Storm Water Pollution Prevention Plan

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA

July 2025

Environmental Support Services Contract
80ARC020F0036
Storm Water Pollution Prevention Plan

Prepared for:
Environmental Management Division
NASA Ames Research Center
M/S 204-15
Building N204, Room 102B
Moffett Field, CA 94035-0001

July 2025

BB&E
CONSULTING ENGINEERS
& PROFESSIONALS

Executive Summary

The NASA ARC SWPPP (CDRL 06-064) was developed for implementation to meet compliance objectives in accordance with Title 40, Code of Federal Regulations, Parts 122, 123, and 124 and the California State Water Resource Control Board Industrial General Permit (IGP).

This SWPPP has two major objectives:

1. Identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of a facility's storm water discharges and authorized non-storm water discharges.
2. Identify, describe, and implement required site-specific BMPs to reduce or prevent pollutants associated with industrial activities in storm water discharges and authorized non-storm water discharges. BMPs are required and shall be selected to achieve Best Available Technology/Best Control Technology (BAT/BCT) and compliance with water quality standards.

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 ensure 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."

_____	Jeanne Sabin
Authorized Signature	Print Name
July 15, 2025	Water Compliance Program Manager
Date	Title

Table of Contents

APPENDICES ..... **III**

LIST OF ACRONYMS ..... **IV**

EXECUTIVE SUMMARY **1**

INTRODUCTION **2**

1.0 FACILITY DESCRIPTION AND CONTACT INFORMATION **4**

1.1 Facility Information **4**

1.2 Contact Information/Responsible Parties **4**

1.3 General Location Map **5**

1.4 Site Maps **6**

1.5 Storm Water Pollution Prevention Team **6**

2.0 FACILITY ASSESSMENT **7**

2.1 Facility Description **7**

2.1.1 Storm Water Drainage System 8

2.2 Industrial Activities, Materials Inventory, and Associated Pollutants **9**

2.2.1 Level 1 Status 10

2.2.2 Industrial Activities 10

2.2.3 Materials Inventory 10

2.2.4 Associated Pollutants 11

2.3 Significant Spills and Leaks **13**

2.3.1 Non-storm Water Discharges 13

2.3.2 Authorized Non-storm Water Discharges 13

2.3.3 Illicit Connections 15

2.3.4 Soil Erosion 15

3.0 BMP IDENTIFICATION **15**

3.1 Minimum BMPs **16**

3.2 Advanced BMPs **16**

3.3 Site-Specific BMPs **16**

3.4 BMP Implementation **17**

3.4.1 BMP Updates Identified by ERA Evaluation 17

3.4.2 Employee Training Program 18

3.4.3 Quality Assurance and Recordkeeping 18

4.0 EVALUATION AND MONITORING PROGRAM **19**

4.1 Sampling Plan **19**

4.1.1 Locations 19

4.1.2 Laboratory Analysis 19

4.1.3 Field Instrument Calibration 21

4.2 Exceedance Response Actions (ERAs) **21**

4.3 Annual Comprehensive Site Compliance Evaluation (ACSCE) **22**

4.2.1 Evaluation of BMPs 22

4.2.2 Review and Revise SWPPP....22
5.0 SMALL MS4 PERMIT REQUIREMENTS....23
5.1 Employee Education and Outreach on Storm Water Impacts....23
5.2 Illicit Discharge Detection and Elimination....23
5.3 Construction Site Storm Water Runoff Control....24
5.4 Post Construction Storm Water Management in New Development and Redevelopment....24
5.5 Pollution Prevention/Good Housekeeping for Municipal Operations....27

APPENDICES

Appendix A Designation of Duly Authorized Representative
Appendix B Site Maps
Figure 2 Storm Distribution
Figure 3 Storm Water Drainage and Discharge Areas
Figure 4 Impervious Areas
Figure 5 Areas of Industrial Activities
Figure 6 Significant Spills and Leaks
Figure 7 Utility Vault Dewatering Delimited Zone
Appendix C NASA Ames Research Center Required Best Management Practices (BMPs)
Table A Summary of Moffett Field Industrial Activities and BMPs
Appendix D Locations of Industrial Activities
Appendix E Hangar 1 Summary Report
Appendix F Table B: List of Significant Spills or Leaks
Appendix G Example of Chain of Custody Form
Appendix H Storm Water Level 1 Exceedance Response Action (ERA) Evaluation for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year
Appendix I Storm Water Level 1 Exceedance Response Action (ERA) Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

LIST OF ACRONYMS

ACSCE	Annual Comprehensive Site Compliance Evaluation
AFFF	Aqueous Film Forming Foam
APR	Ames Procedural Requirement
ARC	Ames Research Center
ASAP	Ames Safety Accountability Program
BAT/BCT	Best Available Technology/Best Control Technology
BMP	Best Management Practice
CAANG	California Air National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGP	Construction General Permit
COC	Chain of Custody
CWA	Clean Water Act
DFSP	Defense Fuel Support Point
DoN	Department of the Navy
EATS	Eastside Aquifer Treatment System
EDM	Eastern Diked Marsh
EIS	Environmental Impact Statement
EMD	Environmental Management Division
EPA	Environmental Protection Agency
ERA	Exceedance Response Action
FEMA	Federal Emergency Management Agency
gpm	gallons per minute
GWTS	Groundwater Treatment System
IGP	Industrial General Permit
IRP	Installation Restoration Program
LRP	Legally Responsible Person
MEP	maximum extent practicable
MEW	Middlefield-Ellis-Whisman
MIMP	Mitigation Implementation and Monitoring Plan
MS4	Municipal Separate Storm Sewer System
NADP	NASA Ames Development Plan
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRP	NASA Research Park

NSWD	Non-Storm Water Discharges
PCBs	Polychlorinated biphenyls
PV	Planetary Ventures
QISP	Qualified Industrial Stormwater Practitioner
QSD	Qualified Storm Water Pollution Prevention Plan Developer
QSE	Qualifying Storm Event
RGRP	Regional Groundwater Remediation Program
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
RY	Reporting Year
SMARTS	Storm Water Multiple Application and Report Tracking System
SPCC	Spill Prevention, Control, and Countermeasures
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWRP	Storm Water Retention Pond
SWSB	Storm Water Settling Basin
TOC	Total Organic Carbon
TOG	Total Oil & Grease
USFWS	United States Fish and Wildlife Service
VOCs	Volatile Organic Compounds
WATS	Westside Aquifer Treatment System
WDRs	Waste Discharge Requirements

Storm Water Pollution Prevention Plan (SWPPP)

Executive Summary

The discharge of storm water from National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) is regulated by four permits issued by the State Water Resources Control Board (SWRCB) under the National Pollutant Discharge Elimination System (NPDES):

- NPDES No. CAS000001: General Permit for Storm Water Discharges Associated with Industrial Activities, Industrial General Permit Order 2014-0057-DWQ as amended in 2015 and 2018. On November 6, 2018, the State Water Board amended the Industrial General Permit Order 2014-0057-DWQ, Order 2015-0122-DWQ, and Order 2018-0028-DWQ. In accordance with this permit, a SWPPP has been established and is reviewed annually, or more frequently as needed. In addition to regular updates to the SWPPP, an annual report is submitted to the San Francisco Bay Regional Water Quality Control Board (RWQCB) as required by the IGP.
- NPDES No. CAS000004: General Permit for Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Order 2013-0001-DWQ as amended by Order WQ 2015-0133-EXEC, Order WQ 2016-0069-EXEC, WQ Order 2017-0031-DWQ, Order WQ 2018-0001-EXEC, and Order WQ 2018-0007-EXEC, effective January 24, 2018. The ARC SWPPP is an equivalent document as described in Section F.4 of Order WQ 2018-0007-EXEC and therefore is not implementing a separate MS4 program.
- NPDES General Permit No. CAS000002: State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, adopted by the State Water Resources Control Board adopted the 2022 Construction Stormwater General Permit, Order 2022-0057-DWQ, on September 8, 2022, and it went into effect on September 1, 2023.
- NPDES No. CAG912002: California Regional Water Quality Control Board San Francisco Bay Region General Waste Discharge Requirements for Discharge or Reclamation of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Volatile Organic Compounds (VOC), Fuel Leaks, Fuel Additives, and Other Related Wastes (VOC and Fuel General Permit), became effective on January 1, 2019. NPDES No. CAG912002 (amendment Order No. R2-2018-0050) applies to the ARC Remedial Groundwater Remediation Program (RGRP) at the Westside Aquifer Treatment System (WATS).

Each NPDES permit requires the development and implementation of BMPs designed to reduce the discharge of pollutants to the maximum extent practicable (MEP). As part of the aforementioned General Permits, NASA ARC must abide by any standards and requirements established by Santa Clara County and the San Francisco Bay RWQCB. Santa Clara County is a member of the Santa Clara Valley Urban Runoff Pollution Prevention Program and incorporates their recommendations into the County's Parameter Benchmark Values. The San Francisco Bay RWQCB establishes and defines its requirements through the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan).

In April 2015, Planetary Ventures (PV) entered into a 60-year land lease agreement with NASA. Included in the lease was a portion of the land to be used for parking and maintaining a fleet of commuter buses for PV employees. Roughly 320 large commuter buses are parked in a paved lot located between Hangar 3 and the Golf Club at Moffett Field on the east side of ARC. Industrial operations in this area are dissimilar to other industrial operations at ARC, and PV filed a Notice of Intent (NOI) for their Planetary Ventures Bus Parking Facility (depicted on Figure 3) which covers activities performed within the bus operations area. Therefore, the Planetary Ventures Bus Parking Facility is not directly covered under ARC's SWPPP. However, discharge from the Planetary Ventures Bus Parking Facility enters ARC's stormwater system and is at that point covered under ARC's SWPPP.

Introduction

The NASA ARC SWPPP has been developed and implemented to comply with the requirements of Title 40, Code of Federal Regulations, Parts 122, 123, and 124 and the requirements of the IGP.

This SWPPP has two major objectives:

1. Identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of a facility's storm water discharges and authorized non-storm water discharges; and
2. Identify, describe, and implement required site-specific BMPs to reduce or prevent pollutants associated with industrial activities in storm water discharges and authorized non-storm water discharges. BMPs are required and shall be selected to achieve Best Available Technology/Best Control Technology (BAT/BCT) and compliance with water quality standards.

NASA endeavors to eliminate pollutants from storm water discharges at ARC. This SWPPP was developed and implemented in accordance with the Federal Water Pollution Control Act, also known as the Federal Clean Water Act (CWA) to achieve this goal.

Under the CWA's authorization, the California SWRCB has elected to issue a statewide Industrial General Permit (IGP) that applies to all storm water discharges associated with industrial activities that require a permit, with the exception of discharges related to construction activities. Separate general permit(s) are issued for discharges associated with construction activities that encompass more than one (1) acre of land disturbance. The IGP authorizes the discharge of industrial storm water and prohibits non-storm water discharges unless authorized by a NPDES permit, with the exception of certain authorized non-storm water discharges.

The IGP requires the development and implementation of a SWPPP that places an emphasis on BMPs that reduce or prevent pollutants in both storm water discharges and authorized non-storm water discharges. Each pollutant and its source may require one or more BMPs. BMPs may include a variety of pollution prevention measures and pollution control devices. ARC has incorporated the seven (7) Minimum BMPs required by the IGP, five (5) Advanced BMPs, and 25 Site-Specific BMPs (Appendix C). ARC generates potential storm water pollutants through multiple ongoing industrial activities. The industrial activities at ARC are primarily associated with research and development in aeronautics and space science technologies, aircraft operations, and site-wide

property maintenance. Each area of industrial activity is evaluated annually and assigned the appropriate BMPs for the industrial activities being performed in each location.

On February 5, 2013, the SWRCB adopted a statewide general permit for Small MS4s, requiring NPDES permits for storm water discharged from non-traditional MS4s: storm water systems serving public campuses (including universities, community colleges, primary schools and other publicly owned learning institutions with campuses), military bases and prison and hospital complexes within or adjacent to other regulated MS4s; and from construction sites disturbing between one and five acres of land. According to Sections F.3 and F.4 of Order WQ 2018-EXEC, adopted January 24, 2018: "Permittees may incorporate the required storm water provisions into already existing programs and leverage existing staff to implement BMPs during its day to day business and operations" (Section F.3); and "A Permittee may utilize an equivalent or existing document such as a standard Operations and Procedures manual, Operation and Maintenance Plan, or Spill Response Plan if that document includes the necessary information required to comply with the provisions of this section" (Section F.4). Although ARC is a Non-Traditional Small MS4 Permittee, this SWPP is implemented across the entire ARC property (other than equivalently permitted tenant operations) and is implemented as an equivalent document as described in Section F.4. Section 5.0 of this SWPPP provides a detailed discussion of the NPDES MS4 General Permit, and of ARC's responsibilities under it.

During the 2023-2024 reporting year (RY), ARC exceeded the NAL for Nitrate + Nitrite (as N) (N+N as N), thereby elevating ARC to Level 1 status for that parameter, effective July 1, 2024. In response, Marcia Christlieb (ERT, Inc.), QISP # 00620, conducted a Level 1 ERA Evaluation between August 6-September 27, 2024 (Attachment E). Section 4.2 of this SWPPP presents further discussion of ARC's status.

1.0 Facility Description and Contact Information

1.1 Facility Information

Name of Facility: NASA Ames Research Center
Street: Environmental Management Division
MS 204-15, Building 204, Room 102
City: Moffett Field **State:** California
ZIP Code: 94035-0001 **County:** Santa Clara
Facility WDID Number: 2 43I011003
SIC Code: 3728-Aircraft Parts and Auxiliary Equipment, NEC
Estimated area of industrial activity at site exposed to storm water: 942 acres
Latitude: 37.413154 **Longitude:** -122.061282

1.2 Contact Information/Responsible Parties

Facility Owner/Operator
Name: NASA Ames Research Center
Address: Moffett Field, California
Mailing Address: MS 204-15, Building 204, Room 102
City: Moffett Field **State:** CA **ZIP Code:** 94035-0001

Primary Legally Responsible Person (LRP)
Name: Jeanne Sabin
Water Compliance Program Manager
Telephone Number: (650) 604-1800
Email Address: Jeanne.m.sabin@nasa.gov
Fax Number: (650) 604-7572

Secondary Legally Responsible Person (LRP)
Name: Garrett Michael Turner
Restoration Program Manager
Telephone Number: (650) 604-1406
Email Address: garrett.michael.turner@nasa.gov
Fax Number: (650) 604-7572

CWA regulations require the facility director to sign CWA permits and, if desired, to designate in writing a Legally Responsible Person (LRP) to sign CWA-related documents. The ARC Director, Dr. Eugene Tu, has authorized both Jeanne Sabin, Water Compliance Program Manager; and Garrett Michael Turner, Restoration Program Manager as his Duly Authorized Representatives for purposes of signing reports submitted to State permit programs under the CWA (Appendix A).

1.3 General Location Map

1.4 Site Maps

The following Site Maps are presented in Appendix B:

- Figure 2-Storm Distribution: shows the location of the storm water collection and conveyance system; including any structural control measures that affect storm water discharges. The map also identifies municipal storm drain inlets where the facility's storm water discharges and authorized non-storm water discharges may be received.
- Figure 3-Storm Water Drainage and Discharge Areas: shows the facility boundaries; the outline of all storm water drainage areas within the facility boundaries; sample collection and observation locations, associated points of discharge; portions of the drainage area impacted by run-on from surrounding areas; direction of flow of each drainage area, on-site and nearby surface water bodies, the locations of the Caltrans Culverts; and the location of the Settling Basin.
- Figure 4-Impervious Areas: shows the outline of all impervious areas, including paved areas, buildings, covered storage areas, or other roofed structures.
- Figure 5-Areas of Industrial Activities: shows the locations where materials are directly exposed to precipitation.
- Figure 6-Significant Spills or Leaks: shows the locations where significant spills or leaks identified in Section 2.3 have occurred.
- Figure 7-Utility Vault Dewatering Delimited Zone: depicts the boundary of the A1 aquifer where the concentrations of contaminates in the groundwater are above water quality criteria for the protection of aquatic life. Water removed from utility vaults within the delimited zone must be containerized and characterized to determine the appropriate wastewater disposal method. Refer to the Utility Vault Dewatering BMP for additional information.

