must be conveyed to an ECO (e.g., the VP-QA/EHS) and the laboratory's Quality Director within 24 hours of discovery.

Whether an inaccurate result was reported due to calculation or quantitation errors, data entry errors, improper practices, or failure to follow SOPs, the data must be evaluated to determine the possible effect.

The Laboratory Director, QA Manager, ECOs, VP of Operations and the Quality Directors have the authority and responsibility to halt work, withhold final reports, or suspend an analysis for due cause as well as authorize the resumption of work.

11.3 Evaluation of Significance and Actions Taken

For each nonconforming issue reported, an evaluation of its significance and the level of management involvement needed is made. This includes reviewing its impact on the final data, whether or not it is an isolated or systematic issue, and how it relates to any special client requirements.

Corporate SOP entitled Data Recalls (CW-Q-S-005) is the procedure to be followed when it is discovered that erroneous or biased data may have been reported to clients or regulatory agencies.

Corporate SOP entitled Internal Investigations (CW-L-S-002) is the procedure to be followed for investigation and correction of situations involved alleged incidents of misconduct or violation of the company's ethics policy.

Laboratory level decisions are documented and approved using the laboratory's standard nonconformance/corrective action reporting in lieu of the data recall determination form contained in Eurofins Environment Testing America Corporate SOP No. CW-Q-S-005.

11.4 Prevention of Nonconforming Work

If it is determined that the nonconforming work could recur, further corrective actions must be made following the laboratory's corrective action system. On a monthly basis, the QA

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Department evaluates non-conformances to determine if any nonconforming work has been repeated multiple times. If so, the laboratory's corrective action process may be followed.

11.5 Method Suspension / Restriction (Stop Work Procedures)

In some cases, it may be necessary to suspend/restrict the use of a method or target analyte which constitutes significant risk and/or liability to the laboratory. Suspension/restriction procedures can be initiated by any of the persons noted in Section 11.2, Paragraph 5.

Prior to suspension/restriction, confidentiality will be respected, and the problem with the required corrective and preventive action will be stated in writing and presented to the Laboratory Director.

The Laboratory Director shall arrange for the appropriate personnel to meet with the QA Manager as needed. This meeting shall be held to confirm that there is a problem, that suspension/restriction of the method is required and will be concluded with a discussion of the steps necessary to bring the method/target or test fully back on line. In some cases, that may not be necessary if all appropriate personnel have already agreed there is a problem and there is agreement on the steps needed to bring the method, target or test fully back on line. The QA Manager will also initiate a corrective action report as described in Section 12 if one has not already been started. A copy of any meeting notes and agreed upon steps should be e-mailed by the laboratory to the appropriate VP of Operations and member of Corporate QA. This e-mail acts as notification of the incident.

After suspension/restriction, the lab will hold all reports to clients pending review. No faxing, mailing or distributing through electronic means may occur. The report must not be posted for viewing on the internet. It is the responsibility of the Laboratory Director to hold all reporting and to notify all relevant laboratory personnel regarding the suspension/restriction (e.g., Project Management, Log-in, etc.). Clients will NOT generally be notified at this time. Analysis may proceed in some instances depending on the non-conformance issue.

Within 72 hours, the QA Manager will determine if compliance is now met and reports can be released, OR determine the plan of action to bring work into compliance, and release work. A team, with all principals involved (e.g., Laboratory Director, Technical Manager, QA Manager) can devise a start-up plan to cover all steps from client notification through compliance and release of reports. Project Management and the Directors of Client Services and Sales and Marketing must be notified if clients must be notified or if the suspension/restriction affects the laboratory's ability to accept work. The QA Manager must approve start-up or elimination of any restrictions after all corrective action is complete.

SECTION 12. CORRECTIVE ACTION

12.1 Overview

A major component of Eurofins Environment Testing America Quality Assurance (QA) Program is the problem investigation and feedback mechanism designed to keep the laboratory staff informed on quality related issues and to provide insight to problem resolution. When nonconforming work or departures from policies and procedures in the quality system or technical operations are identified, the corrective action procedure provides a systematic

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approach to assess the issues, restore the laboratory's system integrity, and prevent reoccurrence. Eurofins employs two systems to manage non-conformances. Issues suspected of being systematic in nature and for which root cause analysis and a formal Corrective Action Report (CAR) are documented in the Incident Corrective Action Tracking (ICAT) database. Routine batch non-conformances, events that are understood to be isolated in nature, are documented in the LIMS non-conformance memo (NCM) system. See Figure 12-1 and 12-2 for an example.

12.2 General

Problems within the quality system or within analytical operations may be discovered in a variety of ways, such as QC sample failures, internal or external audits, proficiency testing (PT) performance, client complaints, staff observation, etc.

The purpose of a corrective action system is to:

- Identify non-conformance events and assign responsibility(s) for investigating.
- Resolve non-conformance events and assign responsibility for any required corrective action.
- Identify systematic problems before they become serious.
- Identify and track client complaints and provide resolution.

12.2.1 Non-Conformance Memo (NCM) Program

The TALS NCM program is used to document the following types of corrective actions:

- Deviations from an established procedure or SOP
- QC outside of limits (non-matrix related)
- Isolated reporting / calculation errors
- Client complaints
- Discrepancies in materials / goods received vs. manufacturer packing slips. (Forms of documentation other than NCMs in the LIMS are also acceptable.)

12.2.2 Corrective Actions Documented in the ICAT Database

The ICAT database is used to document the following types of corrective actions:

- Internal and external audit findings.
- Failed or unacceptable PT results.
- Identified poor process or method performance trends.
- Systematic reporting / calculation errors.
- Data recall investigations.
- Questionable trends that are found in the review of NCMs.

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- Client complaints.
- Excessive revised reports.

The ICAT database is used to document background information, track the results of corrective action investigations and root cause analysis, and to provide reports of corrective action plans.

12.3 Closed Loop Corrective Action Process

Any employee in the company can initiate a corrective action. There are four main components to a closed-loop corrective action process once an issue has been identified: Cause Analysis, Selection and Implementation of Corrective Actions (both short and long term), Monitoring of the Corrective Actions, and Follow-up.

12.3.1 Cause Analysis

Upon discovery of a non-conformance event, the event must be defined and documented. An entry into the ICAT system must be initiated, someone is assigned to investigate the issue and the event is investigated for cause. Table 12-1 provides some general guidelines on determining responsibility for assessment.

The cause analysis step is the key to the process as a long term corrective action cannot be determined until the cause is determined.

If the cause is not readily obvious, the Technical Manager, Laboratory Director, or QA Manager (or QA designee) is consulted.

12.3.2 Selection and Implementation of Corrective Actions

Where corrective action is needed, the laboratory shall identify potential corrective actions. The action(s) most likely to eliminate the problem and prevent recurrence are selected and implemented. Responsibility for implementation is assigned.

Corrective actions shall be to a degree appropriate to the magnitude of the problem identified through the cause analysis.

Whatever corrective action is determined to be appropriate, the laboratory shall document and implement the changes. The ICAT record is used for this documentation.

12.3.3 Root Cause Analysis

Root Cause Analysis is a class of problem solving (investigative) methods aimed at identifying the basic or causal factor(s) that underlie variation in performance or the occurrence of a significant failure. The root cause may be buried under seemingly innocuous events, many steps preceding the perceived failure. At first glance, the immediate response is typically directed at a symptom and not the cause. Typically, root cause analysis would be best with three or more incidents to triangulate a weakness. Corporate SOP Root Cause Analysis (No. CA-Q-S-009) describes the procedure.

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Systematically analyze and document the root causes of the more significant problems that are reported. Identify, track, and implement the corrective actions required to reduce the likelihood of recurrence of significant incidents. Trend the root cause data from these incidents to identify root causes that, when corrected, can lead to dramatic improvements in performance by eliminating entire classes of problems.

Identify the one event associated with problem and ask why this event occurred. Brainstorm the root causes of failures; for example, by asking why events occurred or conditions existed; and then why the cause occurred consecutive times until you get to the root cause. For each of these sub events or causes, ask why it occurred. Repeat the process for the other events associated with the incident.

Root cause analysis does not mean the investigation is over. Look at technique, or other systems outside the normal indicators. Often creative thinking will find root causes that ordinarily would be missed, and continue to plague the laboratory or operation.

12.3.4 Monitoring of the Corrective Actions

The Technical Manager and QA Manager are responsible to ensure that the corrective action taken was effective.

Ineffective actions are documented and re-evaluated until acceptable resolution is achieved. Technical Managers are accountable to the Laboratory Director to ensure final acceptable resolution is achieved and documented appropriately.

The QA Manager reviews monthly NCM and ICAT records for trends. Highlights are included in the QA monthly report (refer to Section 16). If a significant trend develops that adversely affects quality, an audit of the area is performed and corrective action implemented.

Any out-of-control situations that are not addressed acceptably at the laboratory level may be reported to the Corporate Quality Director by the QA Manager, indicating the nature of the out-of-control situation and problems encountered in solving the situation.

12.3.5 Follow-up Audits

Follow-up audits may be initiated by the QA Manager and shall be performed as soon as possible when the identification of a nonconformance casts doubt on the laboratory's compliance with its own policies and procedures, or on its compliance with state or federal requirements.

These audits often follow the implementation of the corrective actions to verify effectiveness. An additional audit would only be necessary when a critical issue or risk to business is discovered.

(Also refer to Section 15.1.4, Special Audits.)

12.4 Technical Corrective Actions

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In addition to providing acceptance criteria and specific protocols for technical corrective actions in the method SOPs, the laboratory has general procedures to be followed to determine when departures from the documented policies and procedures and quality control have occurred (refer to Section 11). The documentation of these procedures is through the use of an NCM or record in the ICAT system.

Table 12-1 includes examples of general technical corrective actions. For specific criteria and corrective actions, refer to the analytical methods or specific method SOPs. The laboratory may also maintain Work Instructions on these items that are available upon request.

Table 12-1 provides some general guidelines for identifying the individual(s) responsible for assessing each QC type and initiating corrective action. The table also provides general guidance on how a data set should be treated if associated QC measurements are unacceptable. Specific procedures are included in Method SOPs, Work Instructions, QAM Sections 19 and 20. All corrective actions are reviewed monthly, at a minimum, by the QA Manager and highlights are included in the QA monthly report.

To the extent possible, samples shall be reported only if all quality control measures are acceptable. If the deficiency does not impair the usability of the results, data will be reported with an appropriate data qualifier and/or the deficiency will be noted in the case narrative. Where sample results may be impaired, the Project Manager is notified by an NCM and appropriate corrective action (e.g., reanalysis) is taken and documented.

12.5 Basic Corrections

When mistakes occur in records, each mistake shall be crossed-out, [not obliterated (e.g. no white-out)], and the correct value entered alongside. All such corrections shall be initialed (or signed) and dated by the person making the correction. In the case of records stored electronically, the original uncorrected file must be maintained intact and a second corrected file is created.

This same process applies to adding additional information to a record. All additions made later than the initial must also be initialed (or signed) and dated.

When corrections are due to reasons other than obvious transcription errors, the reason for the corrections (or additions) shall also be documented.

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Figure 12-1. Example – TALS NCM Program

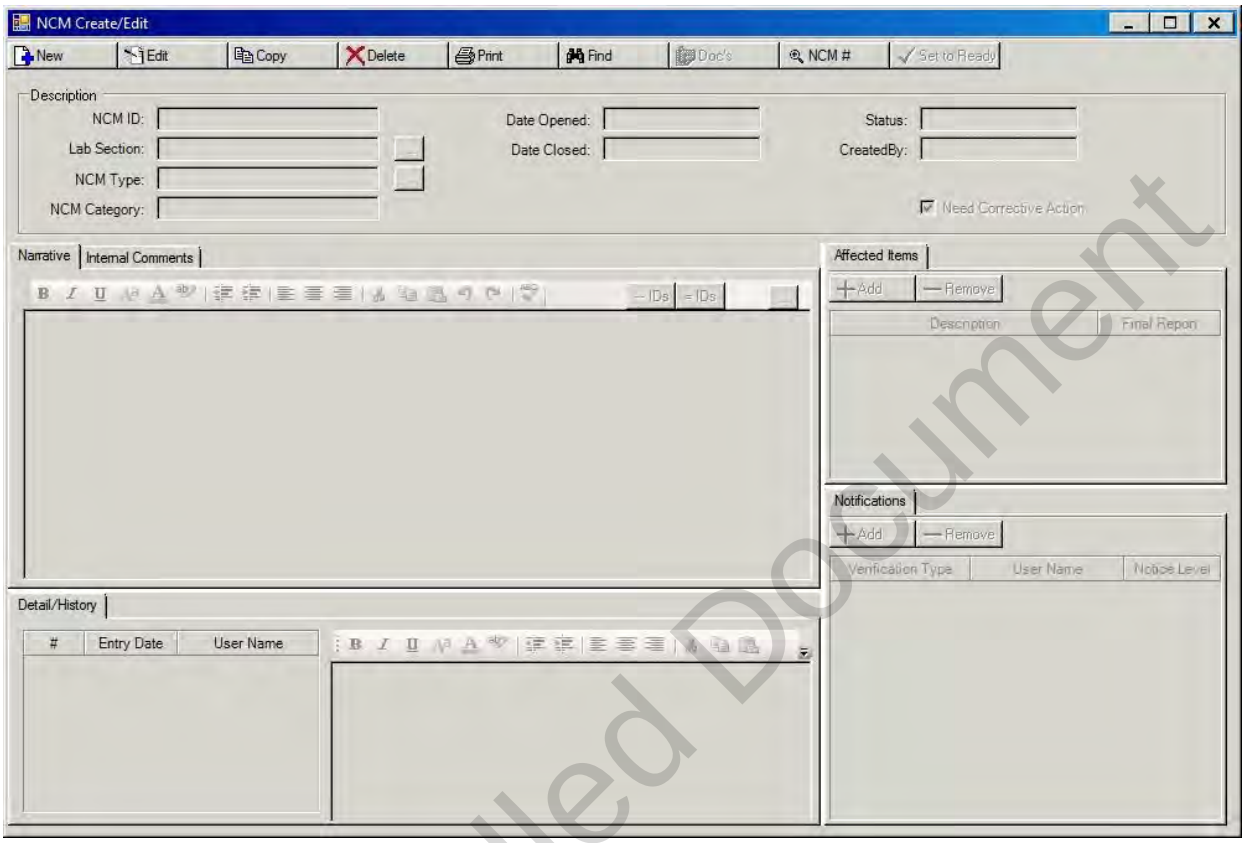

Figure 12-2. Example – ICAT Database

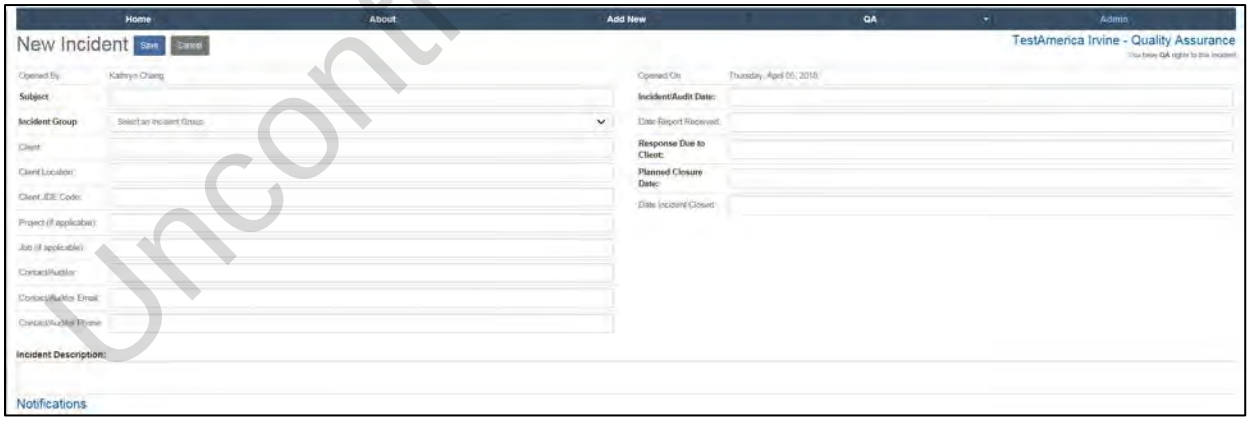

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Figure 12-2. Example – ICAT Database (Cont.)

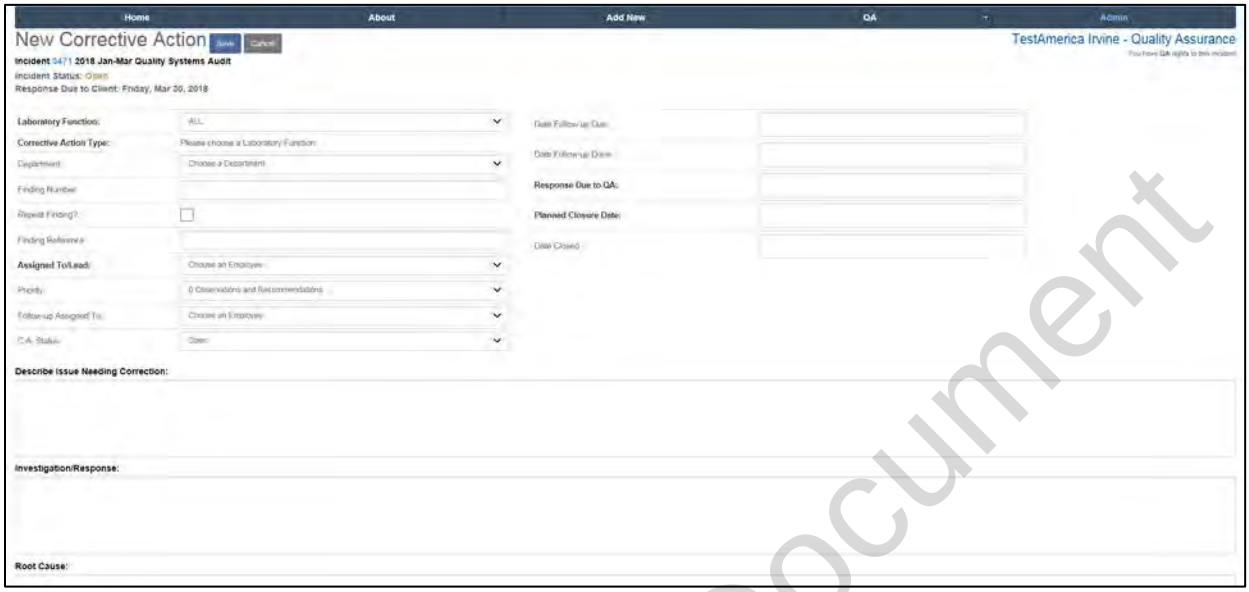

Table 12-1. Example – General Corrective Action Procedures

QC Activity *(Individual Responsible for Initiation/Assessment)*	Acceptance Criteria	Recommended Corrective Action
Initial Instrument Blank *(Analyst)*	- Instrument response < MDL.	- Prepare another blank. - If same response, determine cause of contamination: reagents, environment, instrument equipment failure, etc.
Initial Calibration Standards *(Analyst, Technical Manager(s))*	- Correlation coefficient > 0.99 or standard concentration value. - % Recovery within acceptance range. - See details in Method SOP.	- Reanalyze standards. - If still unacceptable, remake standards and recalibrate instrument.
Independent Calibration Verification (Second Source) *(Analyst, Technical Manager(s))*	- % Recovery within control limits.	- Remake and reanalyze standard. - If still unacceptable, then remake calibration standards or use new primary standards and recalibrate instrument.
Continuing Calibration Standards *(Analyst, Data Reviewer)*	- % Recovery within control limits.	- Reanalyze standard. - If still unacceptable, then recalibrate and rerun affected samples.

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QC Activity *(Individual Responsible for Initiation/Assessment)*	Acceptance Criteria	Recommended Corrective Action
Matrix Spike / Matrix Spike Duplicate (MS/MSD) *(Analyst, Data Reviewer)*	- % Recovery within limits documented in TALS Method Limit Groups.	- If the acceptance criteria for duplicates or matrix spikes are not met because of matrix interferences, the acceptance of the analytical batch is determined by the validity of the LCS. - If the LCS is within acceptable limits the batch is acceptable. - The results of the duplicates, matrix spikes and the LCS are reported with the data set. - For matrix spike or duplicate results outside criteria the data for that sample shall be reported with qualifiers.
Laboratory Control Sample (LCS) *(Analyst, Data Reviewer)*	- % Recovery within limits specified in TALS Method Limit Groups.	- Batch must be re-prepared and re-analyzed. This includes any allowable marginal exceedance. When not using marginal exceedances, the following exceptions apply: 1) When the acceptance criteria for the positive control are exceeded high (i.e., high bias) and there are associated samples that are non-detects, then those non-detects may be reported with data qualifying codes; 2) When the acceptance criteria for the positive control are exceeded low (i.e., low bias), those sample results may be reported if they exceed a maximum regulatory limit/decision level with data qualifying codes. **Note:** If there is insufficient sample or the holding time cannot be met, contact client and report with flags.
Surrogates *(Analyst, Data Reviewer)*	- % Recovery within limits of method or within three standard deviations of the historical mean.	- Individual sample must be repeated. Place comment in TALS. - Surrogate results outside criteria shall be reported with qualifiers.

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QC Activity *(Individual Responsible for Initiation/Assessment)*	Acceptance Criteria	Recommended Corrective Action
Method Blank (MB) *(Analyst, Data Reviewer)*	< Reporting Limit [1,2]	- Reanalyze blank. - If still positive, determine source of contamination. If necessary, reprocess (i.e. digest or extract) entire sample batch. Report blank results. - Qualify the result(s) if the concentration of a targeted analyte in the MB is at or above the reporting limit AND is > 1/10 of the amount measured in the sample.
Proficiency Testing (PT) Samples *(QA Manager, Technical Manager(s))*	- Criteria supplied by PT Supplier.	- Any failures or warnings must be investigated for cause. Failures may result in the need to repeat a PT sample to show the problem is corrected.
Internal / External Audits *(QA Manager, Technical Manager(s), Laboratory Director)*	- Defined in Quality System documentation such as SOPs, QAM, etc.	- Non-conformances must be investigated through ICAT database and necessary corrections must be made.
Reporting / Calculation Errors *(Depends on issue – possible individuals include: Analysts, Data Reviewers, Project Managers, Technical Managers, QA Manager, Corporate QA, Corporate Management)*	- SOP CW-Q-S-005, Data Recall.	- Corrective action is determined by type of error. Follow the procedures in SOP CW-L-S-002.
Client Complaints *(Project Managers, Laboratory Director, Sales and Marketing)*	- QAM.	- Corrective action is determined by the type of complaint. For example, a complaint regarding an incorrect address on a report will result in the report being corrected and then follow-up must be performed on the reasons the address was incorrect (e.g., database needs to be updated).
QA Monthly Report (Refer to Section 16 for an example) *(QA Manager, Laboratory Director, Technical Manager(s))*	- QAM, SOPs.	- Corrective action is determined by the type of issue. For example, CARs for the month are reviewed and possible trends are investigated.

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QC Activity *(Individual Responsible for Initiation/Assessment)*	Acceptance Criteria	Recommended Corrective Action
Health and Safety Violation *(Safety Officer, Laboratory Director, Technical Manager(s))*	- Environmental Health and Safety (EHS) Manual.	- Non-conformance is investigated and corrected through ICAT database.

Note:

[1] Program or project specific requirements may dictate that method blank must not contain target analytes greater than ½ the reporting limit (RL).

[2] Except as noted below for certain compounds, the method blank should be below the detection limit. Concentrations up to five times the reporting limit will be allowed for the ubiquitous laboratory and reagent contaminants: methylene chloride, toluene, acetone, 2-butanone and phthalates **provided** they appear in similar levels in the reagent blank and samples. This allowance presumes that the detection limit is significantly below any regulatory limit to which the data are to be compared and that blank subtraction will not occur. For benzene and ethylene dibromide (EDB) and other analytes for which regulatory limits are extremely close to the detection limit, the method blank must be below the method detection limit (MDL).

SECTION 13. PREVENTIVE ACTION / IMPROVEMENT

13.1 Overview

The laboratory's preventive action programs improve or eliminate potential causes of nonconforming product and/or nonconformance to the quality system. This preventive action process is a proactive and continuous process of improvement activities that can be initiated through feedback from clients, employees, business providers, and affiliates. The QA Department has the overall responsibility to ensure that the preventive action process is in place, and that relevant information on actions is submitted for management review.

Dedicating resources to an effective preventive action system emphasizes the laboratory's commitment to its Quality Program. It is beneficial to identify and address negative trends before they develop into complaints, problems and corrective actions. Additionally, the laboratory continually strives to improve customer service and client satisfaction through continuous improvements to laboratory systems.

Opportunities for improvement may be discovered through any of the following:

- Review of the monthly QA Metrics Report,
- Trending NCMs,
- Review of control charts and QC results,
- Trending proficiency testing (PT) results,
- Performance of management system reviews,
- Trending client complaints,

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- Review of processing operations, or
- Staff observations.

The monthly Management Systems Metrics Report shows performance indicators in all areas of the laboratory and quality system. These areas include revised reports, corrective actions, audit findings, internal auditing and data authenticity audits, client complaints, PT samples, holding time violations, SOPs, ethics training, etc. The metrics report is reviewed monthly by the laboratory management, Corporate QA and Eurofins Environment Testing America's corporate officers. These metrics are used in evaluating the management and quality system performance on an ongoing basis and provide a tool for identifying areas for improvement.

Items identified as continuous improvement opportunities to the management system may be issued as goals from the annual management systems review, recommendations from internal audits, white papers, Lessons Learned, Technical Services audit report, Technical Best Practices, or as Corporate or management initiatives.

The laboratory's corrective action process is integral to implementation of preventive actions. A critical piece of the corrective action process is the implementation of actions to prevent further occurrence of a non-compliance event. Historical review of corrective action and non-conformances provides a valuable mechanism for identifying preventive action opportunities.

13.1.1 The following elements are part of a preventive action/process improvement system:

- Identification of an opportunity for preventive action or process improvement.
- Process for the preventive action or improvement.
- Define the measurements of the effectiveness of the process once undertaken.
- Execution of the preventive action or improvement.
- Evaluation of the plan using the defined measurements.
- Verification of the effectiveness of the preventive action or improvement.
- Close-Out by documenting any permanent changes to the Quality System as a result of the Preventive Action or Process Improvement. Documentation of Preventive Action/process Improvement is incorporated into the monthly QA reports, corrective action process and management review.

13.1.2 Any Preventive Actions/Process Improvement undertaken or attempted shall be taken into account during the annual Management Systems Review (Section 16). A highly detailed report is not required; however, a summary of successes and failures within the preventive action program is sufficient to provide management with a measurement for evaluation.

13.2 Management of Change

The Management of Change process is designed to manage significant events and changes that occur within the laboratory. Through these procedures, the potential risks inherent with a new event or change are identified and evaluated. The risks are minimized or eliminated through pre-planning and the development of preventive measures. The types of changes

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covered under this system include: Facility Changes, Major Accreditation Changes, Addition or Deletion to Division's Capabilities or Instrumentation, Key Personnel Changes, Laboratory Information Management System (LIMS) changes.

Eurofins Calscience Irvine utilizes the Irvine Intranet SharePoint to manage and document significant events and changes occurring within the laboratory. There is no formal Management of Change process and system implemented at the time of the effective date of this QAM.

SECTION 14. CONTROL OF RECORDS

The laboratory maintains a records management system appropriate to its needs and that complies with applicable standards or regulations as required. The system produces unequivocal, accurate records that document all laboratory activities. The laboratory retains all original observations, calculations and derived data, calibration records and a copy of the analytical report for a minimum of five years after it has been issued. Exceptions for programs with longer retention requirements are discussed in Section 14.1.2.

14.1 Overview

The laboratory has established procedures for identification, collection, indexing, access, filing, storage, maintenance and disposal of quality and technical records. A record index is listed in Table 14-1. More detailed information on retention of specific records is provided in CW-L-P-001, Records Retention Policy and CW-L-WI-001, Eurofins Environment Testing America Records Retention/Storage Schedule. Quality records are maintained by the QA department in a local or network server, which is backed up as part of the regular laboratory backup. Records are of two types; either electronic or hard copy paper formats depending on whether the record is computer or hand generated (some records may be in both formats). Technical records are maintained by the laboratory department responsible for generating the specific technical record. When archived, they are maintained by the Technical Managers.

Table 14-1. Record Index [1]

	Record Types [1]:	Retention Time:
Technical Records	- Raw Data - Logbooks [2] - Standards - Certificates - Analytical Records - MDLs/IDLs/DOCs - Lab Reports	5 Years from analytical report issue*
Official Documents	- Quality Assurance Manual (QAM) - Work Instructions - Policies - SOPs - Policy Memorandums - Manuals - Published Methods	Indefinitely
QA Records	- Certifications - Method and Software Validation / Verification Data	Indefinitely

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	Record Types [1]:	Retention Time:
QA Records	- Internal & External Audits/Responses - Corrective/Preventive Actions - Management Reviews - Data Investigation	5 Years from archival* **Data Investigation:** 5 years or the life of the affected raw data storage whichever is greater (beyond 5 years if ongoing project or pending investigation)
Project Records	- Sample Receipt & COC Documents - Contracts and Amendments - Correspondence - QAPP - SAP - Telephone Logbooks - Lab Reports	5 Years from analytical report issue*
Administrative Records	Financial and Business Operations	10 years
	EH&S Manual, Permits	Indefinitely
	Disposal Records	Indefinitely
	Employee Handbook	Indefinitely
	Personnel Files, Employee Signature & Initials, Administrative Training Records (e.g., Ethics)	Refer to HR Manual
	Administrative Policies	Indefinitely
	Technical Training Records	7 years
	Legal Records	Indefinitely
	HR Records	Refer to CW-L-WI-001
	IT Records	Refer to CW-L-WI-001
	Corporate Governance Records	Refer to CW-L-WI-001
	Sales & Marketing	5 years
	Real Estate	Indefinitely

[1] Record Types encompass hardcopy and electronic records.
[2] Examples of Logbook types: Maintenance, Instrument Run, Preparation (standard and samples), Standard and Reagent Receipt, Archiving, Balance Calibration, Temperature (hardcopy or electronic records).
* Exceptions listed in Table 14-2.

14.1.1 All records are stored and retained in such a way that they are secure and readily retrievable at the laboratory facility or the Iron Mountain data storage facility that provides a suitable environment to prevent damage or deterioration and to prevent loss. All records shall be protected against fire, theft, loss, environmental deterioration, and vermin. In the case of electronic records, electronic or magnetic sources, storage media are protected from deterioration caused by magnetic fields and/or electronic deterioration. The procedures for record archiving and retrieval are outlined in the laboratory SOP No. IR-QA-ARCH.

Access to the data is limited to laboratory and company employees and shall be documented with an access log. Records archived off-site are stored in a secure location where a record is

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maintained of any entry into the storage facility. Whether on-site or off-site storage is used, logs are maintained in each storage box to note removal and return of records. Retention of records is maintained on-site at the laboratory for at least 1 year after their generation and moved offsite for the remainder of the required storage time. Records are maintained for a minimum of five years unless otherwise specified by a client or regulatory requirement.

For raw data and project records, record retention shall be calculated from the date the project report is issued. For other records, such as Controlled Documents, QA, or Administrative Records, the retention time is calculated from the date the record is formally retired. Records related to the programs listed in Table 14-2 have lengthier retention requirements and are subject to the requirements in Section 14.1.3.

14.1.2 Programs with Longer Retention Requirements

Some regulatory programs have longer record retention requirements than the standard record retention time. These are detailed in Table 14-2 with their retention requirements. In these cases, the longer retention requirement is enacted. If special instructions exist such that client data cannot be destroyed prior to notification of the client, the container or box containing that data is marked as to who to contact for authorization prior to destroying the data.

Table 14-2. Example – Special Record Retention Requirements

Program	Retention Requirement [1]
Drinking Water – All States	10 years (lab reports and raw data) 10 years - Radiochemistry (project records)
Drinking Water Lead and Copper Rule	12 years (project records)
Commonwealth of MA – All environmental data 310 CMR 42.14	10 years
FIFRA – 40 CFR Part 160	Retain for life of research or marketing permit for pesticides regulated by EPA
Housing and Urban Development (HUD) Environmental Lead Testing	10 years
Alaska	10 years
Louisiana – All	10 years
Michigan Department of Environmental Quality – all environmental data	10 years
Navy Facilities Engineering Service Center (NFESC)	10 years
Ohio VAP	10 years and State contacted prior to disposal
OSHA	30 years

Note:

[1] Extended retention requirements must be noted with the archive documents or addressed in facility-specific records retention procedures.

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14.1.3 The laboratory has procedures to protect and back-up records stored electronically and to prevent unauthorized access to or amendment of these records. All analytical data is maintained as hard copy or in a secure readable electronic format. For analytical reports that are maintained as copies in PDF format, refer to Section 19.15.1 and the laboratory's SOP No. IR-IT-COMPUSEC for more information.

14.1.4 The record keeping system allows for historical reconstruction of all laboratory activities that produced the analytical data, as well as rapid recovery of historical data. (Records stored off site should be accessible within 2 days of a request for such records). The history of the sample from when the laboratory took possession of the samples must be readily understood through the documentation. This shall include inter-laboratory transfers of samples and/or extracts.

- The records include the identity of personnel involved in sampling, sample receipt, preparation, or testing. All analytical work contains the initials (at least) of the personnel involved. The laboratory's copy of the COC is scanned and stored with the invoice and the work order sheet generated by the LIMS in the designated project folder. If a correction was made to a COC at any time before the final report is issued, the corrected COC is scanned and stored with the first scanned copy in the same folder. The Eurofins chain of custody would indicate the name of the sampler. If any sampling notes are provided with a work order, they are kept with this package.
- All information relating to the laboratory facilities equipment, analytical test methods, and related laboratory activities, such as sample receipt, sample preparation, or data verification are documented.
- The record keeping system facilitates the retrieval of all working files and archived records for inspection and verification purposes (e.g., set format for naming electronic files, set format for what is included with a given analytical data set, etc.). Instrument data is stored sequentially by instrument. A given day's analyses are maintained in the order of the analysis. Run logs are maintained for each instrument or method; a copy of each day's run log or instrument sequence is stored with the data to aid in re-constructing an analytical sequence. Where an analysis is performed without an instrument, bound logbooks or bench sheets are used to record and file data. Standard and reagent information is recorded in logbooks or entered into the LIMS Reagent program for each method as required.
- Changes to hardcopy records shall follow the procedures outlined in Section 12 and 19. Changes to electronic records in LIMS or instrument data are recorded in audit trails.
- The reason for a signature or initials on a document is clearly indicated in the records such as "sampled by," "prepared by," "reviewed by", or "analyzed by".
- All generated data except those that are generated by automated data collection systems, are recorded directly, promptly and legibly in permanent dark ink.
- Hard copy data may be scanned into PDF format for record storage as long as the scanning process can be verified in order to ensure that no data is lost and the data files and storage media must be tested to verify the laboratory's ability to retrieve the information prior to the destruction of the hard copy that was scanned.
- Also refer to Section 19.15.1 'Computer and Electronic Data Related Requirements'.

14.2 Technical and Analytical Records

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14.2.1 The laboratory retains records of original observations, derived data and sufficient information to establish an audit trail, calibration records, staff records and a copy of each analytical report issued, for a minimum of five years unless otherwise specified by a client or regulatory requirement. The records for each analysis shall contain sufficient information to enable the analysis to be repeated under conditions as close as possible to the original. The records shall include the identity of laboratory personnel responsible for the sampling, performance of each analysis and reviewing results.

14.2.2 Observations, data and calculations are recorded real-time and are identifiable to the specific task.

14.2.3 Changes to hardcopy records shall follow the procedures outlined in Section 12 and 19. Changes to electronic records in LIMS or instrument data are recorded in audit trails.

The essential information to be associated with analysis, such as strip charts, tabular printouts, computer data files, analytical notebooks, and run logs, include:

- Laboratory sample ID code;
- Date of analysis; Time of Analysis is also required if the holding time is seventy-two (72) hours or less, or when time critical steps are included in the analysis (e.g., drying times, incubations, etc.); instrumental analyses have the date and time of analysis recorded as part of their general operations. Where a time critical step exists in an analysis, location for such a time is included as part of the documentation in a specific logbook or on a benchsheet.
- Instrumentation identification and instrument operating conditions/parameters. Operating conditions/parameters are typically recorded in instrument maintenance logs where available.
- Analysis type;
- All manual calculations and manual integrations;
- Analyst's or operator's initials/signature;
- Sample preparation including, but are not limited to, cleanup, separation protocols, incubation periods or subculture, ID codes, volumes, weights, instrument printouts, meter readings, calculations, reagents;
- Test results;
- Standard and reagent origin, receipt, preparation, and use;
- Calibration criteria, frequency and acceptance criteria;
- Data and statistical calculations, review, confirmation, interpretation, assessment and reporting conventions;
- Quality control protocols and assessment;
- Electronic data security, software documentation and verification, software and hardware audits, backups, and records of any changes to automated data entries; and

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- Method performance criteria including expected quality control requirements. These are indicated both in the LIMS and on specific analytical report formats.

14.2.4 All logbooks used during receipt, preparation, storage, analysis, and reporting of samples or monitoring of support equipment shall undergo a periodic, documented supervisory or peer review.

14.3 Laboratory Support Activities

In addition to documenting all the above-mentioned activities, the following are retained QA records and project records (previous discussions in this section relate where and how these data are stored):

- All original raw data, whether hard copy or electronic, for calibrations, samples and quality control measures, including analysts' work sheets and data output records (chromatograms, strip charts, and other instrument response readout records);
- A written description or reference to the specific test method used which includes a description of the specific computational steps used to translate parametric observations into a reportable analytical value;
- Copies of final reports;
- Archived SOPs;
- Correspondence relating to laboratory activities for a specific project;
- All corrective action reports, audits and audit responses;
- Proficiency test results and raw data; and
- Results of data review, verification, and crosschecking procedures.

14.3.1 Sample Handling Records

Records of all procedures to which a sample is subjected while in the possession of the laboratory are maintained. These include but are not limited to records pertaining to:

- Sample preservation including appropriateness of sample container and compliance with holding time requirement;
- Sample identification, receipt, acceptance or rejection and login;
- Sample storage and tracking including shipping receipts, sample transmittal / COC forms; and
- Procedures for the receipt and retention of samples, including all provisions necessary to protect the integrity of samples.

14.4 Administrative Records

The laboratory also maintains the administrative records in either electronic or hard copy form. Refer to Table 14-1.

14.5 Records Management, Storage and Disposal

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All records (including those pertaining to test equipment), certificates and reports are safely stored, held secure and in confidence to the client. Certification related records are available upon request.

All information necessary for the historical reconstruction of data is maintained by the laboratory. Records that are stored only on electronic media must be supported by the hardware and software necessary for their retrieval.

Records that are stored or generated by computers or personal computers have hard copy, write-protected backup copies, or an electronic audit trail controlling access.

The laboratory has a record management system (a.k.a., document control) for control of laboratory notebooks, instrument logbooks, standards logbooks, and records for data reduction, validation, storage and reporting. Laboratory notebooks or logbooks are issued on a per analysis basis, and are numbered sequentially. All data are recorded sequentially within a series of sequential notebooks. Bench sheets are filed sequentially. Standards are maintained in the LIMS Reagent program – no logbooks are used to record that data. Records are considered archived when noted as such in the records management system (a.k.a., document control).