1.5 Storm Water Pollution Prevention Team

Personnel specifically responsible for the SWPPP at ARC are associated with the Environmental Management Division (EMD), Code JQ. These personnel are listed below.

Staff	Title	Phone	Responsibilities
Antonette Doherty	EMD Division Chief	(575) 202-5406	Oversees the SWPPP Program Ensures that affected personnel receive necessary training.
Jeanne Sabin	EMD Water Programs Manager Code JQ	(650) 604-1800	Acts as the Legally Responsible Person. Ensures that affected personnel receive necessary training. Oversees the development and implementation of the SWPPP.
Garrett Turner	EMD Restoration Program Manager QSD/QSP, QISP, Code JQ	(650) 604-1406	Acts as the backup Legally Responsible Person.
Marcia Christlieb	Spill Prevention Control and Countermeasures (SPCC), and SWPPP Subject Matter Expert, QISP, Code JQ, ERT	(650) 604-5360	Manages the development, implementation, and revisions to the SWPPP. Conducts storm water monthly and annual inspections and prepares Storm Water Annual Report. Oversees Monitoring Plan. Coordinates storm water sampling.

Every NASA employee is responsible for complying with environmental regulations and NASA policies related to official duties. Each NASA organizational element has responsibility for incorporating environmental policies into planning and budgeting; allocating and maintaining appropriate levels of authority and funding; assuring appropriate training; overseeing environmental process and material selection; minimizing hazardous waste; and stewardship for energy and water usage. The responsibility for environmental compliance falls on the director of each field installation, and those individuals with management and functional responsibilities. It is the responsibility of each individual in a management position to know and understand the environmental regulatory requirements applicable to their operation(s) and to ensure that sufficient resources are applied to achieve and maintain compliance with applicable federal, state, and local regulations.

The EMD, Code JQ, at ARC is responsible for amending the SWPPP whenever there is a change in design, construction, operations, or maintenance that has a significant effect on the potential for the discharge of pollutants to surface waters, ground waters, or the local agency's storm water system.

2.0 Facility Assessment

2.1 Facility Description

NASA ARC occupies approximately 421 acres of the 2,000-acre site that constitutes Moffett Federal Airfield and the NASA Research Park. Stewardship of the airfield and adjoining property was transferred to ARC in July of 1994, with the closure of the Naval Air Station (NAS) in response to the recommendation of the Defense Base Closure and Realignment Commission. Planetary Ventures assumed operations of Moffett Field, which includes both the airfield and the golf course, in April 2015. Planetary Ventures provides airfield fueling operations at Moffett Field.

ARC is located approximately one mile from the southwestern shoreline of San Francisco Bay, approximately 25 miles east of the Pacific Coast. The City of Mountain View is adjacent to the western and southern boundaries of the facility. The eastern and southern boundaries adjoin the City of Sunnyvale. Downtown San Jose is located approximately seven miles southeast and the City of San Francisco is located approximately 32 miles northwest of the site. U.S. Highway 101 passes south of the facility. ARC is bounded by Lockheed Martin to the east, Highway 101 to the south, Stevens Creek to the west, and the United States Fish and Wildlife Service (USFWS) salt ponds to the north.

The ARC Campus consists of approximately 40 technical facilities and 48 other major supporting and administrative buildings and structures. The resident staff at ARC is roughly 2,300 employees which include approximately 1,200 civil service employees (temporary and permanent assignments) and 1,100 contract and subcontract employees. The mission of ARC is to conduct research and development in the fields of nanotechnology, biotechnology, aeronautics, space science, life science, information science, and earth system science.

Pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500—1508), NASA policy and procedures (14 CFR part 1216 subpart 1216.3), NASA has prepared a programmatic Environmental Impact Statement (EIS) and

signed a Record of Decision (ROD) to implement the NASA Ames Development Plan (NADP). In the NADP, NASA proposed the development of a world-class, shared-use education, research and development campus at ARC. The shared use campus, which includes the NASA Research Park (NRP), is focused on astrobiology, life sciences, space sciences, nanotechnology, biotechnology, information technology and aeronautics. As part of the NADP, NASA officials are creating partnerships with Federal, State and local government agencies, universities, private industry and non-profit organizations in support of NASA's mission to conduct research and develop new technologies. Responsible parties will submit a NOI to obtain a separate NPDES permit for construction activities associated with the redevelopment.

2.1.1 Storm Water Drainage System

The storm water at ARC flows through a storm drainage system consisting of approximately 230 manholes, 505 catch basins, one Storm Water Settling Basin (SWSB), two storm drainage treatment systems, two water pumps, and various pipes and ditches. The westernmost storm drainage treatment system is located along Zook Road, adjacent to the VTOL Pad and the easternmost storm drainage treatment system is located on the northeast corner of the intersection of Macon Road and Marriage Road. The water pumps are located in the storm drain pumping station at Building M191, northeast of the airfield, and are designed to continuously discharge water from the North Patrol Road Ditch into the Northern Channel. The piping is made of concrete and ranges in size from 6 inches to 42 inches in diameter.

PV Bay View Campus, located west of N254 and south of the Western Diked Marsh, is designed as a zero-discharge campus and able to contain a 100-year storm. Storm water on the PV Bay View Campus collects in the black water pond, which is treated and reused throughout the campus as non-potable water. An overflow pond northwest of the blackwater pond serves as secondary containment during large storm events. The overflow pond also has an above-ground overflow north into ARC's western diked marsh if 100-year storm precipitation is exceeded.

A detailed depiction of the storm water distribution system is presented in Figure 2 (Appendix B).

Eastern Drainage System

The storm water from the southern portion of the runways and the areas around N244 and N245 flows through Manhole D170 to Building M191. For the areas east of the runways, Hangar 2, and Hangar 3, storm water flows into Macon Road Ditch, and Marriage Road Ditch, which in turn flows to North Patrol Road Ditch and into Building M191. Water from the northern portion of the runways flows to Building M191 via storm drain line No 9. The flow from Building M191 is pumped over to the Northern Channel, where it flows to the Lockheed Pumping Station before it is pumped one more time from the Lockheed Channel to the Moffett Channel, the flow then meets up with the Guadalupe Slough and eventually, the San Francisco Bay. In wet years, storm water may be pumped from North Patrol Road Ditch into the Northern Channel utilizing emergency pumps at Gate 14A and Gate 14B as flood control measures.

Approximately 11 acres of the Eastern Drainage System has been set aside for the PV Bus Parking Facility. Roughly 320 large commuter buses are parked and maintained within a paved lot located between Hangar 3 and the Golf Club at Moffett Field. PV obtained and maintains IGP coverage for activities associated with the bus parking facility. Although the parking facility is

not covered under ARC's SWPPP, the area does discharge into the ARC storm distribution system.

Western Drainage System

The storm drain main enters the ARC Campus at Bushnell Street and McCord Avenue. It then proceeds north on McCord Avenue to Hunsaker Road, collecting runoff from the central core of the developed portion of the ARC Campus. It then proceeds west along Hunsaker to a junction structure with a 38-inch by 60-inch low head PVC pipe, which passes under the High Pressure Compressed Air Storage Facility. A smaller portion of the runoff from the northwesterly area of the ARC Campus south of Hunsaker Road is collected by an 18-inch diameter main running north along DeFrance Avenue and east along Hunsaker Road to the junction structure. The western drainage system proceeds north from the High Pressure Compressed Air Storage Facility into a pair of 40-inch pipes, which discharge into the SWSB. Overflow from the SWSB spills onto the diked wetland area north of the basin, currently known as the Eastern Diked Marsh (EDM). The EDM was included in the Navy's cleanup project, which is known as Site 25. The storm water then flows overland to the Perimeter Road outfall structure. Three 48-inch storm drainpipes run beneath Perimeter Road to allow drainage of the EDM into the Storm Water Retention Pond (SWRP), where it evaporates during the dry season.

Storm water from the southwestern portion of ARC, known as the NRP, includes the WATS, Hangar 1, intern housing area, and the Wescoat Housing area. In addition, drainage from approximately 50 acres of the Highway 101 right-of-way discharges onto ARC by means of several bubble-up drainage structures and culverts. Storm water from the westernmost portion of the ARC Campus includes the Full-Scale Aerodynamics Complex, the Unitary Plan Wind Tunnel Complex, various research facilities, as well as run-on from the PG&E electrical substation that is adjacent to the western border of the ARC Campus. Storm water from these areas and the area around Hangar 1 flows into the SWSB, the SWSB discharges into the Eastern Diked Marsh, before discharging to the SWRP.

NASA Ames is currently in the planning process to develop a mixed-use housing project with approximately 3,000 housing units within the footprint of the NRP. This SWPPP will be updated to include changes to the existing MS4 footprint when they occur.

RT Jones Road, which runs north-south along the western perimeter of ARC, was recently redeveloped to accommodate an increase of traffic to the newly constructed Planetary Ventures Bay View Campus. Storm water from RT Jones Road discharges onto NASA property. The RT Jones storm water system includes a series of bio-swales and two below-ground storm drainage treatment systems along RT Jones Road, terminating at the southwest corner of the western diked marsh. Samples are collected from the access point at the terminating end of the storm distribution system as detailed in Figure 3 (Appendix B). A detailed depiction of the storm water distribution system is presented in Figure 2 (Appendix B).

2.2 Industrial Activities, Materials Inventory, and Associated Pollutants

Industrial activities at ARC are primarily associated with research and development in aeronautics and space science and technologies, aircraft operations, and site-wide property maintenance. ARC is open for regular business, Monday through Friday, between the hours of 0700 and 1630.

ARC is operated and managed in a manner that minimizes potential contact of pollutants with storm water discharge. Materials of both hazardous and non-hazardous nature are managed, stored, and disposed of in a manner that does not pose a threat to storm water quality.

2.2.1 Level 1 Status

On July 1, 2024, ARC entered Level 1 status for N+N as N. An evaluation of potential pollutant sources that may have contributed to the Numeric Action Level (NAL) exceedance of N+N as N in storm water samples collected during the 2023-2024 Reporting Year (RY) is presented as Appendix E. The Level 1 ERA Evaluation was performed to explore potential pollutant sources related to an exceedance of N+N as N, evaluate the effectiveness of existing Best Management Practices (BMPs), and assess the need to develop and implement additional BMPs to address the exceedance. Results of this evaluation and recommended actions are presented in Section 3.4.1.

2.2.2 Industrial Activities

ARC generates potential storm water pollutants through multiple ongoing industrial activities. Storm water runoff from urban and industrial areas typically contains significant quantities of the same general types of pollutants found in industrial and wastewater point source discharges and cause similar water quality problems.

Automobiles can contribute particles and fluids high in metals content: tires, brake-pad linings, and automotive fluids such as fuels, oils, antifreeze, and brake and transmission fluids. Road-surfacing materials such as asphalt and paint can also contain high concentrations of metals and petroleum.

Dusts and particulates are potentially generated through several operations at ARC. These include routine building and grounds maintenance, golf course maintenance, construction, demolition, building remodeling and excavation. All of these activities are covered by BMPs, which address sediment as a potential pollutant. The goal of these BMPs is to minimize the potential for dusts and particulates to settle on impervious surfaces that would allow them to be mobilized by storm water flow and discharged.

The ARC Research Center BMPs are presented in Appendix C, and general descriptions of the BMPs are presented in Section 3 of this SWPPP. To date, 18 areas of industrial activities with a potential for contaminating storm water have been identified at ARC. Located within the BMPs is Table A: Summary of Moffett Field Industrial Activities and BMPs, which provides a description of each industrial activity, along with a listing of the potential pollutants, and the applicable BMPs to be implemented is included in the BMPs.

2.2.3 Materials Inventory

For information on significant materials that have been properly treated, stored, or disposed of, this SWPPP will refer to the hazardous materials inventories and hazardous waste manifests files on record in the EMD, Code JQ, Building N204, as authorized by Section X.G.1.D.ii.b of the IGP. The Hazardous Materials Inventory is updated annually by NASA ARC for hazardous materials threshold limits and reporting purposes.

Areas where hazardous materials and/or hazardous waste are stored in outside locations at ARC have been identified as areas with a potential to impact storm water quality. As such, these locations are inspected annually as part of an Annual Comprehensive Site Compliance Evaluation (ACSCE). A table listing all the locations to be inspected, including hazardous material or hazardous waste handling and storage areas, is included as Appendix D. Detailed descriptions of each of these locations, including the types of materials or waste stored, any spill or leak prevention measures and any associated containment structures, are included as part of the individual inspection reports and retained on site in accordance with the IGP section XXI.J.

2.2.4 Associated Pollutants

Pollutants most frequently associated with storm water include sediment, nutrients, bacteria and viruses, polychlorinated biphenyls (PCBs), oxygen demanding substances, oil and grease, heavy metals, and other toxic materials. These pollutants and their impacts on water quality and aquatic habitat are described below.

Bacteria and Viruses

Bacteria and viruses are generally present on ARC due to animal excrement and sanitary sewer overflows. There is minimal potential for bacteria and viruses to be present in the storm water discharge from ARC.

Heavy Metals

Cadmium, copper, chromium, lead, mercury, nickel, and zinc are the heavy metals most commonly used at ARC. Heavy metals are toxic to aquatic organisms, can bioaccumulate, and have the potential to contaminate drinking water supplies. Storm water runoff has contributed significantly to the accumulation of metals in the sediment of South San Francisco Bay. This accumulation has resulted in restricted water uses and impaired aquatic habitat. Lead, zinc, and copper have been detected in very low quantities in storm water discharge from ARC. Mercury was not previously included in the storm water sampling plan but was added to the plan in June of 2016 due to its presence at ARC.

Nutrients

Nutrients, including nitrogen and phosphorous, can cause excessive or accelerated growth of vegetation or algae resulting in a reduction of beneficial uses of various bodies of water. In addition, un-ionized ammonia, a form of nitrogen, can be toxic to fish. Vegetation and fertilizer are the primary nutrient sources at ARC. In response to increased nutrients detected in storm water runoff during the 2023-2024 season, Site-Specific BMPs were modified to increase monitoring of nutrient application activities and to establish a more aggressive maintenance schedule for the storm water distribution system (Section 3.0).

Oil and Grease

Oil and grease, including all petroleum products, contain a wide array of hydrocarbon compounds, some of which are toxic to aquatic life at low concentrations. Oil and grease are commonly found in runoff from streets, parking lots, and runways. The potential exists for variable quantities of oil and grease to be present in the storm water discharge from ARC. Low levels of petroleum products have been detected in storm water runoff at ARC. This can be attributed to street runoff and various

industrial activities. Minimum, Advanced, and Site-Specific BMPs have been established to address oil and grease at ARC (Section 3.0).

Oxygen Demanding Substances
Oxygen Demanding Substances include plant debris (such as leaves and lawn clippings), animal excrement, street litter, and organic matter and are commonly found in storm water. Such substances depress the dissolved oxygen levels in creeks, estuaries, and the San Francisco Bay. The potential exists for small quantities of plant debris and street litter to be present in the storm water discharge from ARC.

PCBs
PCBs are biphenyl molecules that have been chlorinated to varying degrees and that belong to a family of organic compounds known as chlorinated hydrocarbons. PCBs have a heavy oil-like consistency, a high boiling point, a high degree of chemical stability, low flammability, and low electrical conductivity. PCBs and PCB byproducts are highly toxic and persistent. They have been found to be teratogenic and carcinogenic. PCBs are known to cause chronic reproductive effects, gastric disorders, and skin lesions, such as chloracne.

The only toxic chemical listed in 40 CFR 372 that has been discharged to the storm drain system is an uncommon PCB; Aroclor 1268, which was first detected in sediment samples from the Storm Water Retention Basin in 1997, and again in storm water samples in 1999, when the investigation was conducted to identify the source of this contamination. This investigation was outlined in the subsequent Annual Reports. In July of 2002, samples taken from the roof of Hangar 1 confirmed the suspicion that the deterioration of siding, paint, and roofing material containing Aroclor 1268 and Aroclor 1260 was the source of Aroclor 1268 in both storm water and sediment at ARC. The release was reported to the RWQCB, National Response Center, and California Office of Emergency Services as continuous and ongoing. The Hangar 1 Summary Report summarizes the investigation and subsequent findings, and is included as Appendix E.

Priority Pollutants
Other toxic materials including those on the Priority Pollutants list may be found in storm water in low concentrations. Chlorinated solvents have been detected in storm water at ARC, resulting from infiltration of the contaminated groundwater plume into the storm drain system.

Sediment
Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, and reproduction. In addition, sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids, a common water quality parameter. There is minimal potential for sediments to be present in the storm water discharge from ARC.

Specific Conductance
Specific conductance is no longer analyzed at ARC. The current IGP removed the requirement to analyze for specific conductance since the U.S. Environmental Protection Agency (EPA) does not require it for any industry type. Additionally, stakeholder comments indicated that non-industrial sources may cause high specific conductance that would interfere with the test. ARC will consider

including specific conductance in the future if it would prove useful in detecting a particular pollutant of concern.

2.3 Significant Spills and Leaks

Every effort must be taken to prevent accidental releases. When significant spills or unauthorized discharges occur, the release is required to be reported to the EMD. ARC is prepared to deploy a response team to control and clean up spills in a way that minimizes and/or eliminates contact with storm water. Any spills, leaks, or unauthorized discharges impacting the storm sewer system will be reported to the RWQCB within eight hours of discovery. Verbal reports will be followed up with written reports outlining the following:

- Investigation into the cause of the spill or leak,
- Measures taken to clean up the spill or leak, and
- Any corrective actions taken or proposed to prevent the reoccurrence.

Spills of any size must be documented in a Spill Log and must include the following details of the spill or unauthorized discharge:

- Date and time of the spill,
- A description of materials released,
- The quantity spilled,
- Any spill or leak cleanup measures administrated, and
- Measures taken or proposed to prevent a reoccurrence.

The spill log must be maintained by the responsible party and retained on site for a period of at least five (5) years in accordance with the IGP section XXI.J. Any significant spill or leak occurring subsequent to this revision of the SWPPP will be recorded and included in Table B: Table of Significant Spills or Leaks (Appendix F) of the next SWPPP update.

2.3.1 Non-storm Water Discharges

As outlined in Section IV.A of the IGP, all non-storm water discharges and their sources must be identified in the SWPPP. This shall include the source, quantity, frequency, and characteristics of the non-storm water discharges and associated drainage areas.

2.3.2 Authorized Non-storm Water Discharges

Non-storm water discharges are issued individual NPDES permits. Four such operations are covered by individual NPDES Permits at ARC:

1. Middlefield-Ellis-Whisman (MEW) North of 101 Treatment System - In 1997, Locus Technologies received a NPDES permit (File No. 2189.8009) from the RWQCB for authorization to discharge treated groundwater from the MEW RGRP groundwater treatment system located on ARC (current NPDES Permit No. CAG912002, Order No. R2-2017-0048 and R2-2018-0050). This treatment system is part of the groundwater cleanup of the regional plume containing volatile organic compounds (VOCs) from the MEW site. The treatment system on ARC property addresses contamination that has migrated onto ARC from the MEW site and is part of a regional cleanup effort. After the treatment to discharge requirements have been met, the groundwater is directed to ARC's Unitary Cooling Tower or Arc Jet boiler for reuse. When these facilities are not in operation or are unable to accept the water, it is redirected

and discharged through a dedicated line to Stevens Creek, and ultimately to San Francisco Bay. This discharge line, which is shared with the NASA groundwater treatment system and the MEW RGRP system, discharges at a maximum rate of 150 gallons per minute (gpm).

2. West-side Aquifers Treatment System (WATS) - On October 20, 1998, the Department of the Navy received a NPDES permit (File Nos. 2189.8009 and 1210.48 (FA)) from the RWQCB for authorization to discharge treated groundwater from the WATS as part of remedial actions aimed to treat VOCs in the Site 28 area of ARC. Discharge of the treated water was in accordance with RWQCB Resolution 88-160 for disposal of extracted groundwater from cleanup projects but has been discharging under the VOC and Fuel General Permit, NPDES Permit No. CAG912002 since March 27th, 2014. Treated groundwater is discharged at an average rate of approximately 50 gpm into the storm distribution system immediately east of the WATS. Discharge water flows through the storm distribution system into the SWSB. After passing through the SWSB, the water flows overland to the SWRP north of ARC where it is expected to evaporate. No discharge to San Francisco Bay is anticipated. WATS sampling is currently conducted in accordance with the NPDES Self-Monitoring Program, NPDES Permit No. CAG912002, Order No R2-2017-0048 and R2-2018-0050. Operational responsibility of the WATS was transferred from Navy to NASA on November 1st, 2016.
3. NASA Groundwater Treatment System (GWTS) - On December 7, 1999, NASA ARC received a NPDES permit (File no. 2189.8009, and 1210.48 (FA)) from the RWQCB for authorization to discharge treated groundwater from the ARC groundwater treatment system. The treated groundwater is the result of the cleanup of groundwater polluted by VOCs on the northwestern side of ARC. After treatment to discharge requirements, the groundwater is discharged through a dedicated line, shared by the MEW treatment system, to Stevens Creek when ARC's Unitary Cooling Tower or Arc Jet boiler are not accepting the water for reuse. The ARC system came on-line on September 10, 2001, and discharges a maximum of 20 gpm. The NASA GWTS currently discharges treated groundwater under the same permit and order as WATS and MEW: NPDES Permit No. CAG912002, Order No. R2-2017-0048 and R2-2018-0050.

In addition to the authorized non-storm water discharges discussed above, the IGP authorizes the following types of non-storm water discharges at ARC:

- Discharges from firefighting activities. **Note:** releases of Aqueous Film Forming Foam (AFFF) are **not** authorized under the IGP.
- Fire hydrant flushing.
- Potable water sources including waterline flushing.
- Lawn watering.
- Uncontaminated groundwater discharges.
- Routine exterior building wash-down which does not use detergents, abrasives, or other compounds.
- Air conditioning condensate.

When chlorine levels in the drinking water system reach unsafe levels, the drinking water system will be flushed at M191. Water must be aerated prior to entry into the North Patrol Road Ditch.

Monthly observations of the storm water system to identify pollutants in industrial storm water and their sources are documented and records will be maintained on-site in accordance with IGP Section XXI.J.

2.3.3 Illicit Connections

Since 1987, over 100 illicit connections to the storm drain system have been identified and eliminated through ongoing studies at ARC. Any illicit connections discovered during subsequent investigations and surveys will be discussed in the Annual Comprehensive Site Compliance Evaluation (ACSCE). Records of these inspections will be maintained on-site in accordance with IGP Section XXI.J.

2.3.4 Soil Erosion

The geography and geology at ARC is such that there is no known naturally occurring soil erosion. This does not include potential erosion caused by construction activity or emergency flood control measures. The potential for erosion due to construction activity is addressed in the existing Minimum BMP (Erosion and Sediment Controls). The potential for erosion due to emergency flood control measures will be addressed in a site-specific BMP for Emergency Flood Control, which will be developed as needed to manage conditions unique to each flood event. Flooding in the eastern drainage area can be controlled by utilizing the water pumps at Gates 14A and 14B to discharge storm water from the North Patrol Road Ditch into the Northern Channel. Water pumps at Gates 14A and 14B would be used in addition to the two pumps at Building M191 that are already in operation for normal storm water discharge. The discharge of storm water into Stevens Creek is not currently permitted. ARC is currently evaluating emergency flood control procedures for the western drainage area. Any flood control procedures put into place will be included in the next SWPPP update.

3.0 BMP IDENTIFICATION

BMPs are described in the IGP as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment measures, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may include any type of pollution prevention and pollution control measure necessary to achieve compliance with the IGP. **In accordance with APR 8500.1.14; all personnel, tenants, and partners are required to implement all ARC Storm Water BMPs relevant to their activities.**

The purpose of the BMPs described in this section is to meet the intent of Paragraph X of Section C.1.b in the IGP. The BMPs employed at ARC are categorized as Minimum, Advanced, and Site-Specific. ARC developed these Site-Specific BMPs to address potential pollutants associated with particular activities on site. Implementation of these BMPs is expected to reduce or prevent pollutants in storm water and authorized non-storm water discharges. A table listing each industrial activity, along with the pollutant source, potential pollutants, and the applicable BMPs to be implemented is included in the BMPs as Table A within Appendix C.

3.1 Minimum BMPs

ARC shall, to the extent feasible, implement and maintain all of the following minimum BMPs to reduce or prevent pollutants in industrial storm water discharges. These minimum BMPs consist of processes, prohibitions, procedures, and schedules of activities that prevent pollutants associated with industrial activity from contaminating storm water and authorized non-storm water discharges. Minimum BMPs are considered low technology cost-effective measures. Facility operators are expected to implement all of the minimum BMPs at each pollutant source.

The Minimum BMPs as required by the IGP are:

- Employee Training Program.
- Erosion and Sediment Controls.
- Good Housekeeping.
- Material Handling and Waste Management.
- Preventive Maintenance.
- Quality Assurance and Recordkeeping.
- Spill and Leak Prevention and Response.

3.2 Advanced BMPs

Where the Minimum BMPs as identified above are not effective, Advanced BMPs shall be considered. Advanced BMPs generally consist of structural devices that reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

The following Advanced BMPs have been implemented, where applicable, at ARC:

- Control Devices.
- Overhead Coverage.
- Retention Ponds.
- Secondary Containment Structures.
- Water Treatment.

3.3 Site-Specific BMPs

To date, the following industrial activities with a potential for contaminating storm water have been identified at ARC. Site-Specific BMPs are intended to address industrial activities that have a potential to impact storm water quality.

The Site-Specific BMPs for ARC are:

- Aircraft Exhaust and Fueling.
- Aircraft Maintenance.
- Aircraft Washing and Rinsing.
- Building and Grounds Maintenance.
- Building Repair, Remodeling, and Construction.
- Construction, Demolition, and Excavation Operations That Disturb Ground Surfaces Less Than One Acre.
- Dewatering: Groundwater
- Dewatering: Utility Vault
- Elimination of Non-Storm Water Discharges.
- Fire Department Equipment Testing and Training.
- Fire Fighting Activities

- Fleet Parking.
- Fuel Tank Vehicles.
- Golf Course Maintenance.
- Outdoor Process Equipment Operations and Maintenance.
- Project Closeout Requirements
- Small Motor Oil Spill Response Procedures
- Source Reduction.
- Transportation Control Measures.
- Vehicle and Equipment Fueling.
- Vehicle and Equipment Maintenance and Repair.
- Vehicle and Equipment Washing.
- Washing and Rinsing of Outdoor Equipment, Materials, and Displays.
- Washing of Exterior Building Surfaces and Fixed Outdoor Equipment.

3.4 BMP Implementation

The implementation of BMPs is facilitated through annual inspections of each location of industrial activity. The BMPs are always available through the EMD website: https://nasa.sharepoint.com/sites/arc-jq/SitePages/storm-water.aspx. Additionally, projects with the potential to impact storm water quality are reviewed by ARC's Construction Permit Review Board, which identifies and provides any required applicable BMPs to be implemented.

3.4.1 BMP Updates Identified by ERA Evaluation

The following table presents the proposed implementation schedule for updating BMPs at ARC in response to Level 1 status for Nitrate + Nitrite (as N).

BMPs to be Implemented	Proposed Implementation Date/Frequency	Applicable SWPPP Section
Maintain log of fertilizer/pesticide application	January 1, 2025	Material Handling and Waste Management Building and Grounds Maintenance Elimination of Non-Stormwater Discharges
Install filter in catch basins along RT Jones Road across from PV Bay View Campus and prior to the 191 outfall	January 1, 2025	Preventative Maintenance
Provide Storm Water Pollution Prevention training to tenants and all groups involved in grounds maintenance activities	January 2025	Employee Training
Perform regular maintenance of storm distribution system including annual cleanouts	August 20, 2025, and annually thereafter	Preventative Maintenance

BMPs to be Implemented	Proposed Implementation Date/Frequency	Applicable SWPPP Section
Train ARC facilities about the importance of annual catch basin cleanouts for future RYs	January 1, 2025	Preventative Maintenance

3.4.2 Employee Training Program

Beginning July 1, 2023, Storm Water Pollution Prevention Plan training shall be completed annually all personnel at ARC. This requirement includes both federal and contract personnel as well as all resident agencies —unless otherwise stated in the lease agreement.

The storm water training course is available online, 24-hours a through the SATERN web-based training module (COURSE ARC-001-01) and attendance is tracked via the Ames Safety Accountability Program (ASAP). COURSE ARC-001-01 is automatically assigned to all personnel who have access to ASAP. The class emphasizes the awareness that all personnel are required to implement each of the applicable BMPs for their operations. Through the training course, employees and contractors are provided with information on how to prevent storm water pollution at work and at home.

Personnel and tenants without access to the ASAP training program will be offered an equivalent training program upon availability. A comparable class may be substituted provided it contains a corresponding level of storm water pollution prevention awareness. A limited number of in-person instructor-led classes are offered to facility personnel and tenants upon request.

Information on classes offered by the ARC Health, Safety and Environmental Training Department is available on the Safety, Health and Medical Services web page: (http://q.arc.nasa.gov/content/training/), and in a training catalog that is published and distributed annually.

3.4.3 Quality Assurance and Recordkeeping

In accordance with IGP Section XXI.J, all records of laboratory analysis, inspections, and observations along with all reports and data pertinent to storm water management are kept for a minimum of five years. These records are available, upon request, from the EMD, Code JQ. In addition to the information included in this SWPPP, the following information is discussed in the Storm Water Annual Report (SWARM), which covers the period from July 1 through June 30:

- Sampling and analysis results.
- Records of monthly dry weather and qualified storm event visual observations.
- Records of the Annual Comprehensive Site Compliance Evaluation.
- Records of significant spills or leaks.
- Listing of potential pollutants and associated industrial activities.
- Current BMPs.
- Current site maps.

The Storm Water Annual Report and analytical results of sampling and analysis efforts are submitted online through the SWRCB's Storm Water Multiple Application and Report Tracking

System (SMARTS) website. All records are maintained on-site in accordance with IGP Section XXI.J.

4.0 EVALUATION AND MONITORING PROGRAM

4.1 Sampling Plan

The Storm Water Monitoring Program at ARC includes both observations of storm water discharge locations as well as storm water sampling for laboratory analysis. Dry weather visual observations are conducted monthly. Visual observations are also conducted during each Qualifying Storm Event (QSE) sampling activities. A QSE is defined as a precipitation event that produces a discharge for at least one drainage area and is preceded by 48 hours with no discharge from any drainage area. These observations are intended to document the presence or absence of any floating and suspended material, oil and grease, discolorations, turbidity, odor, and source of any pollutants. Records of these inspections will be maintained on-site in accordance with IGP Section XXI.J.

On July 1, 2015, the sampling program was updated to integrate the requirements included in the new IGP. Storm water sampling is now conducted four times each year during QSEs. Two QSEs are sampled within the first half of each RY – July 1 to December 31) and two QSEs are sampled within the second half of each RY – January 1 to June 30. Sample collection is only required of storm water discharges that occur during scheduled facility operating hours and are within four hours of the start of the discharge or the start of scheduled facility operating hours if the QSE occurred within the previous twelve hours. Sampling and analysis results are submitted online as Ad Hoc reports through the SWRCB's SMARTS website.

The trench around Hangar 1 is inspected periodically to identify sediment build up. If the amount of sediment is determined to be of a sufficient amount, the sediment is removed and sampled. The inspection is scheduled for the month of August, with any sampling and removal taking place in September, before the beginning of the wet season. The SWSB is cleaned out annually and the sediment is sampled and analyzed to gauge the effectiveness of the treatment system and to characterize the waste. All catch basins at ARC are cleaned out annually, and the sediments are sampled and analyzed to characterize the waste. Finally, the EDM immediately downstream from the overflow area of the SWSB is sampled each year during the dry season.

4.1.1 Locations

There are five storm water discharge locations at ARC: the discharge location of Building M191, the effluent outlet of the SWSB, and the effluent outlet of the RT Jones Road outfall (see Figure 2 in Appendix B for locations of monitoring and sampling points). In addition, there are two emergency pumps along North Patrol Road Ditch that are available to use for emergency storm water discharge into the Northern Channel during flood events. Emergency storm water discharge during flood events is representative of the discharge at outfall M191 and will not be sampled individually.