14.5.1 Transfer of Ownership

In the event that the laboratory transfers ownership or goes out of business, the laboratory shall ensure that the records are maintained or transferred according to client's instructions. Upon ownership transfer, record retention requirements shall be addressed in the ownership transfer agreement and the responsibility for maintaining archives is clearly established. In addition, in cases of bankruptcy, appropriate regulatory and state legal requirements concerning laboratory records must be followed. In the event of the closure of the laboratory, all records will revert to the control of the corporate headquarters. Should the entire company cease to exist, as much notice as possible will be given to clients and the accrediting bodies who have worked with the laboratory during the previous 5 years of such action.

14.5.2 Records Disposal

Records are removed from the archive and destroyed after 5 years unless otherwise specified by a client or regulatory requirement. On a project specific or program basis, clients may need to be notified prior to record destruction. Records are destroyed in a manner that ensures their confidentiality such as shredding, mutilation or incineration. (Refer to Tables 14-1 and 14-2).

Electronic copies of records must be destroyed by erasure or physically damaging off-line storage media so no records can be read.

If a third party records management company is hired to dispose of records, a "Certificate of Destruction" is required.

SECTION 15. AUDITS

15.1 Internal Audits

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Internal audits are performed to verify that laboratory operations comply with the requirements of the lab's quality system and with the external quality programs under which the laboratory operates. Audits are planned and organized by the QA staff. Personnel conducting the audits should be independent of the area being evaluated. Auditors will have sufficient authority, access to work areas, and organizational freedom necessary to observe all activities affecting quality and to report the assessments to laboratory management and, when requested, to corporate management.

Audits are conducted and documented as described in the Eurofins Environment Testing America Corporate SOP on performing Internal Auditing, SOP No. CW-Q-S-003. The types and frequency of routine internal audits are described in Table 15-1. Special or ad hoc assessments may be conducted as needed under the direction of the QA staff.

Table 15-1. Types of Internal Audits and Frequency

Description	Performed by	Frequency
Quality Systems Audits	QA Department, QA approved designee, or Corporate QA	All areas of the laboratory annually
Method Audits QA Technical Audits	Joint responsibility: a) QA Manager or designee b) Technical Manager or designee (Refer to CW-Q-S-003)	QA Technical Audits Frequency: 50% of methods annually
SOP Method Compliance	Joint responsibility: a) QA Manager or designee b) Technical Manager or designee (Refer to CW-Q-S-003)	SOP Compliance Review Frequency: Every 2 years for all SOPs, and annually for SOPs affecting Drinking Water analyses (including QA and administrative SOPs)
Special Audits	QA Department or designee	Surveillance or spot checks performed as needed, e.g., to confirm corrective actions from other audits
Performance Testing	Analysts with QA oversight	Two successful per year for each TNI field of testing or as dictated by regulatory requirements

15.1.1 Annual Quality Systems Audit

An annual quality systems audit is required to ensure compliance to analytical methods and SOPs, Eurofins Environment Testing America's Data Integrity and Ethics Policies, TNI quality systems, client and state requirements, and the effectiveness of the internal controls of the analytical process, including but not limited to data review, quality controls, preventive action and corrective action. The completeness of earlier corrective actions is assessed for effectiveness & sustainability. The audit is divided into sections for each operating or support area of the lab, and each section is comprehensive for a given area. The area audits may be performed on a rotating schedule throughout the year to ensure adequate coverage of all areas. This schedule may change as situations in the laboratory warrant.

15.1.2 QA Technical Audits

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QA technical audits assess data authenticity and analyst integrity. These audits are based on client projects, associated sample delivery groups, and the methods performed. Reported results are compared to raw data to verify the authenticity of results. The validity of calibrations and QC results are compared to data qualifiers, footnotes, and case narratives. Documentation is assessed by examining run logs and records of manual integrations. Manual calculations are checked. Where possible, electronic audit miner programs (e.g., Chrom AuditMiner) are used to identify unusual manipulations of the data deserving closer scrutiny. QA technical audits will include all methods within a two-year period. All analysts should be reviewed over the course of a two year period through at least one QA Technical Audit.

15.1.3 SOP Method Compliance

Compliance of all SOPs with the source methods and compliance of the operational groups with the SOPs will be assessed by the Technical Manager or qualified designee at least every two years, or annually for methods, QA, and administrative SOPs related to the Drinking Water program. It is also recommended that the work of each newly hired analyst is assessed within 3 months of working independently, (e.g., completion of method IDOC). In addition, as analysts add methods to their capabilities, (new IDOC) reviews of the analyst work products will be performed within 3 months of completing the documented training.

15.1.4 Special Audits

Special audits are conducted on an as needed basis, generally as a follow up to specific issues such as client complaints, corrective actions, PT results, data audits, system audits, validation comments, regulatory audits or suspected ethical improprieties. Special audits are focused on a specific issue, and report format, distribution, and timeframes are designed to address the nature of the issue.

15.1.5 Performance Testing

The laboratory participates semi-annually in performance audits conducted through the analysis of PT samples provided by a third party. The laboratory generally participates in the following types of PT studies: Drinking Water (WS), Non-potable Water (WP), and Soil (HW).

It is Eurofins Environment Testing America's policy that PT samples be treated as typical samples in the production process. Furthermore, where PT samples present special or unique problems, in the regular production process they may need to be treated differently, as would any special or unique request submitted by any client. The QA Manager must be consulted and in agreement with any decisions made to treat a PT sample differently due to some special circumstance.

Written investigations for unacceptable PT results are required. In some cases it may be necessary for blind QC samples to be submitted to the laboratory to show a return to control.

15.2 External Audits

External audits are performed when certifying agencies or clients conduct on-site inspections or submit performance testing samples for analysis. It is Eurofins Environment Testing America's policy to cooperate fully with regulatory authorities and clients. The laboratory makes every

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effort to provide the auditors with access to personnel, documentation, and assistance. Laboratory supervisors are responsible for providing corrective actions to the QA Manager who coordinates the response. Audit responses are due in the time allotted by the client or agency performing the audit. When requested, a copy of the audit report and the labs corrective action plan will be forwarded to Corporate Quality.

The laboratory cooperates with clients and their representatives to monitor the laboratory's performance in relation to work performed for the client. The client may only view data and systems related directly to the client's work. All efforts are made to keep other client information confidential.

15.2.1 Confidential Business Information (CBI) Considerations

During on-site audits, auditors may come into possession of information claimed as business confidential. A business confidentiality claim is defined as "a claim or allegation that business information is entitled to confidential treatment for reasons of business confidentiality or a request for a determination that such information is entitled to such treatment." When information is claimed as business confidential, the laboratory must place on (or attach to) the information at the time it is submitted to the auditor, a cover sheet, stamped or typed legend or other suitable form of notice, employing language such as "trade secret", "proprietary" or "company confidential". Confidential portions of documents otherwise non-confidential must be clearly identified. CBI may be purged of references to client identity by the responsible laboratory official at the time of removal from the laboratory. However, sample identifiers may not be obscured from the information. Additional information regarding CBI can be found in within the 2009 TNI standards.

15.3 Audit Findings

Audit findings are documented using the corrective action process and database (see Section 12). The laboratory's corrective action responses for both types of audits may include action plans that could not be completed within a predefined timeframe. In these instances, a completion date must be set and agreed to by operations management and the QA Manager.

Developing and implementing corrective actions to findings is the responsibility of the Technical Manager where the finding originated. Findings that are not corrected by specified due dates are reported monthly to management in the QA monthly report. When requested, a copy of the audit report and the labs corrective action plan will be forwarded to Corporate Quality.

If any audit finding casts doubt on the effectiveness of the operations or on the correctness or validity of the laboratory's test results, the laboratory shall take timely corrective action, and shall notify clients in writing if the investigations show that the laboratory results have been affected. Once corrective action is implemented, a follow-up audit is scheduled to ensure that the problem has been corrected.

Clients must be notified promptly in writing, of any event such as the identification of defective measuring or test equipment that casts doubt on the validity of results given in any test report or amendment to a test report. The investigation must begin within 24-hours of discovery of the problem and all efforts are made to notify the client within two weeks after the completion of the investigation.

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SECTION 16. MANAGEMENT REVIEWS

16.1 Quality Assurance Report

A comprehensive QA Report shall be prepared each month by the laboratory's QA Department and forwarded to the Laboratory Director, Technical Managers, their Quality Director as well as the VP of Operations. All aspects of the QA system are reviewed to evaluate the suitability of policies and procedures. During the course of the year, the Laboratory Director, VP of Operations or Corporate QA may request that additional information be added to the report.

On a monthly basis, Corporate QA compiles information from all the monthly laboratory reports. The Corporate Quality Directors prepare a report that includes a compilation of all metrics and notable information and concerns regarding the QA programs within the laboratories. The report also includes a listing of new regulations that may potentially impact the laboratories. This report is presented to the Senior Management Team and VPs of Operations.

16.2 Annual Management Review

The senior lab management team (Laboratory Director, Technical Managers, QA Manager, and the Manager of Project Management) conducts a review annually of its quality systems and LIMS to ensure its continuing suitability and effectiveness in meeting client and regulatory requirements and to introduce any necessary changes or improvements. It will also provide a platform for defining goals, objectives and action items that feed into the laboratory planning system. Corporate Operations and Corporate QA personnel are to be included in this meeting at the discretion of the Laboratory Director. The LIMS review consists of examining any audits, complaints or concerns that have been raised through the year that are related to the LIMS. The laboratory will summarize any critical findings that cannot be solved by the lab and report them to Corporate IT.

This management systems review (Corporate SOP No. CW-Q-S-004 and Work Instruction No. CW-Q-WI-003) uses information generated during the preceding year to assess the "big picture" by ensuring that routine actions taken and reviewed on a monthly basis are not components of larger systematic concerns. The monthly review should keep the quality systems current and effective; therefore, the annual review is a formal senior management process to review specific existing documentation. Significant issues from the following documentation are compiled or summarized by the QA Manager prior to the review meeting:

- Matters arising from the previous annual review.
- Prior Monthly QA Reports issues.
- Laboratory QA Metrics.
- Review of report reissue requests.
- Review of client feedback and complaints.
- Issues arising from any prior management or staff meetings.
- Minutes from prior senior lab management meetings. Issues that may be raised from these meetings include:
    - Adequacy of staff, equipment and facility resources.

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- Adequacy of policies and procedures.
- Future plans for resources and testing capability and capacity.

- The annual internal double blind PT program sample performance (if performed).
- Compliance to the Ethics Policy and Data Integrity Plan. Including any evidence/incidents of inappropriate actions or vulnerabilities related to data Integrity.
- Evaluation of overall risk, including risks to impartiality, confidentiality, reporting statements of conformity, and nonconforming work.

A report is generated by the QA Manager and management. The report is distributed to the appropriate VP of Operation and the Quality Director. The report includes, but is not limited to:

- The date of the review and the names and titles of participants.
- A reference to the existing data quality related documents and topics that were reviewed.
- Quality system or operational changes or improvements that will be made as a result of the review [e.g., an implementation schedule including assigned responsibilities for the changes (Action Table)].

Changes to the quality systems requiring update to the laboratory QA Manual shall be included in the next revision of the QA Manual.

16.3 Potential Integrity Related Managerial Reviews

Potential integrity issues (data or business related) must be handled and reviewed in a confidential manner until such time as a follow-up evaluation, full investigation, or other appropriate actions have been completed and issues clarified. Eurofins Environment Testing America's Corporate Internal Investigations SOP shall be followed (SOP No. CW-L-S-002). All investigations that result in finding of inappropriate activity are documented and include any disciplinary actions involved, corrective actions taken, and all appropriate notifications of clients.

Eurofins' corporate officers receive a monthly report from the VP-QA/EHS summarizing any current data integrity or data recall investigations. The VPs of Operations are also made aware of progress on these issues for their specific labs.

SECTION 17. PERSONNEL

17.1 Overview

The laboratory's management believes that its highly qualified and professional staff is the single most important aspect in assuring a high level of data quality and service. The staff consists of professionals and support personnel as outlined in the organization chart in Figure 4-1.

All personnel must demonstrate competence in the areas where they have responsibility. Any staff that is undergoing training shall have appropriate supervision until they have demonstrated their ability to perform their job function on their own. Staff shall be qualified for their tasks based on appropriate education, training, experience and/or demonstrated skills as required.

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The laboratory employs sufficient personnel with the necessary education, training, technical knowledge and experience for their assigned responsibilities.

All personnel are responsible for complying with all QA/QC requirements that pertain to the laboratory and their area of responsibility. Each staff member must have a combination of experience and education to adequately demonstrate a specific knowledge of their particular area of responsibility. Technical staff must also have a general knowledge of lab operations, test methods, QA/QC procedures and records management.

Laboratory management is responsible for formulating goals for lab staff with respect to education, training and skills and ensuring that the laboratory has a policy and procedures for identifying training needs and providing training of personnel. The training shall be relevant to the present and anticipated responsibilities of the lab staff.

The laboratory only uses personnel that are employed by or under contract to, the laboratory. Contracted personnel, when used, must meet competency standards of the laboratory and work in accordance to the laboratory's quality system.

17.2 Education and Experience Requirements for Technical Personnel

The laboratory makes every effort to hire analytical staffs that possess a college degree (AA, BA, BS) in an applied science with some chemistry in the curriculum. Exceptions can be made based upon the individual's experience and ability to learn. Selection of qualified candidates for laboratory employment begins with documentation of minimum education, training, and experience prerequisites needed to perform the prescribed task. Minimum education and training requirements for Eurofins Environment Testing America employees are outlined in job descriptions and are generally summarized for analytical staff in the table below.

The laboratory maintains job descriptions for all personnel who manage, perform or verify work affecting the quality of the environmental testing the laboratory performs. Job Descriptions are located on the Eurofins intranet site's Human Resources web-page (Also see Section 4 for position descriptions/responsibilities).

Experience and specialized training are occasionally accepted in lieu of a college degree (basic lab skills such as using a balance, colony counting, aseptic or quantitation techniques, etc., are also considered).

As a general rule for analytical staff:

Specialty	Education	Experience
Extractions, Digestions, some electrode methods (pH, DO, Redox, etc.), or Titrimetric and Gravimetric Analyses	H.S. Diploma	On the job training (OJT)
CVAA, Single component or short list Chromatography (e.g., Fuels, IC)	A college degree in an applied science or 2 years of college and at least 1 year of college chemistry	Or 2 years prior analytical experience is required

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Specialty	Education	Experience
ICP, ICPMS, Long List or complex chromatography (e.g., Pesticides, PCB, etc.), HPLC, GCMS	A college degree in an applied science or 2 years of college chemistry	Or 5 years of prior analytical experience
Spectra Interpretation	A college degree in an applied science or 2 years of college chemistry	And 2 years relevant experience Or 5 years of prior analytical experience
Technical Managers – **General**	Bachelor's Degree in an applied science or engineering with 24 semester hours in chemistry An advanced (MS, PhD.) degree may substitute for one year of experience	And 2 years experience in environmental analysis of representative analytes for which they will oversee
Technical Managers – **Wet Chemistry** only (no advanced instrumentation)	Associates degree in an applied science or engineering or 2 years of college with 16 semester hours in chemistry	And 2 years relevant experience
Technical Managers – **Microbiology**	Bachelor's degree in applied science with at least 16 semester hours in general microbiology and biology An advanced (MS, PhD.) degree may substitute for one year of experience	And 2 years of relevant experience

When an analyst does not meet these requirements, they can perform a task under the direct supervision of a qualified analyst, peer reviewer or Technical Manager, and are considered an analyst in training. The person supervising an analyst in training is accountable for the quality of the analytical data and must review and approve data and associated corrective actions.

17.3 Training

The laboratory is committed to furthering the professional and technical development of employees at all levels.

Orientation to the laboratory's policies and procedures, in-house method training, and employee attendance at outside training courses and conferences all contribute toward employee proficiency.

Below are examples of various areas of required employee training:

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Required Training	Time Frame	Employee Type
Environmental Health & Safety	Prior to lab work	All
Ethics – New Hires	1 week of hire	All
Ethics – Comprehensive	90 days of hire	All
Data Integrity	30 days of hire	Technical and PMs
Quality Assurance	90 days of hire	All
Ethics – Comprehensive Refresher	Annually	All
Initial Demonstration of Capability (DOC)	Prior to unsupervised method performance	Technical

The laboratory maintains records of relevant authorization/competence, education, professional qualifications, training, skills and experience of technical personnel (including contracted personnel) as well as the date that approval/authorization was given. These records are kept on file at the laboratory. Also refer to "Demonstration of Capability" in Section 19.

The training of technical staff is kept up to date by:

- Each employee must have documentation in their training file that they have read, understood and agreed to follow the most recent version of the laboratory QA Manual and SOPs in their area of responsibility. This documentation is updated as SOPs are updated.
- Documentation from any training courses or workshops on specific equipment, analytical techniques or other relevant topics.
- Documentation of proficiency (refer to Section 19).
- An Ethics Agreement signed by each staff member (renewed each year) and evidence of annual ethics training.
- A Confidentiality Agreement signed by each staff member signed at the time of employment.
- Human Resources maintains documentation and attestation forms on employment status & records; benefit programs; timekeeping/payroll; and employee conduct (e.g., ethics violations). This information is maintained in the employee's secured personnel file.

Evidence of successful training could include such items as:

- Adequate documentation of training within operational areas, including one-on-one technical training for individual technologies, and particularly for people cross-trained.
- Analysts' knowledge to refer to QA Manual for quality issues.
- Analysts following SOPs, i.e., practice matches SOPs.
- Analysts regularly communicate to supervisors and QA if SOPs need revision, rather than waiting for auditors to find problems.

Further details of the laboratory's training program are described in the Laboratory Training SOP No. IR-QA-TRAIN.

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17.4 Data Integrity and Ethics Training Program

Establishing and maintaining a high ethical standard is an important element of a Quality System. Ethics and data integrity training is integral to the success of Eurofins Environment Testing America and is provided for each employee at Eurofins Environment Testing America. It is a formal part of the initial employee orientation within 1 week of hire followed by technical data integrity training within 30 days, comprehensive training within 90 days, and an annual refresher for all employees. Senior management at each facility performs the ethics training for their staff.

In order to ensure that all personnel understand the importance Eurofins Environment Testing America places on maintaining high ethical standards at all times; Eurofins Environment Testing America has established a Corporate Ethics Policy (Policy No. CW-L-P-004) and an Ethics Statement. All initial and annual training is documented by signature on the signed Ethics Statement demonstrating that the employee has participated in the training and understands their obligations related to ethical behavior and data integrity.

Violations of this Ethics Policy will not be tolerated. Employees who violate this policy will be subject to disciplinary actions up to and including termination. Criminal violations may also be referred to the Government for prosecution. In addition, such actions could jeopardize Eurofins Environment Testing America's ability to do work on Government contracts, and for that reason, Eurofins Environment Testing America has a Zero Tolerance approach to such violations.

Employees are trained as to the legal and environmental repercussions that result from data misrepresentation. Key topics covered in the presentation include:

- Organizational mission and its relationship to the critical need for honesty and full disclosure in all analytical reporting.
- Ethics Policy.
- How and when to report ethical/data integrity issues. Confidential reporting.
- Record keeping.
- Discussion regarding data integrity procedures.
- Specific examples of breaches of ethical behavior (e.g. peak shaving, altering data or computer clocks, improper macros, etc., accepting/offering kickbacks, illegal accounting practices, unfair competition/collusion).
- Internal monitoring. Investigations and data recalls.
- Consequences for infractions including potential for immediate termination, debarment, or criminal prosecution.
- Importance of proper written narration / data qualification by the analyst and project manager with respect to those cases where the data may still be usable but are in one sense or another partially deficient.

Additionally, a data integrity hotline (1-800-736-9407) is maintained by Eurofins Environment Testing America and administered by the Corporate Quality Department.

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SECTION 18. ACCOMMODATIONS AND ENVIRONMENTAL CONDITIONS

18.1 Overview

The laboratory is a 45,000 ft^2 secure laboratory facility with controlled access and designed to accommodate an efficient workflow and to provide a safe and comfortable work environment for employees. All visitors sign in and are escorted by laboratory personnel. Access is controlled by various measures.

The laboratory is equipped with structural safety features. Each employee is familiar with the location, use, and capabilities of general and specialized safety features associated with their workplace. The laboratory provides and requires the use of protective equipment including safety glasses, protective clothing, gloves, etc., OSHA and other regulatory agency guidelines regarding required amounts of bench and fume hood space, lighting, ventilation (temperature and humidity controlled), access, and safety equipment are met or exceeded.

Traffic flow through sample preparation and analysis areas is minimized to reduce the likelihood of contamination. Adequate floor space and bench top area is provided to allow unencumbered sample preparation and analysis space. Sufficient space is also provided for storage of reagents and media, glassware, and portable equipment. Ample space is also provided for refrigerated sample storage before analysis and archival storage of samples after analysis. Laboratory HVAC and deionized water systems are designed to minimize potential trace contaminants.

The laboratory is separated into specific areas for sample receiving, sample preparation, volatile organic sample analysis, non-volatile organic sample analysis, inorganic sample analysis, microbiological sample analysis, and administrative functions.

18.2 Environment

Laboratory accommodation, test areas, energy sources, lighting are adequate to facilitate proper performance of tests. The facility is equipped with heating, ventilation, and air conditioning (HVAC) systems appropriate to the needs of environmental testing performed at this laboratory.

The environment in which these activities are undertaken does not invalidate the results or adversely affect the required accuracy of any measurements.

The laboratory provides for the effective monitoring, control and recording of environmental conditions that may affect the results of environmental tests as required by the relevant specifications, methods, and procedures. Such environmental conditions include humidity, voltage, temperature, and vibration levels in the laboratory.

When any of the method or regulatory required environmental conditions change to a point where they may adversely affect test results, analytical testing will be discontinued until the environmental conditions are returned to the required levels.
Environmental conditions of the facility housing the computer network and LIMS are regulated to protect against raw data loss.

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When the laboratory performs laboratory activities at sites or facilities outside its permanent control, it shall ensure that the requirements related to facilities and environmental conditions of this document are met.

Specific requirements for facility and environmental conditions, as well as periodic monitoring of conditions, are given in the Environmental Health & Safety Manual plus each laboratory's Facility Addendum.

18.3 Work Areas

There is effective separation between neighboring areas when the activities therein are incompatible with each other. Examples include:

- Volatile organic chemical handling areas, including sample preparation and waste disposal, and volatile organic chemical analysis areas.

Access to and use of all areas affecting the quality of analytical testing is defined and controlled by secure access to the laboratory building as described below in the Building Security section.

Adequate measures are taken to ensure good housekeeping in the laboratory and to ensure that any contamination does not adversely affect data quality. These measures include regular cleaning to control dirt and dust within the laboratory. Work areas are available to ensure an unencumbered work area. Work areas include:

- Access and entryways to the laboratory.
- Sample receipt areas.
- Sample storage areas.
- Chemical and waste storage areas.
- Data handling and storage areas.
- Sample processing areas.
- Sample analysis areas.

Refer to the following documents and procedures for specific requirements for microbiological laboratory facility requirements:

- Standard Methods, 9020B, Section 2.
- TNI V1M5, 1.7.3.7.a.

18.4 Floor Plan

A floor plan can be found in Appendix 1.

18.5 Building Security

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The Eurofins Calscience Irvine facility is considered to be a secure facility, using electronic access entry doors. All active employees are assigned a security fob that allows for entrance into the Eurofins Calscience Irvine facility.

Visitors to the laboratory sign in and out in a visitor's logbook. A visitor is defined as any person who visits the laboratory who is not an employee of the laboratory. In addition to signing into the laboratory, the Environmental, Health and Safety Manual contains requirements for visitors and vendors. There are specific safety forms that must be reviewed and signed. Visitors (with the exception of company employees) are escorted by laboratory personnel at all times, or the location of the visitor is noted in the visitor's logbook. Signs are posted in the laboratory designating employee only areas - "Authorized employees beyond this point".

SECTION 19. TEST METHODS AND METHOD VALIDATION

19.1 Overview

The laboratory uses methods that are appropriate to meet our clients' requirements and that are within the scope of the laboratory's capabilities. These include sampling, handling, transport, storage and preparation of samples, and, where appropriate, an estimation of the measurement of uncertainty as well as statistical techniques for analysis of environmental data.

Instructions are available in the laboratory for the operation of equipment as well as for the handling and preparation of samples. All instructions, Standard Operating Procedures (SOPs), reference methods and manuals relevant to the working of the laboratory are readily available to all staff. Deviations from published methods are documented (with justification) in the laboratory's approved SOPs. SOPs are submitted to clients for review at their request. Significant deviations from published methods require client approval and regulatory approval where applicable.

19.2 Standard Operating Procedures (SOPs)

The laboratory maintains SOPs that accurately reflect all phases of the laboratory such as assessing data integrity, corrective actions, handling customer complaints as well as all analytical methods and sampling procedures. The method SOPs are derived from the most recently promulgated/approved, published methods and are specifically adapted to the laboratory facility. Modifications or clarifications to published methods are clearly noted in the SOPs. All SOPs are controlled in the laboratory.

- All SOPs contain a revision number, effective date, and appropriate approval signatures. Controlled copies are available to all staff.
- Procedures for writing an SOP are incorporated by reference to Eurofins Environment Testing America's Corporate SOP entitled 'Writing a Standard Operating Procedure', No. CW-Q-S-002.
- SOPs are reviewed at a minimum of every 2 years (annually for Drinking Water SOPs), and where necessary, revised to ensure continuing suitability and compliance with applicable requirements.

19.3 Laboratory Methods Manual

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For each test method, the laboratory shall have available the published referenced method as well as the laboratory developed SOP.

Note: If more stringent standards or requirements are included in a mandated test method or regulation than those specified in this manual, the laboratory shall demonstrate that such requirements are met. If it is not clear which requirements are more stringent, the standard from the method or regulation is to be followed. Any exceptions or deviations from the referenced methods or regulations are noted in the specific analytical SOP.

The laboratory maintains an SOP Index for both technical and non-technical SOPs. Technical SOPs are maintained to describe a specific test method. Non-technical SOPs are maintained to describe functions and processes not related to a specific test method.

19.4 Selection of Methods

Since numerous methods and analytical techniques are available, continued communication between the client and laboratory is imperative to assure the correct methods are utilized. Once client methodology requirements are established, this and other pertinent information is summarized by the Project Manager. These mechanisms ensure that the proper analytical methods are applied when the samples arrive for log-in. For non-routine analytical services (e.g., special matrices, non-routine compound lists), the method of choice is selected based on client needs and available technology. The methods selected should be capable of measuring the specific parameter of interest, in the concentration range of interest, and with the required precision and accuracy.

19.4.1 Sources of Methods

Routine analytical services are performed using standard EPA-approved methodology. In some cases, modification of standard approved methods may be necessary to provide accurate analyses of particularly complex matrices. When the use of specific methods for sample analysis is mandated through project or regulatory requirements, only those methods shall be used.

When clients do not specify the method to be used or methods are not required, the methods used will be clearly validated and documented in an SOP and available to clients and/or the end user of the data.

The analytical methods used by the laboratory are those currently accepted and approved by the U. S. EPA and the state or territory from which the samples were collected. Reference methods include:

- *Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures; 40CFR Part 136 as amended by Method Update Rule; August 28, 2017.*
- *Methods for Chemical Analysis of Water and Wastes, EPA 600 (4-79-020), 1983.*
- *Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993.*
- *Methods for the Determination of Metals in Environmental Samples, EPA/600/4-91/010, June 1991. Supplement I, EPA-600/R-94/111, May 1994.*

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- *Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88-039, December 1988, Revised, July 1991, Supplement I, EPA-600-4-90-020, July 1990, Supplement II, EPA-600/R-92-129, August 1992. Supplement III, EPA/600/R-95/131 - August 1995 (EPA 500 Series) (EPA 500 Series methods)*
- *Technical Notes on Drinking Water Methods, EPA-600/R94-173, October 1994*
- *Statement of Work for Inorganics & Organics Analysis, SOM and ISM, current versions, USEPA Contract Laboratory Program Multi-media, Multi-concentration.*
- *Standard Methods for the Examination of Water and Wastewater, 18th, 19th, 20th, 22nd, on-line edition; Eaton, A.D. Clesceri, L.S. Greenberg, A.E. Eds; American Water Works Association, Water Pollution Control Federation, American Public Health Association: Washington, D.C.*
- *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, September 1986, Final Update I, July 1992, Final Update IIA, August 1993, Final Update II, September 1994; Final Update IIB, January 1995; Final Update III, December 1996; Final Update IV, January 2008; Final Update V, August 2015.*
- *Annual Book of ASTM Standards, American Society for Testing & Materials (ASTM), Philadelphia, PA.*
- *Manual for the Certification of Laboratories Analyzing Drinking Water (EPA 815-R-05-004, January 2005)*
- *Code of Federal Regulations (CFR) 40, Parts 136, 141, 172, 173, 178, 179 and 261*

The laboratory reviews updated versions to all the aforementioned references for adaptation based upon capabilities, instrumentation, etc., and implements them as appropriate. As such, the laboratory strives to perform only the latest versions of each approved method as regulations allow or require.

Other reference procedures for non-routine analyses may include methods established by specific states (e.g., Underground Storage Tank methods), ASTM or equipment manufacturers. Sample type, source, and the governing regulatory agency requiring the analysis will determine the method utilized.

The laboratory shall inform the client when a method proposed by the client may be inappropriate or out of date. After the client has been informed, and they wish to proceed contrary to the laboratory's recommendation, it will be documented.

19.4.2 Demonstration of Capability

Before the laboratory may institute a new method and begin reporting results, the laboratory shall confirm that it can properly operate the method. In general, this demonstration does not test the performance of the method in real world samples, but in an applicable and available clean matrix sample. If the method is for the testing of analytes that are not conducive to spiking, demonstration of capability may be performed on quality control samples.

A demonstration of capability (DOC) is performed whenever there is a change in instrument type (e.g., new instrumentation), matrix, method or personnel (e.g., analyst hasn't performed the test within the last 12 months). Additional information on training and documentation can be found in the Laboratory SOP No. IR-QA-TRAIN.

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Note: The laboratory shall have a DOC for all analytes included in the methods that the laboratory performs, and proficiency DOCs for each analyst shall include all analytes that the laboratory routinely performs. Addition of non-routine analytes does not require new DOCs for all analysts if those analysts are already qualified for routine analytes tested using identical chemistry and instrument conditions.

The initial demonstration of capability must be thoroughly documented and approved by the Technical Manager and QA Manager prior to independently analyzing client samples. All associated documentation must be retained in accordance with the laboratories archiving procedures.

The laboratory must have an approved SOP, demonstrate satisfactory performance, and conduct an MDL study (when applicable). There may be other requirements as stated within the published method or regulations (i.e., retention time window study).

Note: In some instances, a situation may arise where a client requests that an unusual analyte be reported using a method where this analyte is not normally reported. If the analyte is being reported for regulatory purposes, the method must meet all procedures outlined within this QA Manual (SOP, MDL, and Demonstration of Capability). If the client states that the information is not for regulatory purposes, the result may be reported as long as the following criteria are met:

- The instrument is calibrated for the analyte to be reported using the criteria for the method and ICV/CCV criteria are met (unless an ICV/CCV is not required by the method or criteria are per project DQOs).
- The laboratory's nominal or default reporting limit (RL) is equal to the quantitation limit (QL), must be at or above the lowest non-zero standard in the calibration curve and must be reliably determined. Project RLs are client specified reporting levels which may be higher than the QL. Results reported below the QL must be qualified as estimated values. Also see Section 19.6.1.3, Relationship of Limit of Detection (LOD) to Quantitation Limit (QL).
- The client request is documented and the lab informs the client of its procedure for working with unusual compounds. The final report must be footnoted: *Reporting Limit based on the low standard of the calibration curve.*

19.4.3 Initial Demonstration of Capability (IDOC) Procedures

19.4.3.1 The spiking standard used must be prepared independently from those used in instrument calibration.

19.4.3.2 The analyte(s) shall be diluted in a volume of clean matrix sufficient to prepare four aliquots at the concentration specified by a method or the laboratory SOP.

19.4.3.3 At least four aliquots shall be prepared (including any applicable clean-up procedures) and analyzed according to the test method (either concurrently or over a period of days).

19.4.3.4 Using all of the results, calculate the mean recovery in the appropriate reporting units and the standard deviations for each parameter of interest.

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19.4.3.5 When it is not possible to determine the mean and standard deviations, such as for presence, absence and logarithmic values, the laboratory will assess performance against criteria described in the Method SOP.

19.4.3.6 Compare the information obtained above to the corresponding acceptance criteria for precision and accuracy in the test method (if applicable) or in laboratory generated acceptance criteria (LCS or interim criteria) if there is no mandatory criteria established. If any one of the parameters do not meet the acceptance criteria, the performance is unacceptable for that parameter.

19.4.3.7 When one or more of the tested parameters fail at least one of the acceptance criteria, the analyst must proceed according to either option listed below:

- Locate and correct the source of the problem and repeat the test for all parameters of interest beginning with 19.4.3.3 above.
- Beginning with 19.4.3.3 above, repeat the test for all parameters that failed to meet criteria. Repeated failure, however, will confirm a general problem with the measurement system. If this occurs, locate and correct the source of the problem and repeat the test for all compounds of interest beginning with 19.4.3.1 above.

Note: Results of successive LCS analyses can be used to fulfill the DOC requirement.

A certification statement (refer to Figure 19-1 as an example) shall be used to document the completion of each initial demonstration of capability. A copy of the certification is archived in the analyst's training folder.

Methods on line prior to the effective date of this Section shall be updated to the procedures outlined above as new analysts perform their demonstration of capability. A copy of the new record will replace that which was used for documentation in the past. At a minimum, the precision and accuracy of four mid-level laboratory control samples must have been compared to the laboratory's quality control acceptance limits.

19.5 Laboratory Developed Methods and Non-Standard Methods

Any new method developed by the laboratory must be fully defined in an SOP and validated by qualified personnel with adequate resources to perform the method. Method specifications and the relation to client requirements must be clearly conveyed to the client if the method is a non-standard method (not a published or routinely accepted method). The client must also be in agreement to the use of the non-standard method.

19.6 Validation of Methods

Validation is the confirmation by examination and the provision of objective evidence that the particular requirements for a specific intended use are fulfilled.

All non-standard methods, laboratory designed/developed methods, standard methods used outside of their scope, and major modifications to published methods must be validated to confirm they are fit for their intended use. The validation will be as extensive as necessary to

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meet the needs of the given application. The results are documented with the validation procedure used and contain a statement as to the fitness for use.

19.6.1 Method Validation and Verification Activities for All New Methods

While method validation can take various courses, the following activities can be required as part of method validation. Method validation records are designated QC records and are archived accordingly.

When changes are made to any validated methods, the influence of such changes shall be documented and, if appropriate, a new validation shall be performed.

19.6.1.1 **Determination of Method Selectivity** – Method selectivity is the demonstrated ability to discriminate the analyte(s) of interest from other compounds in the specific matrix or matrices from other analytes or interference. In some cases to achieve the required selectivity for an analyte, a confirmation analysis is required as part of the method.

19.6.1.2 **Determination of Method Sensitivity** – Sensitivity can be both estimated and demonstrated. Whether a study is required to estimate sensitivity depends on the level of method development required when applying a particular measurement system to a specific set of samples. Detection limit studies are conducted as described in Section 19.7 below. Where other protocols for estimations and/or demonstrations of sensitivity are required by regulation or client agreement, these shall be followed.

19.6.1.3 **Relationship of Limit of Detection (LOD) to the Limit of Quantitation (LOQ)** – An important characteristic of expression of sensitivity is the distinction between the LOD and the LOQ. The LOD is the minimum level at which the presence of an analyte can be reliably concluded. The LOQ is the minimum concentration of analyte that can be quantitatively determined with acceptable precision and bias, equivalent to the laboratory's routine reporting limit (RL). For most instrumental measurement systems, there is a region where semi-quantitative data is generated around the LOD (both above and below the estimated MDL or LOD) and below the LOQ. In this region, detection of an analyte may be confirmed but quantification of the analyte is unreliable within the accuracy and precision guidelines of the measurement system. When an analyte is detected below the LOQ, and the presence of the analyte is confirmed by meeting the qualitative identification criteria for the analyte, the analyte can be reliably reported, but the amount of the analyte can only be estimated. If data is to be reported in this region, it must be done so with a qualification that denotes the semi-quantitative nature of the result.

19.6.1.4 **Determination of Interferences** – A determination that the method is free from interferences in a blank matrix is performed.

19.6.1.5 **Determination of Range** – Where appropriate to the method, the quantitation range is determined by comparison of the response of an analyte in a curve to established or targeted criteria. Generally the upper quantitation limit is defined by highest acceptable calibration concentration. The lower quantitation limit or QL cannot be

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lower than the lowest non-zero calibration level, and can be constrained by required levels of bias and precision.

19.6.1.6 **Determination of Accuracy and Precision** – Accuracy and precision studies are generally performed using replicate analyses, with a resulting percent recovery and measure of reproducibility (standard deviation, relative standard deviation) calculated and measured against a set of target criteria.

19.6.1.7 **Documentation of Method** – The method is formally documented in an SOP. If the method is a minor modification of a standard laboratory method that is already documented in an SOP, an SOP Attachment describing the specific differences in the new method is acceptable in place of a separate SOP.

19.6.1.8 **Continued Demonstration of Method Performance** – Continued demonstration of Method Performance is addressed in the SOP. Continued demonstration of method performance is generally accomplished by batch specific QC samples such as LCS, method blanks or PT samples.

19.7 Method Detection Limit (MDL) / Limit of Detection (LOD)

The MDL is the minimum measured quantity of a substance that can be reported with 99% confidence that the concentration is distinguishable from method blank results, consistent with 40CFR Part 136 Appendix B, August, 2017. The MDL is equivalent to the TNI LOD. The working or final MDL is the higher of the MDL value determined from spikes (MDLs) and the MDL value determined from blanks (MDLb). An initial MDL study shall be performed during the method validation process and when the method is altered in a way that can reasonably be expected to change its sensitivity. On-going data are collected during each quarter in which samples are being analyzed. At least once every 13 months the MDLs and MDLb are re-calculated and re-evaluated using data collected during the preceding period. Details of Eurofins Environment Testing America's procedure for conducting MDL studies are given in SOP No. CA-Q-S-006.

19.8 Verification of Detection Limits

If it is found during the re-evaluation of detection limit results that more than 5% of the spiked samples do not return positive numeric results that meet all method qualitative identification criteria, then then spiking level shall be increased and the initial MDL study performed at the new spiking concentration.

19.9 Instrument Detection Limits (IDL)

The IDL is sometimes used to assess the reasonableness of the MDLs or in some cases required by the analytical method or program requirements. IDLs are most commonly used in metals analyses but may be useful in demonstration of instrument performance in other areas.

IDLs are calculated to determine an instrument's sensitivity independent of any preparation method. IDLs are calculated either using 7 replicate spike analyses, like MDL but without sample preparation, or by the analysis of 10 instrument blanks and calculating 3 x the absolute value of the standard deviation.

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19.10 Limit of Quantitation

The LOQ shall be at a concentration equivalent to the lowest calibration standard concentration, with the exception of methods using a single-point calibration, and shall be greater than the MDL. The LOQ is verified by preparing and analyzing spikes at concentrations two times or less than the selected LOQ, employing the complete analytical process.