4.1.2 Laboratory Analysis

All storm water samples will be collected in accordance with Section XI.B. A Chain of Custody form (COC) will be completed for each set of samples collected. The COC form shall include the Discharger's name, address, and phone number, identification of each sample container and

sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container. An example of the COC is presented as Appendix G.

All storm water samples shall be analyzed for the following constituents by the following sufficiently sensitive methods:

Constituents	Method (EPA[1] and SM[2])	Instantaneous NAL (ml/L)	Annual NAL (ml/L)
Ammonia	SM 4500-NH3 C	N/A	2.14
Halogenated Volatile Organics	EPA 624	N/A	N/A
Semi-VOCs	EPA 625	N/A	N/A
Total Petroleum Hydrocarbons (Including JP-4, JP-5, JP-8, Diesel, Gasoline and, Motor Oil)	EPA 8015M	N/A	N/A
N-Hexane Extractable Material/Total Oil & Grease (TOG)	EPA 1664A	15	25
Metals	EPA 200.8		
Chromium	EPA 200.8	N/A	N/A
Copper	EPA 200.8	N/A	0.0332
Lead	EPA 200.8	N/A	0.262
Zinc	EPA 200.8	N/A	0.26
Mercury	EPA 245.1	N/A	0.0014
PCBs (Including Aroclor 1013, 1221, 1232, 1242, 1248, 1254, 1260 and 1268)	EPA 8082A	N/A	N/A
Nitrate + Nitrite as Nitrogen	EPA 300.0	N/A	0.68
Total Phosphorus	SM 4500-P E	N/A	2
Biological Oxygen Demand	SM 5210B	N/A	30
Chemical Oxygen Demand	EPA 410.4	N/A	120
Total Suspended Solids	SM 2540-D	100	400
pH	Field	<6.0, >9.0	N/A

The sediment from the annual clean out of the SWSB, catch basins and the soil from the dry season sampling of the EDM shall be analyzed for the following constituents:

[2] EPA – EPA Test Methods
[3] SM – Standard Methods for the Examination of Water and Wastewater, 18th edition

Constituents

Oil & Grease, VOCs, and Semi-VOCs (EPA 1664B, EPA 8260M, EPA 8015M),
CAM 17 Metals (EPA 6020),
STLC for Metals (Cr, Cu, Hg, Pb, Zn) (California Waste Extraction Test, EPA 6010B, EPA 7470A, and EPA 6010B),
TCLP for Cr, Pb (EPA 6010B),
Total Petroleum Hydrocarbons
(Including JP-4, JP-5, JP-8, Diesel, Gasoline, and Motor Oil), (EPA 8260M, EPA 8015M),
PCBs
(Including Aroclor 1016, 1221 1232, 1242, 1248, 1254, 1260 and 1268), (EPA 8082A),
Percent moisture content.

4.1.3 Field Instrument Calibration

pH will be analyzed in the field using a hand-held instrument. The hand-held instrument will be calibrated prior to collecting field samples. All field measurements will be conducted in accordance with the accompanying manufacturer's instructions and section XI.C.2 of the IGP.

4.2 Exceedance Response Actions (ERAs)

ARC began NOI Coverage in a Baseline status for all parameters but moved into Level 1 status for N+N as N on July 1, 2024. In accordance with Section XII.C, ARC completed a Level 1 Exceedance Response Action (ERA) Evaluation (Appendix H) with the assistance of a QISP. Included in the ERA is an evaluation of the industrial pollutant sources in all three ARC drainage areas that are or may be related to the NAL/TNAL exceedance, an identification and evaluation the corresponding BMPs in the SWPPP, and a discussion of any additional BMPs and SWPPP revisions necessary to prevent future NAL/TNAL exceedances. This SWPPP update includes the updated BMPs identified in the evaluation. Further discussion of this evaluation and ARC's response can be found in the Level 1 ERA Report (Appendix I)

For ARC to return to Baseline status for N+N as N: a Level 1 ERA report must be completed, all identified additional BMPs must be implemented, and results from four (4) consecutive QSEs that were sampled following BMP implementation indicate no additional NAL exceedances.

Recent sampling results have indicated an NAL exceedance for N+N as N. Subsequently, ARC's status for N+N as N is expected to elevate to Level 2 Status for that parameter on July 1, 2025. Dischargers with Level 2 status shall certify and submit via SMARTS a Level 2 ERA Action Plan prepared by a QISP that addresses the N+N as N Level 2 NAL exceedance by January 1 following the reporting year during which the NAL exceedance occurred. For each new Level 2 NAL exceedance, ARC is required to identify which demonstrations (D.2.a through c) will be performed in the Level 2 Action Plan. Additionally, the Level 2 ERA Action Plan shall at a minimum address the drainage areas with corresponding Level 2 NAL exceedance, as well as a schedule and detailed description of the tasks required to complete the selected demonstration(s). All elements of the Level 2 ERA Action Plan shall be implemented as soon as practicable and completed no later than 1 year after submitting the Level 2 ERA Action Plan.

4.3 Annual Comprehensive Site Compliance Evaluation (ACSCE)

Section XV of the IGP requires the facility operator to conduct one ACSCE in each reporting period. The ACSCE must include the following:

- A review of all sampling, visual observation, and inspection records conducted during the previous RY.
- An inspection of all areas of industrial activity and associated potential pollutant sources for evidence of, or the potential for, pollutants entering the storm water conveyance system.
- An inspection of all drainage areas previously identified as having no exposure to industrial activities and materials in accordance with the definitions in Section XVII.
- An inspection of equipment needed to implement the BMPs.
- An inspection of any BMPs.
- A review and effectiveness assessment of all BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective at reducing and preventing pollutants in industrial storm water discharges and authorized Non-Storm Water Discharges (NSWDs).
- An assessment of any other factors needed to comply with the requirements in Section XVI.B.

Annual industrial activity inspections are conducted at ARC each year and the records of these inspections will be maintained on-site in accordance with IGP Section XXI.J. These industrial activities include the following:

- Outdoor wash and rinse areas.
- Loading and unloading areas.
- Hazardous material storage areas.
- Hazardous waste storage areas.
- Dust or particulate generating areas.
- Building repair and remodeling operations.
- Construction and operations.
- Vehicle and equipment storage areas.
- Vehicle fueling and maintenance areas.

4.2.1 Evaluation of BMPs

As part of ACSCE, all BMPs are evaluated annually to determine whether they are adequate, properly implemented and maintained, or whether additional BMPs are needed. Additionally, any time a new process or procedure is introduced it is evaluated for potential impacts to storm water quality. If a potential impact is identified, existing BMPs are reviewed for their applicability and, if necessary, revised to specifically address the new process. New BMPs are developed as necessary to address process-specific concerns. Certification that all BMPs have been evaluated and are adequate is included as part of the Annual Report.

4.2.2 Review and Revise SWPPP

As part of the ACSCE, this SWPPP will be reviewed at least annually, as required by the IGP. This SWPPP will be revised, when necessary, and any updates are implemented prior to significant changes in industrial activities which may:

- Significantly increase the quantities of pollutants in storm water discharge,

- Cause a new area of industrial activity at the facility to be exposed to storm water, or
- Begin an industrial activity which would introduce a new pollutant source at the facility.

5.0 SMALL MS4 PERMIT REQUIREMENTS

Permits for discharges covered under the Municipal Storm Water Permitting Program were issued in two phases. Under Phase I, which started in 1990, the RWQCBs adopted NPDES storm water permits for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire. As part of Phase II, the SWRCB adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. This permit expired on May 1, 2008, but remained in effect until the new MS4 General Permit was issued. On February 5, 2013, the State Water Resources Control Board adopted the General Permit for Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems, NPDES No. CAS000004, (WQ Order 2013-0001-DWQ as amended by Orders WQ 2015-0133-EXEC, WQ 2016-0069-EXEC, WQ 2018-0001-EXEC, and WQ 2018-0007-EXEC. The current amendments to WQ Order 2013-0001-DWQ (Order 2018-0007-EXEC), effective on January 4, 2018.

The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program with the goal of reducing the discharge of pollutants to the MEP. MEP is the performance standard specified in Section 402(p) of the CWA. The management programs specify what BMPs will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not; as stated in Order WQ 2018-EXEC, Section F.3: “Permittees may incorporate the required storm water provisions into already existing programs and leverage existing staff to implement BMPs during its day-to-day business and operations”. Section F.4 states: “A Permittee may utilize an equivalent or existing document such as a standard Operations and Procedures manual, Operation and Maintenance Plan, or Spill Response Plan if that document includes the necessary information required to comply with the provisions of this section”. Although ARC is a Non-Traditional Small MS4 Permittee. The BMPs included in Appendix C of this SWPPP address the program elements required by the MS4 Permit. Additionally, this SWPP is implemented across the entire ARC property (other than equivalently permitted tenant operations) and is implemented as an equivalent document as described in Section F.4.

5.1 Employee Education and Outreach on Storm Water Impacts

As outlined in Section 3.4.1 of this SWPPP, employees identified as having the potential to impact storm water quality are required to attend the Storm Water Pollution Prevention class. Additionally, this SWPPP is made available to all employees via the EMD website.

5.2 Illicit Discharge Detection and Elimination

As stated in Section 2.3.3 of this SWPPP, extensive surveys have been conducted to identify and correct illicit connections at ARC. When new illicit connections are discovered, procedures exist

for developing corrective action plans. All known illicit connections will be discussed in the Annual Report along with a description of the actions to be taken to close or mitigate the connections. Non-storm water discharges are effectively prohibited through extensive use of BMPs and employee training.

The storm water Evaluation and Monitoring Program, outlined in Section 4.0 of this SWPPP, utilizes both observations and sampling activities for laboratory analysis to detect unauthorized non-storm water discharges. If such discharges are detected, they are to be reported and any actions taken to prevent any reoccurrence will be documented.

The employee training program is outlined in Section 3.4.1 of this SWPPP. In addition to training classes on Storm Water Pollution Prevention, the ARC Health, Safety, and Environmental Training Department offers classes on Environmental Essentials, Hazardous Material and Hazardous Waste Handling, Hazard Communication, Incidental Wastewater Discharges, Spill Prevention Control and Countermeasures, and other pertinent topics.

Authorized non-storm water discharges at ARC are listed in Section 2.3.2 of this SWPPP and detailed descriptions of identified potential pollutant sources are included in Section 2.2 of this SWPPP.

Storm sewer maps are described in Section 1.4 of this SWPPP and are included as Appendix B.

5.3 Construction Site Storm Water Runoff Control

Construction site plans are reviewed during NASA ARC's NEPA process and by the Construction Permit Review Board, both of which will provide an opportunity to include existing BMPs as a condition of a construction permit, identify areas where new procedures may be needed, and identify mitigation measures to prevent or minimize water quality impacts. As part of the process for developing the EIS for the NRP, ARC thoroughly reviewed proposed plans and included several mitigation measures that will reduce potential negative impacts on storm water quality.

Multiple BMPs exist to address construction site waste and erosion and sediment control at ARC. These include Building Repair, Remodeling and Construction; Construction, Demolition, and Excavation Operations That Disturb Ground Surfaces Less Than One Acre; Good Housekeeping; Erosion and Sediment Controls; and Project Closeout Requirements. These BMPs are discussed in Section 3 of this SWPPP, and are included as Appendix C.

5.4 Post Construction Storm Water Management in New Development and Redevelopment

As described in Section 2.1 of this SWPPP, and as part of the NADP, a General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit) will be obtained prior to the start of all redevelopment activities that disturb ground surfaces of one acre or more.

The 2022 General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order 2022-0057-DWQ, was adopted by the State Water Resources Control Board on September 8, 2022, which went into effect on September 1, 2023. The CGP requires the development and implementation of a site-specific SWPPP by a Qualified SWPPP

Developer (QSD) and implemented by a Qualified Industrial Stormwater Practitioner (QISP). The SWPPP shall contain a site map(s), which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection, and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must be appropriate for the type and complexity of the project and must address project-specific conditions and all possible generated pollutants. The SWPPP must list BMPs the discharger will use to protect storm water runoff and the placement of those BMPs; BMPs must be included that address source control, pollution control, and treatment control. The SWPPP must address the following objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled.
2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated.
3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard.
4. Calculations and design details as well as BMP controls for site run-on are complete and correct.
5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.

The SWPPP must also contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Section XIV of the Construction General Permit describes the elements that must be contained in a SWPPP. These elements will be added to this SWPPP prior to the start of redevelopment activities.

Upgrades to the storm drain system and mitigation measures were discussed in the EIS for the NADP. Proposed changes to the storm water system included the creation of three new drainage areas within the Western Drainage System and a diversion of a portion of the Eastern Drainage System, ultimately resulting in a total of six drainage areas. Descriptions of these proposed drainage areas can be found in section 5.D.2 of Chapter 4 of the EIS. Two new settling basins were proposed in the EIS, one of which was to be located adjacent to the existing basin; these two basins would have drained into the SWRP. The other proposed settling basin would have been located west of the discharge location for the Eastern Drainage Area at Building M191. In 2009, ARC installed two Bay Saver storm drainage treatment units. The first unit is located adjacent to Zook Road at the north end of Runway 32L. The second unit is located at the northeast corner of Marriage Road and Macon Road. The Bay Saver treatment system is a prepackaged product designed to remove both suspended solids and oils from storm water.

Additional mitigation measures included in the Mitigation Implementation and Monitoring Plan (MIMP) for the NADP EIS are as follows:

- CIR-7: Improvements to facilities within Caltrans right-of-way associated with the development proposed under the NADP shall adhere to the conditions and requirements of

Caltrans statewide NPDES Permit CAS #000003, Order #99-06-DWQ and NPDES General Permit CAS #000002, Order #99-08-DWQ, and shall incorporate Treatment Best Management Practices described in Section 4.4 of the Caltrans Statewide Storm Water Management Plan (CTSW-RT-02-008), which implements the Caltrans statewide NPDES permit, as such requirements specifically apply to the proposed improvements. In general, this would include the preparation and implementation of a SWPPP and Best Management Practices for construction and post-construction conditions for each such project.

- AQ-6a: Measures to control dust generation would reduce the impact associated with PM_{10} to a level of less-than-significant.
- BIO-18: Potentially contaminated runoff would be managed using storm water BMPs. Swales would be constructed adjacent to wetlands in upland areas to intercept and filter any runoff before it reaches the wetland. Construction of swales would be permitted within the 61-meter (200-foot) buffer zone around wetlands, but not within the wetlands themselves.
- X-6: Connect landscaping irrigation in Shenandoah Plaza to the Navy's treated groundwater system.
- X-7: Create green space west of Hangar 1.
- X-18: Convert Eastside/Airfield golf course irrigation system to reclaimed water. This transition was completed in February 2009 via a partnership between ARC and the City of Sunnyvale.
- X-24: Construct storm water infiltration measures, e.g., swales, permeable pavement, rooftop gardens, and other measures to ensure that rate and quantity of storm water runoff after construction does not exceed the rate and quantity before construction.

Existing BMPs, including those addressing structural and non-structural means of controlling storm water pollution, are listed in Section 3 of this SWPPP, and are included as Appendix C. As conditions or activities change due to redevelopment, existing BMPs are reviewed and updated as necessary or new BMPs are written to address potential impacts to storm water quality. BMPs will be incorporated into the buildout process and design guidelines to reduce pollutant loading in storm water runoff from construction activities. These are described in detail in Section J of Chapter 2 of the EIS and include the following:

- BMPs for Construction, Demolition and Excavation Operations.
- BMPs for Erosion Control, Site Stabilization and Storm Water Management.
- BMPs to Achieve No Net Increase in Peak Discharge to the SWRP.
- BMPs to Reduce Pollutant Loading in Storm Water Runoff.

As part of the Construction General Permit, the flow rate, quantity, and content of storm water must be addressed. Additionally, the proposed athletic fields in the western drainage area would also serve as a detention pond in times of peak flow. Finally, in-line flow restrictors, storm mains with in-line detention and decentralized detention elements (green roofs, grass lined swales and permeable pavement) are all proposed as part of the effort to achieve no net increase in the peak discharge. Increased monitoring requirements in the Construction General Permit, including increased observations and sampling at construction sites, will address potential impacts to storm water quality, if any.