When the laboratory establishes a quantitation limit, it must be initially verified by the analysis of a low level standard or QC sample at 1−2 times the reporting limit, or by a DL check samples at or below the LOQ. The LOQ is verified annually thereafter. The annual requirement is waived for methods that have an annually verified MDL. The laboratory will comply with any regulatory requirements.

19.11 Retention Time Windows

Most organic analyses and some inorganic analyses use chromatography techniques for qualitative and quantitative determinations. For every chromatography analysis or as specific in the reference method, each analyte will have a specific time of elution from the column to the detector. This is known as the analyte's retention time. The variance in the expected time of elution is defined as the retention time window. As the key to analyte identification in chromatography, retention time windows must be established on every column for every analyte used for that method. These records are kept on file and available for review. Complete details are available in the laboratory SOPs.

19.12 Evaluation of Selectivity

The laboratory evaluates selectivity by following the checks within the applicable analytical methods, which include mass spectral tuning, second column confirmation, ICP interelement interference checks, chromatography retention time windows, sample blanks, spectrochemical, atomic absorption or fluorescence profiles, co-precipitation evaluations and specific electrode response factors.

19.13 Estimation of Uncertainty of Measurement

19.13.1 Uncertainty is "a parameter associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand" (as defined by the International Vocabulary of Basic and General Terms in Metrology, ISO Geneva, 1993, ISBN 92-67-10175-1). Knowledge of the uncertainty of a measurement provides additional confidence in a result's validity. Its value accounts for all the factors which could possibly affect the result, such as adequacy of analyte definition, sampling, matrix effects and interferences, climatic conditions, variances in weights, volumes, and standards, analytical procedure, and random variation. Some national accreditation organizations require the use of an "expanded uncertainty" defined as the range within which the value of the measurand is believed to lie within at least a 95% confidence level with the coverage factor k=2.

19.13.2 Uncertainty is not error. Error is a single value (i.e., the difference between the true result and the measured result). On environmental samples, the true result is never

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known. The measurement is the sum of the unknown true value and the unknown error. Unknown error is a combination of systematic error, or bias, and random error. Bias varies predictably, constantly, and independently from the number of measurements. Random error is unpredictable, assumed to be Gaussian in distribution, and reducible by increasing the number of measurements.

19.13.3 The minimum uncertainty associated with results generated by the laboratory can be determined by using the Laboratory Control Sample (LCS) accuracy range for a given analyte. The LCS limits are used to assess the performance of the measurement system since they take into consideration all of the laboratory variables associated with a given test over time (except for variability associated with the sampling and the variability due to matrix effects). The percent recovery of the LCS is compared either to the method-required LCS accuracy limits or to the statistical, historical, in-house LCS accuracy limits.

19.13.4 To calculate the uncertainty for the specific result reported, multiply the result by the decimal of the lower end of the LCS range percent value for the lower end of the uncertainty range, and multiply the result by the decimal of the upper end of the LCS range percent value for the upper end of the uncertainty range. These calculated values represent uncertainties at approximately the 99% confidence level with a coverage factor of k = 3. As an example, for a reported result of 1.0 mg/L with an LCS recovery range of 50 to 150%, the estimated uncertainty in the result would be 1.0 +/- 0.5 mg/L.

19.13.5 In the case where a well-recognized test method specifies limits to the values of major sources of uncertainty of measurement (e.g., 524.2, 525, etc.) and specifies the form of presentation of calculated results, no further discussion of uncertainty is required.

19.14 Sample Reanalysis Guidelines

Because there is a certain level of uncertainty with any analytical measurement, a sample re-preparation (where appropriate) and subsequent analysis (hereafter referred to as 'reanalysis') may result in either a higher or lower value from an initial sample analysis. There are also variables that may be present (e.g., sample homogeneity, analyte precipitation over time, etc.) that may affect the results of a reanalysis. Based on the above comments, the laboratory will reanalyze samples at a client's request with the following caveats. Client specific Contractual Terms & Conditions for reanalysis protocols may supersede the following items.

- Homogenous samples: If a reanalysis agrees with the original result to within the RPD limits for MS/MSD or Duplicate analyses, or within ± 1 reporting limit for samples ≤ 5x the reporting limit, the original analysis will be reported. At the client's request, both results may be reported on the same report but not on two separate reports.
- If the reanalysis does not agree (as defined above) with the original result, then the laboratory will investigate the discrepancy and reanalyze the sample a third time for confirmation if sufficient sample is available.

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- Any potential charges related to reanalysis are discussed in the contract terms and conditions or discussed at the time of the request. The client will typically be charged for reanalysis unless it is determined that the laboratory was in error.
- Due to the potential for increased variability, reanalysis may not be applicable to Non-homogenous, Encore, and Sodium Bisulfate preserved samples. See the Department Manager or Laboratory Director if unsure.

19.15 Control of Data

The laboratory has policies and procedures in place to ensure the authenticity, integrity, and accuracy of the analytical data generated by the laboratory.

19.15.1 Computer and Electronic Data Related Requirements

The three basic objectives of our computer security procedures and policies are shown below. More detail is outlined in the laboratory SOP No. IR-IT-COMPSEC. The laboratory is currently running the Eurofins LIMS System (ELS) which is a proprietary in-house developed LIMS system that has been highly customized to meet the needs of the laboratory. It is referred to as LIMS for the remainder of this section. More detailed descriptions of computer systems and associated controls given in the "IT Change Control Procedure Manual" (CW-I-M-001) policies and procedures posted on Eurofins' intranet site, Oasis.

19.15.1.1 **Maintain the Database Integrity** – Assurance that data is reliable and accurate through data verification (review) procedures, password-protecting access, anti-virus protection, data change requirements, as well as an internal LIMS permissions procedure.

- LIMS Database Integrity is achieved through data input validation, internal user controls, documentation of system failures and corrective actions taken, and data change requirements.
- Spreadsheets and other software developed in-house must be verified with documentation through hand calculations prior to use. Cells containing calculations must be lock-protected and controlled.
- Instrument hardware and software adjustments are safeguarded through maintenance logs, audit trails and controlled access.

19.15.1.2 **Ensure Information Availability** – Protection against loss of information or service is ensured through scheduled back-ups, stable file server network architecture, secure storage of media, line filter, Uninterruptible Power Supply (UPS), and maintaining older versions of software as revisions are implemented.

19.15.1.3 **Maintain Confidentiality** – Ensure data confidentiality through physical access controls such as password protection or website access approval when electronically transmitting data.

19.15.2 Data Reduction

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The complexity of the data reduction depends on the analytical method and the number of discrete operations involved (e.g., extractions, dilutions, instrument readings and concentrations). The analyst calculates the final results from the raw data or uses appropriate computer programs to assist in the calculation of final reportable values.

For manual data entry, e.g., Wet Chemistry, the data is reduced by the analyst and then verified by the Department Manager or alternate analyst prior to updating the data in LIMS. The spreadsheets, or any other type of applicable documents, are signed by both the analyst and alternate reviewer to confirm the accuracy of the manual entry(s).

Manual integration of peaks will be documented and reviewed and the raw data will be flagged in accordance with the Eurofins Environment Testing America Corporate SOP No. CA-Q-S-002, *Acceptable Manual Integration Practices*.

Analytical results are reduced to appropriate concentration units specified by the analytical method, taking into account factors such as dilution, sample weight or volume, etc. Blank correction will be applied only when required by the method or per manufacturer's indication; otherwise, it should not be performed. Calculations are independently verified by appropriate laboratory staff. Calculations and data reduction steps for various methods are summarized in the respective analytical SOPs or program requirements.

19.15.2.1 All raw data must be retained in the worklist folder, computer file (if appropriate), and/or runlog. All criteria pertinent to the method must be recorded. The documentation is recorded at the time observations or calculations are made and must be signed or initialed/dated (month/day/year). It must be easily identifiable who performed which tasks if multiple people were involved.

19.15.2.2 In general, concentration results are reported in milligrams per liter (mg/L) or micrograms per liter (µg/L) for liquids and milligrams per kilogram (mg/kg) or micrograms per kilogram (µg/kg) for solids. For values greater than 10,000 mg/L, results can be reported in percent, i.e., 10,000 mg/L = 1%. Units are defined in each laboratory SOP.

19.15.2.3 In reporting, the analyst or the instrument output records the raw data result using values of known certainty plus one uncertain digit. If final calculations are performed external to LIMS, the results should be entered in LIMS with at least three significant figures. In general, results are reported to 2 significant figures on the final report.

19.15.2.4 For those methods that do not have an instrument printout or an instrumental output compatible with the LIMS System, the raw results and dilution factors are entered directly into LIMS by the analyst, and the software calculates the final result for the analytical report. LIMS has a defined significant figure criterion for each analyte.

19.15.2.5 The laboratory strives to import data directly from instruments or calculation spreadsheets to ensure that the reported data are free from transcription and calculation errors. For those analyses with an instrumental output compatible with the LIMS, the raw results and dilution factors are transferred into LIMS electronically after reviewing the quantitation report, and removing unrequested or poor spectrally-matched compounds. The analyst may print a copy of what has been entered to

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check for errors. This printout and the instrument's printout of calibrations, concentrations, retention times, chromatograms, and mass spectra, if applicable, are retained with the data file. The data file is stored in a monthly folder on the instrument computer; periodically, this file is transferred to the server and, eventually, to a tape file.

19.15.3 Logbook / Worksheet Use Guidelines

Logbooks and worksheets are filled out 'real time' and have enough information on them to trace the events of the applicable analysis/task. (e.g., calibrations, standards, analyst, sample ID, date, time on short holding time tests, temperatures when applicable, calculations are traceable, etc.).

- Corrections are made following the procedures outlined in Section 12.
- Logbooks are controlled by the QA department. A record is maintained of all logbooks in the lab.
- Unused portions of pages must be "Z"'d out, signed and dated.
- Worksheets are created with the approval of the Technical Manager/QA Manager at the facility. The QA Department controls all worksheets following the procedures in Section 6.

19.15.4 Review / Verification Procedures

Review procedures are outlined in several laboratory SOPs to ensure that reported data are free from calculation and transcription errors, that QC parameters have been reviewed and evaluated before data is reported. The laboratory applies the corporate SOP No. CA-Q-S-002 on Manual Integrations to ensure the authenticity of the data. The general review concepts are discussed below, more specific information can be found in the laboratory SOPs.

19.15.4.1 Log-In Review – The data review process starts at the sample receipt stage. Sample control personnel review chain-of-custody forms and project instructions from the project management group. This is the basis of the sample information and analytical instructions entered into the LIMS. The log-in instructions are reviewed by the personnel entering the information, and a second level review is conducted by the project management staff.

19.15.4.2 First Level Data Review – The next level of data review occurs with the analysts. As data are generated, analysts review their work to ensure that the results meet project and SOP requirements. First level reviews include inspection of all raw data (e.g., instrument output for continuous analyzers, chromatograms, spectra, and manual integrations), evaluation of calibration/calibration verification data in the day's analytical run, evaluation of QC data, and reliability of sample results. The analyst transfers data into LIMS, data qualifiers are added as needed. All first level reviews are documented.

19.15.4.3 Second Level Data Review – All analytical data are subject to review by a second qualified analyst or supervisor. Second level reviews include inspection of all raw data (e.g., instrument output, chromatograms, and spectra) including 100% of data associated with any changes made by the primary analyst, such as manual

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integrations or reassignment of peaks to different analytes, or elimination of false negative analytes. The second review also includes evaluation of initial calibration/calibration verification data in the day's analytical run, evaluation of QC data, reliability of sample results, qualifiers and NCM narratives. Manual calculations are checked in second level review. All second level reviews are documented.

Issues that deem further review include the following:

- QC data are outside the specified control limits for accuracy and precision
- Reviewed sample data does not match with reported results
- Unusual detection limit changes are observed
- Samples having unusually high results
- Samples exceeding a known regulatory limit
- Raw data indicating some type of contamination or poor technique
- Inconsistent peak integration
- Transcription errors
- Results outside of calibration range

19.15.4.4 Unacceptable analytical results may require reanalysis of the samples. Any problems are brought to the attention of the Laboratory Director, Project Manager, Quality Director/Manager, Technical Manager, or Supervisor for further investigation. Corrective action is initiated whenever necessary.

19.15.4.5 The results are then entered or directly transferred into the computer database and a hard copy (or .pdf) is printed for the client.

19.15.4.6 As a final review prior to the release of the report, the Project Manager reviews the results for appropriateness and completeness. This review and approval ensures that client requirements have been met and that the final report has been properly completed. The process includes, but is not limited to, verifying that the COC is followed, cover letters / narratives are present, flags are appropriate, and project specific requirements are met. The Project Manager may also evaluate the validity of results for different test methods given expected chemical relationships.

19.15.4.7 Any project that requires a data package is subject to a tertiary data review for transcription errors and acceptable quality control requirements. The Project Manager then signs the final report. The accounting personnel also check the report for any clerical or invoicing errors. When complete, the report is sent out to the client.

19.15.4.8 A visual summary of the flow of samples and information through the laboratory, as well as data review and validation, is presented in Figure 19-2.

19.15.5 Manual Integrations

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Computerized data systems provide the analyst with the ability to re-integrate raw instrument data in order to optimize the interpretation of the data. Though manual integration of data is an invaluable tool for resolving variations in instrument performance and some sample matrix problems, when used improperly, this technique would make unacceptable data appear to meet quality control acceptance limits. Improper re-integrations lead to legally indefensible data, a poor reputation, or possible laboratory decertification. Because guidelines for re-integration of data are not provided in the methods and most methods were written prior to widespread implementation of computerized data systems, the laboratory trains all analytical staff on proper manual integration techniques using Eurofins Environment Testing America's Corporate SOP (CA-Q-S-002) as the guideline.

19.15.5.1 The analyst must adjust baseline or the area of a peak in some situations, for example when two compounds are not adequately resolved or when a peak shoulder needs to be separated from the peak of interest. The analyst must use professional judgment to determine when manual integrating is required. Analysts are encouraged to ask for assistance from a senior analyst or manager when in doubt.

19.15.5.2 Analysts shall not increase or decrease peak areas for the sole purpose of achieving acceptable QC recoveries that would have otherwise been unacceptable. The intentional recording or reporting of incorrect information (or the intentional omission of correct information) is against company principles and policy and is grounds for immediate termination.

19.15.5.3 Client samples, performance evaluation samples, and quality control samples are all treated equally when determining whether or not a peak area or baseline should be manually adjusted.

19.15.5.4 All manual integrations receive a second level review. Manual integrations must be indicated on an expanded scale "before" and "after" chromatograms such that the integration performed can be easily evaluated during data review. Expanded scale "before" chromatograms are also required for all manual integrations on QC parameters (calibrations, calibration verifications, laboratory control samples, internal standards, surrogates, etc.) unless the laboratory has another documented corporate approved procedure in place that can demonstrate an active process for detection and deterrence of improper integration practices.

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Figure 19-1. Example – Demonstration of Capability Documentation

DEMONSTRATION OF CAPABILITY
CERTIFICATION STATEMENT

Date: **Page 1 of 1**
Laboratory Name:
Laboratory Address:
Analyst(s) Name(s):

Matrix:
SOP# and Rev#:
Parameter:

We, the undersigned, CERTIFY that:

1. The analysts identified above, using the cited test method(s), which is in use at this facility for the analyses of samples under the National Environmental Laboratory Accreditation Program, have met the Demonstration of Capability.

2. The test method(s) was performed by the analyst(s) identified on this certification.

3. A copy of the test method(s) and the laboratory-specific SOPs are available for all personnel on-site.

4. The data associated with the demonstration capability are true, accurate, complete, and self explanatory.[1]

5. All raw data (including a copy of this certification form) necessary to reconstruct and validate these analyses have been retained at the facility, and that the associated information is well organized and available for review by authorized assessors.

Technical Director's Name and Title	Signature	Date
Quality Assurance Manager	Signature	Date

[1] True: Consistent with supporting data.
Accurate: Based on good laboratory practices consistent with sound scientific principles/practices.
Complete: Includes the results of all supporting performance testing.
Self-Explanatory: Date properly labeled and stored so that the results are clear and require no additional explanation.

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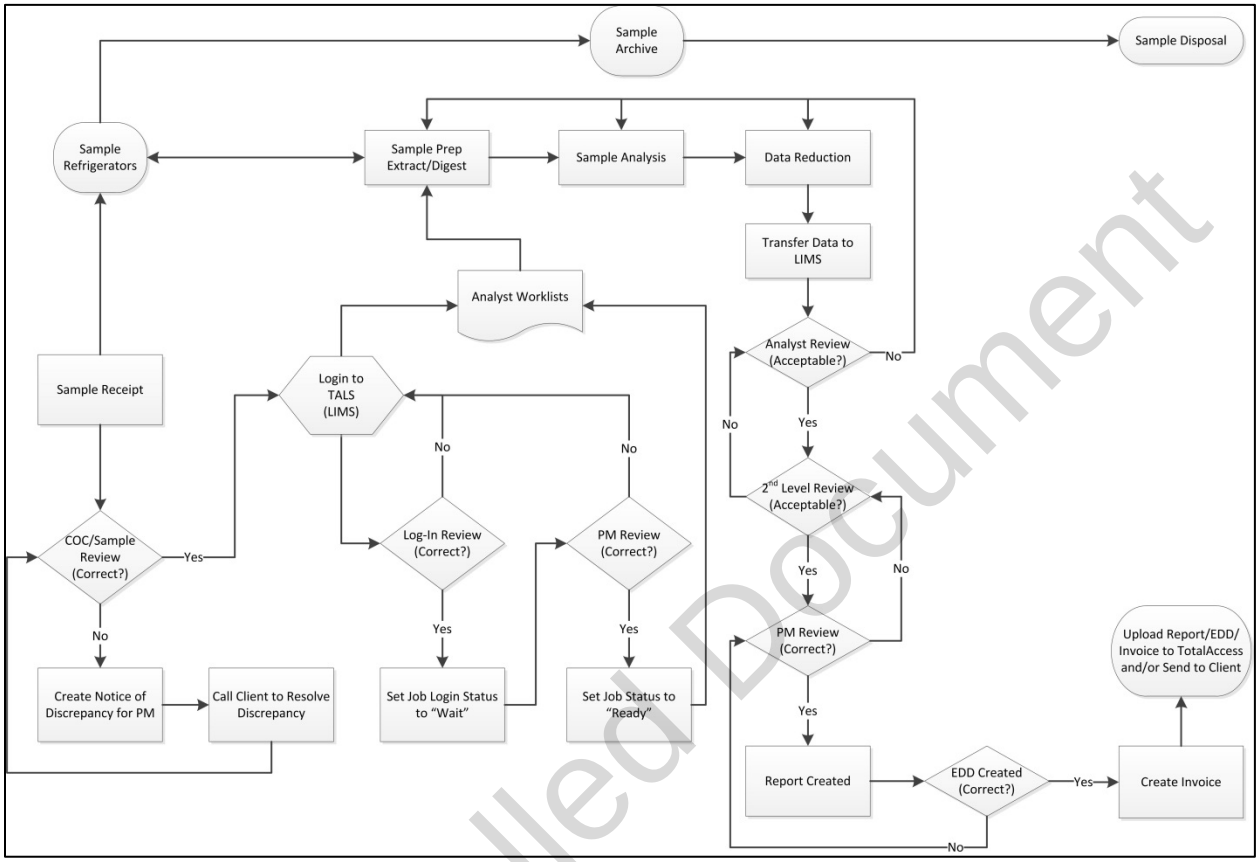
Figure 19-2. Example – Work Flow



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SECTION 20. EQUIPMENT AND CALIBRATIONS

20.1 Overview

The laboratory purchases the most technically advanced analytical instrumentation for sample analyses. Instrumentation is purchased on the basis of accuracy, dependability, efficiency and sensitivity. Each laboratory is furnished with all items of sampling, preparation, analytical testing and measurement equipment necessary to correctly perform the tests for which the laboratory has capabilities. Each piece of equipment is capable of achieving the required accuracy and complies with specifications relevant to the method being performed. Before being placed into use, the equipment (including sampling equipment) is calibrated and checked to establish that it meets its intended specification. The calibration routines for analytical instruments establish the range of quantitation. Calibration procedures are specified in the laboratory SOPs. A list of laboratory instrumentation is presented in Table 20-1.

Equipment is only operated by authorized and trained personnel. Manufacturer's instructions for equipment use are readily accessible to all appropriate laboratory personnel.

20.2 Preventive Maintenance

The laboratory follows a well-defined maintenance program to ensure proper equipment operation and to prevent the failure of laboratory equipment or instrumentation during use. This program of preventive maintenance helps to avoid delays due to instrument failure.

Routine preventive maintenance procedures and frequency, such as cleaning and replacements, should be performed according to the procedures outlined in the manufacturer's manual. Qualified personnel must also perform maintenance when there is evidence of degradation of peak resolution, a shift in the calibration curve, loss of sensitivity, or failure to continually meet one of the quality control criteria.

Table 20-2 lists examples of scheduled routine maintenance. It is the responsibility of each Technical Manager to ensure that instrument maintenance logs are kept for all equipment in his/her department. Preventative maintenance procedures are also outlined in analytical SOPs or instrument manuals. (Note: For some equipment, the log used to monitor performance is also the maintenance log. Multiple pieces of equipment may share the same log as long as it is clear as to which instrument is associated with an entry.)

Instrument maintenance logs are controlled and are used to document instrument problems, instrument repair and maintenance activities. Maintenance logs shall be kept for all major pieces of equipment. Instrument maintenance logs may also be used to specify instrument parameters.

- Documentation must include all major maintenance activities such as contracted preventive maintenance and service and in-house activities such as the replacement of electrical components, lamps, tubing, valves, columns, detectors, cleaning and adjustments.
- Each entry in the instrument log includes the Analyst's initials, the date, a detailed description of the problem (or maintenance needed/scheduled), a detailed explanation of the solution or maintenance performed, and a verification that the equipment is functioning properly (state what was used to determine a return to control; e.g., CCV run on *'date'* was acceptable, or instrument recalibrated on 'date' with acceptable verification, etc.) must also be documented in the instrument records.
- When maintenance or repair is performed by an outside agency, service receipts detailing the service performed shall be affixed into the logbooks adjacent to pages describing the maintenance performed. This stapled in page must be signed across the page entered and the logbook so that it is clear that a page is missing if only half a signature is found in the logbook.

If an instrument requires repair (subjected to overloading or mishandling, gives suspect results, or otherwise has shown to be defective or outside of specified limits), it shall be taken out of operation and tagged as out-of-service or otherwise isolated until such a time as the repairs have been made and the instrument can be demonstrated as operational by calibration and/or verification or other test to demonstrate acceptable performance. The laboratory shall examine the effect of this defect on previous analyses.

In the event of equipment malfunction that cannot be resolved, service shall be obtained from the instrument vendor, manufacturer, or qualified service technician, if such a service can be tendered. If on-site service is unavailable, arrangements shall be made to have the instrument shipped back to the manufacturer for repair. Back up instruments, which have been approved,

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for the analysis shall perform the analysis normally carried out by the malfunctioning instrument. If the back-up is not available and the analysis cannot be carried out within the needed timeframe, the samples shall be subcontracted.

At a minimum, if an instrument is sent out for service or transferred to another facility, it must be recalibrated and the laboratory MDL verified (using an MDLV) prior to return to lab operations.

20.3 Support Equipment

This section applies to all devices that may not be the actual test instrument, but are necessary to support laboratory operations. These include but are not limited to: balances, ovens, refrigerators, freezers, incubators, water baths, field sampling devices, temperature measuring devices, thermal/pressure sample preparation devices and volumetric dispensing devices if quantitative results are dependent on their accuracy, as in standard preparation and dispensing or dilution into a specified volume. All raw data records associated with the support equipment are retained to document instrument performance.

20.3.1 Weights and Balances

The accuracy of the balances used in the laboratory is checked every working day, before use. All balances are placed on stable counter tops.

Each balance is checked prior to initial serviceable use with at least two certified ASTM type 1 weights spanning its range of use (weights that have been calibrated to ASTM type 1 weights may also be used for daily verification). ASTM type 1 weights used only for calibration of other weights (and no other purpose) are inspected for corrosion, damage or nicks at least annually and if no damage is observed, they are calibrated at least every 5 years by an outside calibration laboratory. Any weights (including ASTM Type 1) used for daily balance checks or other purposes are recalibrated/recertified annually to NIST standards (this may be done internally if laboratory maintains “calibration only” ASTM type 1 weights).

All balances are serviced annually by a qualified service representative, who supplies the laboratory with a certificate that identifies traceability of the calibration to the NIST standards.

All of this information is recorded in logs, and the recalibration/recertification certificates are kept on file. Refer to the laboratory SOP No. IR-QA-BAL for procedures.

20.3.2 pH, Conductivity, and Turbidity Meters

The pH meters used in the laboratory are accurate to ± 0.1 pH units, and have a scale readability of at least 0.05 pH units. The meters automatically compensate for the temperature, and are calibrated with at least two working range buffer solutions before each use.

Conductivity meter used in the laboratory are capable or measuring conductivity with an error not exceeding 1% or one umhos/cm, whichever is greater. The meters are also calibrated before each use with a known standard.

Turbidity meters are also calibrated before each use.

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All of this information is documented in logs. Consult pH and Conductivity, and Turbidity SOPs for further information.

20.3.3 Thermometers

All thermometers are calibrated at a specific frequency with a NIST-traceable thermometer. Liquid-in-glass devices are calibrated annually. IR thermometers, digital probes and thermocouples are calibrated quarterly.

- If the temperature measuring device is used over a range of 10°C or less, then a single point verification within the range of use is acceptable;
- If the temperature measuring device is used over a range of greater than 10°C, then the verification must bracket the range of use.
- IR Thermometers should be calibrated over the full range of use, including ambient, iced (4°C) and frozen (0°C to −5°C), per the Drinking Water Manual.

The mercury or digital NIST thermometer is recalibrated every three years (unless thermometer has been exposed to temperature extremes or apparent separation of internal liquid) by an approved outside service and the provided certificate of traceability is kept on file. The NIST thermometer(s) have increments of 1 degree (0.5 degree or less increments are required for drinking water microbiological laboratories), and have ranges applicable to method and certification requirements. The NIST traceable thermometer is used for no other purpose than to calibrate other thermometers.

All of this information is documented in logbooks. Monitoring method-specific temperatures, including incubators, heating blocks, water baths, and ovens, is documented in method-specific logbooks. More information on this subject can be found in the laboratory SOP No. IR-QA-THERMA.

20.3.4 Refrigerators/Freezer Units, Ovens and Incubators

The temperatures of all refrigerator units and freezers used for sample and standard storage are monitored each working day (twice for microbiology).

Ovens and incubators are monitored on days of use.

Each piece of equipment has a unique identification number, and is assigned a thermometer for monitoring.

Sample storage refrigerator temperatures are kept between > 0°C and ≤ 6°C.

Specific temperature settings/ranges for other refrigerators, ovens, and incubators can be found in method specific SOPs.

All of this information is documented in Daily Temperature Logbooks and method-specific logbooks.

20.3.5 Autopipettors, Dilutors, and Syringes

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Mechanical volumetric dispensing devices including burettes (except Class A glassware) and glass microliter syringes are given unique identification numbers and the delivery volumes are verified gravimetrically, at a minimum, on a quarterly basis or monthly per SOP or project specific requirements.

For those dispensers that are not used for analytical measurements, a label shall be applied to the device stating that it is not calibrated. Any device not regularly verified cannot be used for any quantitative measurements. More information on this subject can be found in the laboratory SOP No. IR-QA-PIPET.

Micro-syringes are purchased from Hamilton Company. Each syringe is traceable to NIST. The laboratory keeps on file an "Accuracy and Precision Statement of Conformance" from Hamilton attesting established accuracy.

Glass micro-syringes with volumes of > 20 µL are checked for accuracy every six months. Glass micro-syringes with volumes < 20 µL are certified by the manufacturer (e.g., Hamilton Company). Certificate of accuracy and precision are obtained and kept on file in the laboratory.

20.3.6 Field Sampling Devices (Isco Auto Samplers)

Each Auto Sampler (ISCO) is assigned a unique identification number in order to keep track of the calibration. This number is also recorded on the sampling documentation.

The Auto Sampler is calibrated monthly by setting the sample volume to 100 mL and recording the volume received. The results are recorded in a logbook. The Auto Sampler is programmed to run three (3) cycles and each of the three cycles is measured into a graduated cylinder to verify 100 mL are received.

If the RSD (Relative Standard Deviation) between the 3 cycles is greater than 10%, the procedure is repeated. If the result is still greater than 10%, then the Auto Sampler is taken out of service until it is repaired and calibration verification criteria can be met. The results of this check are kept in a logbook.

Refer to the laboratory SOP No. IR-SC-FIELD for additional information.

20.4 Instrument Calibrations

Calibration of analytical instrumentation is essential to the production of quality data. Strict calibration procedures are followed for each method. These procedures are designed to determine and document the method detection limits, the working range of the analytical instrumentation and any fluctuations that may occur from day to day.

Sufficient raw data records are retained to allow an outside party to reconstruct all facets of the initial calibration. Records contain, but are not limited to, the following: calibration date, method, instrument, analyst(s) initials or signatures, analysis date, analytes, concentration, response, type of calibration (Avg RF, curve, or other calculations that may be used to reduce instrument responses to concentration).

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Sample results must be quantitated from the initial calibration and may not be quantitated from any continuing instrument calibration verification unless otherwise required by regulation, method or program.

If the initial calibration results are outside of the acceptance criteria, corrective action is performed and any affected samples are reanalyzed if possible. If the reanalysis is not possible, any data associated with an unacceptable initial calibration will be reported with appropriate data qualifiers (refer to Section 12).

Note: Instruments are calibrated initially and as needed after that and at least annually (the annual requirement does not apply to isotope dilution). Project-specific requirements may dictate more frequent calibrations (e.g., quarterly), as agreed upon with the client.

20.4.1 Calibration Standards

Calibration standards are prepared using the procedures indicated in the Reagents and Standards section of the determinative method SOP. If a reference method does not specify the number of calibration standards, a minimum of 3 calibration points will be used.

Standards for instrument calibration are obtained from a variety of sources. All standards are traceable to national or international standards of measurement, or to national or international standard reference materials.

The lowest concentration calibration standard that is analyzed during an initial calibration must be at or below the stated reporting limit for the method based on the final volume of extract (or sample).

The other concentrations define the working range of the instrument/method or correspond to the expected range of concentrations found in actual samples that are also within the working range of the instrument/method. Results of samples not bracketed by initial instrument calibration standards (within calibration range to at least the same number of significant figures used to report the data) must be reported as having less certainty, e.g., defined qualifiers or flags (additional information may be included in the case narrative). The exceptions to these rules are ICP and ICPMS methods which define the working range with periodic linear dynamic range studies, rather than through the range of concentrations of daily calibration standards.

All initial calibrations are verified with a standard obtained from a second source and traceable to a national standard, when available (or vendor certified different lot if a second source is not available). For unique situations, such as air analysis where no other source or lot is available, a standard made by a different analyst at a different time or a different preparation would be considered a second source. This verification occurs immediately after the calibration curve has been analyzed, and before the analysis of any samples.

20.4.1.1 Calibration Verification

The calibration relationship established during the initial calibration must be verified initially and at least daily as specified in the laboratory method SOPs in accordance with the referenced analytical methods and in the 2009 TNI Standard. The process of calibration verification applies to both external standard and internal standard calibration techniques, as well as to linear and

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non-linear calibration models. Initial calibration verification (ICV) is with a standard source secondary (second source standard) to the calibration standards, but continuing calibration verifications (CCV) may use the same source standards as the calibration curve.

Note: The process of calibration verification referred to here is fundamentally different from the approach called "calibration" in some methods. As described in those methods, the calibration factors or response factors calculated during calibration are used to update the calibration factors or response factors used for sample quantitation. This approach, while employed in other EPA programs, amounts to a daily single-point calibration.

All target analytes and surrogates, including those reported as non-detects, must be included in periodic calibration verifications for purposes of retention time confirmation and to demonstrate that calibration verification criteria are being met, i.e., RPD, per 2009 TNI Standard EL-V1M4 Section 1.7.2.

All samples must be bracketed by periodic analyses of standards that meet the QC acceptance criteria (e.g., calibration and retention time). The frequency is found in the determinative methods or SOPs.

Note: If an internal standard calibration is being used, then bracketing calibration verification standards are not required, only daily verifications are needed. The results from these verification standards must meet the calibration verification criteria and the retention time criteria (if applicable).

Generally, the calibrations must be verified by an ICV analyzed immediately following initial calibration and before sample analysis. The ICV may be used as the first bracketing CCV, if criteria for both are met.

A continuing instrument calibration verification (CCV) is generally analyzed at the beginning of each 12-hour analytical shift during which samples are analyzed. The 12-hour analytical shift begins with the injection of the calibration verification standard (or the MS tuning standard in MS methods). The shift ends after the completion of the analysis of the last sample, QC, or standard that can be injected within 12-hours of the beginning of the shift. For methods that have quantitation by external calibration models, a CCV is analyzed at the end of each analytical sequence. Some methods have more frequent CCV requirements. See specific SOPs. Most Inorganic methods require the CCV to be analyzed after every 10 samples or injections, including matrix or batch QC samples.

Note: If an internal standard calibration is being used (e.g., GC/MS), then bracketing standards are not required, only daily verifications are needed, except specified by program or method requirements.

If the results of a CCV are outside the established acceptance criteria and analysis of a second consecutive (and immediate) CCV fails to produce results within acceptance criteria, corrective action shall be performed. Once corrective actions have been completed & documented, the laboratory shall demonstrate acceptable instrument / method performance by analyzing two consecutive CCVs, or a new initial instrument calibration shall be performed.

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Sample analyses and reporting of data may not occur or continue until the analytical system is calibrated or calibration verified. However, data associated with an unacceptable calibration verification may be fully useable reported based upon discussion and approval of the client under the following special conditions:

- When the acceptance criteria for the CCV are exceeded high (i.e., high bias) and the associated samples within the batch are non-detects, then those non-detects may be reported with a case narrative comment explaining the high bias. Otherwise, the samples affected by the unacceptable CCV shall be re-analyzed after a new calibration curve has been established, evaluated and accepted; or
- When the acceptance criteria for the CCV are exceeded low (i.e., low bias), those sample results may be reported if they exceed a maximum regulatory limit/decision level. Otherwise the samples affected by the unacceptable CCV shall be re-analyzed after a new calibration curve has been established, evaluated and accepted.

Samples reported by the 2 conditions identified above will be appropriately flagged.

20.4.1.2 Verification of Linear and Non-Linear Calibrations

Calibration verification for calibrations involves the calculation of the percent drift or the percent difference of the instrument response between the initial calibration and each subsequent analysis of the verification standard. (These calculations are available in the laboratory method SOPs.) Verification standards are evaluated based on the % Difference from the average CF or RF of the initial calibration or based on % Drift or % Recovery if a linear or quadratic curve is used.

Regardless of whether a linear or non-linear calibration model is used, if initial verification criterion is not met, then no sample analyses may take place until the calibration has been verified or a new initial calibration is performed that meets the specifications listed in the method SOPs. If the calibration cannot be verified after the analysis of a single verification standard, then adjust the instrument operating conditions and/or perform instrument maintenance, and analyze another aliquot of the verification standard. If the calibration cannot be verified with the second standard, then a new initial calibration is performed.

- When the acceptance criteria for the calibration verification are exceeded high, i.e., high bias, and there are associated samples that are non-detects, then those non-detects may be reported. Otherwise, the samples affected by the unacceptable calibration verification shall be reanalyzed after a new calibration curve has been established, evaluated and accepted.
- When the acceptance criteria for the calibration verification are exceeded low, i.e., low bias, those sample results may be reported if they exceed a maximum regulatory limit/decision level. Otherwise, the samples affected by the unacceptable verification shall be reanalyzed after a new calibration curve has been established, evaluated and accepted. Alternatively, a reporting limit standard may be analyzed to demonstrate that the laboratory can still support non-detects at their reporting limit.

20.5 Tentatively Identified Compounds (TICs) – GC/MS Analysis

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For samples containing components not associated with the calibration standards, a library search may be made for the purpose of tentative identification. The necessity to perform this type of identification will be determined by the purpose of the analyses being conducted. Data system library search routines should not use normalization routines that would misrepresent the library or unknown spectra when compared to each other. Further details are given in in policy memorandum CA-Q-QM-001, Policy on Tentatively Identified Compounds (TICs) – GC/MS Analysis.

Note: If the TIC compound is not part of the client target analyte list, but is calibrated by the laboratory and is both qualitatively and/or quantitatively identifiable, it should not be reported as a TIC. If the compound is reported on the same form as true TICs, it should be qualified and/or narrated that the reported compound is qualitatively and quantitatively (if verification in control) reported compared to a known standard that is in control (where applicable).

20.6 GC/MS Tuning

Prior to any GCMS analytical sequence, including calibration, the instrument parameters for the tune and subsequent sample analyses within that sequence must be set.

Prior to tuning/auto-tuning the mass spectrometer, the parameters may be adjusted within the specifications set by the manufacturer or the analytical method. These generally don't need any adjustment but it may be required based on the current instrument performance. If the tune verification does not pass, it may be necessary to clean the source or perform additional maintenance. Any maintenance is documented in the maintenance log.