5.5 Pollution Prevention/Good Housekeeping for Municipal Operations

Multiple BMPs exist to address storm water pollution prevention and good housekeeping at ARC. These include Elimination of Non-Storm Water Discharges; Building and Grounds Maintenance; Building Repair, Remodeling and Construction; Construction, Demolition and Excavation for Operations That Disturb Ground Surfaces Less Than One Acre; Vehicle and Equipment Washing; and Good Housekeeping. These BMPs are listed in Section 3 and included as Appendix C.

APPENDIX A
DESIGNATION OF DULY AUTHORIZED REPRESENTATIVES

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

September 18, 2023

Reply to Attn of: JQ: 204-15

Ms. Eileen Sobeck
Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Ms. Sobeck:

Pursuant to U.S. Environmental Protection Agency regulation in 40 CFR 122.22(a)(3) and (b), I authorize the below-named person to be my "duly authorized representative" for the purpose of signing reports submitted to State permit programs under the Clean Water Act.

Jeanne M. Sabin
Water Compliance Program Manager
Environmental Management Division
NASA Ames Research Center
MS 204-15
Moffett Field, CA 94035
Telephone: (650) 604-1800
E-mail: jeanne.m.sabin@nasa.gov

Sincerely,

Eugene L. Tu
Center Director

cc:
DL/202A-4/C. Pham
DL/202A-4/D. Hymer
J/200-9/A. Goodsell
JQ/204-15/D. Chuck
JQ/204-15/G. Turner
JQ/204-15/J. Sabin

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

January 19, 2016

Reply to Attn of: D: 200-1

Mr. Tom Howard
Executive Director
State Water Resources Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Mr. Howard:

Pursuant to U.S. Environmental Protection Agency regulations in 40 CFR 122.22(a)(3) and (b), I authorize the following person to be my "duly authorized representative" for the purpose of signing reports submitted to State permit programs under the Clean Water Act:

Garrett Michael Turner
Water Compliance Program Manager
Environmental Management Division
NASA Ames Research Center
MS 204-15
Moffett Field, CA 94035-
Telephone: (650) 604-1406
E-mail: garrett.michael.turner@nasa.gov

Sincerely,

Eugene L. Tu
Center Director

cc:
DL/200-12/T. Berndt
DL/2021-4/G. Sloup
J/200-9/J. Alwyn
JQ/204-15/D. Chuck
JQ/204-15/G. Turner

APPENDIX B
SITE MAPS

Settling Basin

BMP

BMP

Victory Road

Allen Road

Lomax Lane

Boyd Road

Boyd Road

Warner Road

Durand Road

King Road

Bushnell St

Stevens Way

Bushnell Circle

North Akron

North Akron

Clark Road

Arnold Avenue

Wescoat Road

Berry Drive

Berry Cir

West Circle

Macon Drive

Akron Street

Valley Road

Daffodil Road

Gurney Road

Girard Road

Kaiser Road

Bonita Road

Pollack Road

Zook Road

Zook Road

H Lane

Hall Road

Mink Avenue

F Lane

C Lane

Coombs Loop

Mink Avenue

Dugan Road

Cody Road

Carroll Drive

Carroll Drive

Edalroba Road

N. Perimeter

Macon Road

Marriage Road

Mascon Road

Bayes Road

Jasper Road

Macon Road

Fifth Street

Ellis Street

Manila Drive

Highway 101

Highway 101

To San Jose

T/W E

T/W F

T/W D

T/W A

T/W B

T/W C

Field Verify Utility Location
Before digging.
Contractor to provide Utility Locator

NASA Sensitive But Unclassified Information

Storm Legend

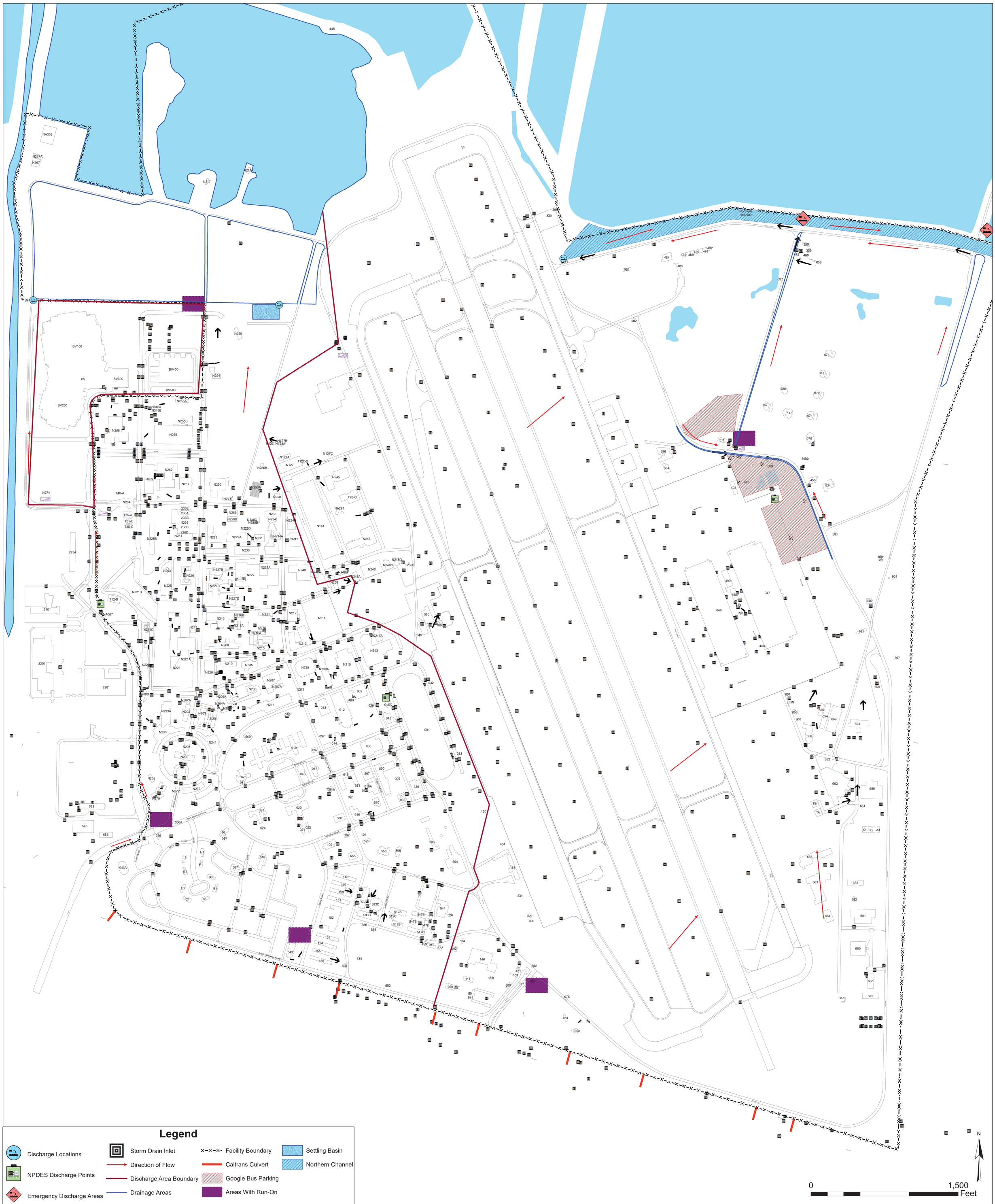
- SD_PipeCap
- Storm CleanOut
- Not Verified
- Storm Catch Basin
- Not Verified
- Storm Catch Basin
- Not Verified
- Storm Manhole
- Not Verified
- Settling Basin
- Runoff Divide
- Ditch (Lined)
- Ditch (Unlined)
- Waterway
- French Drain
- Storm Pipe
- Storm Pipe (Bad)
- Storm Pipe (Good)
- Trench Drain

N W E S

Feet
0 300 600 1,200

Utilities\Distribution_ARC\StormDistribution_ARC.mxd
Printed June 2021

Storm Distribution

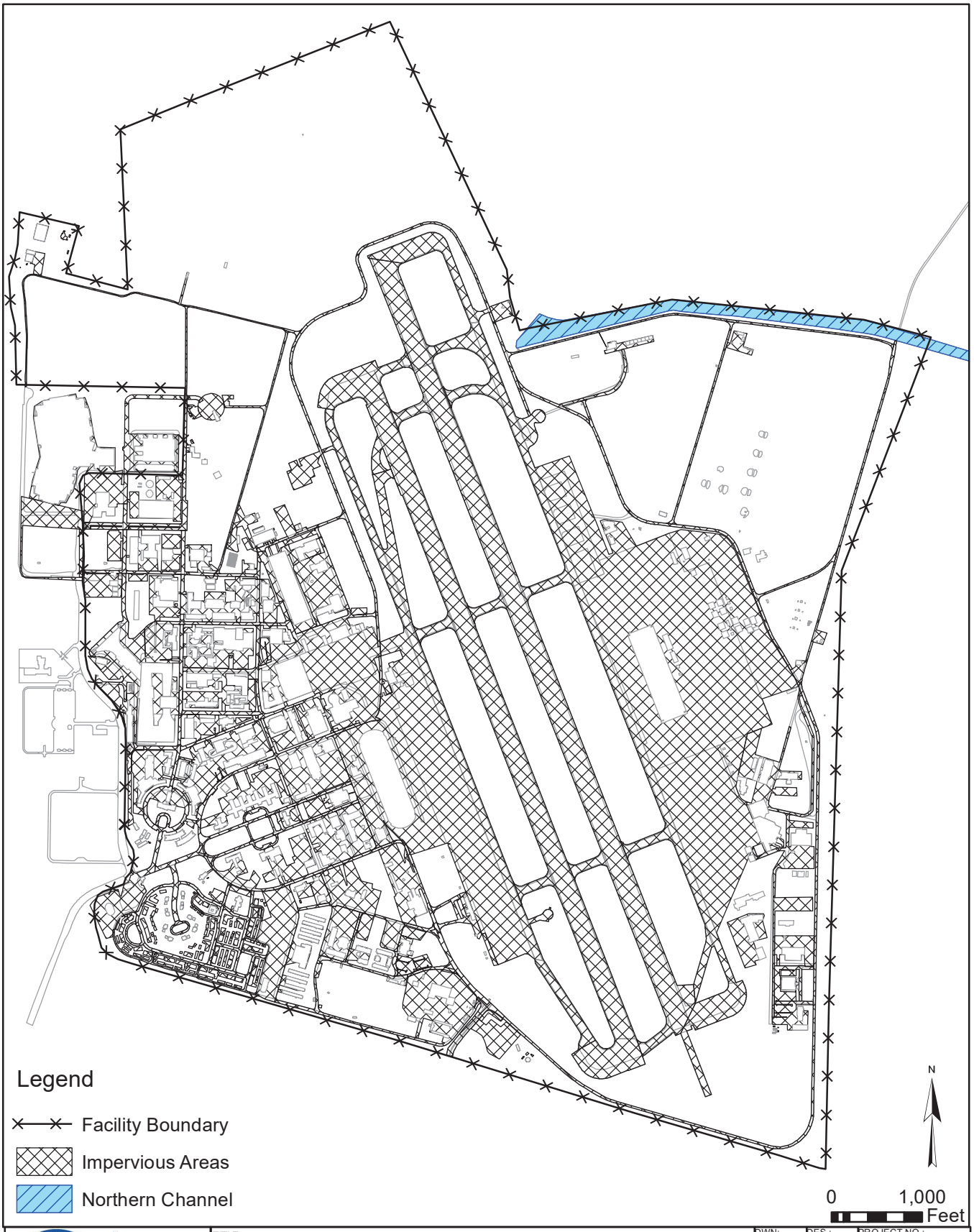


Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Storm Water Drainage and Discharge Areas

DWN:	DES.:	PROJECT NO.:
MJC	MJC	SWPP Plan
CHKD:	REV.:	FIGURE NO.:
JMS	5	3
DATE:	APPD:	
07/25	GMT	

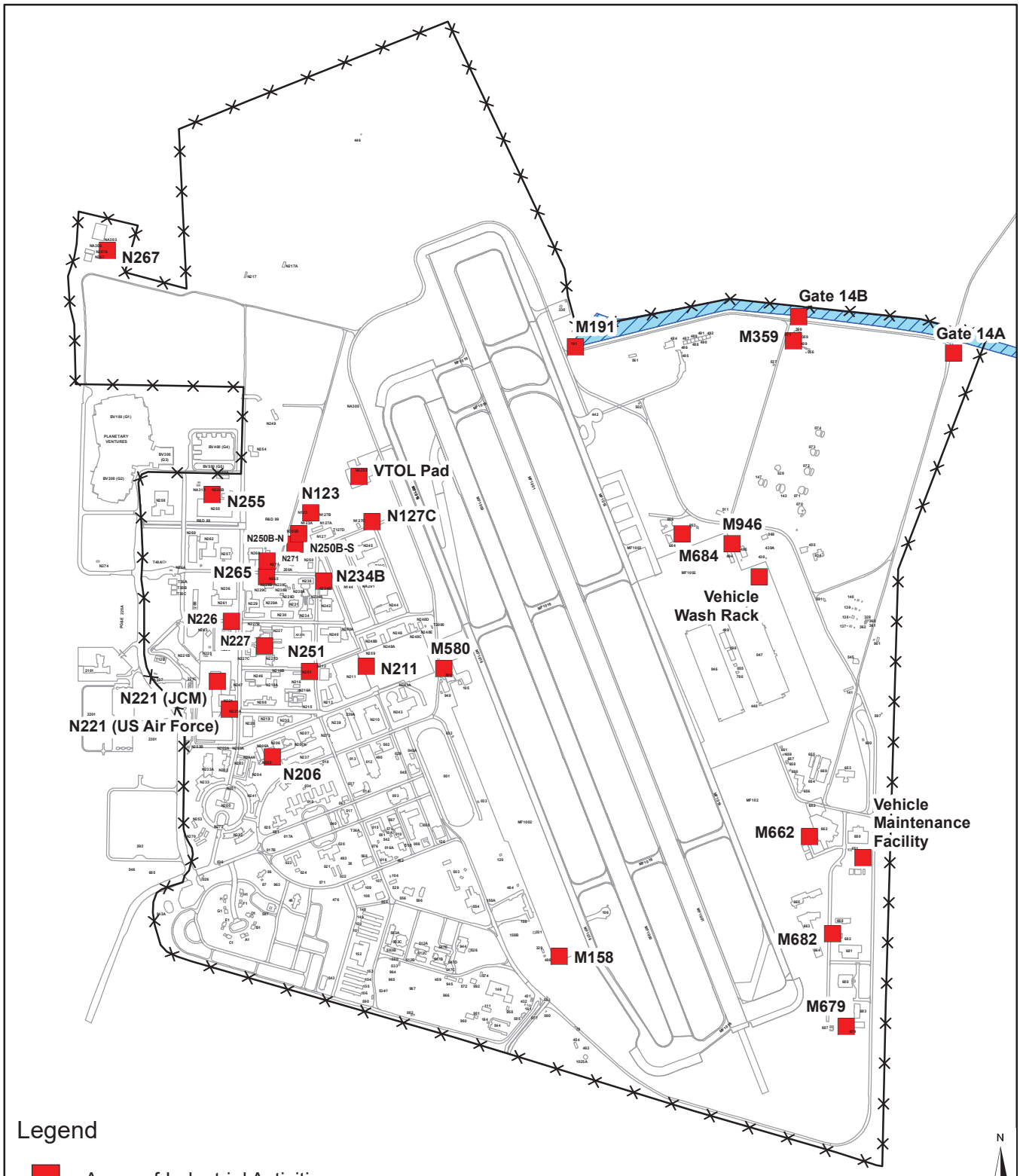


Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Impervious Areas

DWN:	DES.:	PROJECT NO.:
MJC	MJC	SWPP Plan
CHKD:	APPD:	FIGURE NO.:
JMS	JMS	4
DATE:	REV.:	
07/25	5	

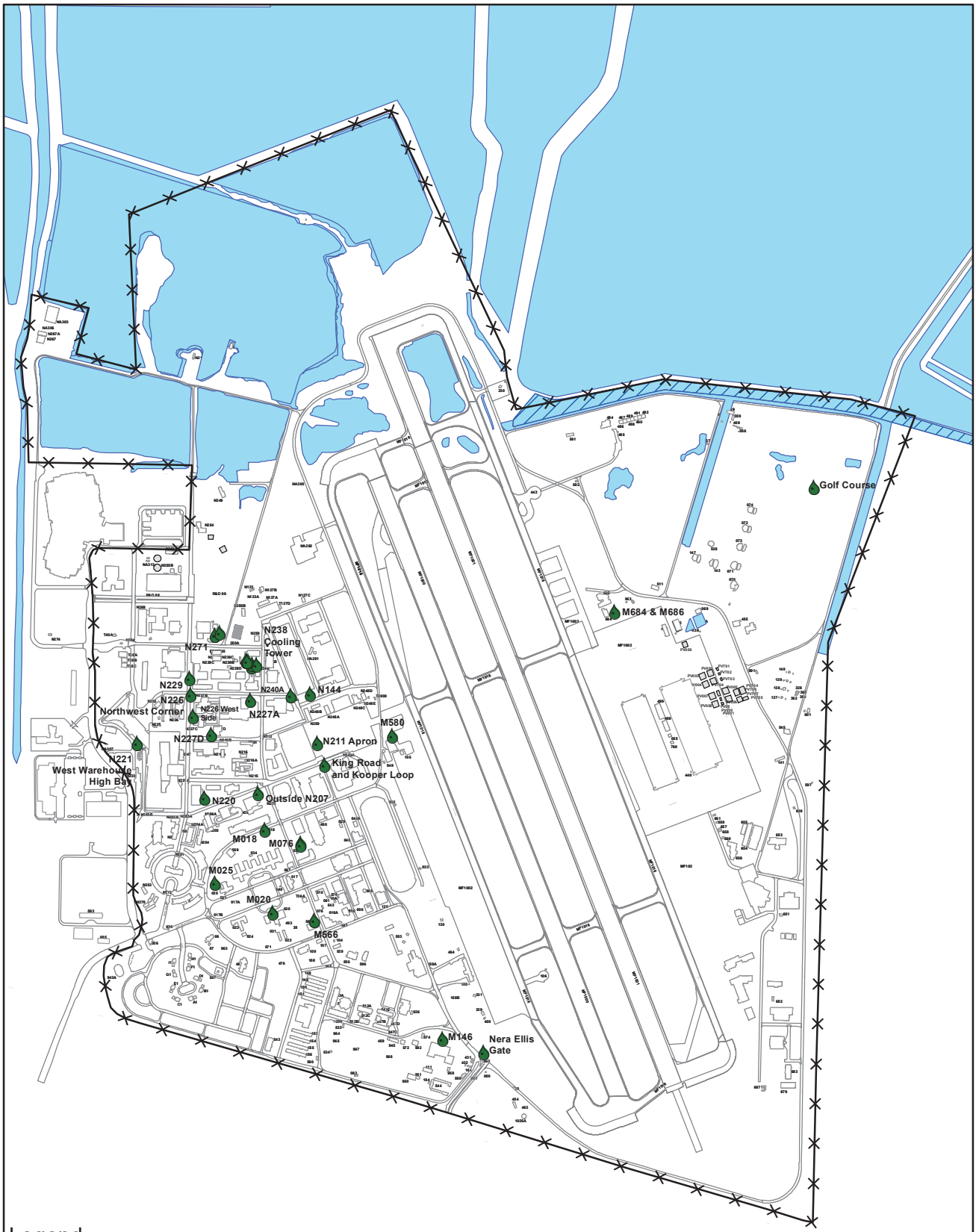


NASA Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Locations With Industrial Activities

DWN: MJC	DES.: MJC	PROJECT NO.: SWPP Plan	
CHKD: JMS	APPD: JMS		
DATE: 07/25	REV.: 7	FIGURE NO.: 5	



Legend

- Significant Spills or Leaks
- Facility Boundary
- Northern Channel

N

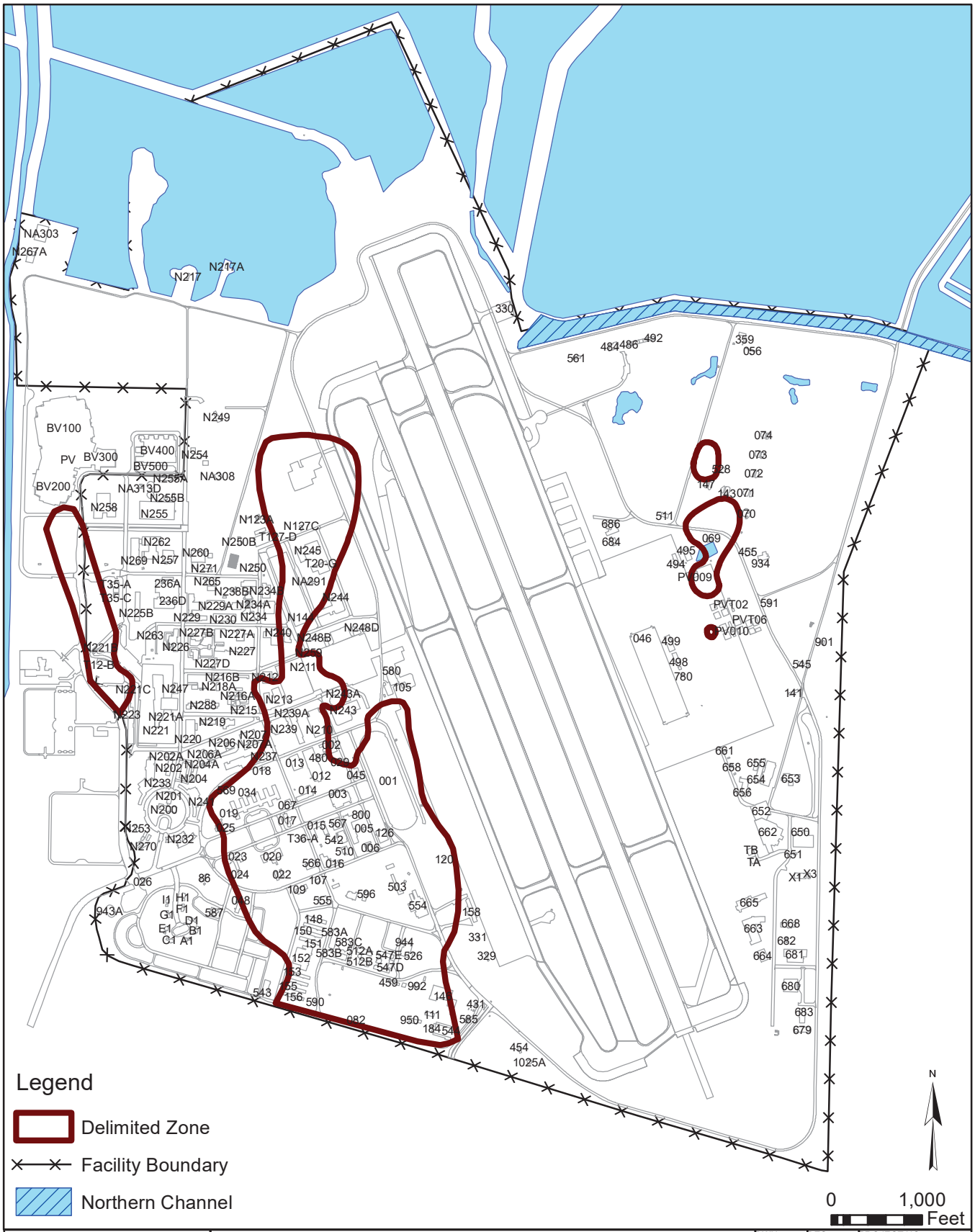
0 1,000 Feet

Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Significant Spills or Leaks

DWN: MJC	DES.: MJC	PROJECT NO.: SWPP Plan	
CHKD: JMS	APPD: MJS		
DATE: 07/25	REV.: 8	FIGURE NO.: 6	



Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Utility Vault Dewatering Delimited Zone

DWN:	DES.:	PROJECT NO.:
MJC	MJC	SWPP Plan
CHKD:	APPD:	FIGURE NO.:
JMS	JMS	7
DATE:	REV.:	
7/25	5	

APPENDIX C
NASA AMES RESEARCH CENTER BMPS

NASA Ames Research Center
Best Management Practices

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA

July 2025

www.nasa.gov

Environmental Support Services Contract
80ARC020F0036
NASA Ames Research Center Best Management Practices

Prepared for:
Environmental Management Division
NASA Ames Research Center
M/S 204-15
Building N204, Room 102B
Moffett Field, CA 94035-0001

July 2025

BB&E
CONSULTING ENGINEERS
& PROFESSIONALS

Executive Summary

The NASA ARC SWPPP (CDRL 06-064) was developed for implementation to meet compliance objectives in accordance with Title 40, Code of Federal Regulations, Parts 122, 123, and 124 and the California State Water Resource Control Board Industrial General Permit (IGP).

This SWPPP has two major objectives:

1. Identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of a facility's storm water discharges and authorized non-storm water discharges; and
2. Identify, describe, and implement site-specific BMPs to reduce or prevent pollutants associated with industrial activities in storm water discharges and authorized non-storm water discharges. BMPs shall be selected to achieve Best Available Technology/Best Control Technology (BAT/BCT) and compliance with water quality standards.

TABLE OF CONTENTS

TABLE OF CONTENTS ..... **I**

INTRODUCTION **2**

TYPES OF BEST MANAGEMENT PRACTICES **3**
TABLE A: SUMMARY OF MOFFETT FIELD INDUSTRIAL ACTIVITIES AND BMPS 4
MINIMUM BMPS 8
EMPLOYEE TRAINING PROGRAM 9
EROSION AND SEDIMENT CONTROLS 11
GOOD HOUSEKEEPING 13
MATERIAL HANDLING AND WASTE MANAGEMENT 15
PREVENTIVE MAINTENANCE 19
QUALITY ASSURANCE AND RECORDKEEPING 21
SPILL AND LEAK PREVENTION AND RESPONSE 23

ADVANCED BMPS **25**
CONTROL DEVICES 26
OVERHEAD COVERAGE 27
RETENTION PONDS 29
SECONDARY CONTAINMENT STRUCTURES 30
WATER TREATMENT 32

SITE-SPECIFIC BMPS **34**
AIRCRAFT EXHAUST AND FUELING 35
AIRCRAFT MAINTENANCE 38
AIRCRAFT WASHING AND RINSING 40
BUILDING AND GROUNDS MAINTENANCE 41
BUILDING REPAIR, REMODELING, AND CONSTRUCTION 43
CONSTRUCTION, DEMOLITION AND EXCAVATION OPERATIONS THAT DISTURB GROUND SURFACES LESS THAN ONE ACRE 45
DEWATERING: GROUNDWATER 48
DEWATERING: UTILITY VAULT 49
ELIMINATION OF NON-STORM WATER DISCHARGES 51
FIRE DEPARTMENT EQUIPMENT TESTING AND TRAINING 53
FIRE-FIGHTING ACTIVITIES 55
FLEET PARKING 56
FUEL TANK VEHICLES 57
GOLF COURSE MAINTENANCE 63
OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE 64
PROJECT CLOSEOUT REQUIREMENTS 65
SOURCE REDUCTION 67
SMALL MOTOR OIL SPILL RESPONSE PROCEDURES 69
TRANSPORTATION CONTROL MEASURES 71
VEHICLE AND EQUIPMENT FUELING 72
VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR 74
VEHICLE AND EQUIPMENT WASHING 77
WASHING AND RINSING OF OUTDOOR EQUIPMENT, MATERIALS, AND DISPLAYS 79
WASHING OF EXTERIOR BUILDING SURFACES AND FIXED OUTDOOR EQUIPMENT 80

INTRODUCTION

The purpose of these Storm Water Best Management Practices (BMPs) is to establish site-specific BMPs for the objectives outlined in the 2021 NASA Ames Research Center (ARC) Storm Water Pollution Prevention Plan (SWPPP). The SWPPP provides three primary objectives: (1) identify potential pollution sources that may reasonably be expected to affect the quality of storm water discharges associated with industrial activity at ARC, (2) implement BMPs to minimize storm water pollution, and (3) assure compliance with all terms and conditions of the 2014 General Permit No. CAS000001. Paragraph X, Section A in the General Permit requires that a SWPPP include a narrative description of the Minimum BMPs as well as any Advanced BMPs required for each potential pollutant and its source. This report provides the necessary Minimum and Advanced BMPs for mitigating storm water contamination at ARC.

Industrial activities at ARC are associated with research and development in aeronautics, space science and technology, aircraft operations, and site-wide property maintenance. ARC Environmental Management division (EMD) has evaluated these industrial activities and concluded that they present a risk to storm water runoff due to the potential exposure to contaminants. Rainfall mobilizes pollutants by falling on and traveling across streets, parking lots, construction, and industrial sites. Through natural or artificial conveyances, the run-off is transported by gravity flow through the drainage system. Storm water run-off scours accumulated pollutants off of rooftops, and out of gutters, catch basins, storm sewers, and drainage channels. Storm water at ARC discharges to surface bodies such as ditches, channels, marshes and San Francisco Bay waters.

Run-off from urban and industrial areas can carry heavy metals, (e.g., chromium, cadmium, copper, lead, mercury, nickel, and zinc), pesticides, herbicides, and organic compounds such as fuels, waste oils, solvents, polychlorinated biphenyls (PCBs), lubricants, and grease. These pollutants may cause problems for both human health and aquatic organisms. In order to address these issues, this SWPPP was developed and implemented in accordance with the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA).

In 1972, the CWA was amended to provide that the discharge of pollutants to waters of the United States from any point source is expressly prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p); which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES program. On November 16, 1990, EPA published final regulations that establish application requirements for storm water permits. The regulations require owners or operators of specific categories of industrial facilities that discharge storm water associated with industrial activity (industrial storm water) to obtain an NPDES permit. Discharge of industrial storm water either directly to surface waters or indirectly through municipal separate storm sewers, must be covered by a permit. This includes the discharge of “sheet flow” through a drainage system or other conveyance.

In accordance with the CWA, the California State Water Resources Control Board (SWRCB) has elected to issue a statewide Industrial General Permit (IGP) that applies to all industrial storm water dischargers in Santa Clara County: Water Quality Order No. 2014-0057-DWQ; NPDES No. CAS000001: General Permit for Storm Water Discharges Associated with Industrial Activities. Construction activity discharges are not covered by the IGP, a separate Construction General Permit is required for construction activities that disturb ground surfaces that are equal to or greater than one acre. Storm water discharges at ARC are governed by the IGP, which prohibits non-storm water discharges unless authorized by a NPDES permit, with the exception of certain specific permissible discharges. The General Permit requires development and implementation of a SWPPP that emphasizes the elimination of discharges of pollutants through the implementation of Minimum, Advanced, and Site-Specific BMPs. Each pollutant source must implement each of the Minimum BMPs; furthermore, each pollutant source will be evaluated and assigned Advanced BMPs and/or Site-Specific BMPs as appropriate. Pollutant sources undergo an Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation) to ensure the appropriate BMPs are being implemented.

TYPES OF BEST MANAGEMENT PRACTICES

BMPs are schedules of activities, prohibitions of practices, maintenance procedures and management practices to reduce or prevent the contact of authorized Non-Storm Water Discharges (NSWDs) with materials or equipment that are potential sources of pollutants. BMP are also designed to reduce, to the extent practicable, the flow or volume of authorized NSWDs; ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards; and reduce or prevent discharges of pollutants in authorized NSWDs. BMPs reflect best industry practices, and consider technological availability, economic practicability, and achievability.

BMPs include treatment measures, operating procedures, and practices to control facility site run-off, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may include any type of pollution prevention and pollution control measure necessary to achieve compliance with the IGP. These practices can be effective in preventing pollution by reducing potential pollutants at the source and are required for all industrial activities at ARC.

In accordance with Section X.H of the IGP, the BMPs are categorized as:

- Minimum BMPs (BMPs that, to the extent feasible, are required to be implemented and maintained throughout ARC to reduce or prevent pollutants in industrial storm water discharges),
- Advanced BMPs (necessary to reduce or prevent discharges of pollutants in its storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability).
- Site-Specific BMPs (BMPs designed to address specific ARC industrial activities and are implemented in addition to the Minimum and Advanced BMPs described above.