Table 20-1. Example – Instrumentation List [1]

Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Colorimeter for Chlorine	Hach	Pocket Colorimeter II	09110E138552		SM 4500-Cl G
Colorimeter for Chlorine	Hach	Pocket Colorimeter II	13050E222500		SM 4500-Cl G
Colorimeter for Chlorine	Hach	Pocket Colorimeter II	08030E089795		SM 4500-Cl G
Colorimeter for Chlorine	Hach	Pocket Colorimeter II	08120E115054		SM 4500-Cl G
Colorimeter for Chlorine	Hach	Pocket Colorimeter II	06060D51326	2006-01-01	SM 4500-Cl G
Conductivity/TDS Probe	Accumet	AP75	943318	2013-01-01	EPA 120.1, SM 2510 B
Conductivity Meter	Thermo	STARA122	H06013	2017-11-01	EPA 120.1, SM 2510 B
Conductivity Meter	Oaktron	COND6+	2894104	2019-12-27	EPA 120.1, SM 2510 B

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Flow Injection Mercury Analyzer	Teledyne Leeman Labs	Leeman Hydra II AA	3002	2018-01-18	EPA 245.1, EPA 7470, EPA 7471
Flow Injection Mercury Analyzer	Teledyne Leeman Labs	Leeman Hydra II AA	US18065024	2018-04-24	EPA 245.1, EPA 7470, EPA 7471
NanoPure Diamond (UV/UF)	Barnstead	D11931	119020964094		
NanoPure Diamond (UV/UF)	Barnstead	D4641	582910257268		
NanoPure Diamond (UV/UF)	Barnstead	D11931	1193040693134		
Flashpoint Tester	Koehler	K-162	10A/Y-2	1992-01-01	EPA 1010, EPA 1010A
Flashpoint Tester	Erdco	RT-0001-600	151436	2015-03-30	EPA 1020A, EPA 1020B
Furnace, Thermolyne 48000	Thermolyne	F48015	1205001206827	2015-01-01	EPA 160.4, SM 2540 E, SM 2540 G
Gas Chromatograph (FID/PID)	Hewlett Packard	5890A	S/N2750A15898	1997-01-01	EPA 8015 Gas
Gas Chromatograph (FID/PID)	Hewlett Packard	5890 Series II	S/N3033A33301	1998-01-01	EPA 8015 Gas
Gas Chromatograph (FID/PID)	Hewlett Packard	5890 Series II	S/N3223A2733	1993-01-01	EPA 8015 Gas
Gas Chromatograph (Dual ECD)	Agilent	6890N	US10215019	2002-01-01	EPA 608.3, EPA 8082
Gas Chromatograph (FID/PID)	Hewlett Packard	5890 Series II	S/N3336A60064	1993-01-01	EPA 8015 Gas
Gas Chromatograph (Dual ECD)	Agilent	6890N/G1530N	US10250081	2005-01-01	EPA 608.3, EPA 8081
Gas Chromatograph (Dual ECD)	Agilent	6890N/G1540N	US10423015	2008-01-01	EPA 608.3, EPA 8081
Gas Chromatograph (Dual ECD)	Agilent	6890N/G1540N	US10423014	2008-01-01	EPA 608.3, EPA 8081
Gas Chromatograph (Dual ECD)	Agilent	6890N/1530N	CN10551059	2007-01-01	EPA 608.3, EPA 8082
Gas Chromatograph (Dual ECD)	Agilent	6890N/G1530N	US10322076	2007-01-01	EPA 608.3, EPA 8082
Gas Chromatograph (Dual ECD)	Agilent	7890A/G3440A	CN10741034	2007-01-01	EPA 608.3 LL, EPA 8082 LL

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Gas Chromatograph (Dual FID)	Agilent	6890N/G1540N	US10546009	2007-01-01	EPA 8015 Diesel
Gas Chromatograph (Dual FID)	Agilent	6890N/G1540N	US10546010	2007-01-01	EPA 8015 Diesel
Gas Chromatograph (FID/PID)	Agilent	5890 Series II	S/N3133A37568	2008-01-01	EPA 8015(M) Methanol/Ethanol
Gas Chromatograph (Dual ECD)	Agilent	6890N	US10212094	2009-01-01	EPA 608.3, EPA 8081
Gas Chromatograph (Dual ECD)	Agilent	6890N	US10402034	2009-01-01	EPA 608.3, EPA 8082
Gas Chromatograph (FID)	Agilent	6890N	CN10505005	2013-01-18	EPA 8015 Diesel
Gas Chromatograph (FID/TCD)	Varian	CP-3800	11827	2013-05-20	EPA 25C
Gas Chromatograph (FID/TCD)	Varian	CP-3800	5262	2013-05-20	RSK-175
Gas Chromatograph (FID/PID)	Agilent	7890A	CN10808110	2016-12-12	EPA 8015 Gas
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	5890Ser.II/5971	3140A39653	1993-01-01	EPA 8270C Screening
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	5890Ser.II/5972	3235A46723	1995-01-01	1,4-Dioxane
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	6890/5973A	US00007750/ US70810354	2000-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	6890/5973A	US00022931/ US82311546	2000-01-01	EPA 624.1, EPA 8260B (Closed System)
Gas Chromatograph/ Mass Spectrometer	Agilent	6850/5973N	US00001207/ US01140222	2001-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6850/5973	US00001206/ US01140215	2001-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6850/5973N	US0001947/ US10340261	2002-01-01	EPA 8260B SIM
Gas Chromatograph/ Mass Spectrometer	Agilent	6850/5973N	US00002140/ US10440793	2002-01-01	EPA 624.1, EPA 8260B (Closed System)
Gas Chromatograph/ Mass Spectrometer	Agilent	6850/5973N	US00002860/ US21843317	2003-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6890/5973	US10130035		EPA 1625B(M)

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Gas Chromatograph/ Mass Spectrometer	Agilent	6890/5973	US00034262/ US01112246	2004-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	CN10318006/ US30945515	2004-01-01	EPA 8260B Screening
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	CN10318007/ US30945517	2004-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	5890Ser.II/5971	3033A30488/ 3133A37717	1993-01-01	1,4-Dioxane
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	CN0523048/ US43146864	2006-01-01	EPA 8260B Screening
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	CN01521014/ US44647184	2005-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	US00001682/ US92522712	2001-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973N	US10222064/ US10462085	2006-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973	US10206070/ US10462145	2006-05-03	EPA 8260B Screening
Gas Chromatograph/ Mass Spectrometer	Agilent	6890/5973/G257 9A	CN10427051/US417 20775	2007-01-01	EPA 8270C SIM PAHs
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973 inert	CN10339005/US351 20285	2007-01-01	EPA 524.2, EPA 524.2 LL
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973 Inert	CN10349032/ US33220240	2008-01-30	EPA 625.1, EPA 8270C
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973 Inert	CN10345035/ US33220184	2009-01-01	EPA 8260B SIM
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N / 5973	CN10521030/ US40620627	2009-01-01	EPA 524.2 SIM (SRL 524.2)
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N/5973N	US10232062/ US21863660	2009-01-01	EPA 625.1 LL, EPA 8270C LL
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N / 5973	CN10503040/ US10461983	2009-01-01	EPA 524.2, EPA 8260B (Special Project)
Gas Chromatograph/ Mass Spectrometer	Agilent	6890N / 5973	US00002015/ US10440578	2009-01-01	EPA 524.2 SIM (SRL 524.2)
Gas Chromatograph/ Mass Spectrometer	Agilent	6890/G1530N	US10243060	2010-01-01	EPA 625.1, EPA 8270C
Gas Chromatograph/ Mass Spectrometer	Agilent	6890/5973	US10226108/ US21843299	2010-01-01	EPA 8270C SIM PAHs

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Gas Chromatograph/ Mass Spectrometer	Agilent	7890/5975	CN10752039/ US80148288	2010-01-01	EPA 625.1 LL, EPA 8270C LL
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	5890/5970	3336A60053/ 3307A00396	2011-01-01	EPA 8270C Screening
Gas Chromatograph/ Mass Spectrometer	Hewlett Packard	6890/5973	US00029799	2011-01-01	EPA 624.1, EPA 8260B
Gas Chromatograph/ Mass Spectrometer	Agilent	7890B/5977B	CN18073031 / US1823M002	2018-06-25	EPA 625.1 LL, EPA 8270C LL
Gas Chromatograph/ Mass Spectrometer	Agilent	7890B/5977B	CN18113093 / US1822MO19	2018-06-26	EPA 524.2
UV/VS Spectrometer	Thermo Spectronic	Genesys 20	3SGQ068003	2012-01-01	SM 3500-Cr D, EPA 365.3, SM 5220 D, EPA 410.4, EPA 7196A, EPA 9014, SM 4500-CN E/I, SM 4500-S2− D, SM 5540 C, SM 4500-KMnO4, LACSD 253B
UV/VS Spectrometer	Thermo Scientific	Genesys 20	LR45227	2018-07-19	SM 3500-Cr D, EPA 365.3, SM 5220 D, EPA 410.4, EPA 7196A, EPA 9014, SM 4500-CN E/I, SM 4500-S2− D, SM 5540 C, SM 4500-KMnO4, LACSD 253B
HPLC (DAD)	Agilent	1100	DE14914766	2009-01-01	EPA 8315A
HPLC (DAD)	Hewlett Packard	G1316A	US54000547	2009-01-01	EPA 8315A
Incubator for Micro (35C)	VWR	1915	1102003	2009-01-01	P/A, HPC-SIM, HPC-PP, Q-Tray
Incubator for BOD	Fisher Scientific	307C	00037-090-00	2002-01-01	SM 5210 B
Incubator for BOD	VWR	2020	6003205	2002-01-01	SM 5210 B
Ion Chromatograph	Dionex	ICS-1000	03110585	2002-01-01	EPA 300.1
Ion Chromatograph	Dionex	LC 30	97040546	2002-01-01	EPA 300.0, EPA 9056
Ion Chromatograph (with UV/VIS Detector)	Metrohm	881	1881000007119	2010-03-29	EPA 218.6, EPA 7199
Ion Chromatograph	Metrohm	881	1881000123101	2012-11-05	EPA 218.6, EPA 7199
Ion Chromatograph (with UV/VIS Detector)	Dionex	ICS-2000-TC	8010736	2013-10-03	EPA 218.6, EPA 7199
Ion Chromatograph	Dionex	ICS-2000	4100753	2013-10-28	EPA 314.0

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
Ion Chromatograph	Dionex	ICS-2100	11021089	2014-01-24	EPA 314.0
Ion Chromatograph	Dionex	ICS-2100	13071408	2015-01-01	EPA 314.0
Ion Chromatograph	Dionex	ICS-1600	14028658	2016-04-06	EPA 300.0, EPA 9056
Ion Chromatograph	Dionex	ICS-1600	11071115	2016-04-06	EPA 300.0, EPA 9056
Ion Chromatograph	Dionex	Aquion	17061052	2017-07-20	EPA 300.0, EPA 9056
Ion Chromatograph	Metrohm	881 Compact Pro	1881000008142	2017-11-10	EPA 314.0(M) pCBSA
Ion Chromatograph	Dionex	ICS-1100	12101232	2018-05-15	EPA 300.0, EPA 9056
Ion Chromatograph	Thermo Scientific	Dionex Aquion	180544857	2018-06-20	EPA 300.0, EPA 9056
Ion Chromatograph	Thermo Scientific	Dionex Aquion	180544940	2018-06-20	EPA 300.1
Ion Chromatograph	Thermo Scientific	Dionex Aquion	180544861	2018-06-20	EPA 218.7
Inductively Coupled Plasma Optical Emission Spectrometer	Agilent	G8015A	MY17100011	2017-05-10	EPA 200.7, EPA 6010
Inductively Coupled Plasma Optical Emission Spectrometer	Agilent	G8015A	MY18181017	2018-06-29	EPA 200.7, EPA 6010
Inductively Coupled Plasma Mass Spectrometer	Agilent	7700 series G3281A	JP09480189	2010-01-01	EPA 200.8, EPA 6020
Inductively Coupled Plasma Mass Spectrometer	Agilent	7700 series G3281A	JP12091608	2012-01-01	EPA 200.8, EPA 6020
Inductively Coupled Plasma Mass Spectrometer	Agilent	7900	JP16211410	2016-06-27	EPA 200.8, EPA 6020
Ammonia Probe	Orion	96-12		2005-01-01	SM 4500-NH3 D
Konelab Aquakem 250	Thermo Scientific	Aquakem 250	E2319629		EPA 351.2
Lachat Flow Injection Analyzer	Lachat	QuickChem 8500 Series 2	140100001626	2014-01-28	EPA 350.1
Auto-titrator	ManTech	PC-Titrate PC1000-102	MS-9K8-210	2009-01-01	SM 2320 B, EPA 150.1, SM 4500-H+ B
Microwave	CEM	MARS5	MD3165	2010-01-01	EPA 3546
Microwave	CEM	MARS XPRESS	MD8441	2010-01-01	EPA 3546

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
pH Meter	Thermo Scientific	Orion 3Star 1219000	A11235	2010-07-01	Field Sampling
pH Meter	Hach	Sens10N™+pH1	321113	2013-07-15	Field Sampling
pH Meter	Mettler Toledo	SevenEasy	1227116127	2006-01-01	SM 2580 B
pH Meter	Denver Instrument	Basic	13036	2006-01-01	SM 5210 B
pH meter	Thermo Scientific	Orion 3 Star pH Portable	A12744	2017-01-01	EPA 150.1, SM 4500-H+ B
pH Meter	Fisher Scientific	Accumet AB15 Plus	AB92334024	2010-01-01	EPA 150.1, SM 4500-H+ B
pH Meter	Denver Instrument	UB-10	UB10107126	2008-01-02	SM 2320 B, EPA 150.1, SM 4500-H+ B
pH Meter	Accumet	Model 25	C0021582	2006-01-01	SM 5210 B
pH Meter	Thermo	OrionStarA111	J00943	2006-01-01	EPA 1311, EPA 1312, CA WET
pH Meter	Thermo Scientific	Orion Star A111	J06791	2014-04-07	EPA 150.1, EPA 9040, EPA 9045, SM 4500-H+ B
pH Meter	Sartorius	Basic Meter PB-11	31350114	2014-10-14	pH Screening
pH meter	Hach	HQ40d	150800013699	2017-02-07	EPA 150.1, SM 4500-H+ B
pH meter	Thermo Scientific	Orion Star A111	J15139	2017-02-09	EPA 150.1, EPA 9040, EPA 9045, SM 4500-H+ B
pH meter	Accumet	AE150	AE98002704	2017-06-02	SM 4500-F C, EPA 9214, SM 4500-NH3 D
pH meter	Accumet	AE150	AE95004164	2018-01-25	pH Screening
pH meter	Thermo Scientific	Orion 5-Star	11235	2018-06-07	Field pH
TOC Analyzer	Tekmar-Dohrmann	Phoenix 8000	US02106006	2002-01-01	SM 5310 C
TOC Analyzer	Shimadzu	TOV-V CSH	HS1104535257CS	2011-01-01	SM 5310 B, EPA 9060
Turbidity Meter	Orbeco-Hellige	965-10A	5187	2009-01-01	EPA 180.1, SM 2130 B
Turbidity Meter	Orbeco-Hellige	965	3635	2017-03-03	EPA 180.1, SM 2130 B

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Equipment/ Instrument	Manufacturer	Model Number	Serial Number	Placed in Service (Year)	Methods Performed
DO Probe	Thermo Scientific	Orion 9708	003/176	2019-06-19	SM 5210 B
BOD Analyzer	Skalar Analytical	99346245	19513	2019-08-05	SM 5210 B
Fluoride Probe	Orion	96-09	9609BN	2006-01-01	SM 4500-F C, EPA 9214
ISCO 3710 Sampler	Teledyne ISCO	603714001	198H00868	2006-01-01	Field Sampling
ISCO GLP Sampler	Teledyne ISCO	60-2954-00	202F00477	2006-01-01	Field Sampling
ISCO GLP Sampler	Teledyne ISCO	60-2954-00	210F01206	2006-01-01	Field Sampling
ISCO GLP Sampler	Teledyne ISCO	60-2954-00	210F01211	2006-01-01	Field Sampling
ISCO GLP Sampler	Teledyne ISCO	60-2954-00	12221-026	2006-01-01	Field Sampling

Note:

[1] The Instrumentation List is subject to change. Refer to the Equipment database for the updated list.

Table 20-2. Example – Schedule of Routine Maintenance

Instrument	Procedure	Frequency
Mercury Analyzer	Check tubing for wear Fill rinse tank with 10% HCl Fill reductant bottle with 10% Stannous Chloride	Daily Daily Daily
ICP	Check/replace pump tubing Check liquid argon supply Check fluid level in waste container Check/clean/replace filters Check torch Clean torch and nebulizer	Daily/as needed Daily Daily Daily/as needed Daily As needed
ICP/ MS	Check/replace pump tubing Inspect torch and injector cones Clean/replace ion lens Replace torch o-rings Check/replace gas filters Change rough pump oil Check chiller water level	Daily/as needed Daily As needed As needed As needed As needed Weekly
UV-Vis Spectrophotometer	Clean sample holder Precision check/alignment of flow cell Wavelength verification check	As required As required Semi-annually
Gas Chromatograph/Mass Spectrometer (GCMS)	Bake trap (VOC only) Clean source Check/change vacuum pump oil Clean injectors; replace liners (SVOC only) Replace column Clean cooling fan grills	Daily As needed Annually, as needed Daily As needed Semiannually

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Instrument	Procedure	Frequency
Gas Chromatograph (GC)	Change septum Check gases Replace or clip column Clean injectors; replace liners Clean cooling fan grills	As needed Daily As needed As needed Semiannually
Electron Capture Detector (ECD)	Detector wipe test (Ni-63) Detector cleaning	Semi-annually Sent out, as needed
Flame Ionization Detector (FID)	Detector cleaning	As required
Flame Photoionization Detector (FPD)	Clean and/or Replace Lamp	As required
Photoionization Detector (PID)	Change O-rings Clean lamp window	As required As required
Ion Chromatograph (IC)	Replace column disks Change guard columns Check pump seals Replace tubing Replace suppressor Check fluid level in waste container Clean cooling fan grills	As required As required As required As required As required Daily Semiannually
Balances	Class “S” traceable weight check Clean pan and check if level Outside calibration service	Daily, when used Daily At least Annually
Conductivity Meter	0.01 M KCl calibration Conductivity cell cleaning	Daily As required
Turbidimeter	Check light bulb Clean sample holder	Daily, when used Daily, when used
Deionized/Distilled Water	Daily conductivity check Check deionizer light Monitor for VOA’s System cleaning Replace cartridge & large mixed bed resins	Daily Daily As required As required As required
Drying Ovens	Temperature monitoring Temperature adjustments	When used As required
Refrigerators/ Freezers	Temperature monitoring Temperature adjustment Defrosting/cleaning	Daily As required As required
pH/Specific Ion Meter	Calibration/check slope Clean electrode	Daily As required
BOD Incubator	Temperature monitoring Incubator cleaning	Daily As required
Centrifuge	Check brushes and bearings	As needed
Water baths	Temperature monitoring Water replaced	Daily Monthly or as needed
TurboVaps	Check gas lines Check water level Calibrate temperature	Daily Daily Annually

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Instrument	Procedure	Frequency
Total Organic Carbon Analyzer	Check gas flow Check reagent reservoir levels Replace o-rings Check autosampler needle Replace scrubbers Replace catalyst	Daily Daily As needed Daily Annually As needed
Automated Analyzer	Clean sampler Check all tubing Clean detector Clean optics and cells	Daily Daily Daily Daily
Infrared Spectrophotometer (IR)	Clean lens/optimize	As needed
Flashpoint Apparatus	Check gas line for leaks Check stirrer speed	Daily Annually
Rotators	Verify rotation speed	Annually

SECTION 21. MEASUREMENT TRACEABILITY

21.1 Overview

Traceability of measurements shall be assured using a system of documentation, calibration, and analysis of reference standards. Laboratory equipment that are peripheral to analysis and whose calibration is not necessarily documented in a test method analysis or by analysis of a reference standard shall be subject to ongoing certifications of accuracy. At a minimum, these must include procedures for checking specifications of ancillary equipment: balances, thermometers, temperature, Deionized (DI) and Reverse Osmosis (RO) water systems, automatic pipettes and other volumetric measuring devices. (Refer to Section 20.3). With the exception of Class A glassware and glass microliter syringes, quarterly (or monthly) accuracy checks are performed for all mechanical volumetric devices. Micro-syringes are verified at least semi-annually or disposed of after 6 months of use. Wherever possible, subsidiary or peripheral equipment is checked against standard equipment or standards that are traceable to national or international standards. Class A glassware and glass microliter syringes should be routinely inspected for chips, acid etching or deformity (e.g., bent needle). If the Class A glassware or syringe is suspect, the accuracy of the glassware will be assessed prior to use.

21.2 NIST-Traceable Weights and Thermometers

Reference standards of measurement shall be used for calibration only and for no other purpose, unless it can be shown that their performance as reference standards would not be invalidated.

For NIST-traceable weights and thermometers, the laboratory requires that all calibrations be conducted by a calibration laboratory accredited by A2LA, NVLAP (National Voluntary Laboratory Accreditation Program), or another accreditation organization that is a signatory to a MRA (Mutual Recognition Arrangement) of one or more of the following cooperations – ILAC (International Laboratory Accreditation Cooperation) or APLAC (Asia–Pacific Laboratory Accreditation Cooperation). A calibration certificate and scope of accreditation is kept on file at the laboratory.

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21.3 Reference Standards / Materials

Reference standards/materials, where commercially available, are traceable to certified reference materials. Commercially prepared reference standards, to the extent available, are purchased from vendors that are accredited to ISO Guide 34 and ISO/IEC Guide 17025. All reference standards from commercial vendors shall be accompanied with a certificate that includes at least the following information:

- Manufacturer
- Analytes or parameters calibrated
- Identification or lot number
- Calibration method
- Concentration with associated uncertainties
- Purity

If a standard cannot be purchased from a vendor that supplies a Certificate of Analysis, the purity of the standard is documented by analysis. The receipt of all reference standards must be documented. Reference standards are labeled with a unique Standard Identification Number and expiration date. All documentation received with the reference standard is retained as a QC record and references the Standard Identification Number.

All reference, primary and working standards/materials, whether commercially purchased or laboratory prepared, must be checked regularly to ensure that the variability of the standard or material from the true value does not exceed method requirements. The accuracy of calibration standards is checked by comparison with a standard from a second source. In cases where a second standard manufacturer is not available, a vendor certified different lot is acceptable for use as a second source. For unique situations, such as air analysis where no other source or lot is available, a standard made by a different analyst would be considered a second source. The appropriate Quality Control (QC) criteria for specific standards are defined in laboratory SOPs. In most cases, the analysis of an Initial Calibration Verification (ICV) or LCS (where there is no sample preparation) is used as the second source confirmation. These checks are generally performed as an integral part of the analysis method (e.g. calibration checks, laboratory control samples).

All standards and materials must be stored and handled according to method or manufacturer's requirements in order to prevent contamination or deterioration. Refer to the Corporate Environmental Health & Safety Manual or laboratory SOPs. For safety requirements, please refer to method SOPs and the laboratory Environmental Health and Safety Manual.

Standards and reference materials shall not be used after their expiration dates unless their reliability is verified by the laboratory and their use is approved by the Quality Assurance Manager. The laboratory must have documented contingency procedures for re-verifying expired standards.

21.4 Documentation and Labeling of Standards, Reagents, and Reference Materials

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Reagents must be at a minimum the purity required in the test method. The date of reagent receipt and the expiration date are documented. The lots for most of the common solvents and acids are tested for acceptability prior to company-wide purchase. [Refer to Eurofins Environment Testing America's Corporate SOP (CA-Q-S-001), Solvent and Acid Lot Testing and Approval.]

All manufacturer or vendor supplied Certificate of Analysis or Purity must be retained, stored appropriately, and readily available for use and inspection. These records are maintained in the TALS Reagent program or in binders or other organized files stored within each department. Records must be kept of the date of receipt and date of expiration of standards, reagents and reference materials. In addition, records of preparation of laboratory standards, reagents, and reference materials must be retained, stored appropriately, and be readily available for use and inspection. For detailed information on documentation and labeling, please refer to method specific SOPs and the laboratory SOP No. IR-QA-STDCNTRL.

Commercial materials purchased for preparation of calibration solutions, spike solutions, etc., are usually accompanied with an assay certificate or the purity is noted on the label. If the assay purity is 96% or better, the weight provided by the vendor may be used without correction. If the assay purity is less than 96% a correction will be made to concentrations applied to solutions prepared from the stock commercial material. Blended gas standard cylinders use a nominal concentration if the certified value is within +/-15%, otherwise the certified values is used for the canister concentration.

21.4.1 All standards, reagents, and reference materials must be labeled in an unambiguous manner. Standards are logged into the LIMS Reagent program, and are assigned a unique identification number. The following information is typically recorded in the electronic database within the LIMS.

- Standard ID
- Description of Standard
- Department
- Preparer's name
- Final volume and number of vials prepared
- Solvent type and lot number
- Preparation Date
- Expiration Date
- Standard source type (stock or daughter)
- Standard type (spike, surrogate, other)
- Parent standard ID (if applicable)
- Parent standard analyte concentration (if applicable)
- Parent standard amount used (if applicable)
- Component analytes

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- Final concentration of each analyte
- Comment box (text field)

Records are maintained electronically for standard and reference material preparation. These records show the traceability to purchased stocks or neat compounds. These records also include method of preparation, date of preparation, expiration date and preparer's name or initials. Preparation procedures are provided in the Method SOPs.

21.4.2 All standards, reagents, and reference materials must be clearly labeled with a minimum of the following information:

- Expiration Date (include prep date for reagents)
- Standard ID (specify from LIMS or logbook)
- Special Health/Safety warnings if applicable

Records must also be maintained of the date of receipt for commercially purchased items or date of preparation for laboratory prepared items. Special Health/Safety warnings must also be available to the analyst. This information is maintained in the LIMS Reagent program.

21.4.3 In addition, the following information may be helpful:

- Date opened (for multi-use containers, if applicable)
- Description of standard (if different from manufacturer's label or if standard was prepared in the laboratory)
- Recommended storage conditions
- Concentration (if applicable)
- Initials of analyst preparing standard or opening container

All containers of prepared reagents must include an expiration date and an ID number to trace back to preparation.

Procedures for preparation of reagents can be found in the Method SOPs.

Standard ID numbers must be traceable through associated logbooks, worksheets and preparation/analytical batch records.

All reagents and standards must be stored in accordance to the following priority: 1) with the manufacturer's recommendations; 2) with requirements in the specific analytical methods as specified in the laboratory SOP.

SECTION 22. SAMPLING

22.1 Overview

The laboratory provides sampling services. Sampling procedures are described in the laboratory SOP No. IR-SC-FIELD.

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22.2 Sampling Containers

The laboratory offers clean sampling containers for use by clients. These containers are obtained from reputable container manufacturers and meet EPA specifications as required. Certificates of cleanliness for bottles and preservatives are provided by the supplier and are maintained at the laboratory. Alternatively, the certificates may be maintained by the supplier and available to the laboratory on-line.

22.2.1 Preservatives

Upon request, preservatives are provided to the client in pre-cleaned sampling containers. In some cases containers may be purchased pre-preserved from the container supplier. Whether prepared by the laboratory or bought pre-preserved, the grades of the preservatives are at a minimum:

- Hydrochloric Acid – Reagent ACS (Certified VOA Free) or equivalent
- Methanol – Purge and Trap grade
- Nitric Acid – Instra-Analyzed or equivalent
- Sodium Bisulfate – ACS Grade or equivalent
- Sodium Hydroxide – Instra-Analyzed or equivalent
- Sulfuric Acid – Instra-Analyzed or equivalent
- Sodium Thiosulfate – ACS Grade or equivalent

22.3 Definition of Holding Time

The date and time of sampling documented on the COC form establishes the day and time zero. As a general rule, when the maximum allowable holding time is expressed in days (e.g., 14 days, 28 days), the holding time is based on calendar day measured. Holding times expressed in hours (e.g., 6 hours, 24 hours, etc.) are measured from date and time zero. Holding times for analysis include any necessary reanalysis. However, there are some programs that determine holding time compliance based on the date and specific time of analysis compared to the time of sampling regardless of how long the holding time is.

22.4 Sampling Containers, Preservation Requirements, Holding Times

The preservation and holding time criteria specified in the laboratory SOPs are derived from the source documents for the methods. If method required holding times or preservation requirements are not met, the reports will be qualified using a flag, footnote or case narrative. As soon as possible or “ASAP” is an EPA designation for tests for which rapid analysis is advised, but for which neither EPA nor the laboratory have a basis for a holding time.

22.5 Sample Aliquots / Subsampling

Taking a representative sub-sample from a container is necessary to ensure that the analytical results are representative of the sample collected in the field. The size of the sample container, the quantity of sample fitted within the container, and the homogeneity of the sample need

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consideration when sub-sampling for sample preparation. It is the laboratory's responsibility to take a representative subsample or aliquot of the sample provided for analysis.

Analysts should handle each sample as if it is potentially dangerous. At a minimum, safety glasses, gloves, and lab coats must be worn when preparing aliquots for analysis.

Guidelines on taking sample aliquots & subsampling are located in the laboratory SOP No. IR-QA-SUBSAMP.

SECTION 23. HANDLING OF SAMPLES

Sample management procedures at the laboratory ensure that sample integrity and custody are maintained and documented from sampling/receipt through disposal.

23.1 Chain of Custody (COC)

The COC form is the written documented history of any sample and is initiated when bottles are sent to the field, or at the time of sampling. This form is completed by the sampling personnel and accompanies the samples to the laboratory where it is received and stored under the laboratory's custody. The purpose of the COC form is to provide a legal written record of the handling of samples from the time of collection until they are received at the laboratory. It also serves as the primary written request for analyses from the client to the laboratory. The COC form acts as a purchase order for analytical services when no other contractual agreement is in effect. An example of a COC form may be found in Figure 23-1.

23.1.1 Field Documentation

The information the sampler needs to provide at the time of sampling on the container label is:

- Sample identification
- Date and time
- Preservative

During the sampling process, the COC form is completed and must be legible (see Figure 23-1). This form includes information such as:

- Client name, address, phone number and fax number (if available).
- Project name and/or number.
- The sample identification.
- Date, time and location of sampling.
- Sample collector's name.
- The matrix description.
- The container description.
- The total number of each type of container.
- Preservatives used.

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- Analysis requested.
- Requested turnaround time (TAT).
- Any special instructions.
- Purchase Order number or billing information (e.g., quote number) if available.
- The date and time that each person received or relinquished the sample(s), including their signed name.

When the sampling personnel deliver the samples directly to Eurofins Environment Testing America personnel, the samples are stored in a cooler with ice, as applicable, and remain solely in the possession of the client's field technician until the samples are delivered to the laboratory personnel. The sample collector must assure that each container is in his/her physical possession or in his/her view at all times, or stored in such a place and manner to preclude tampering. The field technician relinquishes the samples in writing on the COC form to the sample control personnel at the laboratory or to a Eurofins courier. When sampling personnel deliver the samples through a common carrier (Fed-Ex, UPS), the COC relinquished date/time is completed by the field personnel and samples are released to the carrier. Samples are only considered to be received by the laboratory when personnel at the fixed laboratory facility have physical contact with the samples.

Note: Independent couriers are not required to sign the COC form. The COC is usually kept in the sealed sample cooler. The receipt from the courier is stored in log-in by date; it lists all receipts each date.

23.1.2 Legal / Evidentiary Chain-of-Custody

If samples are identified for legal/evidentiary purposes on the COC, sample receiving personnel will complete the custody seal, retain the shipping record with the COC, and initiate an internal COC for laboratory use by analysts and a sample disposal record during login.

23.2 Sample Receipt

Samples are received at the laboratory by designated sample receiving personnel and a unique laboratory project identification number is assigned. Each sample container shall be assigned a unique sample identification number that is cross-referenced to the client identification number such that traceability of test samples is unambiguous and documented. Each sample container is affixed with a durable sample identification label. Sample acceptance, receipt, tracking and storage procedures are summarized in the following sections and are discussed in detail in laboratory SOP No. IR-SC-LOGIN.

23.2.1 Laboratory Receipt

When samples arrive at the laboratory, sample receiving personnel inspect the coolers and samples. The integrity of each sample must be determined by comparing sample labels or tags with the COC and by visual checks of the container for possible damage. Any non-conformance, irregularity, or compromised sample receipt must be documented in the TALS Login Sample Receipt Checklist and/or the NCM program, and brought to the immediate attention of the client. The COC, shipping documents, documentation of any non-conformance,

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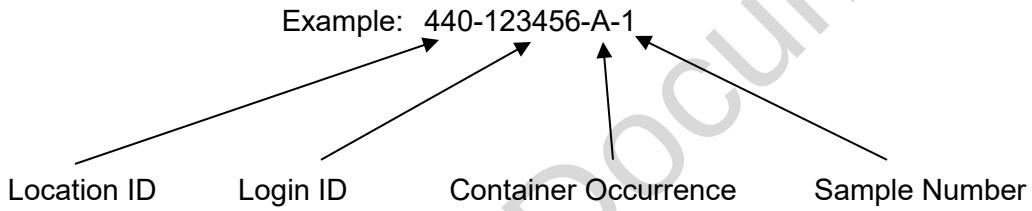
irregularity, or compromised sample receipt, record of client contact, and resulting instructions become part of the project record.

23.2.1.1 Unique Sample Identification

All samples that are processed through the laboratory receive a unique sample identification to ensure that there can be no confusion regarding the identity of such samples at any time. This system includes identification for all samples, subsamples and subsequent extracts and/or digestates.

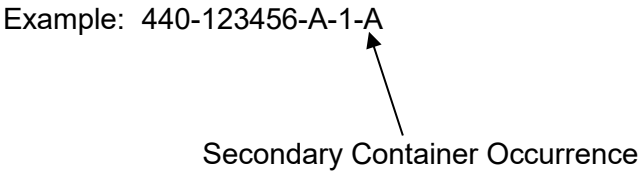
The laboratory assigns a unique identification (e.g., Sample ID) code to each sample container received at the laboratory. This Primary ID is made up of the following information (consisting of 4 components):



Note: Sample ID is generated by LIMS.

The above example states that Eurofins Calscience Irvine Laboratory (Location 440). Login ID is 123456 (unique to a particular client/job occurrence). The container code indicates it is the first container ("A") of Sample #1.

If the primary container goes through a prep step that creates a "new" container, then the new container is considered secondary and gets another ID. An example of this being a client sample in a 1-Liter amber bottle is sent through a Liquid/Liquid Extraction and an extraction vial is created from this step. The vial would be a SECONDARY container. The secondary ID has 5 components.



Example: 440-123456-A-1-A would indicate the PRIMARY container listed above that went through a step that created the 1st occurrence of a Secondary container.

With this system, a client sample can literally be tracked throughout the laboratory in every step from receipt to disposal.

23.3 Sample Acceptance Policy

The laboratory has a written sample acceptance policy (Figure 23-2) that clearly outlines the circumstances under which samples shall be accepted or rejected. These include:

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- A COC filled out completely;
- Samples must be properly labeled;
- Proper sample containers with adequate volume for the analysis (Sampling Guide) and necessary QC;
- Samples must be preserved according to the requirements of the requested analytical method (Sampling Guide);
- sample holding times must be adhered to (Sampling Guide);

The project manager will be notified if any sample is received in damaged condition.

Data from samples which do not meet these criteria are flagged and the nature of the variation from policy is defined.

23.3.1 After inspecting the samples, the sample receiving personnel sign and date the COC form, make any necessary notes of the samples' conditions and store them in appropriate refrigerators or storage locations.

23.3.2 Any deviations from these checks that question the suitability of the sample for analysis, or incomplete documentation as to the tests required will be resolved by consultation with the client. If the sample acceptance policy criteria are not met, the laboratory shall either:

- Retain all correspondence and/or records of communications with the client regarding the disposition of rejected samples, or
- Fully document any decision to proceed with sample analysis that does not meet sample acceptance criteria.

Once sample acceptance is verified, the samples are logged into the LIMS according to the laboratory SOP No. IR-SC-LOGIN.

23.4 Sample Storage

In order to avoid deterioration, contamination or damage to a sample during storage and handling, from the time of receipt until all analyses are complete, samples are stored in refrigerators, freezers or protected locations suitable for the sample matrix and for analyses requiring thermal preservation. In addition, samples to be analyzed for volatile organic parameters are stored in separate refrigerators designated for volatile organic parameters only. Samples are never to be stored with reagents, standards or materials that may create contamination.

To ensure the integrity of the samples during storage, refrigerator blanks are maintained in the volatile sample refrigerators and analyzed every two weeks.

Analysts and technicians retrieve the sample container allocated to their analysis from the designated refrigerator and place them on carts, analyze the sample, and return the remaining sample or empty container to the refrigerator from which it originally came. All unused portions of samples, including empty sample containers, are returned to the secure sample control area.

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All samples are kept in the refrigerators for two to four weeks after analysis, which meets or exceeds most sample holding times. After two to four weeks the samples are moved to dry room temperature, sample archive area where they are stored for an additional four weeks before they are disposed of. This eight week holding period allows samples to be checked if a discrepancy or question arises. Special arrangements may be made to store samples for longer periods of time. This extended holding period allows additional metal analyses to be performed on the archived sample and assists clients in dealing with legal matters or regulatory issues.

Access to the laboratory is controlled such that sample storage need not be locked at all times unless a project specifically demands it. Samples are accessible to laboratory personnel only. Visitors to the laboratory are prohibited from entering the refrigerator and laboratory areas unless accompanied by an employee of Eurofins Environment Testing America.

23.5 Hazardous Samples and Foreign Soils

To minimize exposure to personnel and to avoid potential accidents, hazardous and foreign soil samples are stored in an isolated area designated for hazardous waste only. For any sample that is known to be hazardous at the time of receipt or, if after completion of analysis the result exceeds the acceptable regulatory levels, a Hazardous Sample Notice must be completed by the analyst. This form may be completed by Sample Control, Project Managers, or analysts and must be attached to the report. The sample itself is clearly marked with a red stamp, stamped on the sample label reading “HAZARDOUS” or “FOREIGN SOIL” and placed in a colored and/or marked bag to easily identify the sample. The date, log number, lab sample number, and the result or brief description of the hazard are all written on the Hazardous & Foreign Soil Sample Notice. A copy of the form must be included with the original COC and Work Order and the original must be given to the Sample Control Custodian. Analysts will notify Sample Control of any sample determined to be hazardous after completion of analysis by completing a Hazardous Sample Notice. All hazardous samples are either returned to the client or disposed of appropriately through a hazardous waste disposal firm that lab-packs all hazardous samples and removes them from the laboratory. Foreign soil samples are sent out for incineration by a USDA-approved waste disposal facility.

23.6 Sample Shipping

In the event that the laboratory needs to ship samples, the samples are placed in a cooler with enough ice to ensure the samples remain just above freezing and at or below 6.0°C during transit. The samples are carefully surrounded by packing material to avoid breakage (yet maintain appropriate temperature). A trip blank is enclosed for those samples requiring water/solid volatile organic analyses (see Note). The chain-of-custody form is signed by the sample control technician and attached to the shipping paperwork. Samples are generally shipped overnight express or hand-delivered by a Eurofins courier to maintain sample integrity. All personnel involved with shipping and receiving samples must be trained to maintain the proper chain-of-custody documentation and to keep the samples intact and on ice. The Environmental, Health and Safety Manual contains additional shipping requirements.

Note: If a client does not request trip blank analysis on the COC or other paperwork, the laboratory will not analyze the trip blanks that were supplied. However, in the interest of good client service, the laboratory will advise the client at the time of sample receipt that it was noted that they did not request analysis of the trip blank; and that the laboratory is providing the

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notification to verify that they are not inadvertently omitting a key part of regulatory compliance testing.

23.7 Sample Disposal

Samples should be retained for a minimum of 30 days after the project report is sent, however, provisions may be made for earlier disposal of samples once the holding time is exceeded. Some samples are required to be held for longer periods based on regulatory or client requirements (e.g., 60 days after project report is sent). The laboratory must follow the longer sample retention requirements where required by regulation or client agreement. Several possibilities for sample disposal exist: the sample may be consumed completely during analysis, the sample may be returned to the customer or location of sampling for disposal, or the sample may be disposed of in accordance with the laboratory's waste disposal procedures (SOP No. IR-EHS-WASTE). All procedures in the laboratory Environmental, Health and Safety Manual are followed during disposal. Samples are normally maintained in the laboratory no longer than two months from receipt unless otherwise requested. Unused portions of samples found or suspected to be hazardous according to state or federal guidelines may be returned to the client upon completion of the analytical work.

If a sample is part of a known litigation, the affected legal authority, sample data user, and/or submitter of the sample must participate in the decision about the sample's disposal. All documentation and correspondence concerning the disposal decision process must be kept on file. Pertinent information includes the date of disposal, nature of disposal (such as sample depletion, hazardous waste facility disposal, return to client, etc.), names of individuals who conducted the arrangements and physically completed the task. The laboratory will remove or deface sample labels prior to disposal unless this is accomplished through the disposal method (e.g., samples are incinerated). A Waste Disposal Record should be completed.