Collective implementation of these BMPs should reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

Detailed descriptions of each BMP are located on the ARC Environmental Management Division's (EMD) web site at: http://environmentalmanagement.arc.nasa.gov/alpha_index/index.html#b.

TABLE A: SUMMARY OF MOFFETT FIELD INDUSTRIAL ACTIVITIES AND BMPS

Industrial Activity	Pollutant	
Aircraft Exhaust and Fueling	Oil & Grease, Fuel, Heavy Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Aircraft Exhaust and Fueling; Elimination of Non-Storm Water Discharges; Fleet Parking, Fuel Tank Vehicles; Small Motor Oil Spill Response Procedures; and Source Reduction.
Aircraft Maintenance	Sediment, Oil & Grease, Jet Fuel, Toxic Materials, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Aircraft Exhaust and Fueling; Aircraft Maintenance; Aircraft Washing and Rinsing; Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations and Maintenance; Small Motor Oil Spill Response Procedures; and Source Reduction.
Aircraft Washing & Rinsing	Sediment, Oil & Grease, Fuel, Toxic Materials, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Aircraft Washing & Rinsing; Elimination of Non-Storm Water Discharges; and Source Reduction.
Building & Grounds Maintenance	Sediment, Nutrients, Herbicides, Oil & Grease, Fuel Products, Toxic Materials,	**Minimum BMPs -** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs -** Building & Grounds Maintenance; Construction, Demolition and Excavation Operations That Disturb Ground Surfaces Less Than One Acre; Dewatering: Groundwater; Dewatering: Utility Vault; Washing and Rinsing of Outdoor Equipment, Materials, and Displays; Elimination of Non-Storm Water Discharges; Fuel Tank Vehicles; Outdoor Process Equipment Operations and Maintenance; Small Motor Oil Spill Response Procedures; Source Reduction; Dewatering: Washing of Exterior Building Surfaces.
Building Repair, Remodeling & Construction	Sediment, Oil & Grease, Toxic Materials, Heavy Metals	**Minimum BMPs -** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs -** Building & Grounds Maintenance; Building Repair, Remodeling and Construction; Construction, Demolition and Excavation Operations That Disturb Ground Surfaces Less Than One Acre; Dewatering: Groundwater; Dewatering: Utility Vault; Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations; and Maintenance; Project Closeout Requirements; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; Vehicle and Equipment Maintenance; Washing of Exterior Building Surfaces.

Industrial Activity	Pollutant	
Construction, Demolition & Excavation Operations for Projects That Disturb Ground Surfaces Less Than One Acre	Sediment, Nutrients, Oil & Grease, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Building & Grounds Maintenance; Building Repair, Remodeling and Construction; Construction, Demolition and Excavation Operations That Disturb Ground Surfaces Less Than One Acre; Dewatering: Groundwater; Dewatering: Utility Vault; Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations; and Maintenance; ; Project Closeout Requirements; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; Vehicle and Equipment Maintenance; Washing of Exterior Building Surfaces.
Dewatering: Groundwater	Sediment, Nutrients, Oil & Grease, Fuel, Metals, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Building & Grounds Maintenance; Dewatering: Groundwater; Elimination of Non-Storm Water Discharges; Outdoor Process Equipment Operations & Maintenance; Source Reduction.
Dewatering: Utility Vault	Sediment, Nutrients, Oil & Grease, Fuel, Metals, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Building & Grounds Maintenance; Dewatering: Utility Vault; Elimination of Non-Storm Water Discharges; Outdoor Process Equipment Operations & Maintenance; Source Reduction.
Elimination of Non-Storm Water Discharges	Sediment, Nutrients, Oil & Grease, Floatable Materials, Heavy Metals, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Dewatering: Groundwater; Dewatering: Utility Vault; Elimination of Non-Storm Water Discharges: Source Reduction; and Transportation Control Measures.
Fire Department Equipment Testing and Training	Fuel, Oil & Grease	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Fire Department Equipment Testing; Fleet Parking; Outdoor Process Equipment Operations and Maintenance; Source Reduction; and Small Motor Oil Spill Response Procedures.
Fire-fighting Activities	Sediment, Nutrients, Oil & Grease, Floatable Materials, Heavy Metals, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Fire Department Equipment Testing; Fleet Parking; Outdoor Process Equipment Operations and Maintenance; Source Reduction; and Small Motor Oil Spill Response Procedures.
Fleet Parking	Fuel, Oil & Grease	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; and Vehicle and Equipment Maintenance.

Industrial Activity	Pollutant	
Fuel Tank Vehicles	Sediment, Oil & Grease, Jet Fuel, Toxic Materials,	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Aircraft Exhaust and Fueling; Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations and Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; Vehicle and Equipment Maintenance and Repair.
Golf Course Maintenance	Sediment, Nutrients, Oil & Grease, Fuel, Metals, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Building and Grounds Maintenance; Building Repair, Remodeling and Construction; Construction, Demolition, and Excavation Operations That Disturb Less Than One Acre of Ground Surface; Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Golf Course Maintenance; Outdoor Process Equipment Operations & Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle & Equipment Washing; Vehicle & Equipment Fueling; Vehicle Equipment Maintenance and Repair; and Washing of Exterior Building Surfaces and Outdoor Equipment.
Outdoor Process Equipment Operations & Maintenance	Oil & Grease, Fuel, Toxic Materials, Heavy Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Dewatering: Utility Vault; Elimination of Non-Storm Water Discharges; Outdoor Process Equipment Operations & Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; Vehicle and Equipment Maintenance; and Washing of Exterior Building Surfaces and Fixed Outdoor Equipment.
Source Reduction	Nutrients, Oil & Grease, Toxic Materials	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –**Elimination of Non-Storm Water Discharges; Source Reduction; and Transportation Control Measures.
Small Spill Response Procedures	Sediment, Nutrients, Oil & Grease, Fuel, Toxic Materials, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations & Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; and Vehicle and Equipment Maintenance and Repair.
Transportation Control Measures	Sediment, Oil & Grease, Fuel, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –**Elimination of Non-Storm Water Discharges; Transportation Control Measures; and Source Reduction.

Industrial Activity	Pollutant	
Vehicle and Equipment Fueling	Fuel, Oil & Grease	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations and Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle & Equipment Fueling; Vehicle and Equipment Maintenance and Repair.
Vehicle and Equipment Maintenance and Repair	Oil & Grease, Fuel, Toxic Materials, Heavy Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Fleet Parking; Fuel Tank Vehicles; Outdoor Process Equipment Operations & Maintenance; Source Reduction; Small Motor Oil Spill Response Procedures; Vehicle and Equipment Washing; Vehicle and Equipment Fueling; and Vehicle and Equipment Maintenance and Repair.
Vehicle and Equipment Washing	Sediment, Nutrients, Oil & Grease, Fuel, Toxic Materials, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Outdoor Process Equipment Operation and Maintenance; Source Reduction; and Vehicle & Equipment Washing.
Washing and Rinsing of Outdoor Equipment, Materials, and Displays	Sediment, Oil & Grease, Fuel, Toxic Materials, Metals	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Building and Grounds Maintenance; Building Repair, Remodeling, and Construction; Elimination of Non-Storm Water Discharges; Outdoor Process Equipment Operations and Maintenance; Source Reduction; Vehicle & Equipment Washing; Washing and Rinsing of Outdoor Equipment, Materials, and Displays; and Washing of Exterior Building Surfaces & Fixed Outdoor Equipment.
Washing of Exterior Building Surfaces & Fixed Outdoor Equipment	Sediment	**Minimum BMPs –** Employee Training Program; Erosion and Sediment Controls; Good Housekeeping; Material Handling & Waste Management; Preventive Maintenance; Quality Assurance and Record Keeping; Spill and Leak Prevention and Response; Control Devices; Secondary Containment; Water Treatment. **Site Specific BMPs –** Elimination of Non-Storm Water Discharges; Source Reduction; and Washing of Exterior Building Surfaces & Fixed Outdoor Equipment.

MINIMUM BMPS

ARC shall, to the extent feasible, implement and maintain all of the following minimum BMPs to reduce or prevent pollutants in industrial storm water discharges. These minimum BMPs consist of processes, prohibitions, procedures, schedule of activities, etc., that prevent pollutants associated with industrial activity from contacting with storm water discharges and authorized non-storm water discharge. Minimum BMPs are most often comprised of low technology cost-effective measures. To maintain compliance with the IGP, facility operators must implement all of the minimum BMPs at each pollutant source.

The minimum BMPs required by the IGP are as follows:

- Employee Training Program
- Erosion and Sediment Controls
- Good Housekeeping
- Material Handling and Waste Management
- Preventive Maintenance
- Quality Assurance and Recordkeeping
- Spill and Leak Prevention and Response

MINIMUM BMP:
EMPLOYEE TRAINING PROGRAM

DESCRIPTION

This BMP includes training of all personnel who are responsible for:

- Implementing activities identified in the SWPPP;
- Conducting inspections, storm water sampling and visual observations; and,
- Proper management of storm water.

Training should address topics such as:

- Good housekeeping;
- Material handling procedures;
- Preventive maintenance;
- Spill response; and,
- Actions necessary to implement all Best Management Practices identified in the SWPPP.

The SWPPP identifies periodic dates for this training, which is regularly offered to ARC employees, contractors, and resident agencies. Records of all training sessions are maintained for a minimum of five years. Employee training, like equipment maintenance, is a method by which to reinforce Best Management Practices. This BMP highlights the importance of training and of integrating the elements of employee training from the individual source control measures into a comprehensive training program.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This Best Management Practice is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Ensure that all team members performing the various compliance activities of the IGP are properly trained to implement the requirements of the IGP, including but not limited to:
   - BMP implementation,
   - BMP effectiveness evaluations,
   - Visual observations, and
   - Monitoring activities.
2. In the event that ARC enters Level 1 status, as described by the IGP, appropriate team members shall be trained by a Qualified Industrial Storm water Practitioner (QISP);
3. Prepare or acquire appropriate training manuals or training materials;
   - Environmental Compliance/Safety Trainers are employed under the Safety, Health and Medical Services Office, Code QH, and the EMD, Code JQ.
   - The Storm Water Pollution Prevention training materials are prepared by a QISP.
4. Identify which personnel need to be trained, their responsibilities, and the type of training they shall receive;
   - A list of facilities at ARC that have a potential to contribute to storm water contamination is presented in the SWPPP (Figure 5).
   - All personnel performing work at ARC, including resident agencies—unless otherwise stated in the lease agreement **are required** to attend the Storm Water Pollution Prevention training class.
5. Provide a training schedule:

- Regularly scheduled safety and environmental courses are available to ARC civil servants and most contract employees both in-person and online.
    - An instructor-led Storm Water Pollution Prevention class is presented by a QISP certified instructor at ARC four times each year as requested through the EMD.
    - An online version of the Storm Water Pollution Prevention class is offered online through the SATERN training website and is available 24 hours a day to ARC personnel who have access to the ASAP system.
    - Personnel and resident agencies without access to the ASAP training program will be offered an equivalent training program upon availability.
    - A comparable class may be substituted provided it contains a corresponding level of storm water pollution prevention awareness.
- Daily project specific tailgate meetings should integrate storm water quality management with existing training programs.

6. Maintain documentation of all completed training classes and the personnel that received SWPPP training.
    - SWPPP training records are maintained by Code QH and must be retained on site for a period of at least five years.
    - Daily tailgate meeting records will be maintained by each individual facility and must be retained on site for a period of at least five years.
7. Promote employee ownership of problems and the solutions.
8. Integrate employee feedback into training and BMP implementation.

MINIMUM BMP:
EROSION AND SEDIMENT CONTROLS

DESCRIPTION

This BMP includes a description of all sediment and erosion control activities. This includes the planting and maintenance of vegetation, diversion of storm water run-on and run-off, use of sandbags, silt screens or other sediment control devices, etc.

Any site where soils are exposed to water and wind can have soil erosion and sedimentation problems. Erosion is a natural process in which soil and rock materials are loosened and removed. Sedimentation occurs when soil particles are suspended in surface run-off or wind and are then deposited in streams and other water bodies.

Human activities can accelerate erosion by removing vegetation, disturbing the soil, changing natural drainage patterns, and by covering the ground with impermeable surfaces (pavement, concrete, and buildings). Impervious surfaces prevent storm water from seeping into or "infiltrating" the ground, resulting in larger amounts of water moving more quickly across the site, which can carry more sediment and other pollutants to creeks and streams. Many areas of ARC consist of marshlands and grasslands. Areas such as these do not require soil erosion; however, erosion prevention measures must be addressed throughout the rest of ARC, including during any construction and/or grounds maintenance activities.

TARGETED CONSTITUENTS

- Sediment
- Heavy Metals
- Toxic Materials

APPLICABILITY

This BMP is a minimum requirement and applicable to all building, construction, and landscaping activities at ARC. Projects that disturb ground surfaces equal to or greater than one acre must submit an NOI with the SWRCB and prepare a project-specific SWPPP that meets the requirements of NPDES General Permit No. CAS000002: State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

REQUIREMENTS

1. For each erodible surface facility location identified in the SWPPP:
    - Implement effective wind erosion controls:
        - Retain as much vegetation (plants) on-site as possible.
        - Minimize the time that soil is exposed;
        - Apply water to exposed areas to control dust;
        - Cover stockpiles to protect from wind erosion.
    - Provide effective stabilization for inactive areas, finished slopes, and other erodible areas prior to a forecasted storm event;
        - Stabilize the disturbed soils as soon as possible by planting EMD approved vegetation or hydro seed mix;
        - Place filtering media (e.g. straw bales, rocks, silt fences, etc.) around the base of each stockpile or at the storm drain inlet to remove materials from rainwater run-off; and,
        - Remove sediment from storm water run-off before it leaves the site.
    - Maintain effective perimeter controls and stabilize all site entrances and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site;
    - Divert run-on and storm water generated from within the facility away from all erodible material:
        - Slow down the run-off flowing across site (regrading, silt fences, planting).
        - Prevent run-off from flowing across disturbed areas (divert the flow to vegetated areas).
        - Provide drainage ways for the increased run-off (use grassy swales rather than concrete drains);

- If sediment basins are implemented, ensure compliance with the design storm standards in Section X.H.6 of the IGP. Identify areas which, due topography, activities or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and / or stabilization measures used to limit erosion.