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Figure 23-1. Example – Chain of Custody (COC)

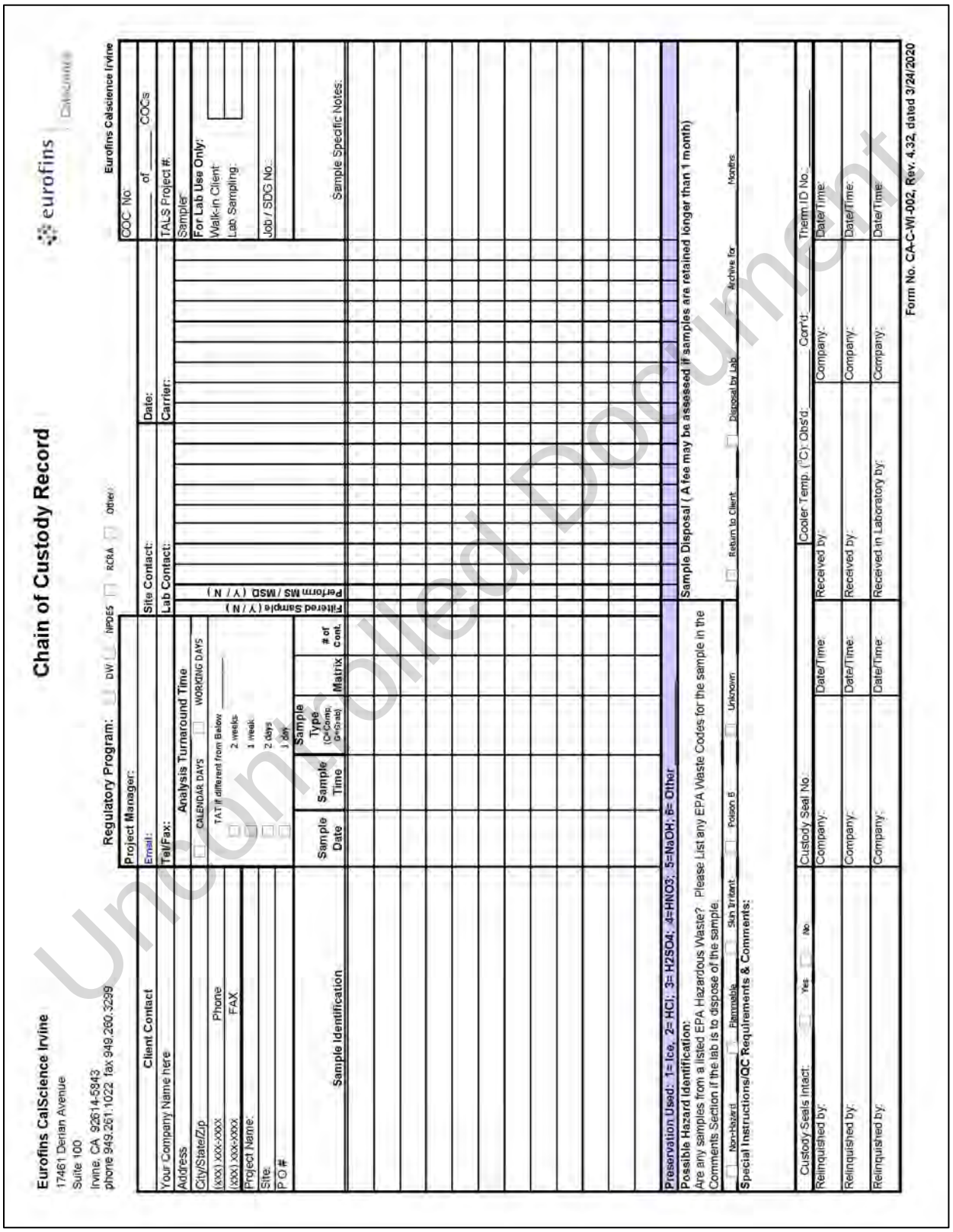

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Figure 23-2. Example – Sample Acceptance Policy (Page 1 of 2)

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Eurofins Calscience Irvine Sample Acceptance Policy

All incoming work will be evaluated against the criteria listed below. Where applicable, data from any samples that do not meet the criteria listed below will be noted on the laboratory report defining the nature and substance of the variation. In addition, the client will be notified either by telephone or e-mail ASAP after the receipt of the samples.

Per State and/or Federal Regulation, the client is responsible to ensure that samples are shipped in accordance with DOT/IATA requirements, and that radioactive materials may only be delivered to licensed facilities. Any samples containing (or suspected to contain) Source, Byproduct, or Special Nuclear Material as defined by 10 CFR should be delivered directly to facilities licensed to handle such radioactive material. Eurofins Calscience Irvine is not a licensed facility and cannot accept this type of material. Natural material or ores containing naturally occurring radionuclides may be delivered to any Eurofins Environment Testing America facility or courier as long as the activity concentration of the material does not exceed 270 pCi/g alpha or 2700 pCi/g beta (49 CFR Part 173).

Product samples or samples with known chemical hazards must be disclosed prior to acceptance for analysis. This information is required to protect employees from un-necessary exposure and the potential of mixing incompatible chemicals resulting in a violent reaction, and to protect valuable instrumentation.

Biohazardous samples, or samples suspected or known to contain human waste, blood or bodily fluids, pathological waste, sharps or other biohazards, unless submitted as a part of our routine testing protocols (i.e., bacteriological testing), must be disclosed prior to acceptance for analysis. This information is required to protect employees from un-necessary exposure. Eurofins Calscience Irvine retains the right to reject samples if they are known or suspected to be biohazardous.

1) Samples must arrive with labels intact with a Chain of Custody filled out completely. The following information must be recorded.
   - Client name, address, phone number and fax number (if available).
   - Project name and/or number.
   - The sample identification.
   - Date, time and location of sampling.
   - The collector's name.
   - The matrix description.
   - The container description.
   - The total number of each type of container.
   - Preservatives used.
   - Analysis requested.
   - Requested turnaround time (TAT).
   - Any special instructions.
   - Purchase Order number or billing information (e.g., quote number) if available.
   - The date and time each person received or relinquished the sample(s), including their signed name.
   - The date and time of receipt must be recorded between the last person to relinquish the samples and the person who receives the samples in the lab, and they must be exactly the same.
   - Information must be legible.
2) Samples must be properly labeled.
   - Use durable labels (labels provided by Eurofins Environment Testing America are preferred).
   - Include a unique identification number.
   - Include sampling date and time & sampler ID.
   - Include preservative used.
   - Use indelible ink.
   - Information must be legible.
3) Proper sample containers with adequate volume for the analysis and necessary QC are required for each analysis requested. See Eurofins Environment Testing America Sample Reference Guide (CA-Q-WI-025).
4) Samples must be preserved according to the requirements of the requested analytical method (See Sample Reference Guide).
5) Most analytical methods require chilling samples to 4°C (other than water samples for metals analysis and samples for air analysis). For these methods, the criteria are met if the samples are chilled to below 6°C and above freezing (0°C). For methods with other temperature criteria (e.g., some bacteriological methods require ≤ 10°C), the samples must arrive within ± 2°C of the required temperature or within the method specified range.

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Filename: Sample_Acceptance_Policy_2020-04-01rev.docx

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Figure 23-2. Example – Sample Acceptance Policy (Page 2 of 2)

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a) Samples that are delivered to the laboratory on the same day they are collected may not meet the requirements of Section 5. In this case, the samples shall be considered acceptable if the samples were received on ice.

b) If sample analysis is begun within fifteen (15) minutes of collection, thermal preservation is not required.

c) Thermal preservation is not required in the field if the laboratory receives and refrigerates the sample within fifteen (15) minutes of collection.

- Chemical preservation (pH) will be verified prior to analysis and documented, either in sample control or at the analyst's level. The project manager will be notified immediately if there is a discrepancy. If analyses will still be performed, all affected results will be flagged to indicate improper preservation.
- For Volatile Organic analyses in drinking water (EPA Methods 502.2 or 524.2), residual chlorine must be neutralized prior to preservation. If there is prior knowledge that the samples are not chlorinated, state it on the COC and use the VOA vials pre-preserved with HCl. The following are other options for a sampler and laboratory where the presence of chlorine is not known:
  - Test for residual chlorine in the field prior to sampling.
    - If no chlorine is present, the samples are to be preserved using HCl as usual.
    - If chlorine is present, add either ascorbic acid or sodium thiosulfate prior to adding HCl.
  - Use VOA vials pre-preserved with sodium thiosulfate or ascorbic acid and add HCl after filling the VOA vial with the sample.
- **WATER SAMPLES TESTED FOR CYANIDE** (by Standard Methods or EPA Method 335):
  - In the Field: Samples are to be tested for sulfide using lead acetate paper prior to the addition of sodium hydroxide (NaOH). If sulfide is present, the sample must be treated with cadmium chloride and filtered prior to the addition of NaOH.
    - If the sulfide test and treatment is not performed in the field, the lab will test the samples for sulfide using lead acetate paper. If sulfide is present in the sample, the client will be notified and given the option of retaking the sample and treating in the field per the method requirements or the laboratory can analyze the samples as delivered and qualify the results in the final report.
  - It is the responsibility of the client to notify the laboratory if thiosulfate, sulfite, or thiocyanate are known or suspected to be present in the sample. This notification may be on the chain of custody. The samples may need to be subcontracted to a laboratory that performs a UV digestion. If the lab does not perform the UV digestion on samples that contain these compounds, the results must be qualified in the final report.
  - The laboratory must test the sample for oxidizing agents (e.g., chlorine) prior to analysis and treat according to the methods prior to distillation. (Ascorbic acid or sodium arsenite are the preferred choice.)

6) Sample Holding Times

- Eurofins Environment Testing America will make every effort to analyze samples within the regulatory holding time. Samples must be received in the laboratory with enough time to perform the sample analysis. Except for short holding time samples (< 48hr HT), samples must be received with at least 48 hrs (2 working days) remaining on the holding time for us to ensure a primary analysis is attempted, assuming sufficient preparation and analytical capacity is available upon receipt. Samples received with insufficient holding time remaining will be flagged with an "H" qualifier in the final report to indicate holding time exceedance.
- Analyses that are designated as "field" analyses (pH, Dissolved Oxygen, Residual Chlorine, and Redox Potential) should be analyzed ASAP by the field sampler prior to delivering to the lab (within 15 minutes). However, if the analyses are to be performed in the laboratory, Eurofins Environment Testing America will make every effort to analyze the samples within 24 hours from receipt of the samples in the testing laboratory. Samples for "field" analyses received after 4:00 pm on Friday or on the weekend will be analyzed no later than the next business day after receipt (Monday unless a holiday). Samples will remain refrigerated and sealed until the time of analysis. The actual times of all "field" sample analyses are noted on the "Short Hold Time Detail Report" in the final report. Samples analyzed in the laboratory will be qualified on the final report with an 'H' qualifier to indicate holding time exceedance.
  - Dissolved Metals samples should be filtered in the field within 15 minutes.
  - Dissolved Sulfide samples should be flocculated in the field within 15 minutes.

7) All samples submitted for Volatile Organic analyses should have a Trip Blank submitted at the same time. Eurofins Environment Testing America will supply a blank with the bottle order when requested.

8) The project manager will be notified if any sample is received in damaged condition. Eurofins Environment Testing America will request that a sample be resubmitted for analysis.

9) Recommendations for packing samples for shipment.

- Pack samples in "wet" ice rather than "Blue" ice packs.
- Soil sample containers should be placed in plastic zip-lock bags. The containers often have dirt around the top and do not seal very well and are prone to intrusion from the water from melted ice.
- Water samples would be best if wrapped with bubble-wrap or paper (newspaper, or paper towels work) and then placed in plastic zip-lock bags.
- In all cases, it is recommended that sample containers and sample labels are protected from direct contact with ice/melted ice.
- Fill extra cooler space with bubble wrap and ice.

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Filename: Sample_Acceptance_Policy_2020-04-01rev.docx

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Figure 23-3. Example – Hazardous & Quarantine/Foreign Soil - Drum for Incineration Sample Notice

HAZARDOUS & QUARANTINE/FOREIGN SOIL - DRUM FOR INCINERATION SAMPLE NOTICE

Date:_____

LOG NO:_____

CLIENT:_____

PROJECT ID NO:_____ MATRIX_____

_____ Sample Potentially Hazardous

_____ Sample Hazardous

_____ Sample From Foreign Soil (Mexico, Canada, Hawaii, etc.)

SAMPLE ID	CONTAINER TYPE	HAZARD (Compound & Result)

DATE ARCHIVED:_____ Initials
(Sample placed on hazardous shelves)

DATE DISPOSED: Initials
(On the date samples are removed for hazardous sample disposal, please date & return this form to Sample Control)

G:\Depts\QUALITY\FORMS\SampleControl\HazSample
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SECTION 24. ASSURING THE QUALITY OF TEST RESULTS

24.1 Overview

In order to assure our clients of the validity of their data, the laboratory continuously evaluates the quality of the analytical process. The analytical process is controlled not only by instrument calibration as discussed in Section 20, but also by routine process quality control measurements (e.g. Blanks, Laboratory Control Samples (LCS), Matrix Spikes (MS), duplicates (DUP), surrogates, Internal Standards (IS)). These quality control checks are performed as required by the method or regulations to assess precision and accuracy. Quality control samples are to be treated in the exact same manner as the associated field samples being tested. In addition to the routine process quality control samples, Proficiency Testing (PT) Samples (concentrations unknown to laboratory) are analyzed to help ensure laboratory performance.

24.2 Controls

Sample preparation or pre-treatment is commonly required before analysis. Typical preparation steps include homogenization, grinding, solvent extraction, sonication, acid digestion, distillation, reflux, evaporation, drying and ashing. During these pre-treatment steps, samples are arranged into discreet manageable groups referred to as preparation (prep) batches. Prep batches provide a means to control variability in sample treatment. Control samples are added to each prep batch to monitor method performance and are processed through the entire analytical procedure with investigative/field samples.

24.3 Negative Controls

Table 24-1. Example – Negative Controls

Control Type	Details
Method Blank (MB)	Are used to assess preparation and analysis for possible contamination during the preparation and processing steps. The specific frequency of use for method blanks during the analytical sequence is defined in the specific standard operating procedure for each analysis. Generally, it is 1 for each batch of samples; not to exceed 20 environmental samples. The method blank is prepared from a clean matrix similar to that of the associated samples that is free from target analytes (e.g., Reagent water, Ottawa sand, glass beads, etc.) and is processed along with and under the same conditions as the associated samples. The method blank goes through all of the steps of the process (including as necessary: filtration, clean-ups, etc.). Reanalyze or qualify associated sample results when the concentration of a targeted analyte in the blank is at or above the reporting limit (or at or above ½ the reporting limit) as established by the method or by regulation, AND is greater than 1/10 of the amount measured in the sample.
Calibration Blanks	Are prepared and analyzed along with calibration standards where applicable. They are prepared using the same reagents that are used to prepare the standards. In some analyses, the calibration blank may be included in the calibration curve.
Instrument Blanks	Are blank reagents or reagent water that may be processed during an analytical sequence in order to assess contamination in the analytical system. In general, instrument blanks are used to differentiate between contamination caused by the analytical system and that caused by the sample handling or sample prep process. Instrument blanks may also be inserted throughout the analytical sequence to minimize the effect of carryover from samples with high analyte content.

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Control Type	Details
Trip Blank [1]	Are required to be submitted by the client with each shipment of samples requiring aqueous and solid volatiles analyses (or as specified in the client's project plan). Additionally, trip blanks may be prepared and analyzed for volatile analysis of air samples, when required by the client. A trip blank may be purchased (certified clean) or is prepared by the laboratory by filling a clean container with pure deionized water that has been purged to remove any volatile compounds. Appropriate preservatives are also added to the container. The trip blank is sent with the bottle order and is intended to reflect the environment that the containers are subjected to throughout shipping and handling and help identify possible sources if contamination is found. The field sampler returns the trip blank in the cooler with the field samples.
Field Blanks [1]	Are sometimes used for specific projects by the field samplers. A field blank prepared in the field by filling a clean container with pure reagent water and appropriate preservative, if any, for the specific sampling activity being undertaken. (EPA OSWER)
Equipment Blanks [1]	Are also sometimes created in the field for specific projects. An equipment blank is a sample of analyte-free media which has been used to rinse common sampling equipment to check effectiveness of decontamination procedures. (TNI)
Holding Blanks	Also referred to as refrigerator or freezer blanks, are used to monitor the sample storage units for volatile organic compounds during the storage of VOA samples in the laboratory.

[1] When known, these field QC samples should not be selected for matrix QC as it does not provide information on the behavior of the target compounds in the field samples. Usually, the client sample ID will provide information to identify the field blanks with labels such as "FB", "EB", or "TB."

Evaluation criteria and corrective action for these controls are defined in the specific standard operating procedure for each analysis.

24.4 Positive Controls

Control samples (e.g., QC indicators) are analyzed with each batch of samples to evaluate data based upon (1) Method Performance (Laboratory Control Sample (LCS) or Blank Spike (BS)), which entails both the preparation and measurement steps; and (2) Matrix Effects (Matrix Spike (MS) or Sample Duplicate (MD, DUP), which evaluates field sampling accuracy, precision, representativeness, interferences, and the effect of the matrix on the method performed. Each regulatory program and each method within those programs specify the control samples that are prepared and/or analyzed with a specific batch.

Note that frequency of control samples vary with specific regulatory, methodology and project specific criteria. Complete details on method control samples are as listed in each analytical SOP.

24.4.1 Method Performance Control - Laboratory Control Sample (LCS)

The LCS measures the accuracy of the method in a blank matrix and assesses method performance independent of potential field sample matrix affects in a laboratory batch.

The LCS is prepared from a clean matrix similar to that of the associated samples that is free from target analytes (for example: Reagent water, Ottawa sand, glass beads, etc.) and is processed along with and under the same conditions as the associated samples. The LCS is spiked with verified known amounts of analytes or is made of a material containing known and verified amounts of analytes, taken through all preparation and analysis steps along with the field samples. Where there is no preparation taken for an analysis (such as in aqueous

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volatiles), or when all samples and standards undergo the same preparation and analysis process (such as Phosphorus), a calibration verification standard is reported as the LCS. In some instances where there is no practical clean solid matrix available, aqueous LCS's may be processed for solid matrices; final results may be calculated as mg/kg or µg/kg, assuming 100% solids and a weight equivalent to the aliquot used for the corresponding field samples, to facilitate comparison with the field samples.

Certified pre-made reference material purchased from a NIST/A2LA accredited vendor may also be used for the LCS when the material represents the sample matrix or the analyte is not easily spiked (e.g. solid matrix LCS for metals, TDS, etc.).

The specific frequency of use for LCS during the analytical sequence is defined in the specific standard operating procedure for each analysis. It is generally 1 for each batch of samples; not to exceed 20 environmental samples.

If the mandated or requested test method, or project requirements, do not specify the spiking components, the laboratory shall spike all reportable components to be reported in the Laboratory Control Sample (and Matrix Spike) where applicable (e.g., no spike of pH). However, in cases where the components interfere with accurate assessment (such as simultaneously spiking chlordane, toxaphene and PCBs in Method 608), the test method has an extremely long list of components or components are incompatible, at a minimum, a representative number of the listed components (see below) shall be used to control the test method. The selected components of each spiking mix shall represent all chemistries, elution patterns and masses, permit specified analytes and other client requested components. However, the laboratory shall ensure that all reported components are used in the spike mixture within a two-year time period.

- For methods that have 1-10 target analytes, spike all components.
- For methods that include 11-20 target analytes, spike at least 10 or 80%, whichever is greater.
- For methods with more than 20 target analytes, spike at least 16 components.
- Exception: Due to analyte incompatibility in pesticides, Toxaphene and Chlordane are only spiked at client request based on specific project needs.
- Exception: Due to analyte incompatibility between the various PCB aroclors, aroclors 1016 and 1260 are used for spiking as they cover the range of all of the aroclors. Specific aroclors may be used by request on a project specific basis.

24.5 Sample Matrix Controls

Table 24-2. Sample Matrix Control

Control Type	Details	
Matrix Spikes (MS)	Use	Used to assess the effect sample matrix of the spiked sample has on the precision and accuracy of the results generated by the method used.

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Control Type	Details	
Matrix Spikes (MS)	Typical Frequency [1]	At a minimum, with each matrix-specific batch of samples processed, an MS is carried through the complete analytical procedure. Unless specified by the client, samples used for spiking are randomly selected and rotated between different client projects. If the mandated or requested test method does not specify the spiking components, the laboratory shall spike all reportable components to be reported in the Laboratory Control Sample and Matrix Spike. Refer to the method SOP for complete details.
	Description	Essentially, a sample fortified with a known amount of the test analyte(s).
Surrogate	Use	Measures method performance to sample matrix (organics only).
	Typical Frequency [1]	Are added to all samples, standards, and blanks, for all organic chromatography methods except when the matrix precludes its use or when a surrogate is not available. The recovery of the surrogates is compared to the acceptance limits for the specific method. Poor surrogate recovery may indicate a problem with sample composition and shall be reported, with data qualifiers, to the client whose sample produced poor recovery.
Surrogate	Description	Are similar to matrix spikes except the analytes are compounds with properties that mimic the analyte of interest and are unlikely to be found in environment samples.
Duplicates [2]	Use	For a measure of analytical precision, with each matrix-specific batch of samples processed, a matrix duplicate (MD or DUP) sample, matrix spike duplicate (MSD), or LCS duplicate (LCSD) is carried through the complete analytical procedure.
	Typical Frequency [1]	Duplicate samples are usually analyzed with methods that do not require matrix spike analysis.
	Description	Performed by analyzing two aliquots of the same field sample independently or an additional LCS.
Internal Standards	Use	Are spiked into all environmental and quality control samples (including the initial calibration standards) to monitor the qualitative aspect of organic and some inorganic analytical measurements.
	Typical Frequency [1]	All organic and ICP methods as required by the analytical method.
	Description	Used to correct for matrix effects and to help troubleshoot variability in analytical response and are assessed after data acquisition. Possible sources of poor internal standard response are sample matrix, poor analytical technique or instrument performance.

[1] See the specific analytical SOP for type and frequency of sample matrix control samples.

[2] LCSD's are normally not performed except when regulatory agencies or client specifications require them. The recoveries for the spiked duplicate samples must meet the same laboratory established recovery limits as the accuracy QC samples. If an LCSD is analyzed both the LCS and LCSD must meet the same recovery criteria and be included in the final report. The precision measurement is reported as "Relative Percent Difference" (RPD). Poor precision between duplicates (except LCS/LCSD) may indicate non-homogeneous matrix or sampling.

24.6 Acceptance Criteria (Control Limits)

As mandated by the test method and regulation, each individual analyte in the LCS, MS, or Surrogate Spike is evaluated against the control limits published in the test method. Where there are no established acceptance criteria, the laboratory calculates in-house control limits

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with the use of control charts or, in some cases, utilizes client project specific control limits. When this occurs, the regulatory or project limits will supersede the laboratory's in-house limits.

Note: For methods, analytes and matrices with very limited data (e.g., unusual matrices not analyzed often), interim limits are established using available data or by analogy to similar methods or matrices.

Once control limits have been established, they are verified, reviewed, and updated if necessary on an annual basis unless the method requires more frequent updating. Control limits are established per method (as opposed to per instrument) regardless of the number of instruments utilized.

Laboratory generated % Recovery acceptance (control) limits are generally established by taking ± 3 Standard Deviations (99% confidence level) from the average recovery of a minimum of 20-30 data points (more points are preferred).

- Regardless of the calculated limit, the limit should be no tighter than the Calibration Verification (ICV/CCV), unless the analytical method specifies a tighter limit.
- In-house limits cannot be any wider than those mandated in a regulated analytical method. Client or contract required control limits are evaluated against the laboratory's statistically derived control limits to determine if the data quality objectives (DQOs) can be achieved. If laboratory control limits are not consistent with DQOs, then alternatives must be considered, such as method improvements or use of an alternate analytical method.
- The lowest acceptable recovery limit will be 10% (the analyte must be detectable and identifiable). Exception: The lowest acceptable recovery limit for Benzidine will be 5% and the analyte must be detectable and identifiable.
- The maximum acceptable recovery limit will be 150%.
- The maximum acceptable RPD limit will be 35% for waters and 40% for soils. The minimum RPD limit is 10%.
- If either the high or low end of the control limit changes by ≤ 5% from previous, the control chart is visually inspected and, using professional judgment, they may be left unchanged if there is no effect on laboratory ability to meet the existing limits.

24.6.1 The lab must be able to generate a current listing of their control limits and track when the updates are performed. In addition, the laboratory must be able to recreate historical control limits. Refer to laboratory SOP No. IR-QA-CNTRLLIM.

One example: The QA department generates a Quality Control Limit Summary that contains tables that summarize the precision and accuracy acceptability limits for analyses performed at Eurofins Calscience Irvine. This summary includes an effective date, is updated each time new limits are generated and is located in the LIMS. An archive of all limits used within the laboratory is also maintained in the LIMS.

24.6.2 A LCS that is within the acceptance criteria establishes that the analytical system is in control and is used to validate the process. Samples that are analyzed with an LCS with recoveries outside of the acceptance limits may be determined as out of control and should be reanalyzed if possible. If reanalysis is not possible, then the

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results for all affected analytes for samples within the same batch must be qualified when reported. The internal corrective action process (see Section 12) is also initiated if an LCS exceeds the acceptance limits. Sample results may be qualified and reported without reanalysis if:

- The analyte results are below the reporting limit and the LCS is above the upper control limit.
- If the analytical results are above the relevant regulatory limit and the LCS is below the lower control limit.

For TNI work, there is an allowable number of Marginal Exceedances (ME):

< 11 analytes	0 marginal exceedances are allowed
11 − 30 Analytes	1 marginal exceedance is allowed
31 − 50 Analytes	2 marginal exceedances are allowed
51 − 70 Analytes	3 marginal exceedances are allowed
71 − 90 Analytes	4 marginal exceedances are allowed
> 90 Analytes	5 marginal exceedances are allowed

- Marginal exceedances are recovery exceedances between 3 SD and 4 SD from the mean recovery limit (TNI).
- Marginal exceedances must be random. If the same analyte exceeds the LCS control limit repeatedly, it is an indication of a systematic problem. The source of the error must be located and corrective action taken. The laboratory has a system to monitor marginal exceedances to ensure that they are random.

Though marginal exceedances may be allowed, the data must still be qualified to indicate it is outside of the normal limits.

24.6.3 If the MS/MSDs do not meet acceptance limits, the MS/MSD and the associated spiked sample is reported with a qualifier for those analytes that do not meet limits. If obvious preparation errors are suspected, or if requested by the client, unacceptable MS/MSDs are reprocessed and reanalyzed to prove matrix interference. A more detailed discussion of acceptance criteria and corrective action can be found in the lab's method SOPs and in Section 12.

24.6.4 If a surrogate standard falls outside the acceptance limits, and if there is not obvious chromatographic matrix interference, reanalyze the sample to confirm a possible matrix effect. If the recoveries confirm or there was obvious chromatographic interference, results are reported from the original analysis and a qualifier is added. If the reanalysis meets surrogate recovery criteria, the second run is reported (or both are reported if requested by the client). Under certain circumstances, where all of the samples are from the same location and share similar chromatography, the reanalysis may be performed on a single sample rather than all of the samples and if the surrogate meets the recovery criteria in the reanalysis, all of the affected samples would require reanalysis.

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24.7 Additional Procedures to Assure Quality Control

The laboratory has written and approved method SOPs to assure the accuracy of the test method including calibration (see Section 20), use of certified reference materials (see Section 21) and use of PT samples (see Section 15).

A discussion regarding MDLs, Limit of Detection (LOD) and Limit of Quantitation (LOQ) can be found in Section 19.

- Use of formulae to reduce data is discussed in the method SOPs and in Section 20.
- Selection of appropriate reagents and standards is included in Section 9 and 21.
- A discussion on selectivity of the test is included in Section 5.
- Constant and consistent test conditions are discussed in Section 18.
- The laboratories sample acceptance policy is included in Section 23.

SECTION 25. REPORTING RESULTS

25.1 Overview

The results of each test are reported accurately, clearly, unambiguously, and objectively in accordance with State and Federal regulations as well as client requirements. Analytical results are issued in a format that is intended to satisfy customer and laboratory accreditation requirements as well as provide the end user with the information needed to properly evaluate the results. Where there is conflict between client requests and laboratory ethics or regulatory requirements, the laboratory's ethical and legal requirements are paramount, and the laboratory will work with the client during project set up to develop an acceptable solution. Refer to Section 7.

A variety of report formats are available to meet specific needs.

In cases where a client asks for simplified reports, there must be a written request from the client. There still must be enough information that would show any analyses that were out of conformance (QC out of limits) and there should be a reference to a full report that is made available to the client. Review of reported data is included in Section 19.

25.2 Test Reports

Analytical results are reported in a format that is satisfactory to the client and meets all requirements of applicable accrediting authorities and agencies. A variety of report formats are available to meet specific needs. The report is printed on laboratory letterhead, reviewed, and signed by the appropriate project manager. At a minimum, the standard laboratory report shall contain the following information:

25.2.1 A report title (e.g., Analytical Report For Samples) with a "sample results" column header.

25.2.2 The cover page shall include the laboratory name, address and telephone number.

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25.2.3 A unique identification of the report (e.g., Eurofins Job number) and on each page an identification in order to ensure the page is recognized as part of the report and a clear identification of the end.

Note: Page numbers of report are represented as page # of ##. Where the first number is the page number and the second is the total number of pages.

25.2.4 A copy of the chain of custody (COC).

- Any COCs involved with Subcontracting are included.

25.2.5 The name and address of client and a project name/number, if applicable.

25.2.6 Client project manager or other contact.

25.2.7 Description and unambiguous identification of the tested sample(s) including the client identification code.

25.2.8 Date of receipt of sample, date and time of collection, and date(s) of test preparation and performance, and time of preparation or analysis if the required holding time for either activity is less than or equal to 72 hours.

25.2.9 Date reported or date of revision, if applicable.

25.2.10 Method of analysis including method code (EPA, Standard Methods, etc.).

25.2.11 Practical quantitation limits or reporting limit.

25.2.12 Method detection limits (if requested).

25.2.13 Definition of data qualifiers and reporting acronyms (e.g., ND).

25.2.14 Sample results.

25.2.15 QC data consisting of method blank, surrogate, LCS, and MS/MSD recoveries and control limits.

25.2.16 Condition of samples at receipt including temperature. This may be accomplished in a narrative or by attaching sample login sheets (Refer to Sec. 25.2.4 – Item 3 regarding additional addenda).

25.2.17 A statement expressing the validity of the results, that the source methodology was followed and all results were reviewed for error.

25.2.18 A statement to the effect that the results relate only to the items tested and the sample as received by the laboratory, except when information is provided by the client. When data is provided by the client there shall be a clear identification of it, and a disclaimer shall be put in the report when the client supplied data can affect the validity of the test.

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25.2.19 A statement that the report shall not be reproduced except in full, without prior express written approval by the laboratory.

25.2.20 A signature and title of the person(s) accepting responsibility for the content of the report and date of issue. Authorized signatories are qualified Project Managers appointed by the Manager of Project Managers.

25.2.21 When TNI accreditation is required, the lab shall certify that the test results meet all requirements of TNI or provide reasons and/or justification if they do not.

25.2.22 The laboratory includes a cover letter.

25.2.23 Where applicable, a narrative to the report that explains the issue(s) and corrective action(s) taken in the event that a specific accreditation or certification requirement was not met.

25.2.24 When soil samples are analyzed, a specific identification as to whether soils are reported on a “wet weight” or “dry weight” basis.

25.2.25 Appropriate laboratory certification number for the state of origin of the sample, if applicable.

25.2.26 If only part of the report is provided to the client (client requests some results before all of it is complete), it must be clearly indicated on the report (e.g., partial report). A complete report must be sent once all of the work has been completed.

25.2.27 Any non-Eurofins subcontracted analysis results are provided as a separate report on the official letterhead of the subcontractor. All Eurofins subcontracting is clearly identified on the report as to which laboratory performed a specific analysis.

25.2.28 A Certification Summary Report, where required, will document that, unless otherwise noted, all analytes tested and reported by the laboratory were covered by the noted certifications.

Note: Refer to the Corporate SOP on Electronic Reporting and Signature Policy (No. CA-I-P-002) for details on internally applying electronic signatures of approval.

25.2.29 Where the laboratory is responsible for the sampling stage, in addition to the requirements listed above, reports containing the results of sampling shall include the following, where necessary for the interpretation of test results:

- The date of sampling
- Unambiguous identification of the material sampled
- The location of sampling plan and procedures, and deviations, addition to or exclusions from the sample procedures
- A reference to the sampling plan and procedure, and deviations, additions to or exclusions from the sample procedures

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- Details of any environmental conditions during sampling that affect the interpretation of test results
- Information required to evaluate measurement uncertainty for subsequent testing

25.3 Reporting Level or Report Type

The laboratory offers four levels of quality control reporting. Each level, in addition to its own specific requirements, contains all the information provided in the preceding level. The packages provide the following information in addition to the information described above:

- Level 1 is a report with all of the elements outlined in Section 25.2 above, excluding 25.2.15 (QC data).
- Level II is a Level I report plus summary information, including results for the method blank reported to the laboratory MDL, percent recovery for laboratory control samples and matrix spike samples, and the RPD values for all MSD and sample duplicate analyses.
- Level III contains all the information supplied in Level II, but presented on the CLP-like summary forms, and relevant calibration information. A Level II report is not included, unless specifically requested. No raw data is provided.
- Level IV is the same as Level III with the addition of all raw supporting data.

In addition to the various levels of QC packaging, the laboratory also provides reports in CD deliverable form. Initial reports may be provided to clients by facsimile or e-mail, or uploaded to Eurofins Environment Testing America's Total Access database. Procedures used to ensure client confidentiality are outlined in Section 25.6.

25.3.1 Electronic Data Deliverables (EDDs)

EDDs are routinely offered as part of Eurofins Environment Testing America's services in addition to the test report as described in Section 25.2. When NELAP accreditation is required and both a test report and EDD are provided to the client, the official version of the test report will be the combined information of the report and the EDD. Eurofins Calscience Irvine offers a variety of EDD formats including, but is not limited to, NAS, ADR, COELT EDF, EQuIS, GISKEY, Microsoft Excel, Locus EIM, Standard Eurofins Environment Testing America Format, FoxPro, and Terrabase.

EDD specifications are submitted to the IT department by the PM for review and undergo the contract review process. Once the laboratory has committed to providing data in a specific electronic format, the coding of the format may need to be performed. This coding is documented and validated. The validation of the code is retained by the IT staff coding the EDD.

EDDs shall be subject to a review to ensure their accuracy and completeness. If EDD generation is automated, review may be reduced to periodic screening if the laboratory can demonstrate that it can routinely generate that EDD without errors. Any revisions to the EDD format must be reviewed until it is demonstrated that it can routinely be generated without errors. If the EDD can be reproduced accurately and if all subsequent EDDs can be produced error-free, each EDD does not necessarily require a review.

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25.4 Supplemental Information for Test

The lab identifies any unacceptable QC analyses or any other unusual circumstances or observations such as environmental conditions and any non-standard conditions that may have affected the quality of a result. This is typically in the form of a footnote or a qualifier and/or a narrative explaining the discrepancy in the front of the report.

Numeric results with values outside of the calibration range, either high or low are qualified as estimated.

Where quality system requirements are not met, a statement of compliance/non-compliance with requirements and/or specifications is required, including identification of test results derived from any sample that did not meet TNI sample acceptance requirements such as improper container, holding time, or temperature.

Where applicable, a statement on the estimated uncertainty of measurements; information on uncertainty is needed when a client's instructions so require.

When, as requested by the client and agreed to by Eurofins Environment Testing America, the report includes a statement of conformity to specification or standard (see Special Services, Section 7.4), the report shall clearly identify:

- To which results the statement applies,
- Which specifications, standard or parts thereof are met or not, and
- The decision rule that was applied (unless the decision rule is inherent in the requested specification or standard, taking into account the level of risk (such as false accept and false reject and statistical assumptions) associated with the decision rule.

Opinions and Interpretations - The test report contains objective information, and generally does not contain subjective information such as opinions and interpretations. If such information is required by the client, the Laboratory Director will determine if a response can be prepared. If so, the Laboratory Director will designate the appropriate member of the management team to prepare a response. The response will be fully documented, and reviewed by the Laboratory Director, before release to the client. There may be additional fees charged to the client at this time, as this is a non-routine function of the laboratory.

Note: Review of data deliverable packages for submittal to regulatory authorities requires responses to non-conforming data concerning potential impact on data quality. This necessitates a limited scope of interpretation, and this work is performed by the QA Department. This is the only form of "interpretation" of data that is routinely performed by the laboratory.

When opinions or interpretations are included in the report, the laboratory provides an explanation as to the basis upon which the opinions and interpretations have been made. Opinions and interpretations are clearly noted as such and where applicable, a comment should be added suggesting that the client verify the opinion or interpretation with their regulator.

25.5 Environmental Testing Obtained From Subcontractors

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If the laboratory is not able to provide the client the requested analysis, the samples would be subcontracted following the procedures outlined in the Corporate SOP on Subcontracting (SOP No. CW-L-S-004).

Data reported from analyses performed by a subcontract laboratory are clearly identified as such on the analytical report provided to the client. Results from a subcontract laboratory outside of Eurofins Environment Testing America are reported to the client on the subcontract laboratory's original report stationary and the report includes any accompanying documentation.

25.6 Client Confidentiality

Eurofins Environment Testing America is responsible for maintaining in confidence all client information obtained or created. In situations involving the transmission of environmental test results by telephone, facsimile or other electronic means, client confidentiality must be maintained.

Eurofins Environment Testing America will not intentionally divulge to any person (other than the Client or any other person designated by the Client in writing) any information regarding the services provided by Eurofins or any information disclosed to Eurofins by the Client. Furthermore, information known to be potentially endangering to national security or an entity's proprietary rights will not be released.

Information about the client obtained from sources other than the client (e.g., complainant, regulators) shall be confidential between client and the laboratory. The source of this information shall be confidential to the laboratory and shall not be shared with the client, unless agreed by the source.

Note: This shall not apply to the extent that the information is required to be disclosed by Eurofins Environment Testing America under the compulsion of legal process. Eurofins Environment Testing America will, to the extent feasible, provide reasonable notice to the client before disclosing the information.

Note: Authorized representatives of an accrediting authority are permitted to make copies of any analyses or records relevant to the accreditation process, and copies may be removed from the laboratory for purposes of assessment.

25.6.1 Report deliverable formats are discussed with each new client. If a client requests that reports be faxed or e-mailed, the reports are to meet all requirements of this document, including cover letter.

25.7 Format of Reports

The format of reports is designed to accommodate each type of environmental test carried out and to minimize the possibility of misunderstanding or misuse.

25.8 Amendments to Test Reports

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Corrections, additions, or deletions to reports are only made when justification arises through supplemental documentation. Justification is documented using the laboratory's corrective action system (refer to Section 12).

The revised report is retained in the LIMS, as is the original report. The revised report is stored in LIMS under the job number along with a sequential revision number.

When the report is re-issued, a notation of "report re-issue" is placed on the cover/signature page of the report or at the top of the narrative page with a brief explanation of reason for the re-issue and a reference back to the last final report generated. *For example: This final report, identified as Revision 1, was revised on 11/3/2014 to include toluene in sample NQA1504 per client's request. This final report replaces the final report identified as Revision 0*.

25.9 Policies on Client Requests for Amendments

25.9.1 Policy on Data Omissions or Reporting Limit Increases

Fundamentally, our policy is simply to not omit previously reported results (including data qualifiers) or to not raise reporting limits and report sample results as ND. This policy has few exceptions. Exceptions are:

- Laboratory error.
- Sample identification is indeterminate (confusion between COC and sample labels).
- An incorrect analysis (not analyte) was requested (e.g., COC lists 8315 but client wanted 8310). A written request for the change is required.
- Incorrect limits reported based on regulatory requirements.
- The requested change has absolutely *no possible* impact on the interpretation of the analytical results and there is *no possibility* of the change being interpreted as misrepresentation by anyone inside or outside of our company.

25.9.2 Multiple Reports

Eurofins Environment Testing America does not issue multiple reports for the same work order where there is different information on each report (this does not refer to copies of the same report) unless required to meet regulatory needs and approved by QA.

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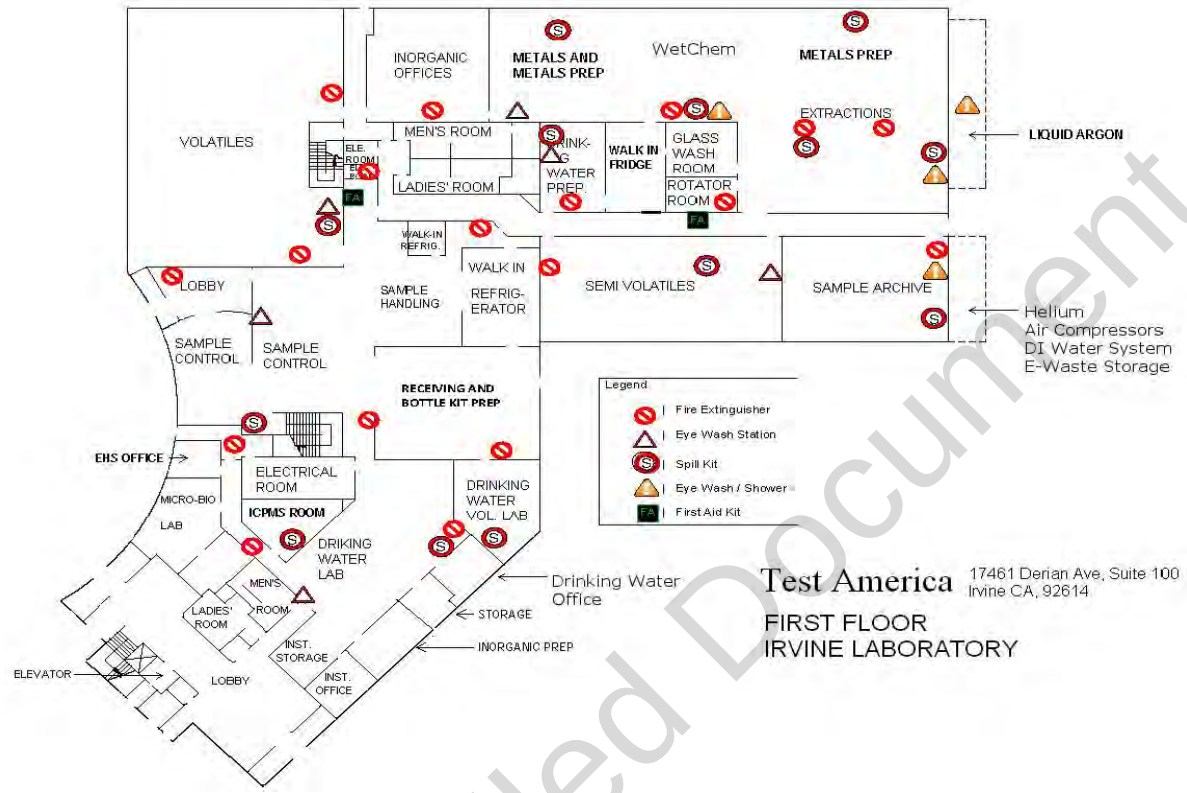
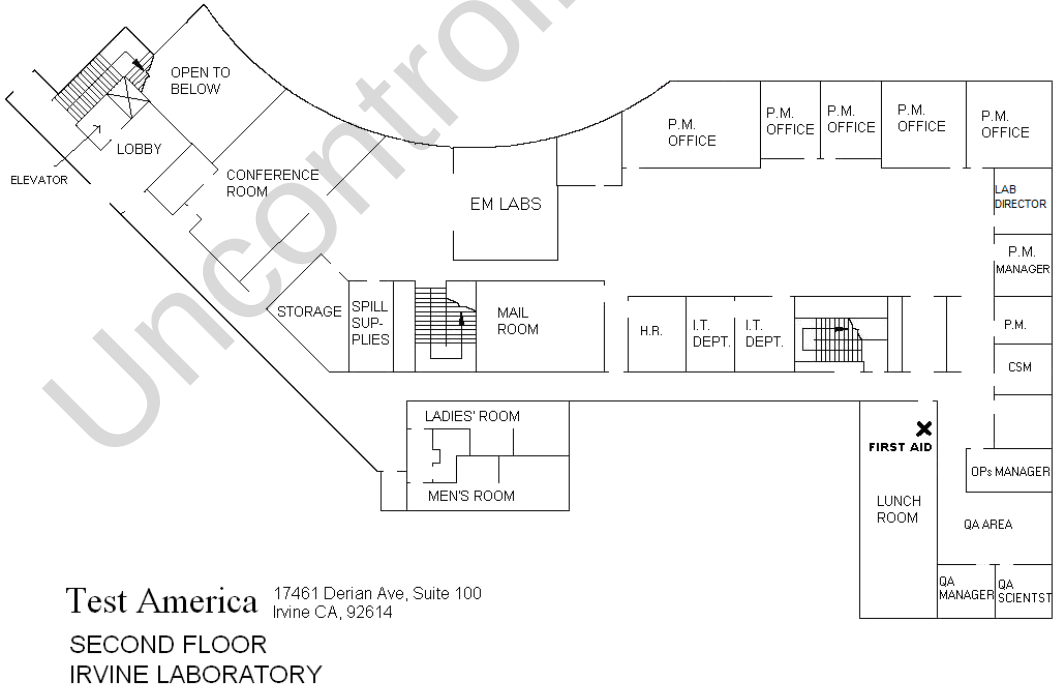
Appendix 1. Laboratory Floor Plan





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Appendix 2. Glossary/Acronyms (EL-V1M2 Sec. 3.1)

Glossary:

Acceptance Criteria: Specified limits placed on characteristics of an item, process, or service defined in requirement documents. (ASQC)

Accreditation: The process by which an agency or organization evaluates and recognizes a laboratory as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory.

Accuracy: The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components which are due to sampling and analytical operations; a data quality indicator. (QAMS)

Analyst: The designated individual who performs the "hands-on" analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.

Analytical Uncertainty: A subset of Measurement Uncertainty that includes all laboratory activities performed as part of the analysis. (TNI)

Anomaly: A condition or event, other than a deficiency, that may affect the quality of the data, whether in the laboratory's control or not.

Assessment: The evaluation process used to measure or establish the performance, effectiveness, and conformance of an organization and/or its systems to defined criteria (to the standards and requirements of laboratory accreditation). (TNI)

Audit: A systematic and independent examination of facilities, equipment, personnel, training, procedures, record-keeping, data validation, data management, and reporting aspects of a system to determine whether QA/QC and technical activities are being conducted as planned and whether these activities will effectively achieve quality objectives. (TNI)

Batch: Environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A **preparation batch** is composed of one (1) to twenty (20) environmental samples of the same quality systems matrix, meeting the above mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be twenty-four (24) hours. An **analytical batch** is composed of prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various quality system matrices and can exceed twenty (20) samples. (TNI)

Bias: The systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). (TNI)

Blank: A sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results. (ASQC)

Calibration: A set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards. (TNI)

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1) In calibration of support equipment the values realized by standards are established through the use of reference standards that are traceable to the International System of Units (SI).

2) In calibration according to methods, the values realized by standards are typically established through the use of Reference Materials that are either purchased by the laboratory with a certificate of analysis or purity, or prepared by the laboratory using support equipment that has been calibrated or verified to meet specifications.

Calibration Curve: The mathematical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response. (TNI)

Calibration Standard: A substance or reference material used to calibrate an instrument. (QAMS)

Certified Reference Material (CRM): A reference material accompanied by a certificate, having a value, measurement uncertainty, and stated metrological traceability chain to a national metrology institute. (TNI)

Chain of Custody (COC) Form: Record that documents the possession of the samples from the time of collection to receipt in the laboratory. This record generally includes: the number and types of containers; the mode of collection; the collector; time of collection; preservation; and requested analyses. (TNI)

Compromised Samples: Those samples which are improperly sampled, insufficiently documented (chain of custody and other sample records and/or labels), improperly preserved, collected in improper containers, or exceeding holding times when delivered to a laboratory. Under normal conditions, compromised samples are not analyzed. If emergency situation require analysis, the results must be appropriately qualified.

Confidential Business Information (CBI): Information that an organization designates as having the potential of providing a competitor with inappropriate insight into its management, operation or products. TNI and its representatives agree to safeguard identified CBI and to maintain all information identified as such in full confidentiality.

Confirmation: Verification of the identity of a component through the use of an approach with a different scientific principle from the original method. These may include, but are not limited to Second Column Confirmation; Alternate wavelength; Derivatization; Mass spectral interpretation; Alternative detectors or Additional Cleanup procedures. (TNI)

Conformance: An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements. (ANSI/ASQC E4-1994)

Correction: Actions necessary to correct or repair analysis specific non-conformances. The acceptance criteria for method specific QC and protocols as well as the associated corrective actions. The analyst will most frequently be the one to identify the need for this action as a result of calibration checks and QC sample analysis. No significant action is taken to change behavior, process or procedure.

Corrective Action: The action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence. (ISO 8402)

Data Audit: A qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data re of acceptable quality (i.e., that they meet specified acceptance criteria).

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Data Reduction: The process of transforming the number of data items by arithmetic or statistical calculations, standard curves, and concentration factors, and collation into a more useable form. (TNI)

Deficiency: An unauthorized deviation from acceptable procedures or practices, or a defect in an item (ASQC), whether in the laboratory's control or not.

Demonstration of Capability: A procedure to establish the ability of the analyst to generate analytical results of acceptable accuracy and precision. (TNI)

Document Control: The act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly, and controlled to ensure use of the correct version at the location where the prescribed activity if performed. (ASQC)

Duplicate Analyses: The analyses or measurements of the variable of interest performed identically on two subsamples of the same sample. The results from duplicate analyses are used to evaluate analytical or measurement precision but not the precision of sampling, preservation or storage internal to the laboratory. (EPA-QAD)

Equipment Blank: Sample of analyte-free media which has been used to rinse common sampling equipment to check effectiveness of decontamination procedures.

External Standard Calibration: Calibrations for methods that do not utilize internal standards to compensate for changes in instrument conditions.

Field Blank: Blank prepared in the field by filing a clean container with pure de-ionized water and appropriate preservative, if any, for the specific sampling activity being undertaken. (EPA OSWER)

Field of Accreditation: Those matrix, technology/method, and analyte combinations for which the accreditation body offers accreditation.

Holding Times: The maximum time that samples may be held prior to analyses and still be considered valid or not compromised. (40 CFR Part 136)

Internal Standard: A known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical test method. (TNI)

Internal Standard Calibration: Calibrations for methods that utilize internal standards to compensate for changes in instrument conditions.

Instrument Blank: A clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination. (EPA-QAD)

Instrument Detection Limit (IDL): The minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific instrument. The IDL is associated with the instrumental portion of a specific method only, and sample preparation steps are not considered in its derivation. The IDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is ± 100%. The IDL represents a range where qualitative detection occurs on a specific instrument. Quantitative results are not produced in this range.

Laboratory Control Sample (however named, such as laboratory fortified blank, spiked blank, or QC check sample): A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes, taken through all preparation and analysis steps of the procedure unless otherwise noted in a reference method. It is

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generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

An LCS shall be prepared at a minimum of 1 per batch of 20 or less samples per matrix type per sample extraction or preparation method except for analytes for which spiking solutions are not available such as total suspended solids, total dissolved solids, total volatile solids, total solids, pH, color, odor, temperature, dissolved oxygen or turbidity. The results of these samples shall be used to determine batch acceptance.

Least Squares Regression (1st Order Curve): The least squares regression is a mathematical calculation of a straight line over two axes. The y axis represents the instrument response (or Response ratio) of a standard or sample and the x axis represents the concentration. The regression calculation will generate a correlation coefficient (r) that is a measure of the "goodness of fit" of the regression line to the data. A value of 1.00 indicates a perfect fit. In order to be used for quantitative purposes, r must be greater than or equal to 0.99 for organics and 0.995 for inorganics.

Limit(s) of Detection (LOD) [a.k.a., Method Detection Limit (MDL)]: The MDL is the minimum measured quantity of a substance that can be reported with 99% confidence that the concentration is distinguishable from method blank results, consistent with 40 CFR Part 136 Appendix B, August, 2017.

Limit(s) of Quantitation (LOQ) [a.k.a., Reporting Limit]: The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.

(QS) Matrix: The component or substrate that contains the analyte of interest. For purposes of batch and QC requirement determinations, the following matrix distinctions shall be used:

Aqueous: Any aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine. Includes surface water, groundwater effluents, and TCLP or other extracts.

Drinking Water: Any aqueous sample that has been designated as a potable or potential potable water source.

Saline/Estuarine: Any aqueous sample from an ocean or estuary, or other salt water source such as the Great Salt Lake.

Non-Aqueous Liquid: Any organic liquid with <15% settleable solids.

Biological Tissue: Any sample of a biological origin such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origin.

Solids: Includes soils, sediments, sludges, and other matrices with >15% settleable solids.

Chemical Waste: A product or by-product of an industrial process that results in a matrix not previously defined.

Air & Emissions: Whole gas or vapor samples including those contained in flexible or rigid wall containers and the extracted concentrated analytes of interest from a gas or vapor that are collected with a sorbent tube, impinger solution, filter, or other device. (TNI)

Matrix Spike (spiked sample or fortified sample): A sample prepared, taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a referenced method, by adding a known amount of target analyte to a specified amount of sample for which an independent test

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result of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

Matrix Spike Duplicate (spiked sample or fortified sample duplicate): A replicate matrix spike prepared and analyzed to obtain a measure of the precision of the recovery for each analyte.

Method Blank: A sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.

Method Detection Limit: See Limit of Detection (LOD).

Negative Control: Measures taken to ensure that a test, its components, or the environment do not cause undesired effects, or produce incorrect test results.

Non-conformance: An indication, judgment, or state of not having met the requirements of the relevant specifications, contract, or regulation.

Observation: A record of phenomena that (1) may assist in evaluation of the sample data; (2) may be of importance to the project manager and/or the client, and yet not at the time of the observation have any known effect on quality.

Performance Audit: The routine comparison of independently obtained qualitative and quantitative measurement system data with routinely obtained data in order to evaluate the proficiency of an analyst or laboratory.

Positive Control: Measures taken to ensure that a test and/or its components are working properly and producing correct or expected results from positive test subjects.

Precision: The degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance or range, in either absolute or relative terms. (TNI)

Preservation: Any conditions under which a sample must be kept in order to maintain chemical and/or biological integrity prior to analysis. (TNI)

Proficiency Testing: A means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source. (TNI)

Proficiency Testing Program: The aggregate of providing rigorously controlled and standardized environmental samples to a laboratory for analysis, reporting of results, statistical evaluation of the results and the collective demographics and results summary of all participating laboratories. (TNI)

Proficiency Test Sample (PT): A sample, the composition of which is unknown to the laboratory and is provided to test whether the laboratory can produce analytical results within specified acceptance criteria. (TNI)

Quality Assurance: An integrated system of management activities involving planning, implementation, assessment, reporting and quality improvement to ensure that a process, item or service is of the type of quality needed and expected by the client. (TNI)

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Quality Assurance [Project] Plan (QAPP): A formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved. (EAP-QAD)

Quality Control: The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality; also the system of activities and checks used to ensure that measurement systems are maintained within prescribed limits, providing protection against "out of control" conditions and ensuring that the results are of acceptable quality. (TNI)

Quality Control Sample: A sample used to assess the performance of all or a portion of the measurement system. One of any number of samples, such as Certified Reference Materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking, intended to demonstrate that a measurement system or activity is in control. (TNI)

Quality Manual: A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users. (TNI)

Quality System: A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA and QC activities. (TNI)

Raw Data: The documentation generated during sampling and analysis. This documentation includes, but is not limited to, field notes, electronic data, magnetic tapes, untabulated sample results, QC sample results, print outs of chromatograms, instrument outputs, and handwritten records. (TNI)

Record Retention: The systematic collection, indexing and storing of documented information under secure conditions.

Reference Material: Material or substance one or more properties of which are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. (TNI)

Reference Standard: Standard used for the calibration of working measurement standards in a given organization or a given location. (TNI)

Sampling: Activity related to obtaining a representative sample of the object of conformity assessment, according to a procedure.

Second Order Polynomial Curve (Quadratic): The 2nd order curves are a mathematical calculation of a slightly curved line over two axis. The y axis represents the instrument response (or Response ratio) of a standard or sample and the x axis represents the concentration. The 2nd order regression will generate a coefficient of determination (COD or r^2) that is a measure of the "goodness of fit" of the quadratic curvature the data. A value of 1.00 indicates a perfect fit. In order to be used for quantitative purposes, r^2 must be greater than or equal to 0.99.

Selectivity: The ability to analyze, distinguish, and determine a specific analyte or parameter from another component that may be a potential interferent or that may behave similarly to the target analyte or parameter within the measurement system. (TNI)

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Sensitivity: The capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest. (TNI)

Spike: A known mass of target analyte added to a blank, sample or sub-sample; used to determine recovery efficiency or for other quality control purposes.

Standard: The document describing the elements of laboratory accreditation that has been developed and established within the consensus principles of standard setting and meets the approval requirements of standard adoption organizations procedures and policies. (TNI)

Standard Operating Procedures (SOPs): A written document which details the method for an operation, analysis, or action, with thoroughly prescribed techniques and steps. SOPs are officially approved as the methods for performing certain routine or repetitive tasks. (TNI)

Storage Blank: A blank matrix stored with field samples of a similar matrix (volatiles only) that measures storage contribution to any source of contamination.

Surrogate: A substance with properties that mimic the analyte of interest. It is unlikely to be found in environment samples and is added to them for quality control purposes.

Surrogate compounds must be added to all samples, standards, and blanks, for all organic chromatography methods except when the matrix precludes its use or when a surrogate is not available. Poor surrogate recovery may indicate a problem with sample composition and shall be reported to the client whose sample produced poor recovery. (QAMS)

Systems Audit (also Technical Systems Audit): A thorough, systematic, qualitative on-site assessment of the facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system. (EPA-QAD)

Technical Manager: A member of the staff of an environmental laboratory who exercises actual day-to-day supervision of laboratory operations for the appropriate fields of accreditation and reporting of results.

Technology: A specific arrangement of analytical instruments, detection systems, and/or preparation techniques.

Traceability: The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, traceability relates measuring equipment to national or international standards, primary standards, basic physical constants or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project. (TNI)

Trip Blank: A blank matrix placed in a sealed container at the laboratory that is shipped, held unopened in the field, and returned to the laboratory in the shipping container with the field samples.

Uncertainty: A parameter associated with the result of a measurement that characterizes the dispersion of the value that could reasonably be attributed to the measured value.

Acronyms:

CAR – Corrective Action Report
CCV – Continuing Calibration Verification
CF – Calibration Factor
CFR – Code of Federal Regulations
COC – Chain of Custody

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DOC – Demonstration of Capability
DQO – Data Quality Objectives
DUP - Duplicate
EHS – Environment, Health and Safety
EPA – Environmental Protection Agency
GC - Gas Chromatography
GC/MS - Gas Chromatography/Mass Spectrometry
HPLC - High Performance Liquid Chromatography
ICP - Inductively Coupled Plasma Atomic Emission Spectroscopy
ICP/MS – ICP/Mass Spectrometry
ICV – Initial Calibration Verification
IDL – Instrument Detection Limit
IH – Industrial Hygiene
IS – Internal Standard
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
LIMS – Laboratory Information Management System
LOD – Limit of Detection
LOQ – Limit of Quantitation
MDL – Method Detection Limit
MDLCK – MDL Check Standard
MDLV – MDL Verification Check Standard
MRL – Method Reporting Limit Check Standard
MS – Matrix Spike
MSD – Matrix Spike Duplicate
SDS - Safety Data Sheet
NELAP - National Environmental Laboratory Accreditation Program
PT – Performance Testing
TNI – The NELAC Institute
QAM – Quality Assurance Manual
QA/QC – Quality Assurance / Quality Control
QAPP – Quality Assurance Project Plan
RF – Response Factor
RPD – Relative Percent Difference
RSD – Relative Standard Deviation
SD – Standard Deviation
SOP – Standard Operating Procedure
TAT – Turn-Around-Time
VOA – Volatiles
VOC – Volatile Organic Compound

Appendix 3. Laboratory Certifications, Accreditations, Validations

Eurofins Calscience Irvine maintains accreditations, certifications, and approvals with numerous state and national entities. Programs vary but may include on-site audits, reciprocal agreements with another entity, performance testing evaluations, review of the QA Manual, Standard Operating Procedures, Method Detection Limits, training records, etc. At the time of this QA Manual revision, the laboratory has accreditation/ certification/licensing with the following organizations:

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eurofins | Environment Testing TestAmerica

Certification List

Laboratory	Program	Authority	Identification	Expiration Date
Irvine	Los Angeles County Sanitation Districts	California	10256	06/30/2020
Irvine	NELAP	Kansas	E-10420	07/31/2020
Irvine	NELAP	Oregon	4028 - 007	01/29/2021
Irvine	State	Alaska	CA01531	06/30/2020
Irvine	State	Arizona	AZ0671	10/14/2020
Irvine	State	California	2706	06/30/2020
Irvine	State	Guam	20-004R	01/23/2021
Irvine	State	Hawaii	CA01531	01/29/2021
Irvine	State	Nevada	CA01531 2020-7	07/31/2020
Irvine	State	Washington	C900	09/03/2020
Irvine	US Federal Programs	USDA	P330-18-00214	07/09/2021

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4/1/20

* Certification Valid - Laboratory is Pending Renewal with the Program Authority

For more information, or to contact a local Eurofins representative nearest you, please visit our website at www.testamericainc.com

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The certificates and accredited parameter lists are available for each State/Program at www.eurofinsus.com/environment-testing/laboratories/eurofins-calscience under “Certifications and Accreditations”.

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Interim

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins Calscience

Irvine

17461 Derian Avenue

Irvine, CA 92614-5817

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2706**

Expiration Date: **6/30/2021**

Effective Date: **7/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Eurofins Calscience
Irvine
17461 Derian Avenue
Irvine, CA 92614-5817
Phone: 9492611022

Certificate No. **2706**
Expiration Date **6/30/2021**
INTERIM

Field of Testing: 102 - Inorganic Chemistry of Drinking Water

102.015	001	Hydrogen Ion (pH)	EPA 150.1
102.020	001	Turbidity	EPA 180.1
102.026	001	Calcium	EPA 200.7
102.026	002	Magnesium	EPA 200.7
102.026	003	Potassium	EPA 200.7
102.026	004	Silica	EPA 200.7
102.026	005	Sodium	EPA 200.7
102.026	006	Hardness (Calculation)	EPA 200.7
102.030	003	Chloride	EPA 300.0
102.030	005	Fluoride	EPA 300.0
102.030	006	Nitrate (as N)	EPA 300.0
102.030	007	Nitrite (as N)	EPA 300.0
102.030	008	Phosphate,Ortho (as P)	EPA 300.0
102.030	009	Sulfate (as SO4)	EPA 300.0
102.040	001	Bromide	EPA 300.1
102.040	002	Chlorite	EPA 300.1
102.040	003	Chlorate	EPA 300.1
102.040	004	Bromate	EPA 300.1
102.045	001	Perchlorate	EPA 314.0
102.095	001	Turbidity	SM 2130 B-2001
102.100	001	Alkalinity	SM 2320 B-1997
102.120	001	Hardness (Calculation)	SM 2340 B-1997
102.121	001	Hardness	SM 2340 C-1997
102.130	001	Specific Conductance	SM 2510 B-1997
102.140	001	Residue, Filterable TDS	SM 2540 C-1997
102.175	001	Chlorine, Free	SM 4500-Cl G-2000
102.175	002	Chlorine, Total Residual	SM 4500-Cl G-2000
102.190	001	Cyanide, Total	SM 4500-CN E-1999
102.200	001	Fluoride	SM 4500-F C-1997
102.203	001	Hydrogen Ion (pH)	SM 4500-H+ B-2000
102.262	001	Organic Carbon-Total (TOC)	SM 5310 C-2000
102.263	001	Dissolved Organic Carbon (DOC)	SM 5310 C-2000
102.270	001	Surfactants	SM 5540 C-2000

102.564	001	Cyanide, Total	Kelada-01

Field of Testing: 103 - Toxic Chemical Elements of Drinking Water

103.130	001	Aluminum	EPA 200.7
103.130	003	Barium	EPA 200.7
103.130	004	Beryllium	EPA 200.7
103.130	005	Cadmium	EPA 200.7
103.130	007	Chromium	EPA 200.7
103.130	008	Copper	EPA 200.7
103.130	009	Iron	EPA 200.7
103.130	011	Manganese	EPA 200.7
103.130	012	Nickel	EPA 200.7
103.130	015	Silver	EPA 200.7
103.130	017	Zinc	EPA 200.7
103.130	018	Boron	EPA 200.7
103.140	001	Aluminum	EPA 200.8
103.140	002	Antimony	EPA 200.8
103.140	003	Arsenic	EPA 200.8
103.140	004	Barium	EPA 200.8
103.140	005	Beryllium	EPA 200.8
103.140	006	Cadmium	EPA 200.8
103.140	007	Chromium	EPA 200.8
103.140	008	Copper	EPA 200.8
103.140	009	Lead	EPA 200.8
103.140	010	Manganese	EPA 200.8
103.140	012	Nickel	EPA 200.8
103.140	013	Selenium	EPA 200.8
103.140	014	Silver	EPA 200.8
103.140	015	Thallium	EPA 200.8
103.140	016	Zinc	EPA 200.8
103.140	018	Vanadium	EPA 200.8
103.160	001	Mercury	EPA 245.1
103.310	001	Chromium (VI)	EPA 218.6
103.311	001	Chromium (VI)	EPA 218.7

Field of Testing: 104 - Volatile Organic Chemistry of Drinking Water

104.035	001	1,2,3-Trichloropropane (TCP)	SRL 524M-TCP
104.040	001	Benzene	EPA 524.2
104.040	007	n-Butylbenzene	EPA 524.2
104.040	008	sec-Butylbenzene	EPA 524.2
104.040	009	tert-Butylbenzene	EPA 524.2
104.040	010	Carbon Tetrachloride	EPA 524.2
104.040	011	Chlorobenzene	EPA 524.2
104.040	015	2-Chlorotoluene	EPA 524.2

104.040	016	4-Chlorotoluene	EPA 524.2
104.040	019	1,3-Dichlorobenzene	EPA 524.2
104.040	020	1,2-Dichlorobenzene	EPA 524.2
104.040	021	1,4-Dichlorobenzene	EPA 524.2
104.040	022	Dichlorodifluoromethane	EPA 524.2
104.040	023	1,1-Dichloroethane	EPA 524.2
104.040	024	1,2-Dichloroethane	EPA 524.2
104.040	025	1,1-Dichloroethene (1,1-Dichloroethylene)	EPA 524.2
104.040	026	cis-1,2-Dichloroethene	EPA 524.2
104.040	027	trans-1,2-Dichloroethene	EPA 524.2
104.040	028	Dichloromethane (Methylene Chloride)	EPA 524.2
104.040	029	1,2-Dichloropropane	EPA 524.2
104.040	033	cis-1,3-Dichloropropene	EPA 524.2
104.040	034	trans-1,3-Dichloropropene	EPA 524.2
104.040	035	Ethylbenzene	EPA 524.2
104.040	037	Isopropylbenzene	EPA 524.2
104.040	039	Naphthalene	EPA 524.2
104.040	041	N-propylbenzene	EPA 524.2
104.040	042	Styrene	EPA 524.2
104.040	043	1,1,1,2-Tetrachloroethane	EPA 524.2
104.040	044	1,1,2,2-Tetrachloroethane	EPA 524.2
104.040	045	Tetrachloroethylene (Tetrachloroethene)	EPA 524.2
104.040	046	Toluene	EPA 524.2
104.040	047	1,2,3-Trichlorobenzene	EPA 524.2
104.040	048	1,2,4-Trichlorobenzene	EPA 524.2
104.040	049	1,1,1-Trichloroethane	EPA 524.2
104.040	050	1,1,2-Trichloroethane	EPA 524.2
104.040	051	Trichloroethene	EPA 524.2
104.040	052	Trichlorofluoromethane	EPA 524.2
104.040	054	1,2,4-Trimethylbenzene	EPA 524.2
104.040	055	1,3,5-Trimethylbenzene	EPA 524.2
104.040	056	Vinyl Chloride	EPA 524.2
104.040	059	o-Xylene	EPA 524.2
104.040	061	Carbon Disulfide	EPA 524.2
104.040	062	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	EPA 524.2
104.040	063	m+p-Xylene	EPA 524.2
104.045	001	Bromodichloromethane	EPA 524.2
104.045	002	Bromoform	EPA 524.2
104.045	003	Chloroform	EPA 524.2
104.045	004	Dibromochloromethane	EPA 524.2
104.050	002	Methyl tert-butyl Ether (MTBE)	EPA 524.2
104.050	003	tert-Amyl Methyl Ether (TAME)	EPA 524.2

104.050	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.2
104.050	005	Trichlorotrifluoroethane (Freon 113)	EPA 524.2
104.050	006	tert-Butyl Alcohol (TBA)	EPA 524.2

Field of Testing: 106 - Radionuclides in Drinking Water

106.092	001	Uranium	EPA 200.8

Field of Testing: 108 - Inorganic Constituents in Non-Potable Water

108.001	001	Specific Conductance	EPA 120.1 (1982 Rev.1.0)
108.007	001	Residue, Volatile	EPA 160.4 (1971)
108.009	001	Turbidity	EPA 180.1 (1993 Rev. 2.0)
108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)
108.013	003	Phosphorus,Total	EPA 200.7 (1994 Rev. 4.4)
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)
108.013	005	Silica, Dissolved	EPA 200.7 (1994 Rev. 4.4)
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	005	Nitrate-Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	007	Phosphate,Ortho (as P)	EPA 300.0 (1993 Rev. 2.1)
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)
108.025	001	Ammonia (as N)	EPA 350.1 (1993 Rev. 2.0)
108.029	001	Kjeldahl Nitrogen,Total (as N)	EPA 351.2 (1993 Rev. 2.0)
108.037	001	Phosphate,Ortho (as P)	EPA 365.3 (1978)
108.037	002	Phosphorus,Total	EPA 365.3 (1978)
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)
108.053	001	Oil & Grease Total	EPA 1664 A
108.053	002	Oil & Grease Total	EPA 1664 B
108.055	001	Color	SM 2120 B-2011
108.059	001	Turbidity	SM 2130 B-2011
108.061	001	Acidity	SM 2310 B-2011
108.063	001	Alkalinity	SM 2320 B-2011
108.065	001	Hardness (Calculation)	SM 2340 B-2011
108.067	001	Hardness	SM 2340 C-2011
108.069	001	Specific Conductance	SM 2510 B-2011
108.071	001	Residue, Total	SM 2540 B-2011
108.073	001	Residue, Filterable TDS	SM 2540 C-2011
108.075	001	Residue, Non-filterable TSS	SM 2540 D-2011
108.077	001	Residue, Volatile	SM 2540 E-2011
108.079	001	Residue, Settleable	SM 2540 F-2011

108.114	001	Chlorine, Total Residual	SM 4500-Cl G-2011
108.114	002	Chlorine, Free	SM 4500-Cl G-2011
108.125	001	Cyanide, Total	SM 4500-CN E-2011
108.129	001	Cyanide, Available	SM 4500-CN G-2011
108.131	001	Fluoride	SM 4500-F C-2011
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011
108.140	001	Ammonia (as N)	SM 4500-NH3 D-2011
108.147	001	Ammonia (as N)	SM 4500-NH3 G-2011
108.173	001	Oxygen, Dissolved	SM 4500-O G-2011
108.201	001	Sulfide (as S)	SM 4500-S D-2011
108.207	001	Biochemical Oxygen Demand	SM 5210 B-2011
108.207	002	Carbonaceous BOD	SM 5210 B-2011
108.213	001	Chemical Oxygen Demand	SM 5220 D-2011
108.215	001	Organic Carbon-Total (TOC)	SM 5310 B-2011
108.225	001	Surfactants	SM 5540 C-2011
108.335	001	Cyanide, Total	Kelada-01

Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water

109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)
109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)
109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)

109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)
109.629	001	Chromium (VI)	EPA 218.6 (1994 Rev. 3.3)
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)
109.685	002	Chromium (VI)	SM 3500-Cr B-2011
109.693	001	Iron	SM 3500-Fe B-2011

Field of Testing: 110 - Volatile Organic Constituents in Non-Potable Water

110.040	001	Acetone	EPA 624.1
110.040	002	Acetonitrile	EPA 624.1
110.040	003	Acrolein	EPA 624.1
110.040	004	Acrylonitrile	EPA 624.1
110.040	005	Benzene	EPA 624.1
110.040	006	Bromodichloromethane	EPA 624.1
110.040	007	Bromoform	EPA 624.1
110.040	008	Bromomethane (Methyl Bromide)	EPA 624.1
110.040	009	tert-Butyl Alcohol (TBA)	EPA 624.1
110.040	010	Carbon Tetrachloride	EPA 624.1
110.040	011	Chlorobenzene	EPA 624.1
110.040	012	Chloroethane	EPA 624.1
110.040	013	2-Chloroethylvinyl Ether	EPA 624.1
110.040	014	Chloroform	EPA 624.1
110.040	015	Chloromethane (Methyl Chloride)	EPA 624.1
110.040	016	Dibromochloromethane	EPA 624.1
110.040	017	1,2-Dichlorobenzene	EPA 624.1
110.040	018	1,3-Dichlorobenzene	EPA 624.1
110.040	019	1,4-Dichlorobenzene	EPA 624.1
110.040	020	1,1-Dichloroethane	EPA 624.1

110.040	021	1,2-Dichloroethane	EPA 624.1
110.040	022	1,1-Dichloroethene (1,1-Dichloroethylene)	EPA 624.1
110.040	023	trans-1,2-Dichloroethene	EPA 624.1
110.040	024	1,2-Dichloropropane	EPA 624.1
110.040	025	cis-1,3-Dichloropropene	EPA 624.1
110.040	026	trans-1,3-Dichloropropene	EPA 624.1
110.040	029	Ethylbenzene	EPA 624.1
110.040	031	Methylene Chloride (Dichloromethane)	EPA 624.1
110.040	032	4-Methyl-2-pentanone (MIBK)	EPA 624.1
110.040	034	1,1,2,2-Tetrachloroethane	EPA 624.1
110.040	035	Tetrachloroethylene (Tetrachloroethene)	EPA 624.1
110.040	037	Toluene	EPA 624.1
110.040	038	1,1,1-Trichloroethane	EPA 624.1
110.040	039	1,1,2-Trichloroethane	EPA 624.1
110.040	040	Trichloroethene	EPA 624.1
110.040	041	Vinyl Chloride	EPA 624.1
110.040	043	o-Xylene	EPA 624.1
110.040	045	Trichlorofluoromethane	EPA 624.1
110.040	046	m+p-Xylene	EPA 624.1
110.040	047	2-Butanone (MEK)	EPA 624.1

Field of Testing: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.055	001	Aldrin	EPA 608.3
111.055	002	alpha-BHC	EPA 608.3
111.055	003	beta-BHC	EPA 608.3
111.055	004	delta-BHC	EPA 608.3
111.055	005	gamma-BHC (Lindane)	EPA 608.3
111.055	006	Chlordane	EPA 608.3
111.055	007	4,4'-DDD	EPA 608.3
111.055	008	4,4'-DDE	EPA 608.3
111.055	009	4,4'-DDT	EPA 608.3
111.055	010	Dieldrin	EPA 608.3
111.055	011	Endosulfan I	EPA 608.3
111.055	012	Endosulfan II	EPA 608.3
111.055	013	Endosulfan Sulfate	EPA 608.3
111.055	014	Endrin	EPA 608.3
111.055	015	Endrin Aldehyde	EPA 608.3
111.055	016	Heptachlor	EPA 608.3
111.055	017	Heptachlor Epoxide	EPA 608.3
111.055	019	PCB-1016	EPA 608.3
111.055	020	PCB-1221	EPA 608.3
111.055	021	PCB-1232	EPA 608.3
111.055	022	PCB-1242	EPA 608.3

111.055	023	PCB-1248	EPA 608.3
111.055	024	PCB-1254	EPA 608.3
111.055	025	PCB-1260	EPA 608.3
111.055	046	Methoxychlor	EPA 608.3
111.055	060	Toxaphene	EPA 608.3
111.160	001	Acenaphthene	EPA 625.1
111.160	002	Acenaphthylene	EPA 625.1
111.160	003	Anthracene	EPA 625.1
111.160	004	Benzidine	EPA 625.1
111.160	005	Benzo(a)anthracene	EPA 625.1
111.160	006	Benzo(a)pyrene	EPA 625.1
111.160	007	Benzo(b)fluoranthene	EPA 625.1
111.160	008	Benzo(g,h,i)perylene	EPA 625.1
111.160	009	Benzo(k)fluoranthene	EPA 625.1
111.160	010	Bis(2-chloroethoxy) Methane	EPA 625.1
111.160	011	Bis(2-chloroethyl) Ether	EPA 625.1
111.160	012	Bis(2-chloroisopropyl) Ether	EPA 625.1
111.160	013	Bis(2-ethylhexyl)phthalate	EPA 625.1
111.160	014	4-Bromophenyl Phenyl Ether	EPA 625.1
111.160	015	Butyl Benzyl Phthalate	EPA 625.1
111.160	016	2-Chloronaphthalene	EPA 625.1
111.160	017	4-Chlorophenyl Phenyl Ether	EPA 625.1
111.160	018	Chrysene	EPA 625.1
111.160	019	Dibenz(a,h)anthracene	EPA 625.1
111.160	020	3,3'-Dichlorobenzidine	EPA 625.1
111.160	021	Diethyl Phthalate	EPA 625.1
111.160	022	Dimethyl Phthalate	EPA 625.1
111.160	023	Di-n-butyl Phthalate	EPA 625.1
111.160	024	2,4-Dinitrotoluene	EPA 625.1
111.160	025	2,6-Dinitrotoluene	EPA 625.1
111.160	026	Di-n-octyl Phthalate	EPA 625.1
111.160	027	Fluoranthene	EPA 625.1
111.160	028	Fluorene	EPA 625.1
111.160	029	Hexachlorobenzene	EPA 625.1
111.160	030	Hexachlorobutadiene	EPA 625.1
111.160	031	Hexachloroethane	EPA 625.1
111.160	032	Indeno(1,2,3-c,d)pyrene	EPA 625.1
111.160	033	Isophorone	EPA 625.1
111.160	034	Naphthalene	EPA 625.1
111.160	035	Nitrobenzene	EPA 625.1
111.160	036	N-nitrosodi-n-propylamine	EPA 625.1
111.160	037	Phenanthrene	EPA 625.1

111.160	038	Pyrene	EPA 625.1
111.160	039	1,2,4-Trichlorobenzene	EPA 625.1
111.160	040	4-Chloro-3-methylphenol	EPA 625.1
111.160	041	2-Chlorophenol	EPA 625.1
111.160	042	2,4-Dichlorophenol	EPA 625.1
111.160	043	2,4-Dimethylphenol	EPA 625.1
111.160	044	2,4-Dinitrophenol	EPA 625.1
111.160	045	2-Methyl-4,6-dinitrophenol	EPA 625.1
111.160	046	2-Nitrophenol	EPA 625.1
111.160	047	4-Nitrophenol	EPA 625.1
111.160	048	Pentachlorophenol	EPA 625.1
111.160	049	Phenol	EPA 625.1
111.160	050	2,4,6-Trichlorophenol	EPA 625.1
111.160	098	Hexachlorocyclopentadiene	EPA 625.1
111.160	108	N-nitrosodimethylamine	EPA 625.1
111.160	110	N-nitrosodiphenylamine	EPA 625.1
111.160	141	o-Cresol	EPA 625.1
111.160	145	Pyridine	EPA 625.1
111.260	041	N-nitrosodimethylamine	EPA 1625 B

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B
114.010	002	Arsenic	EPA 6010 B
114.010	003	Barium	EPA 6010 B
114.010	004	Beryllium	EPA 6010 B
114.010	005	Cadmium	EPA 6010 B
114.010	006	Chromium	EPA 6010 B
114.010	007	Cobalt	EPA 6010 B
114.010	008	Copper	EPA 6010 B
114.010	009	Lead	EPA 6010 B
114.010	010	Molybdenum	EPA 6010 B
114.010	011	Nickel	EPA 6010 B
114.010	012	Selenium	EPA 6010 B
114.010	013	Silver	EPA 6010 B
114.010	014	Thallium	EPA 6010 B
114.010	015	Vanadium	EPA 6010 B
114.010	016	Zinc	EPA 6010 B
114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020

114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.103	001	Chromium (VI)	EPA 7196 A
114.106	001	Chromium (VI)	EPA 7199
114.140	001	Mercury	EPA 7470 A
114.141	001	Mercury	EPA 7471 A
114.222	001	Cyanide, Total	EPA 9014
114.230	001	Sulfides, Total	EPA 9034
114.240	001	Corrosivity - pH Determination	EPA 9040 B
114.241	001	Corrosivity - pH Determination	EPA 9045 C
114.250	001	Fluoride	EPA 9056
114.270	001	Fluoride	EPA 9214
Field of Testing: 115 - Extraction Test of Hazardous Waste			
115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311 (TCLP)
115.021	001	TCLP Inorganics	EPA 1311 (TCLP)
115.022	001	TCLP Extractables	EPA 1311 (TCLP)
115.023	001	TCLP Volatiles	EPA 1311 (TCLP)
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312 (SPLP)
Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste			
116.030	001	Gasoline-range Organics	EPA 8015 B
116.080	000	Volatile Organic Compounds	EPA 8260 B
116.080	120	Oxygenates	EPA 8260 B
116.100	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT GC/MS
116.110	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT
Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste			
117.010	001	Diesel-range Total Petroleum Hydrocarbons	EPA 8015 B
117.016	001	Diesel-range Total Petroleum Hydrocarbons	LUFT
117.110	000	Extractable Organics	EPA 8270 C
117.150	000	Carbonyl Compounds	EPA 8315 A
117.210	000	Organochlorine Pesticides	EPA 8081 A
117.220	000	PCBs	EPA 8082
Field of Testing: 120 - Physical Properties of Hazardous Waste			

120.010	001	Ignitability	EPA 1010
120.020	001	Ignitability	EPA 1020A
120.070	001	Corrosivity - pH Determination	EPA 9040 B
120.080	001	Corrosivity - pH Determination	EPA 9045 C

June 18, 2020

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Irvine, CA 92614-5817

Dear Linda Scharpenberg: Certificate No. 2706

Congratulations! This notice advises that the laboratory named above has been accredited as an environmental testing laboratory pursuant to the provisions of the California Health and Safety Code (HSC) Sections 100825-100920. The analyses for which this laboratory is accredited are indicated on the enclosed "Accredited Fields of Testing" List.

The laboratory's accreditation begins on the date printed on the enclosed certificate. For renewed accreditations, this date is determined by compliance with applicable deadlines. Noncompliance with these deadlines may have resulted in lapse of accreditation.

Be advised, the laboratory may have been denied accreditation for one or more analyses for which it applied due to failure to comply with regulatory requirements for application or accreditation. It is the laboratory's responsibility to review the enclosed list and know for which methods the laboratory has been accredited. This accreditation is a final action of the state board, subject to petition under Health and Safety Code Section 116701 within 30 days. However, if you believe that a FOT has been left off of your accreditation in error, you may submit to ELAP within 30 days of this letter, an "Accreditation Inquiry Request Form" located at www.waterboards.ca.gov/elap identifying any mistakes or errors you believe occurred in your accreditation, which will begin the period in which to file a petition. ELAP will then review all timely submitted "Accreditation Inquiry Request Forms" and will make a final determination which could then petitioned to the State Water Resources Control Board. **Failure to submit a petition to the State Water Resources Control Board or an "Accreditation Inquiry Request Form" to ELAP within 30 days of this letter will prohibit you from obtaining any further review of your accreditation.**

HSC Section 100890 lists the civil penalties for environmental laboratories that perform analyses for state regulatory purposes without a valid certificate.

Continued accreditation is contingent upon compliance with HSC Sections 100825-100920 and California Code of Regulations, Title 22, Division 4, Chapter 19, Certification of Environmental Laboratories. ELAP reserves the right to take enforcement action, including issuance of civil penalties, or supension and revocation of the laboratory's ELAP certificate, for failure to comply with all applicable regulations, statutes and orders.

Thank you,

Christine Sotelo, Chief
California Environmental Laboratory Accreditation Program (CA ELAP)

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Eurofins Lancaster Laboratories Environmental, LLC

2425 New Holland Pike

Lancaster, PA 17601

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2792**

Expiration Date: **1/31/2021**

Effective Date: **2/1/2020**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Eurofins Lancaster Laboratories Environmental, LLC

2425 New Holland Pike
Lancaster, PA 17601
Phone: 7176562300

Certificate No. 2792
Expiration Date 1/31/2021

				Primary Accreditation Body
Field of Testing: 102 - Inorganic Chemistry of Drinking Water				
102.020	001	Turbidity	EPA 180.1	PA
102.026	001	Calcium	EPA 200.7	PA
102.026	002	Magnesium	EPA 200.7	PA
102.026	003	Potassium	EPA 200.7	PA
102.026	005	Sodium	EPA 200.7	PA
102.030	003	Chloride	EPA 300.0	PA
102.030	005	Fluoride	EPA 300.0	PA
102.030	006	Nitrate (as N)	EPA 300.0	PA
102.030	007	Nitrite (as N)	EPA 300.0	PA
102.030	009	Sulfate (as SO4)	EPA 300.0	PA
102.050	001	Cyanide, Total	EPA 335.4	PA
102.060	001	Nitrate (as N) (Calculation)	EPA 353.2	PA
102.061	001	Nitrite (as N)	EPA 353.2	PA
102.095	001	Turbidity	SM 2130 B	PA
102.100	001	Alkalinity	SM 2320 B	PA
102.120	001	Hardness (Calculation)	SM 2340 B	CA
102.121	001	Hardness	SM 2340 C	PA
102.130	001	Specific Conductance	SM 2510 B	PA
102.140	001	Residue, Filterable TDS	SM 2540 C	PA
102.174	002	Chlorine, Total Residual	SM 4500-Cl F	PA
102.200	001	Fluoride	SM 4500-F C	PA
102.203	001	Hydrogen Ion (pH)	SM 4500-H+B	PA
102.240	001	Phosphate,Ortho (as P)	SM 4500-P E	PA
102.242	001	Silica	SM 4500-SiO2 C	PA
102.262	001	Organic Carbon-Total (TOC)	SM 5310 C	PA
102.270	001	Surfactants	SM 5540-C	PA
Field of Testing: 103 - Toxic Chemical Elements of Drinking Water				
103.130	003	Barium	EPA 200.7	PA
103.130	007	Chromium	EPA 200.7	PA
103.130	008	Copper	EPA 200.7	PA
103.130	009	Iron	EPA 200.7	PA
103.130	011	Manganese	EPA 200.7	PA
103.130	012	Nickel	EPA 200.7	PA

103.130	015	Silver	EPA 200.7	PA
103.130	017	Zinc	EPA 200.7	PA
103.140	001	Aluminum	EPA 200.8	PA
103.140	002	Antimony	EPA 200.8	PA
103.140	003	Arsenic	EPA 200.8	PA
103.140	004	Barium	EPA 200.8	PA
103.140	005	Beryllium	EPA 200.8	PA
103.140	006	Cadmium	EPA 200.8	PA
103.140	007	Chromium	EPA 200.8	PA
103.140	008	Copper	EPA 200.8	PA
103.140	009	Lead	EPA 200.8	PA
103.140	010	Manganese	EPA 200.8	PA
103.140	012	Nickel	EPA 200.8	PA
103.140	013	Selenium	EPA 200.8	PA
103.140	015	Thallium	EPA 200.8	PA
103.140	016	Zinc	EPA 200.8	PA
103.160	001	Mercury	EPA 245.1	PA

Field of Testing: 104 - Volatile Organic Chemistry of Drinking Water

104.035	001	1,2,3-Trichloropropane (TCP)	SRL 524M-TCP	CA
104.040	001	Benzene	EPA 524.2	PA
104.040	007	n-Butylbenzene	EPA 524.2	PA
104.040	008	sec-Butylbenzene	EPA 524.2	PA
104.040	009	tert-Butylbenzene	EPA 524.2	PA
104.040	010	Carbon Tetrachloride	EPA 524.2	PA
104.040	011	Chlorobenzene	EPA 524.2	PA
104.040	015	2-Chlorotoluene	EPA 524.2	PA
104.040	016	4-Chlorotoluene	EPA 524.2	PA
104.040	019	1,3-Dichlorobenzene	EPA 524.2	PA
104.040	020	1,2-Dichlorobenzene	EPA 524.2	PA
104.040	021	1,4-Dichlorobenzene	EPA 524.2	PA
104.040	022	Dichlorodifluoromethane	EPA 524.2	PA
104.040	023	1,1-Dichloroethane	EPA 524.2	PA
104.040	024	1,2-Dichloroethane	EPA 524.2	PA
104.040	025	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 524.2	PA
104.040	026	cis-1,2-Dichloroethylene (cis 1,2 Dichloroethene)	EPA 524.2	PA
104.040	027	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 524.2	PA
104.040	028	Dichloromethane (Methylene Chloride)	EPA 524.2	PA
104.040	029	1,2-Dichloropropane	EPA 524.2	PA
104.040	033	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 524.2	PA
104.040	034	trans-1,3-Dichloropropylene (trans-1,3 Dichloroprope	EPA 524.2	PA
104.040	035	Ethylbenzene	EPA 524.2	PA
104.040	037	Isopropylbenzene	EPA 524.2	PA

104.040	039	Naphthalene	EPA 524.2	PA
104.040	041	N-propylbenzene	EPA 524.2	PA
104.040	042	Styrene	EPA 524.2	PA
104.040	043	1,1,1,2-Tetrachloroethane	EPA 524.2	PA
104.040	044	1,1,2,2-Tetrachloroethane	EPA 524.2	PA
104.040	045	Tetrachloroethylene (Tetrachloroethene)	EPA 524.2	PA
104.040	046	Toluene	EPA 524.2	PA
104.040	047	1,2,3-Trichlorobenzene	EPA 524.2	PA
104.040	048	1,2,4-Trichlorobenzene	EPA 524.2	PA
104.040	049	1,1,1-Trichloroethane	EPA 524.2	PA
104.040	050	1,1,2-Trichloroethane	EPA 524.2	PA
104.040	051	Trichloroethylene (Trichloroethene)	EPA 524.2	PA
104.040	052	Trichlorofluoromethane	EPA 524.2	PA
104.040	054	1,2,4-Trimethylbenzene	EPA 524.2	PA
104.040	055	1,3,5-Trimethylbenzene	EPA 524.2	PA
104.040	056	Vinyl Chloride	EPA 524.2	PA
104.040	057	Xylenes, Total	EPA 524.2	PA
104.040	061	Carbon Disulfide	EPA 524.2	PA
104.040	062	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	EPA 524.2	PA
104.045	000	Trihalomethanes, Total	EPA 524.2	PA
104.045	001	Bromodichloromethane	EPA 524.2	PA
104.045	002	Bromoform	EPA 524.2	PA
104.045	003	Chloroform	EPA 524.2	PA
104.045	004	Dibromochloromethane (Chlorodibromomethane)	EPA 524.2	PA
104.050	002	Methyl tert-butyl Ether (MTBE)	EPA 524.2	PA
104.050	003	tert-Amyl Methyl Ether (TAME)	EPA 524.2	PA
104.050	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.2	PA
104.050	006	tert-Butyl Alcohol (TBA)	EPA 524.2	PA

Field of Testing: 105 - Semi-volatile Organic Chemistry of Drinking Water

105.100	001	Aldicarb (Temik)	EPA 531.1	PA
105.100	002	Aldicarb Sulfone	EPA 531.1	PA
105.100	003	Aldicarb Sulfoxide	EPA 531.1	PA
105.100	004	Carbaryl (Sevin)	EPA 531.1	PA
105.100	005	Carbofuran (Furadan)	EPA 531.1	PA
105.100	006	3-Hydroxycarbofuran	EPA 531.1	PA
105.100	007	Methomyl (Lannate)	EPA 531.1	PA
105.100	008	Oxamyl	EPA 531.1	PA
105.106	000	Per- and Polyfluorinated Alkyl Substances (PFAS)	EPA 537.1	PA
105.230	001	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B	PA

Field of Testing: 108 - Inorganic Constituents in Non-Potable Water

108.007	001	Residue, Volatile	EPA 160.4 (1971)	PA
108.009	001	Turbidity	EPA 180.1 (1993 Rev. 2.0)	PA

108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)	PA
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)	PA
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)	PA
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)	PA
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)	PA
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)	PA
108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)	PA
108.015	005	Sodium	EPA 200.8 (1994 Rev. 5.4)	PA
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)	PA
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)	PA
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)	PA
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)	PA
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)	PA
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)	PA
108.023	001	Cyanide, Total	EPA 335.4 (1993 Rev. 1.0)	PA
108.025	001	Ammonia (as N)	EPA 350.1 (1993 Rev. 2.0)	PA
108.029	001	Kjeldahl Nitrogen,Total (as N)	EPA 351.2 (1993 Rev. 2.0)	PA
108.033	001	Nitrate-Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)	PA
108.033	002	Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)	PA
108.035	002	Phosphorus,Total	EPA 365.1 (1993 Rev. 2.0)	PA
108.037	001	Phosphate,Ortho (as P)	EPA 365.3 (1978)	PA
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)	PA
108.049	001	Phenols, Total	EPA 420.4 (1993 Rev. 2.0)	PA
108.053	002	Oil & Grease Total	EPA 1664 B	PA
108.055	001	Color	SM 2120 B-2011	PA
108.061	001	Acidity	SM 2310 B-2011	PA
108.063	001	Alkalinity	SM 2320 B-2011	PA
108.065	001	Hardness (Calculation)	SM 2340 B-2011	PA
108.067	001	Hardness	SM 2340 C-2011	PA
108.069	001	Specific Conductance	SM 2510 B-2011	PA
108.071	001	Residue, Total	SM 2540 B-2011	PA
108.073	001	Residue, Filterable TDS	SM 2540 C-2011	PA
108.075	001	Residue, Non-filterable TSS	SM 2540 D-2011	PA
108.079	001	Residue, Settleable	SM 2540 F-2011	PA
108.080	001	Temperature	SM 2550 B-2010	PA
108.109	001	Chlorine, Total Residual	SM 4500-Cl F-2011	PA
108.117	001	Chloride	SM 4500-Chloride C-2011	PA
108.129	001	Cyanide, Available	SM 4500-CN G-2011	PA
108.131	001	Fluoride	SM 4500-F C-2011	PA
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011	PA
108.139	001	Ammonia (as N)	SM 4500-NH3 C-2011	PA
108.140	001	Ammonia (as N)	SM 4500-NH3 D-2011	PA

108.173	001	Oxygen, Dissolved	SM 4500-O G-2011	PA
108.175	001	Phosphate,Ortho (as P)	SM 4500-P E-2011	PA
108.177	002	Phosphorus,Total	SM 4500-P F-2011	PA
108.184	001	Silica, Dissolved	SM 4500-SiO2 C-2011	PA
108.189	001	Sulfite (as SO3)	SM 4500-SO3 B-2011	PA
108.201	001	Sulfide (as S)	SM 4500-S D-2011	PA
108.203	001	Sulfide (as S)	SM 4500-S F-2011	PA
108.207	001	Biochemical Oxygen Demand	SM 5210 B-2011	PA
108.207	002	Carbonaceous BOD	SM 5210 B-2011	PA
108.217	001	Organic Carbon-Total (TOC)	SM 5310 C-2011	PA
108.225	001	Surfactants	SM 5540 C-2011	PA
108.321	001	Cyanide, Total	ASTM D7511-12	PA
108.339	001	Cyanide, Available	OIA-1677-09	PA
108.339	002	Cyanide, Free	OIA-1677-09	PA

Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water

109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)	PA
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)	PA
109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)	PA

109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)	PA
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)	PA
109.629	001	Chromium VI (Hexavalent Chromium)	EPA 218.6 (1994 Rev. 3.3)	PA
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)	PA
109.685	002	Chromium VI (Hexavalent Chromium)	SM 3500-Cr B-2011	PA
109.693	001	Iron	SM 3500-Fe B-2011	PA

Field of Testing: 110 - Volatile Organic Constituents in Non-Potable Water

110.040	001	Acetone	EPA 624.1	PA
110.040	002	Acetonitrile	EPA 624.1	PA
110.040	003	Acrolein	EPA 624.1	PA
110.040	004	Acrylonitrile	EPA 624.1	PA
110.040	005	Benzene	EPA 624.1	PA
110.040	006	Bromodichloromethane	EPA 624.1	PA
110.040	007	Bromoform	EPA 624.1	PA
110.040	008	Bromomethane (Methyl Bromide)	EPA 624.1	PA
110.040	009	tert-Butyl Alcohol (TBA)	EPA 624.1	PA
110.040	010	Carbon Tetrachloride	EPA 624.1	PA
110.040	011	Chlorobenzene	EPA 624.1	PA
110.040	012	Chloroethane	EPA 624.1	PA
110.040	013	2-Chloroethyl vinyl Ether	EPA 624.1	PA
110.040	014	Chloroform	EPA 624.1	PA
110.040	015	Chloromethane (Methyl Chloride)	EPA 624.1	PA
110.040	016	Dibromochloromethane (Chlorodibromomethane)	EPA 624.1	PA
110.040	017	1,2-Dichlorobenzene	EPA 624.1	PA
110.040	018	1,3-Dichlorobenzene	EPA 624.1	PA
110.040	019	1,4-Dichlorobenzene	EPA 624.1	PA
110.040	021	1,2-Dichloroethane	EPA 624.1	PA
110.040	022	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 624.1	PA

110.040	023	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 624.1	PA
110.040	024	1,2-Dichloropropane	EPA 624.1	PA
110.040	025	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 624.1	PA
110.040	026	trans-1,3-Dichloropropylene (trans-1,3 Dichloroprope	EPA 624.1	PA
110.040	028	Ethyl Acetate	EPA 624.1	PA
110.040	029	Ethylbenzene	EPA 624.1	PA
110.040	031	Methylene Chloride (Dichloromethane)	EPA 624.1	PA
110.040	032	4-Methyl-2-pentanone (MIBK)	EPA 624.1	PA
110.040	034	1,1,2,2-Tetrachloroethane	EPA 624.1	PA
110.040	035	Tetrachloroethylene (Tetrachloroethene)	EPA 624.1	PA
110.040	036	Tetrahydrofuran	EPA 624.1	PA
110.040	037	Toluene	EPA 624.1	PA
110.040	038	1,1,1-Trichloroethane	EPA 624.1	PA
110.040	039	1,1,2-Trichloroethane	EPA 624.1	PA
110.040	040	Trichloroethylene (Trichloroethene)	EPA 624.1	PA
110.040	041	Vinyl Chloride	EPA 624.1	PA
110.040	042	m-Xylene	EPA 624.1	PA
110.040	043	o-Xylene	EPA 624.1	PA
110.040	044	p-Xylene	EPA 624.1	PA
110.040	045	Trichlorofluoromethane	EPA 624.1	PA
110.070	002	n-Amyl Acetate	EPA 1666	PA
110.070	003	n-Amyl Alcohol	EPA 1666	PA
110.070	004	n-Butyl Acetate	EPA 1666	PA
110.070	005	tert-Butyl Alcohol (TBA)	EPA 1666	PA
110.070	009	Ethyl Acetate	EPA 1666	PA
110.070	010	n-Heptane	EPA 1666	PA
110.070	011	n-Hexane	EPA 1666	PA
110.070	012	Isobutyraldehyde	EPA 1666	PA
110.070	013	Isopropyl Acetate	EPA 1666	PA
110.070	014	Isopropyl Alcohol (Isopropanol)	EPA 1666	PA
110.070	015	Isopropyl Ether (DIPE)	EPA 1666	PA
110.070	018	Methyl Formate	EPA 1666	PA
110.070	019	4-Methyl-2-pentanone (MIBK)	EPA 1666	PA
110.070	021	Tetrahydrofuran	EPA 1666	PA
110.070	023	m-Xylene	EPA 1666	PA
110.070	024	o-Xylene	EPA 1666	PA
110.070	025	p-Xylene	EPA 1666	PA
110.090	001	Acetonitrile	EPA 1671	PA
110.090	002	Diethylamine	EPA 1671	PA
110.090	003	Dimethyl Sulfoxide	EPA 1671	PA
110.090	004	Ethanol	EPA 1671	PA
110.090	005	Methanol	EPA 1671	PA

110.090	006	2-Methoxyethanol	EPA 1671	PA
110.090	007	n-Propanol (1-Propanol)	EPA 1671	PA
110.090	008	Triethylamine	EPA 1671	PA

Field of Testing: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.055	001	Aldrin	EPA 608.3	PA
111.055	002	alpha-BHC	EPA 608.3	PA
111.055	003	beta-BHC	EPA 608.3	PA
111.055	004	delta-BHC	EPA 608.3	PA
111.055	005	gamma-BHC (Lindane)	EPA 608.3	PA
111.055	006	Chlordane	EPA 608.3	PA
111.055	007	4,4'-DDD	EPA 608.3	PA
111.055	008	4,4'-DDE	EPA 608.3	PA
111.055	009	4,4'-DDT	EPA 608.3	PA
111.055	010	Dieldrin	EPA 608.3	PA
111.055	011	Endosulfan I	EPA 608.3	PA
111.055	012	Endosulfan II	EPA 608.3	PA
111.055	013	Endosulfan Sulfate	EPA 608.3	PA
111.055	014	Endrin	EPA 608.3	PA
111.055	015	Endrin Aldehyde	EPA 608.3	PA
111.055	016	Heptachlor	EPA 608.3	PA
111.055	017	Heptachlor Epoxide	EPA 608.3	PA
111.055	019	PCB-1016	EPA 608.3	PA
111.055	020	PCB-1221	EPA 608.3	PA
111.055	021	PCB-1232	EPA 608.3	PA
111.055	022	PCB-1242	EPA 608.3	PA
111.055	023	PCB-1248	EPA 608.3	PA
111.055	024	PCB-1254	EPA 608.3	PA
111.055	025	PCB-1260	EPA 608.3	PA
111.055	046	Methoxychlor	EPA 608.3	PA
111.055	048	Mirex	EPA 608.3	PA
111.055	060	Toxaphene	EPA 608.3	PA
111.150	001	Azinphos Methyl	EPA 622	PA
111.150	002	Chlorpyrifos	EPA 622	PA
111.150	003	Demeton-O	EPA 622	PA
111.150	004	Demeton-S	EPA 622	PA
111.150	005	Diazinon	EPA 622	PA
111.150	006	Dichlorvos (DDVP)	EPA 622	PA
111.150	007	Disulfoton	EPA 622	PA
111.150	008	Ethoprop	EPA 622	PA
111.150	009	Fensulfothion	EPA 622	PA
111.150	010	Fenthion	EPA 622	PA
111.150	011	Merphos	EPA 622	PA

111.150	012	Mevinphos	EPA 622	PA
111.150	013	Naled	EPA 622	PA
111.150	014	Parathion Methyl	EPA 622	PA
111.150	015	Phorate	EPA 622	PA
111.150	016	Stirophos (Tetrachlorovinphos)	EPA 622	PA
111.150	017	Sulprofos (Bolstar)	EPA 622	PA
111.160	001	Acenaphthene	EPA 625.1	PA
111.160	002	Acenaphthylene	EPA 625.1	PA
111.160	003	Anthracene	EPA 625.1	PA
111.160	004	Benzidine	EPA 625.1	PA
111.160	005	Benzo(a)anthracene	EPA 625.1	PA
111.160	006	Benzo(a)pyrene	EPA 625.1	PA
111.160	007	Benzo(b)fluoranthene	EPA 625.1	PA
111.160	008	Benzo(g,h,i)perylene	EPA 625.1	PA
111.160	009	Benzo(k)fluoranthene	EPA 625.1	PA
111.160	010	Bis(2-chloroethoxy) Methane	EPA 625.1	PA
111.160	011	Bis(2-chloroethyl) Ether	EPA 625.1	PA
111.160	012	Bis(2-chloroisopropyl) Ether	EPA 625.1	PA
111.160	013	Bis(2-ethylhexyl)phthalate	EPA 625.1	PA
111.160	014	4-Bromophenyl Phenyl Ether	EPA 625.1	PA
111.160	015	Butyl Benzyl Phthalate	EPA 625.1	PA
111.160	016	2-Chloronaphthalene	EPA 625.1	PA
111.160	017	4-Chlorophenyl Phenyl Ether	EPA 625.1	PA
111.160	018	Chrysene	EPA 625.1	PA
111.160	019	Dibenzo(a,h)anthracene	EPA 625.1	PA
111.160	020	3,3'-Dichlorobenzidine	EPA 625.1	PA
111.160	021	Diethyl Phthalate	EPA 625.1	PA
111.160	022	Dimethyl Phthalate	EPA 625.1	PA
111.160	023	Di-n-butyl Phthalate	EPA 625.1	PA
111.160	024	2,4-Dinitrotoluene	EPA 625.1	PA
111.160	025	2,6-Dinitrotoluene	EPA 625.1	PA
111.160	026	Di-n-octyl Phthalate	EPA 625.1	PA
111.160	027	Fluoranthene	EPA 625.1	PA
111.160	028	Fluorene	EPA 625.1	PA
111.160	029	Hexachlorobenzene	EPA 625.1	PA
111.160	030	Hexachlorobutadiene	EPA 625.1	PA
111.160	031	Hexachloroethane	EPA 625.1	PA
111.160	032	Indeno(1,2,3-c,d)pyrene	EPA 625.1	PA
111.160	033	Isophorone	EPA 625.1	PA
111.160	034	Naphthalene	EPA 625.1	PA
111.160	035	Nitrobenzene	EPA 625.1	PA
111.160	036	N-nitrosodi-n-propylamine	EPA 625.1	PA

111.160	037	Phenanthrene	EPA 625.1	PA
111.160	038	Pyrene	EPA 625.1	PA
111.160	039	1,2,4-Trichlorobenzene	EPA 625.1	PA
111.160	040	4-Chloro-3-methylphenol	EPA 625.1	PA
111.160	041	2-Chlorophenol	EPA 625.1	PA
111.160	042	2,4-Dichlorophenol	EPA 625.1	PA
111.160	043	2,4-Dimethylphenol	EPA 625.1	PA
111.160	044	2,4-Dinitrophenol	EPA 625.1	PA
111.160	045	2-Methyl-4,6-dinitrophenol	EPA 625.1	PA
111.160	046	2-Nitrophenol	EPA 625.1	PA
111.160	047	4-Nitrophenol	EPA 625.1	PA
111.160	048	Pentachlorophenol	EPA 625.1	PA
111.160	049	Phenol	EPA 625.1	PA
111.160	050	2,4,6-Trichlorophenol	EPA 625.1	PA
111.160	098	Hexachlorocyclopentadiene	EPA 625.1	PA
111.160	108	N-nitrosodimethylamine	EPA 625.1	PA
111.160	110	N-nitrosodiphenylamine	EPA 625.1	PA
111.250	001	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B	PA
111.250	002	Total Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613 B	PA
111.250	003	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	EPA 1613 B	PA
111.250	004	Total Tetrachlorodibenzofuran (TCDF)	EPA 1613 B	PA
111.250	005	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	EPA 1613 B	PA
111.250	006	Total Pentachlorodibenzo-p-dioxin (PeCDD)	EPA 1613 B	PA
111.250	007	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 1613 B	PA
111.250	008	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 1613 B	PA
111.250	009	Total Pentachlorodibenzofuran (PeCDF)	EPA 1613 B	PA
111.250	010	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B	PA
111.250	011	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B	PA
111.250	012	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B	PA
111.250	013	Total Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613 B	PA
111.250	014	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B	PA
111.250	015	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B	PA
111.250	016	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B	PA
111.250	017	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613 B	PA
111.250	018	Total Hexachlorodibenzofuran (HxCDF)	EPA 1613 B	PA
111.250	019	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 1613 B	PA
111.250	020	Total Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 1613 B	PA
111.250	021	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	PA
111.250	022	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	PA
111.250	023	Total Heptachlorodibenzofuran (HpCDF)	EPA 1613 B	PA
111.250	024	OCDD	EPA 1613 B	PA
111.250	025	OCDF	EPA 1613 B	PA

111.345	001	N-Ethylperfluorooctane Sulfonamido Acetic Acid (NEt	DoD QSM Version 5.1 (or newer)	DOD
111.345	002	4:2 Fluorotelomer Sulfonic Acid (4:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	003	6:2 Fluorotelomer Sulfonic Acid (6:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	004	8:2 Fluorotelomer Sulfonic Acid (8:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	005	N-Methylperfluorooctane Sulfonamido Acetic Acid (N	DoD QSM Version 5.1 (or newer)	DOD
111.345	006	Perfluorobutanoic Acid (PFBA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	007	Perfluorobutane Sulfonic Acid (PFBS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	008	Perfluorodecanoic Acid (PFDA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	009	Perfluorododecanoic Acid (PFDoA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	010	Perfluorodecane Sulfonic Acid (PFDS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	011	Perfluoroheptanoic Acid (PFHpA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	012	Perfluoroheptane Sulfonic Acid (PFHpS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	013	Perfluorohexane Sulfonic Acid (PFHxS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	014	Perfluorohexanoic Acid (PFHxA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	015	Perfluorononanoic Acid (PFNA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	016	Perfluorooctanoic Acid (PFOA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	017	Perfluorooctane Sulfonic Acid (PFOS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	018	Perfluorooctane Sulfonamide (PFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
111.345	019	Perfluoropentanoic Acid (PFPeA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	020	Perfluoropentane Sulfonic Acid (PFPeS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	021	Perfluorotetradecanoic Acid (PFTA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	022	Perfluorotridecanoic Acid (PFTrDA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	023	Perfluoroundecanoic Acid (PFUnDA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	024	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)	DOD
111.345	025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)	DOD
111.345	026	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	027	N-Ethylperfluorooctane Sulfonamide (EtFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
111.345	028	N-Ethylperfluorooctane Sulfonamido Ethanol (EtFOS	DoD QSM Version 5.1 (or newer)	DOD
111.345	029	10:2 Fluorotelomer Sulfonic Acid (10:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
111.345	030	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	031	N-Methylperfluorooctane Sulfonamide (MeFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
111.345	032	N-Methylperfluorooctane Sulfonamido Ethanol (MeF	DoD QSM Version 5.1 (or newer)	DOD
111.345	033	Perfluorohexadecanoic Acid (PFHxDA)	DoD QSM Version 5.1 (or newer)	DOD
111.345	034	Perfluorononane Sulfonic Acid (PFNS)	DoD QSM Version 5.1 (or newer)	DOD

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B	PA
114.010	002	Arsenic	EPA 6010 B	PA
114.010	003	Barium	EPA 6010 B	PA
114.010	004	Beryllium	EPA 6010 B	PA
114.010	005	Cadmium	EPA 6010 B	PA
114.010	006	Chromium	EPA 6010 B	PA
114.010	007	Cobalt	EPA 6010 B	PA

114.010	008	Copper	EPA 6010 B	PA
114.010	009	Lead	EPA 6010 B	PA
114.010	010	Molybdenum	EPA 6010 B	PA
114.010	011	Nickel	EPA 6010 B	PA
114.010	012	Selenium	EPA 6010 B	PA
114.010	013	Silver	EPA 6010 B	PA
114.010	014	Thallium	EPA 6010 B	PA
114.010	015	Vanadium	EPA 6010 B	PA
114.010	016	Zinc	EPA 6010 B	PA
114.020	001	Antimony	EPA 6020	CA
114.020	002	Arsenic	EPA 6020	CA
114.020	003	Barium	EPA 6020	CA
114.020	004	Beryllium	EPA 6020	CA
114.020	005	Cadmium	EPA 6020	CA
114.020	006	Chromium	EPA 6020	CA
114.020	007	Cobalt	EPA 6020	CA
114.020	008	Copper	EPA 6020	CA
114.020	009	Lead	EPA 6020	CA
114.020	010	Molybdenum	EPA 6020	CA
114.020	011	Nickel	EPA 6020	CA
114.020	012	Selenium	EPA 6020	CA
114.020	013	Silver	EPA 6020	CA
114.020	014	Thallium	EPA 6020	CA
114.020	015	Vanadium	EPA 6020	CA
114.020	016	Zinc	EPA 6020	CA
114.103	001	Chromium VI (Hexavalent Chromium)	EPA 7196 A	PA
114.106	001	Chromium VI (Hexavalent Chromium)	EPA 7199	PA
114.141	001	Mercury	EPA 7471 A	PA
114.221	001	Cyanide, Total	EPA 9012 A	PA
114.241	001	Corrosivity - pH Determination	EPA 9045 C	PA
Field of Testing: 115 - Extraction Test of Hazardous Waste				
115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311	PA
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312	PA
Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste				
116.010	000	EDB and DBCP	EPA 8011	PA
116.020	030	Nonhalogenated Volatiles	EPA 8015 B	PA
116.020	031	Ethanol and Methanol	EPA 8015 B	PA
116.030	001	Gasoline Range Organics (GRO)	EPA 8015 B	PA
116.080	000	Volatile Organic Compounds	EPA 8260 B	PA
116.080	120	Oxygenates	EPA 8260 B	PA
Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste				
117.010	001	Diesel Range Organics (DRO)	EPA 8015 B	PA

117.110	000	Extractable Organics	EPA 8270 C	PA
117.130	000	Dioxins and Dibenzofurans	EPA 8290	PA
117.150	000	Carbonyl Compounds	EPA 8315 A	PA
117.171	000	Nitroaromatics and Nitramines	EPA 8330 A	PA
117.210	000	Organochlorine Pesticides	EPA 8081 A	PA
117.220	000	PCBs	EPA 8082	PA
117.240	000	Organophosphorus Pesticides	EPA 8141 A	PA
117.250	000	Chlorinated Herbicides	EPA 8151 A	PA
117.270	000	Carbamates, N-methylcarbamates	EPA 8318	PA
117.575	001	N-Ethylperfluorooctane Sulfonamide (EtFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
117.575	002	N-Ethylperfluorooctane Sulfonamido Acetic Acid (NEt	DoD QSM Version 5.1 (or newer)	DOD
117.575	003	N-Ethylperfluorooctane Sulfonamido Ethanol (EtFOS	DoD QSM Version 5.1 (or newer)	DOD
117.575	004	4:2 Fluorotelomer Sulfonic Acid (4:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	005	6:2 Fluorotelomer Sulfonic Acid (6:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	006	8:2 Fluorotelomer Sulfonic Acid (8:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	007	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)	DOD
117.575	008	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)	DOD
117.575	009	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	010	N-Methylperfluorooctane Sulfonamide (MeFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
117.575	011	N-Methylperfluorooctane Sulfonamido Acetic Acid (N	DoD QSM Version 5.1 (or newer)	DOD
117.575	012	N-Methylperfluorooctane Sulfonamido Ethanol (MeF	DoD QSM Version 5.1 (or newer)	DOD
117.575	013	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	014	Perfluorobutanoic Acid (PFBA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	015	Perfluorobutane Sulfonic Acid (PFBS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	016	Perfluorodecanoic Acid (PFDA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	017	Perfluorododecanoic Acid (PFDoA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	018	Perfluorodecane Sulfonic Acid (PFDS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	019	Perfluoroheptanoic Acid (PFHpA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	020	Perfluoroheptane Sulfonic Acid (PFHpS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	021	Perfluorohexane Sulfonic Acid (PFHxS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	022	Perfluorohexanoic Acid (PFHxA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	023	Perfluorononanoic Acid (PFNA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	024	Perfluorooctanoic Acid (PFOA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	025	Perfluorooctane Sulfonic Acid (PFOS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	026	Perfluorooctane Sulfonamide (PFOSAm)	DoD QSM Version 5.1 (or newer)	DOD
117.575	027	Perfluoropentanoic Acid (PFPeA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	028	Perfluoropentane Sulfonic Acid (PFPeS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	029	Perfluorotetradecanoic Acid (PFTA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	030	Perfluorotridecanoic Acid (PFTrDA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	031	Perfluoroundecanoic Acid (PFUnDA)	DoD QSM Version 5.1 (or newer)	DOD
117.575	032	10:2 Fluorotelomer Sulfonic Acid (10:2 FTS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	033	Perfluorohexadecanoic Acid (PFHxDA)	DoD QSM Version 5.1 (or newer)	DOD

117.575	034	Perfluorononane Sulfonic Acid (PFNS)	DoD QSM Version 5.1 (or newer)	DOD
117.575	035	Perfluorooctadecanoic Acid (PFODA)	DoD QSM Version 5.1 (or newer)	DOD

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010	PA
120.040	001	Reactive Cyanide	Section 7.3 SW-846	PA
120.050	001	Reactive Sulfide	Section 7.3 SW-846	PA
120.080	001	Corrosivity - pH Determination	EPA 9045 C	PA

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Field of Testing: 101 - Microbiology of Drinking Water

101.010	001	Heterotrophic Bacteria	SM 9215 B
101.020	004	Total Coliform (Enumeration)	SM 9221 B,C
101.020	005	Fecal Coliform (Enumeration)	SM 9221 B,E
101.020	006	E. coli (Enumeration)	SM 9221 B,F
101.050	001	Total Coliform P/A	SM 9223 B Colilert
101.050	002	E. coli P/A	SM 9223 B Colilert
101.050	003	Total Coliform (Enumeration)	SM 9223 B Colilert
101.050	004	E. coli (Enumeration)	SM 9223 B Colilert
101.050	005	Total Coliform P/A	SM 9223 B Colilert 18
101.050	006	E. coli P/A	SM 9223 B Colilert 18
101.050	007	Total Coliform (Enumeration)	SM 9223 B Colilert 18
101.050	008	E. coli (Enumeration)	SM 9223 B Colilert 18
101.050	009	Total Coliform P/A	SM 9223 B Colisure
101.050	010	E. coli P/A	SM 9223 B Colisure
101.140	001	Enterococci	SM 9230 B
101.170	001	Enterococci	Enterolert

Field of Testing: 102 - Inorganic Chemistry of Drinking Water

102.020	001	Turbidity	EPA 180.1
102.026	001	Calcium	EPA 200.7
102.026	002	Magnesium	EPA 200.7
102.026	003	Potassium	EPA 200.7
102.026	004	Silica	EPA 200.7
102.026	005	Sodium	EPA 200.7
102.026	006	Hardness (Calculation)	EPA 200.7
102.030	001	Bromide	EPA 300.0
102.030	003	Chloride	EPA 300.0
102.030	005	Fluoride	EPA 300.0
102.030	006	Nitrate (as N)	EPA 300.0
102.030	007	Nitrite (as N)	EPA 300.0
102.030	009	Sulfate (as SO4)	EPA 300.0
102.040	001	Bromide	EPA 300.1
102.040	002	Chlorite	EPA 300.1
102.040	003	Chlorate	EPA 300.1

102.040	004	Bromate	EPA 300.1
102.045	001	Perchlorate	EPA 314.0
102.047	001	Perchlorate	EPA 331.0
102.048	001	Perchlorate	EPA 332.0
102.050	001	Cyanide, Total	EPA 335.4
102.060	001	Nitrate (as N) (Calculation)	EPA 353.2
102.061	001	Nitrite (as N)	EPA 353.2
102.070	001	Phosphate,Ortho (as P)	EPA 365.1
102.086	001	Dissolved Organic Carbon (DOC)	EPA 415.3 Revision 1.2
102.086	002	Specific UV Absorbance SUVA	EPA 415.3 Revision 1.2
102.086	003	Organic Carbon-Total (TOC)	EPA 415.3 Revision 1.2
102.086	004	UV254	EPA 415.3 Revision 1.2
102.090	001	Bromate	EPA 557
102.100	001	Alkalinity	SM 2320 B-1997
102.130	001	Specific Conductance	SM 2510 B-1997
102.140	001	Residue, Filterable TDS	SM 2540 C-1997
102.175	001	Chlorine, Free	SM 4500-Cl G-2000
102.175	002	Chlorine, Total Residual	SM 4500-Cl G-2000
102.180	001	Chlorine Dioxide	SM 4500-ClO2 D-2000
102.203	001	Hydrogen Ion (pH)	SM 4500-H+ B-2000
102.260	001	Organic Carbon-Total (TOC)	SM 5310 B-2000
102.261	001	Dissolved Organic Carbon (DOC)	SM 5310 B-2000
102.270	001	Surfactants	SM 5540 C-2000
102.280	001	UV254	SM 5910 B-2011
102.570	001	Cyanide, Free	OIA-1677, DW

Field of Testing: 103 - Toxic Chemical Elements of Drinking Water

103.130	001	Aluminum	EPA 200.7
103.130	003	Barium	EPA 200.7
103.130	007	Chromium	EPA 200.7
103.130	008	Copper	EPA 200.7
103.130	009	Iron	EPA 200.7
103.130	011	Manganese	EPA 200.7
103.130	012	Nickel	EPA 200.7
103.130	015	Silver	EPA 200.7
103.130	017	Zinc	EPA 200.7
103.130	018	Boron	EPA 200.7
103.140	001	Aluminum	EPA 200.8
103.140	002	Antimony	EPA 200.8
103.140	003	Arsenic	EPA 200.8
103.140	004	Barium	EPA 200.8
103.140	005	Beryllium	EPA 200.8
103.140	006	Cadmium	EPA 200.8

103.140	007	Chromium	EPA 200.8
103.140	008	Copper	EPA 200.8
103.140	009	Lead	EPA 200.8
103.140	010	Manganese	EPA 200.8
103.140	011	Mercury	EPA 200.8
103.140	012	Nickel	EPA 200.8
103.140	013	Selenium	EPA 200.8
103.140	014	Silver	EPA 200.8
103.140	015	Thallium	EPA 200.8
103.140	016	Zinc	EPA 200.8
103.140	017	Boron	EPA 200.8
103.140	018	Vanadium	EPA 200.8
103.140	019	Strontium	EPA 200.8
103.160	001	Mercury	EPA 245.1
103.310	001	Chromium (VI)	EPA 218.6
103.311	001	Chromium (VI)	EPA 218.7

Field of Testing: 104 - Volatile Organic Chemistry of Drinking Water

104.030	001	1,2-Dibromoethane (EDB, Ethylene Dibromide)	EPA 504.1
104.030	002	1,2-Dibromo-3-chloropropane (DBCP)	EPA 504.1
104.035	001	1,2,3-Trichloropropane (TCP)	SRL 524M-TCP
104.040	000	Volatile Organic Compounds	EPA 524.2
104.040	001	Benzene	EPA 524.2
104.040	007	n-Butylbenzene	EPA 524.2
104.040	008	sec-Butylbenzene	EPA 524.2
104.040	009	tert-Butylbenzene	EPA 524.2
104.040	010	Carbon Tetrachloride	EPA 524.2
104.040	011	Chlorobenzene	EPA 524.2
104.040	015	2-Chlorotoluene	EPA 524.2
104.040	016	4-Chlorotoluene	EPA 524.2
104.040	019	1,3-Dichlorobenzene	EPA 524.2
104.040	020	1,2-Dichlorobenzene	EPA 524.2
104.040	021	1,4-Dichlorobenzene	EPA 524.2
104.040	022	Dichlorodifluoromethane	EPA 524.2
104.040	023	1,1-Dichloroethane	EPA 524.2
104.040	024	1,2-Dichloroethane	EPA 524.2
104.040	025	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 524.2
104.040	026	cis-1,2-Dichloroethylene (cis 1,2 Dichloroethene)	EPA 524.2
104.040	027	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 524.2
104.040	028	Dichloromethane (Methylene Chloride)	EPA 524.2
104.040	029	1,2-Dichloropropane	EPA 524.2
104.040	033	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 524.2
104.040	034	trans-1,3-Dichloropropylene (trans-1,3 Dichloroprope	EPA 524.2

104.040	035	Ethylbenzene	EPA 524.2
104.040	037	Isopropylbenzene	EPA 524.2
104.040	039	Naphthalene	EPA 524.2
104.040	041	N-propylbenzene	EPA 524.2
104.040	042	Styrene	EPA 524.2
104.040	043	1,1,1,2-Tetrachloroethane	EPA 524.2
104.040	044	1,1,2,2-Tetrachloroethane	EPA 524.2
104.040	045	Tetrachloroethylene (Tetrachloroethene)	EPA 524.2
104.040	046	Toluene	EPA 524.2
104.040	047	1,2,3-Trichlorobenzene	EPA 524.2
104.040	048	1,2,4-Trichlorobenzene	EPA 524.2
104.040	049	1,1,1-Trichloroethane	EPA 524.2
104.040	050	1,1,2-Trichloroethane	EPA 524.2
104.040	051	Trichloroethylene (Trichloroethene)	EPA 524.2
104.040	052	Trichlorofluoromethane	EPA 524.2
104.040	054	1,2,4-Trimethylbenzene	EPA 524.2
104.040	055	1,3,5-Trimethylbenzene	EPA 524.2
104.040	056	Vinyl Chloride	EPA 524.2
104.040	057	Xylenes, Total	EPA 524.2
104.040	061	Carbon Disulfide	EPA 524.2
104.040	062	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	EPA 524.2
104.045	000	Trihalomethanes, Total	EPA 524.2
104.045	001	Bromodichloromethane	EPA 524.2
104.045	002	Bromoform	EPA 524.2
104.045	003	Chloroform	EPA 524.2
104.045	004	Dibromochloromethane (Chlorodibromomethane)	EPA 524.2
104.050	000	Gasoline Additives	EPA 524.2
104.050	002	Methyl tert-butyl Ether (MTBE)	EPA 524.2
104.050	003	tert-Amyl Methyl Ether (TAME)	EPA 524.2
104.050	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.2
104.050	005	Trichlorotrifluoroethane	EPA 524.2
104.050	006	tert-Butyl Alcohol (TBA)	EPA 524.2
104.055	022	1,2-Dibromo-3-chloropropane (DBCP)	EPA 524.3
104.055	023	1,2-Dibromoethane (EDB, Ethylene Dibromide)	EPA 524.3
104.058	000	Volatile Organic Compounds	EPA 524.4
104.058	001	Benzene	EPA 524.4
104.058	002	Carbon Tetrachloride	EPA 524.4
104.058	003	Chlorobenzene	EPA 524.4
104.058	004	1,2-Dichlorobenzene	EPA 524.4
104.058	005	1,4-Dichlorobenzene	EPA 524.4
104.058	006	1,2-Dichloroethane	EPA 524.4
104.058	007	cis-1,2-Dichloroethylene (cis 1,2 Dichloroethene)	EPA 524.4

104.058	008	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 524.4
104.058	009	Dichloromethane (Methylene Chloride)	EPA 524.4
104.058	010	1,2-Dichloropropane	EPA 524.4
104.058	011	Ethylbenzene	EPA 524.4
104.058	012	Styrene	EPA 524.4
104.058	013	Tetrachloroethylene (Tetrachloroethene)	EPA 524.4
104.058	014	1,1,1-Trichloroethane	EPA 524.4
104.058	015	Trichloroethylene (Trichloroethene)	EPA 524.4
104.058	016	Toluene	EPA 524.4
104.058	017	1,2,4-Trichlorobenzene	EPA 524.4
104.058	018	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 524.4
104.058	019	1,1,2-Trichloroethane	EPA 524.4
104.058	020	Vinyl Chloride	EPA 524.4
104.058	021	Xylenes, Total	EPA 524.4
104.059	000	Trihalomethanes, Total	EPA 524.4
104.059	001	Bromodichloromethane	EPA 524.4
104.059	002	Bromoform	EPA 524.4
104.059	003	Chloroform	EPA 524.4
104.059	004	Dibromochloromethane (Chlorodibromomethane)	EPA 524.4
104.061	000	Gasoline Additives	EPA 524.4
104.061	001	Di-isopropyl Ether (DIPE)	EPA 524.4
104.061	003	tert-Amyl Methyl Ether (TAME)	EPA 524.4
104.061	004	Ethyl tert-butyl Ether (ETBE)	EPA 524.4
104.061	005	Trichlorofluoromethane (Freon 11)	EPA 524.4
104.061	006	tert-Butyl Alcohol (TBA)	EPA 524.4
104.061	007	Trichlorotrifluoroethane (Freon 113)	EPA 524.4

Field of Testing: 105 - Semi-volatile Organic Chemistry of Drinking Water

105.035	000	Organochlorine Pesticides and PCBs	EPA 508
105.035	001	Aldrin	EPA 508
105.035	005	Endrin	EPA 508
105.035	007	Heptachlor	EPA 508
105.035	008	Heptachlor Epoxide	EPA 508
105.035	009	Hexachlorobenzene	EPA 508
105.035	010	Lindane (HCH-gamma)	EPA 508
105.035	011	Methoxychlor	EPA 508
105.035	012	Propachlor	EPA 508
105.035	013	Chlordane	EPA 508
105.035	014	Toxaphene	EPA 508
105.035	015	PCBs as Aroclors	EPA 508
105.035	016	Aroclor 1016	EPA 508
105.035	017	Aroclor 1221	EPA 508
105.035	018	Aroclor 1232	EPA 508

105.035	019	Aroclor 1242	EPA 508
105.035	020	Aroclor 1248	EPA 508
105.035	021	Aroclor 1254	EPA 508
105.035	022	Aroclor 1260	EPA 508
105.050	000	Organochlorine Pesticides	EPA 508.1
105.050	005	Chlordane (total)	EPA 508.1
105.050	010	Endrin	EPA 508.1
105.050	011	Heptachlor	EPA 508.1
105.050	012	Heptachlor Epoxide	EPA 508.1
105.050	013	Hexachlorobenzene	EPA 508.1
105.050	014	Hexachlorocyclopentadiene	EPA 508.1
105.050	015	Lindane (HCH-gamma)	EPA 508.1
105.050	016	Methoxychlor	EPA 508.1
105.050	019	Propachlor	EPA 508.1
105.050	021	PCB-1016	EPA 508.1
105.050	022	PCB-1221	EPA 508.1
105.050	023	PCB-1232	EPA 508.1
105.050	024	PCB-1242	EPA 508.1
105.050	025	PCB-1248	EPA 508.1
105.050	026	PCB-1254	EPA 508.1
105.050	027	PCB-1260	EPA 508.1
105.050	028	PCBs as Aroclors	EPA 508.1
105.050	029	Toxaphene	EPA 508.1
105.083	000	Chlorinated Acids	EPA 515.4
105.083	001	2,4-D	EPA 515.4
105.083	002	Dinoseb	EPA 515.4
105.083	003	Pentachlorophenol	EPA 515.4
105.083	004	Picloram	EPA 515.4
105.083	005	2,4,5-TP (Silvex)	EPA 515.4
105.083	006	Dalapon	EPA 515.4
105.083	007	Bentazon	EPA 515.4
105.083	008	Dicamba	EPA 515.4
105.090	000	Semi-volatile Organic Compounds	EPA 525.2
105.090	001	Alachlor	EPA 525.2
105.090	003	Atrazine	EPA 525.2
105.090	004	Benzo(a)pyrene	EPA 525.2
105.090	005	Butachlor	EPA 525.2
105.090	007	Dieldrin	EPA 525.2
105.090	008	Di(2-ethylhexyl) Adipate	EPA 525.2
105.090	009	Di(2-ethylhexyl) Phthalate	EPA 525.2
105.090	013	Endrin	EPA 525.2
105.090	014	Heptachlor	EPA 525.2

105.090	015	Heptachlor Epoxide	EPA 525.2
105.090	016	Hexachlorobenzene	EPA 525.2
105.090	017	Hexachlorocyclopentadiene	EPA 525.2
105.090	018	Lindane (HCH-gamma)	EPA 525.2
105.090	019	Methoxychlor	EPA 525.2
105.090	022	Molinate	EPA 525.2
105.090	023	Pentachlorophenol	EPA 525.2
105.090	025	Simazine	EPA 525.2
105.090	028	Thiobencarb	EPA 525.2
105.101	000	Carbamates	EPA 531.2
105.101	001	Carbofuran	EPA 531.2
105.101	002	Oxamyl	EPA 531.2
105.101	003	Aldicarb	EPA 531.2
105.101	004	Aldicarb Sulfone	EPA 531.2
105.101	005	Aldicarb Sulfoxide	EPA 531.2
105.101	006	Carbaryl	EPA 531.2
105.101	007	3-Hydroxycarbofuran	EPA 531.2
105.101	008	Methomyl	EPA 531.2
105.106	000	Per- and Polyfluorinated Alkyl Substances (PFAS)	EPA 537.1
105.120	001	Glyphosate	EPA 547
105.140	001	Endothall	EPA 548.1
105.150	001	Diquat	EPA 549.2
105.170	031	Disinfection Byproducts	EPA 551.1
105.201	001	Haloacetic Acids (HAA5)	EPA 552.3
105.210	002	2,4-D	EPA 555
105.210	004	Dinoseb	EPA 555
105.210	005	Pentachlorophenol	EPA 555
105.210	006	Picloram	EPA 555
105.210	007	2,4,5-TP (Silvex)	EPA 555
105.210	008	Bentazon	EPA 555
105.215	001	Haloacetic Acids (HAA5)	EPA 557
105.215	002	Dalapon	EPA 557
105.230	002	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) Screenin	EPA 1613 B

Field of Testing: 106 - Radionuclides in Drinking Water

106.010	001	Gross Alpha	EPA 900.0
106.010	002	Gross Beta	EPA 900.0
106.092	001	Uranium	EPA 200.8
106.270	001	Gross Alpha	SM 7110 C
106.610	001	Radon-222	SM 7500-Rn

Field of Testing: 107 - Microbiological Methods for Non-Potable Water and Sewage Sludge

107.001	001	Total Coliform (Enumeration)	SM 9221 B,C-2006
107.001	002	Fecal Coliform (Enumeration)	SM 9221 C,E-2006

107.001	003	E. coli (Enumeration)	SM 9221 C,F-2006
107.007	002	Fecal Streptococci	SM 9230 B-2007
107.013	001	E. coli (Enumeration)	Colilert
107.015	001	E. coli (Enumeration)	Colilert 18
107.015	002	Fecal Coliform (Enumeration)	Colilert 18
107.017	001	Enterococci	Enterolert

Field of Testing: 108 - Inorganic Constituents in Non-Potable Water

108.007	001	Residue, Volatile	EPA 160.4 (1971)
108.009	001	Turbidity	EPA 180.1 (1993 Rev. 2.0)
108.013	001	Calcium	EPA 200.7 (1994 Rev. 4.4)
108.013	002	Magnesium	EPA 200.7 (1994 Rev. 4.4)
108.013	003	Phosphorus,Total	EPA 200.7 (1994 Rev. 4.4)
108.013	004	Potassium	EPA 200.7 (1994 Rev. 4.4)
108.013	005	Silica, Dissolved	EPA 200.7 (1994 Rev. 4.4)
108.013	006	Sodium	EPA 200.7 (1994 Rev. 4.4)
108.015	001	Calcium	EPA 200.8 (1994 Rev. 5.4)
108.015	002	Magnesium	EPA 200.8 (1994 Rev. 5.4)
108.015	003	Potassium	EPA 200.8 (1994 Rev. 5.4)
108.015	005	Sodium	EPA 200.8 (1994 Rev. 5.4)
108.017	001	Bromide	EPA 300.0 (1993 Rev. 2.1)
108.017	002	Chloride	EPA 300.0 (1993 Rev. 2.1)
108.017	003	Fluoride	EPA 300.0 (1993 Rev. 2.1)
108.017	004	Nitrate (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	005	Nitrate-Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	006	Nitrite (as N)	EPA 300.0 (1993 Rev. 2.1)
108.017	008	Sulfate (as SO4)	EPA 300.0 (1993 Rev. 2.1)
108.019	001	Bromide	EPA 300.1 (1997 Rev.1.0)
108.023	001	Cyanide, Total	EPA 335.4 (1993 Rev. 1.0)
108.025	001	Ammonia (as N)	EPA 350.1 (1993 Rev. 2.0)
108.029	001	Kjeldahl Nitrogen,Total (as N)	EPA 351.2 (1993 Rev. 2.0)
108.033	001	Nitrate-Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.033	002	Nitrite (as N)	EPA 353.2 (1993 Rev. 2.0)
108.035	001	Phosphate,Ortho (as P)	EPA 365.1 (1993 Rev. 2.0)
108.035	002	Phosphorus,Total	EPA 365.1 (1993 Rev. 2.0)
108.037	001	Phosphate,Ortho (as P)	EPA 365.3 (1978)
108.037	002	Phosphorus,Total	EPA 365.3 (1978)
108.045	001	Chemical Oxygen Demand	EPA 410.4 (1993 Rev. 2.0)
108.049	001	Phenols, Total	EPA 420.4 (1993 Rev. 2.0)
108.053	002	Oil & Grease Total	EPA 1664 B
108.055	001	Color	SM 2120 B-2011
108.063	001	Alkalinity	SM 2320 B-2011
108.069	001	Specific Conductance	SM 2510 B-2011

108.071	001	Residue, Total	SM 2540 B-2011
108.073	001	Residue, Filterable TDS	SM 2540 C-2011
108.075	001	Residue, Non-filterable TSS	SM 2540 D-2011
108.077	001	Residue, Volatile	SM 2540 E-2011
108.079	001	Residue, Settleable	SM 2540 F-2011
108.080	001	Temperature	SM 2550 B-2010
108.114	001	Chlorine, Total Residual	SM 4500-Cl G-2011
108.114	002	Chlorine, Free	SM 4500-Cl G-2011
108.129	001	Cyanide, Available	SM 4500-CN G-2011
108.137	001	Hydrogen Ion (pH)	SM 4500-H+ B-2011
108.173	001	Oxygen, Dissolved	SM 4500-O G-2011
108.189	001	Sulfite (as SO3)	SM 4500-SO3 B-2011
108.201	001	Sulfide (as S)	SM 4500-S D-2011
108.207	001	Biochemical Oxygen Demand	SM 5210 B-2011
108.207	002	Carbonaceous BOD	SM 5210 B-2011
108.215	001	Organic Carbon-Total (TOC)	SM 5310 B-2011
108.225	001	Surfactants	SM 5540 C-2011
108.321	001	Cyanide, Total	ASTM D7511-12
108.339	001	Cyanide, Available	OIA-1677-09

Field of Testing: 109 - Metals and Trace Elements in Non-Potable Water

109.623	001	Aluminum	EPA 200.7 (1994 Rev. 4.4)
109.623	002	Antimony	EPA 200.7 (1994 Rev. 4.4)
109.623	003	Arsenic	EPA 200.7 (1994 Rev. 4.4)
109.623	004	Barium	EPA 200.7 (1994 Rev. 4.4)
109.623	005	Beryllium	EPA 200.7 (1994 Rev. 4.4)
109.623	006	Boron	EPA 200.7 (1994 Rev. 4.4)
109.623	007	Cadmium	EPA 200.7 (1994 Rev. 4.4)
109.623	008	Chromium	EPA 200.7 (1994 Rev. 4.4)
109.623	009	Cobalt	EPA 200.7 (1994 Rev. 4.4)
109.623	010	Copper	EPA 200.7 (1994 Rev. 4.4)
109.623	011	Iron	EPA 200.7 (1994 Rev. 4.4)
109.623	012	Lead	EPA 200.7 (1994 Rev. 4.4)
109.623	013	Manganese	EPA 200.7 (1994 Rev. 4.4)
109.623	014	Molybdenum	EPA 200.7 (1994 Rev. 4.4)
109.623	015	Nickel	EPA 200.7 (1994 Rev. 4.4)
109.623	016	Selenium	EPA 200.7 (1994 Rev. 4.4)
109.623	017	Silver	EPA 200.7 (1994 Rev. 4.4)
109.623	018	Thallium	EPA 200.7 (1994 Rev. 4.4)
109.623	019	Tin	EPA 200.7 (1994 Rev. 4.4)
109.623	020	Titanium	EPA 200.7 (1994 Rev. 4.4)
109.623	021	Vanadium	EPA 200.7 (1994 Rev. 4.4)
109.623	022	Zinc	EPA 200.7 (1994 Rev. 4.4)

109.625	001	Aluminum	EPA 200.8 (1994 Rev. 5.4)
109.625	002	Antimony	EPA 200.8 (1994 Rev. 5.4)
109.625	003	Arsenic	EPA 200.8 (1994 Rev. 5.4)
109.625	004	Barium	EPA 200.8 (1994 Rev. 5.4)
109.625	005	Beryllium	EPA 200.8 (1994 Rev. 5.4)
109.625	006	Boron	EPA 200.8 (1994 Rev. 5.4)
109.625	007	Cadmium	EPA 200.8 (1994 Rev. 5.4)
109.625	008	Chromium	EPA 200.8 (1994 Rev. 5.4)
109.625	009	Cobalt	EPA 200.8 (1994 Rev. 5.4)
109.625	010	Copper	EPA 200.8 (1994 Rev. 5.4)
109.625	012	Iron	EPA 200.8 (1994 Rev. 5.4)
109.625	013	Lead	EPA 200.8 (1994 Rev. 5.4)
109.625	014	Manganese	EPA 200.8 (1994 Rev. 5.4)
109.625	015	Molybdenum	EPA 200.8 (1994 Rev. 5.4)
109.625	016	Nickel	EPA 200.8 (1994 Rev. 5.4)
109.625	017	Selenium	EPA 200.8 (1994 Rev. 5.4)
109.625	018	Silver	EPA 200.8 (1994 Rev. 5.4)
109.625	019	Thallium	EPA 200.8 (1994 Rev. 5.4)
109.625	020	Tin	EPA 200.8 (1994 Rev. 5.4)
109.625	021	Titanium	EPA 200.8 (1994 Rev. 5.4)
109.625	022	Vanadium	EPA 200.8 (1994 Rev. 5.4)
109.625	023	Zinc	EPA 200.8 (1994 Rev. 5.4)
109.629	001	Chromium (VI)	EPA 218.6 (1994 Rev. 3.3)
109.635	001	Mercury	EPA 245.1 (1994 Rev. 3.0)
109.657	001	Mercury	EPA 1631 E (2002)

Field of Testing: 110 - Volatile Organic Constituents in Non-Potable Water

110.040	001	Acetone	EPA 624.1
110.040	002	Acetonitrile	EPA 624.1
110.040	003	Acrolein	EPA 624.1
110.040	004	Acrylonitrile	EPA 624.1
110.040	005	Benzene	EPA 624.1
110.040	006	Bromodichloromethane	EPA 624.1
110.040	007	Bromoform	EPA 624.1
110.040	008	Bromomethane (Methyl Bromide)	EPA 624.1
110.040	009	tert-Butyl Alcohol (TBA)	EPA 624.1
110.040	010	Carbon Tetrachloride	EPA 624.1
110.040	011	Chlorobenzene	EPA 624.1
110.040	012	Chloroethane	EPA 624.1
110.040	013	2-Chloroethylvinyl Ether	EPA 624.1
110.040	014	Chloroform	EPA 624.1
110.040	015	Chloromethane (Methyl Chloride)	EPA 624.1
110.040	016	Dibromochloromethane (Chlorodibromomethane)	EPA 624.1

110.040	017	1,2-Dichlorobenzene	EPA 624.1
110.040	018	1,3-Dichlorobenzene	EPA 624.1
110.040	019	1,4-Dichlorobenzene	EPA 624.1
110.040	020	1,1-Dichloroethane	EPA 624.1
110.040	021	1,2-Dichloroethane	EPA 624.1
110.040	022	1,1-Dichloroethylene (1,1-Dichloroethene)	EPA 624.1
110.040	023	trans-1,2-Dichloroethylene (trans- 1,2 Dichloroethene)	EPA 624.1
110.040	024	1,2-Dichloropropane	EPA 624.1
110.040	025	cis-1,3-Dichloropropylene (cis 1,3 Dichloropropene)	EPA 624.1
110.040	026	trans-1,3-Dichloropropylene (trans-1,3 Dichloroprope	EPA 624.1
110.040	029	Ethylbenzene	EPA 624.1
110.040	031	Methylene Chloride (Dichloromethane)	EPA 624.1
110.040	032	4-Methyl-2-pentanone (MIBK)	EPA 624.1
110.040	034	1,1,2,2-Tetrachloroethane	EPA 624.1
110.040	035	Tetrachloroethylene (Tetrachloroethene)	EPA 624.1
110.040	037	Toluene	EPA 624.1
110.040	038	1,1,1-Trichloroethane	EPA 624.1
110.040	039	1,1,2-Trichloroethane	EPA 624.1
110.040	040	Trichloroethylene (Trichloroethene)	EPA 624.1
110.040	041	Vinyl Chloride	EPA 624.1
110.040	042	m-Xylene	EPA 624.1
110.040	043	o-Xylene	EPA 624.1
110.040	044	p-Xylene	EPA 624.1
110.040	045	Trichlorofluoromethane	EPA 624.1
110.070	002	n-Amyl Acetate	EPA 1666
110.070	004	n-Butyl Acetate	EPA 1666
110.070	005	tert-Butyl Alcohol (TBA)	EPA 1666
110.070	006	Diethylamine	EPA 1666
110.070	007	Dimethyl Sulfoxide	EPA 1666
110.070	009	Ethyl Acetate	EPA 1666
110.070	010	n-Heptane	EPA 1666
110.070	011	n-Hexane	EPA 1666
110.070	012	Isobutyraldehyde	EPA 1666
110.070	013	Isopropyl Acetate	EPA 1666
110.070	014	Isopropyl Alcohol (Isopropanol)	EPA 1666
110.070	015	Isopropyl Ether (DIPE)	EPA 1666
110.070	017	2-Methoxyethanol	EPA 1666
110.070	018	Methyl Formate	EPA 1666
110.070	019	4-Methyl-2-pentanone (MIBK)	EPA 1666
110.070	021	Tetrahydrofuran	EPA 1666
110.070	022	Triethylamine	EPA 1666
110.070	023	m-Xylene	EPA 1666

110.070	024	o-Xylene	EPA 1666
110.070	025	p-Xylene	EPA 1666

Field of Testing: 111 - Semi-volatile Organic Constituents in Non-Potable Water

111.055	001	Aldrin	EPA 608.3
111.055	002	alpha-BHC	EPA 608.3
111.055	003	beta-BHC	EPA 608.3
111.055	004	delta-BHC	EPA 608.3
111.055	005	gamma-BHC (Lindane)	EPA 608.3
111.055	006	Chlordane	EPA 608.3
111.055	007	4,4'-DDD	EPA 608.3
111.055	008	4,4'-DDE	EPA 608.3
111.055	009	4,4'-DDT	EPA 608.3
111.055	010	Dieldrin	EPA 608.3
111.055	011	Endosulfan I	EPA 608.3
111.055	012	Endosulfan II	EPA 608.3
111.055	013	Endosulfan Sulfate	EPA 608.3
111.055	014	Endrin	EPA 608.3
111.055	015	Endrin Aldehyde	EPA 608.3
111.055	016	Heptachlor	EPA 608.3
111.055	017	Heptachlor Epoxide	EPA 608.3
111.055	019	PCB-1016	EPA 608.3
111.055	020	PCB-1221	EPA 608.3
111.055	021	PCB-1232	EPA 608.3
111.055	022	PCB-1242	EPA 608.3
111.055	023	PCB-1248	EPA 608.3
111.055	024	PCB-1254	EPA 608.3
111.055	025	PCB-1260	EPA 608.3
111.055	046	Methoxychlor	EPA 608.3
111.055	050	Pentachloronitrobenzene (PCNB)	EPA 608.3
111.055	060	Toxaphene	EPA 608.3
111.160	001	Acenaphthene	EPA 625.1
111.160	002	Acenaphthylene	EPA 625.1
111.160	003	Anthracene	EPA 625.1
111.160	004	Benzidine	EPA 625.1
111.160	005	Benzo(a)anthracene	EPA 625.1
111.160	006	Benzo(a)pyrene	EPA 625.1
111.160	007	Benzo(b)fluoranthene	EPA 625.1
111.160	008	Benzo(g,h,i)perylene	EPA 625.1
111.160	009	Benzo(k)fluoranthene	EPA 625.1
111.160	010	Bis(2-chloroethoxy) Methane	EPA 625.1
111.160	011	Bis(2-chloroethyl) Ether	EPA 625.1
111.160	012	Bis(2-chloroisopropyl) Ether	EPA 625.1

111.160	013	Bis(2-ethylhexyl)phthalate	EPA 625.1
111.160	014	4-Bromophenyl Phenyl Ether	EPA 625.1
111.160	015	Butyl Benzyl Phthalate	EPA 625.1
111.160	016	2-Chloronaphthalene	EPA 625.1
111.160	017	4-Chlorophenyl Phenyl Ether	EPA 625.1
111.160	018	Chrysene	EPA 625.1
111.160	019	Dibenz(a,h)anthracene	EPA 625.1
111.160	020	3,3'-Dichlorobenzidine	EPA 625.1
111.160	021	Diethyl Phthalate	EPA 625.1
111.160	022	Dimethyl Phthalate	EPA 625.1
111.160	023	Di-n-butyl Phthalate	EPA 625.1
111.160	024	2,4-Dinitrotoluene	EPA 625.1
111.160	025	2,6-Dinitrotoluene	EPA 625.1
111.160	026	Di-n-octyl Phthalate	EPA 625.1
111.160	027	Fluoranthene	EPA 625.1
111.160	028	Fluorene	EPA 625.1
111.160	029	Hexachlorobenzene	EPA 625.1
111.160	030	Hexachlorobutadiene	EPA 625.1
111.160	031	Hexachloroethane	EPA 625.1
111.160	032	Indeno(1,2,3-c,d)pyrene	EPA 625.1
111.160	033	Isophorone	EPA 625.1
111.160	034	Naphthalene	EPA 625.1
111.160	035	Nitrobenzene	EPA 625.1
111.160	036	N-nitrosodi-n-propylamine	EPA 625.1
111.160	037	Phenanthrene	EPA 625.1
111.160	038	Pyrene	EPA 625.1
111.160	039	1,2,4-Trichlorobenzene	EPA 625.1
111.160	040	4-Chloro-3-methylphenol	EPA 625.1
111.160	041	2-Chlorophenol	EPA 625.1
111.160	042	2,4-Dichlorophenol	EPA 625.1
111.160	043	2,4-Dimethylphenol	EPA 625.1
111.160	044	2,4-Dinitrophenol	EPA 625.1
111.160	045	2-Methyl-4,6-dinitrophenol	EPA 625.1
111.160	046	2-Nitrophenol	EPA 625.1
111.160	047	4-Nitrophenol	EPA 625.1
111.160	048	Pentachlorophenol	EPA 625.1
111.160	049	Phenol	EPA 625.1
111.160	050	2,4,6-Trichlorophenol	EPA 625.1
111.210	006	Diuron	EPA 632
111.260	041	N-nitrosodimethylamine	EPA 1625 B
111.260	042	N-nitrosodi-n-propylamine	EPA 1625 B
111.260	043	N-nitrosodiphenylamine	EPA 1625 B

111.345	001	N-Ethylperfluorooctane Sulfonamido Acetic Acid (NEt	DoD QSM Version 5.1 (or newer)
111.345	002	4:2 Fluorotelomer Sulfonic Acid (4:2 FTS)	DoD QSM Version 5.1 (or newer)
111.345	003	6:2 Fluorotelomer Sulfonic Acid (6:2 FTS)	DoD QSM Version 5.1 (or newer)
111.345	004	8:2 Fluorotelomer Sulfonic Acid (8:2 FTS)	DoD QSM Version 5.1 (or newer)
111.345	005	N-Methylperfluorooctane Sulfonamido Acetic Acid (N	DoD QSM Version 5.1 (or newer)
111.345	006	Perfluorobutanoic Acid (PFBA)	DoD QSM Version 5.1 (or newer)
111.345	007	Perfluorobutane Sulfonic Acid (PFBS)	DoD QSM Version 5.1 (or newer)
111.345	008	Perfluorodecanoic Acid (PFDA)	DoD QSM Version 5.1 (or newer)
111.345	009	Perfluorododecanoic Acid (PFDoA)	DoD QSM Version 5.1 (or newer)
111.345	010	Perfluorodecane Sulfonic Acid (PFDS)	DoD QSM Version 5.1 (or newer)
111.345	011	Perfluoroheptanoic Acid (PFHpA)	DoD QSM Version 5.1 (or newer)
111.345	012	Perfluoroheptane Sulfonic Acid (PFHpS)	DoD QSM Version 5.1 (or newer)
111.345	013	Perfluorohexane Sulfonic Acid (PFHxS)	DoD QSM Version 5.1 (or newer)
111.345	014	Perfluorohexanoic Acid (PFHxA)	DoD QSM Version 5.1 (or newer)
111.345	015	Perfluorononanoic Acid (PFNA)	DoD QSM Version 5.1 (or newer)
111.345	016	Perfluorooctanoic Acid (PFOA)	DoD QSM Version 5.1 (or newer)
111.345	017	Perfluorooctane Sulfonic Acid (PFOS)	DoD QSM Version 5.1 (or newer)
111.345	018	Perfluorooctane Sulfonamide (PFOSAm)	DoD QSM Version 5.1 (or newer)
111.345	019	Perfluoropentanoic Acid (PFPeA)	DoD QSM Version 5.1 (or newer)
111.345	020	Perfluoropentane Sulfonic Acid (PFPeS)	DoD QSM Version 5.1 (or newer)
111.345	021	Perfluorotetradecanoic Acid (PFTA)	DoD QSM Version 5.1 (or newer)
111.345	022	Perfluorotridecanoic Acid (PFTrDA)	DoD QSM Version 5.1 (or newer)
111.345	023	Perfluoroundecanoic Acid (PFUnDA)	DoD QSM Version 5.1 (or newer)
111.345	024	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)
111.345	025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	DoD QSM Version 5.1 (or newer)
111.345	026	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	DoD QSM Version 5.1 (or newer)
111.345	027	N-Ethylperfluorooctane Sulfonamide (EtFOSAm)	DoD QSM Version 5.1 (or newer)
111.345	028	N-Ethylperfluorooctane Sulfonamido Ethanol (EtFOS	DoD QSM Version 5.1 (or newer)
111.345	030	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	DoD QSM Version 5.1 (or newer)
111.345	031	N-Methylperfluorooctane Sulfonamide (MeFOSAm)	DoD QSM Version 5.1 (or newer)
111.345	032	N-Methylperfluorooctane Sulfonamido Ethanol (MeF	DoD QSM Version 5.1 (or newer)
111.345	034	Perfluorononane Sulfonic Acid (PFNS)	DoD QSM Version 5.1 (or newer)

Field of Testing: 112 - Radionuclides in Non-Potable Water

112.001	001	Gross Alpha	EPA 900.0
112.001	002	Gross Beta	EPA 900.0

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010 B
114.010	002	Arsenic	EPA 6010 B
114.010	003	Barium	EPA 6010 B
114.010	004	Beryllium	EPA 6010 B
114.010	005	Cadmium	EPA 6010 B
114.010	006	Chromium	EPA 6010 B

114.010	007	Cobalt	EPA 6010 B
114.010	008	Copper	EPA 6010 B
114.010	009	Lead	EPA 6010 B
114.010	010	Molybdenum	EPA 6010 B
114.010	011	Nickel	EPA 6010 B
114.010	012	Selenium	EPA 6010 B
114.010	013	Silver	EPA 6010 B
114.010	014	Thallium	EPA 6010 B
114.010	015	Vanadium	EPA 6010 B
114.010	016	Zinc	EPA 6010 B
114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020
114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.106	001	Chromium (VI)	EPA 7199
114.140	001	Mercury	EPA 7470 A
114.141	001	Mercury	EPA 7471 A
114.222	001	Cyanide, Total	EPA 9014
114.240	001	Corrosivity - pH Determination	EPA 9040 B
114.241	001	Corrosivity - pH Determination	EPA 9045 C
114.250	001	Fluoride	EPA 9056

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
115.021	001	TCLP Inorganics	EPA 1311
115.022	001	TCLP Extractables	EPA 1311
115.023	001	TCLP Volatiles	EPA 1311
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.020	030	Nonhalogenated Volatiles	EPA 8015 B

116.020	031	Ethanol and Methanol	EPA 8015 B
116.080	000	Volatile Organic Compounds	EPA 8260 B
116.090	000	Acrylamide, Acrylonitrile, Acrolein	EPA 8316
116.100	001	Total Petroleum Hydrocarbons - Gasoline (GRO)	LUFT GC/MS

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel-range Total Petroleum Hydrocarbons	EPA 8015 B
117.110	000	Extractable Organics	EPA 8270 C
117.111	071	Pesticides	EPA 8270 C
117.150	000	Carbonyl Compounds	EPA 8315 A
117.171	000	Nitroaromatics and Nitramines	EPA 8330 A
117.210	000	Organochlorine Pesticides	EPA 8081 A
117.220	000	PCBs	EPA 8082
117.240	000	Organophosphorus Pesticides	EPA 8141 A
117.250	000	Chlorinated Herbicides	EPA 8151 A
117.270	000	Carbamates, N-methylcarbamates	EPA 8318
117.280	000	Carbamates	EPA 8321 A

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.070	001	Corrosivity - pH Determination	EPA 9040 B
120.080	001	Corrosivity - pH Determination	EPA 9045 C

Field of Testing: 126 - Microbiological Methods for Ambient Water

126.003	001	Total Coliform (Enumeration)	SM 9221 B,C-2006
126.003	002	Fecal Coliform (Enumeration)	SM 9221 C,E-2006
126.007	001	E. coli (Enumeration)	SM 9223 B-2004
126.015	001	E. coli (Enumeration)	Colilert
126.017	001	E. coli (Enumeration)	Colilert 18
126.019	001	Enterococci	Enterolert