MINIMUM BMP: GOOD HOUSEKEEPING

DESCRIPTION

Good housekeeping practices are designed to maintain a clean and orderly work environment. Often the most effective first step towards preventing pollution in storm water from industrial sites simply involves using good common sense to improve the facility's basic housekeeping methods. Poor housekeeping can result in more waste being generated than necessary and an increased potential for storm water contamination. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling of chemicals and equipment, thereby reducing safety hazards. Well-maintained material and chemical storage areas should minimize discharges of materials/pollutants that could contaminate storm water. Simple procedures can be used to promote good housekeeping, including improved operation and maintenance of industrial machinery and processes, material storage practices, material inventory controls, routine and regular clean-up schedules, maintaining well-organized work areas, and educational programs. It is the policy of ARC that facility managers as well as line supervisors are responsible for ensuring that personnel are educated in proper environmental hazards management, including storm water pollution prevention.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Observe all outdoor areas associated with industrial activities including but not limited to:
    - Storm water discharge locations;
    - Drainage areas;
    - Conveyance systems;
    - Waste handling/disposal areas; and,
    - Perimeter areas impacted by off-facility materials or storm water run-on to determine housekeeping needs.
2. Any identified debris, waste, spills, tracked materials, or leaked materials shall be cleaned and disposed of properly;
3. Minimize or prevent material tracking;
4. Minimize dust generated from industrial materials or activities;
5. Ensure that all facility areas impacted by rinse/wash waters are cleaned as soon as possible;
6. Cover all stored industrial materials and stock piles that can be readily mobilized by contact with storm water;
7. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water:
    - Wind and rain can transport stockpiled materials into the storm drain system. To eliminate this hazard, cover materials such as hazardous materials, debris, and sand piles that must remain outdoors;
8. Prevent disposal of any rinse/wash waters or industrial materials into the storm water conveyance system;
9. Minimize storm water discharges from non-industrial areas (e.g., storm water flows from employee parking area) that contact industrial areas of the facility; and,

10. Minimize authorized Non Storm Water Discharges (NSWDs) from non-industrial areas (e.g., potable water, fire hydrant testing, etc.) that contact industrial areas of the facility.
11. Conduct formal monthly observations of all buildings and surrounding areas to ensure.
    - Outside areas are cleaned and organized;
    - Drips, leaks, or evidence of such, from equipment or pipes are contained;
    - There is adequate space in work areas to minimize spill potential;
    - Wastes are removed regularly;
    - Walkways and passageways are easily accessible;
    - Walkways and passageways are free of materials that could be spilled;
    - Evidence of dust from painting, sanding, or other industrial activities are cleaned up and properly disposed of; and
    - Cleanup procedures for spilled materials are accessible and utilized.
12. An inspection log will be maintained in order to feed other environmental reporting requirements at ARC.
    - A formal annual inspection of industrial areas at ARC shall be conducted in accordance with the Quality Assurance and Recordkeeping BMP as required by the IGP.
13. Conduct annual inventory of chemical substances, including hazardous materials and pollutants that are present on-site. This inventory shall meet the requirements of the OSHA-required inventory of chemicals and toxic substances.
14. Maintain a current file of all Safety Data Sheets (SDSs) for chemicals and toxic substances.
15. Label chemical containers in accordance with OSHA, EPA, DOT, and other applicable federal, state, and local requirements.
16. Maintain dry and clean floors and ground surfaces by using brooms, shovels, vacuum cleaners, and cleaning machines.
17. Regularly pickup and dispose of garbage, debris and waste material.
18. Make sure equipment is working properly.
19. Routinely inspect for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products.
20. Ensure that all employees understand spill cleanup procedures in accordance with the Employee Training Program BMP and the IGP.
21. Inform on-site contractors of ARC policies. Include appropriate provisions in their contract to make certain proper housekeeping and disposal practices are implemented.
22. Discuss BMP implementation during daily tailgates/briefings.
23. Improper storage can result in the release of materials and chemicals that can cause storm water run-off pollution. Proper storage techniques include the following:
    - Maintain an up-to-date inventory of all materials (hazardous and non-hazardous). This inventory helps to keep material costs down caused by overstocking, enables the tracking of materials stored and handled on-site, and identifies which materials and activities pose the most risk to the environment.
    - Clearly mark on the inventory each hazardous material that requires special handling, storage, use, and disposal considerations.
    - Keep the work site clean and orderly by removing debris in a timely fashion and sweeping the area regularly.
    - Adhere to the Material Handling and Waste Management BMP.
24. Make sure that nearby storm drains are well-marked to minimize the chance of inadvertent disposal of liquids.
25. Do not dump waste paints or other waste liquids down the storm drain. Nothing but clean rainwater may enter the storm drainage system.
26. Washing concrete trucks over the storm drain or onto the ground is prohibited.
27. Cleaning equipment or tools over catch basins or onto the ground is prohibited.

MINIMUM BMP:
MATERIAL HANDLING AND WASTE MANAGEMENT

DESCRIPTION

This BMP includes the procedures or processes to prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event.

Accidental releases of materials from underground liquid storage tanks, aboveground storage tanks, drums, containers, and dumpsters, or from improper handling, storage, or disposal of waste/recyclable materials present the potential for contaminated storm waters with many different pollutants. Materials spilled, leaked, or released from storage containers and dumpsters may accumulate in soils or on the surfaces. The materials may then be carried away by storm water run-off.

This BMP addresses the loading, unloading, and storage of industrial materials, waste (including hazardous wastes), and recyclable materials. Loading or unloading of materials occurs in two ways: relocation of solids or liquids in containers, or direct liquid transfer. Materials leaked, spilled, or lost during loading/unloading can collect in the soil or on other surfaces and are then carried away by run-off. Rainfall can also wash pollutants from machinery used to unload or move materials, and from industrial equipment and materials exposed to rainfall.

Material transfers take place throughout ARC, including NASA Ames Supply Support Facility at N-255, the Naval Air Reserve Hazardous Materials Warehouse at Moffett Federal Airfield Facility M045 and the California Air National Guard Facilities M681 and M682.

In some locations throughout ARC, hazardous materials are stored outdoors in secondarily contained and covered chemical storage facilities or lockers. Standard Operating Procedures (SOPs) for each of the materials prohibit contact with storm water run-off in the event of an accident or spill.

Hazardous waste is temporarily stored at various satellite and 90-day accumulation areas throughout ARC before being transferred to the ARC Hazardous Waste Processing Facility at N-265 and Moffett Federal Airfield Facility M950. Hazardous waste is then categorized and packaged for shipment to an approved, off-site Treatment, Storage, and Disposal, Facility (TSDF). The containment structure of the accumulation areas prohibits materials from contacting storm water runoff. Rainwater captured within the containment structures is pumped to portable holding tanks and the water is characterized. The water is either discharged to the sanitary sewer system or managed as a hazardous waste, as determined from the characterization.

TARGETED CONSTITUENTS

- Floatable Materials
- Heavy Metals
- Oil and Grease
- Oxygen Demanding Substances
- Toxic Materials

APPLICABILITY

This BMP is applicable to all industrial activities at ARC, including any area where liquid materials are stored outside. It should be noted that the storage of reactive, ignitable, or flammable liquids must comply with the California Health and Safety Code, the Santa Clara County Hazardous Materials Storage Ordinance, and the Local Fire code.

REQUIREMENTS

1. Prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event;
    - Prevent or reduce the discharge of pollutants to storm water from outdoor loading/unloading of materials through implementation of the following:

  - When materials are received, they shall remain in the travel path only for a time reasonably necessary to transport the materials but no longer than 24 hours;
  - Use a written operations plan that describes procedures for loading and/or unloading;
  - Secure lids/caps on all containers when not actively transferring materials into/out of them to reduce the chance of a spill
  - Have an emergency spill cleanup plan readily available;
  - Employees trained in spill containment and cleanup should be present during material loading/unloading;
  - Establish spill kits for quick deployment of cleanup materials. Locate spill kits next to or near each loading/unloading area and regularly train employees in their use;
  - Park delivery vehicles so that spills or leaks can be contained; and
  - Cover the loading/unloading docks to reduce exposure of materials to rain.
- Using engineering safe guards and thus reducing accidental releases of pollutants can prevent operator errors. Examples of engineering safeguards include:
  - Overflow protection devices on tank systems to warn the operator to automatically shut down transfer pumps when the tank reaches full capacity;
  - Protective guards (bollards) around tanks and aboveground piping to prevent vehicle or forklift damage; and
  - Clearly tagging or labeling all values to reduce human error
- Proper use of pesticides and fertilizers will reduce the risk of loss to storm water:
  - Pesticide applicators must be licensed with the California Department of Pesticide Regulation and county agricultural commissioners;
  - All applications of fertilizers and pesticides must be recorded in a log documenting the Date, time, location, product, and amount applied, and the weather conditions at time of application. This log must be maintained onsite and made available upon request.
  - No person shall pollute water supplies or waterways while storing, loading, mixing or applying pesticides on ARC property;
  - No person shall transport, handle, store, load, apply or dispose of any pesticide, container or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, humans, plants or animals;
  - Pesticides / fertilizers should not be applied during the wet season as they may be carried from the site by the next storm;
  - Avoid over-watering not only to conserve water but to avoid the discharge of water which may have become contaminated with nutrients and pesticides;
  - Store pesticides and application equipment in a responsible manner; and
  - Properly dispose of the used containers.
- Storm water from parking lots may contain undesirable concentrations of oil, grease, suspended particulates, and metals such as copper, lead, cadmium, and zinc, as well as the petroleum byproducts of engine combustion. Deposition of air particulates, generated by the facility or by adjacent industries, may contribute significant amounts of pollutants. Therefore, the following maintenance operations shall occur:
  - Sweeping of main streets shall be conducted monthly and sweeping of parking lots shall be conducted quarterly. Sweeping should be conducted with a vacuum sweeper, rather than a mechanical brush sweeping device which is not as effective at removing the fine particulates;
  - Cleaning of catch basins and building laterals shall be conducted annually;
  - Maintain painted stencils that mark storm drain inlets “No Dumping! Flows to Bay.” This stencil will minimize inadvertent dumping of liquid wastes; and
  - Debris will be disposed of off-center at an approved landfill site.
- The NASA ARC Site Contingency Plan is the guideline for emergency response to incidents involving hazardous materials/hazardous waste and/or hazardous waste constituents. The emergency coordination and notification for incidents involving hazardous waste and/or hazardous materials shall be in accordance with federal, state, and local statutory and regulatory requirements. Contact the ARC EMD at 650-604-1800.

2. Cover waste disposal containers like trash cans and dumpsters, and industrial material storage containers during precipitation events and when not in use;

3. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water;
    - Provide secondary containment for liquids unless a site specific determination has been made by the Environmental Management Division and an alternative plan has been established;
    - Cover industrial materials and/or waste containers that hold industrial materials during rain events and when not in use. Protect from rainfall, run-off, and wind dispersal by implementing controls such as:
        - Store materials indoors or in a chemical storage locker;
        - Cover the storage area with a roof; and
        - Minimize storm water run-on by enclosing the area or providing a berm.
    - Storage of oil and hazardous materials, wastes, and recyclables must meet specific federal, state, and local standards including:
        - Spill Prevention Control and Countermeasure (SPCC) Plan;
        - Secondary containment, integrity and leak detection monitoring; and
        - Emergency preparedness plans.
    - Hazardous materials shall be properly stored:
        - Hazardous materials should be placed in a designated area;
        - The designated storage area should be covered with a roof;
        - Designated areas should be paved, free of cracks and gaps and liquid tight in order to contain leaks and spills;
        - Liquid materials should be secondarily contained to hold 10 percent of the volume of all the containers or 110 percent of the volume of the largest container, whichever is greater;
        - Drums stored in an area where unauthorized persons may gain access must be secured to prevent accidental spillage, pilferage or any unauthorized use; and
        - Employees trained in emergency spill cleanup procedures shall be present when dangerous waste, liquid chemicals or other wastes are loaded or unloaded.
    - Hazardous and Universal waste materials and recyclables must be segregated according to hazard class, stored in secondary containment to prevent accidental release, labeled according to the container's contents and the material's hazard and accurately inventoried for reporting to the EMD and to federal, state and local regulatory agencies.
4. Divert run-on and storm water generated from within the facility away from all stockpiled materials;
5. Clean all spills of industrial materials or wastes that occur during handling in accordance with the spill response procedures identified in the IGP:
    - Hazardous Substance Plans are available in facilities where hazardous materials are present. The Hazardous Substance Plan details the chemical inventory of the building, hazardous substance spill procedure, and hazardous chemicals training.
    - Establish procedures and/or controls to minimize spills and leaks;
    - Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the storm water conveyance system;
    - Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
    - Identify and describe all necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures;
    - Identify and train appropriate spill and leak response personnel; and,
    - Refer to the Spill and Leak Prevention and Response BMP for additional information.
    - Observe and clean as appropriate, any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes.
6. Conduct daily, weekly, monthly, or annual inspections as outlined in the Quality Assurance and Recordkeeping BMP;
    - All hazardous materials storage areas and hazardous waste accumulation areas must be inspected weekly. Hazardous materials and hazardous waste inspections must be documented. Documentation must be kept on file for a period of five (5) years. Inspections must include the following:
        - A check for external corrosion and structural failure;
        - A check for spills and overfills due to operator error;

- A check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves);
- A check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice-versa;
- Visual inspection of new tank or container installation, loose fittings, loose valves, poor welding and improper or poorly fitted gaskets; and
- Inspect tank foundations, connections, coatings, tank walls and exposed piping system. Look for corrosion, leaks, cracks, scratches and other physical damage that may weaken the tank or container system.
- A check that all materials are correctly segregated.
- A check that all hazardous materials/waste storage areas are clearly identified, with a description of the hazard class(es) of the materials in the storage area.
- A check that all containers (and secondary containment, if needed) are properly labeled to identify the material/waste hazard.
- A check that the secondary containment is free of liquid and/or debris.
- A check that all containers are in good condition.
- A check that the current SDSs for all hazardous materials in the facility are available on site and easily accessed.
- A check that the hazardous materials inventory for the facility is current.

7. Train employees in standard operating procedures and small spill cleanup techniques, as outlined in the Employee Training Program BMP.
   - It is the responsibility of managers and supervisors at ARC to be familiar with the Employee Training Program BMP, and to ensure employee training in these areas:
     - Safe handling of hazardous materials in the employee's work place including spill response, segregation and secondary containment;
     - Proper storage of industrial materials;
     - Proper disposal of hazardous waste including sewer discharge prohibitions; pickup procedures;
     - Spill Prevention Control and Countermeasures (when storing/transferring oil products);
     - Storm Water Pollution Prevention (when performing work outdoors); and,
     - Emergency Response and First Responder Training.

MINIMUM BMP: PREVENTIVE MAINTENANCE

DESCRIPTION

Preventative maintenance includes the regular inspection and maintenance of structural storm water controls (catch basins, oil water separators, etc.) as well as other facility equipment and systems. Certain normal maintenance activities can enhance water quality if they are carried out more frequently and/or in a more deliberate fashion.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This Best Management Practice is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Identify all equipment and systems used outdoors that may spill or leak pollutants:
    - The table titled “Summary of Moffett Field Industrial Activities and BMPs”, presented in the ARC SWPPP, identifies the industrial areas at ARC that have equipment or materials that may spill or leak pollutants into the storm water system.
2. Observe the identified equipment and systems to detect leaks, or identify conditions that may result in the development of leaks:
    - Equipment to be inspected as part of the Preventative Maintenance BMP includes, but is not limited to requirements such as:
        - Pipes;
        - Storage tanks and bins;
        - Process handling equipment;
        - Equipment and supplies stored in outdoor locations;
        - Storm water management devices (oil/water separators, catch basins, and other structural Best Management Practices);
        - Pumps;
        - Pressure vessels;
        - Secondary containment devices;
        - Fuel dispensing pumps; and
        - Fuel dispensing nozzles.
3. Establish an appropriate schedule for maintenance of identified equipment and systems:
    - Inspections schedules are outlined in the Quality Assurance and Recordkeeping BMP.
4. Establish procedures for prompt maintenance and repair of equipment, and maintenance of systems when conditions exist that may result in the development of spills or leaks.
    - Leaks from equipment must be contained and cleaned up immediately upon discovery. Refer to the Spill and Leak Prevention and Response BMP for additional guidance.
    - Equipment should be inspected each day before use. If any part of the equipment is found to be deficient, it should be locked-out and repaired prior to use.
    - Government owned equipment needing maintenance should be promptly reported to the vehicle maintenance shop located within ARC.
    - Vehicles that do not qualify for servicing at the on-site maintenance shop should be promptly maintained by the vehicle owners or vendors.
    - Spill Response procedures are established in the Spill and Leak Prevention and Response BMP.

- Replace equipment coverings when they become brittle/broken to avoid mobilization of materials into the storm drainage system.

5. Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by:
   - Washing and cleaning up with as little water as possible (wash water is not allowed to be discharged to the ground, even when no soap is used);
   - Preventing and cleaning up spills immediately;
   - Keeping debris from entering the storm drains; and
   - Maintaining the storm water collection system.
6. Conduct an inventory of each facility, system, and/or equipment that upon failure could result in discards which may contaminate storm water run-off.
7. Conduct monthly informal inspections of the inventoried equipment that could result in storm water contamination. Review the Quality Assurance and Recordkeeping BMP for inspection and recordkeeping requirements. Formal inspections conducted for hazardous materials storage, or spill prevention programs are considered equivalent and therefore would fulfill this requirement.

MINIMUM BMP:
QUALITY ASSURANCE AND RECORDKEEPING

DESCRIPTION

This BMP includes the procedures to ensure that:

- All elements of the SWPPP and Monitoring Program are adequately conducted;
- All records of inspections, spill maintenance activities, corrective actions, visual observations, etc., are developed, retained, and provided, as necessary, to the appropriate facility personnel;
- Tracking and follow-up procedures are described to ensure adequate corrective actions are taken and SWPPP updates are made.

TARGETED CONSTITUENTS

- Sediments
- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Develop and implement management procedures to ensure that appropriate staff implements all elements of the SWPPP, including the Monitoring Implementation Plan.
   - Identify buildings, facilities, and conditions at ARC that have a potential to contaminate storm water. This list shall be included in the SWPPP and BMP Handbook.
2. Develop a method of tracking and recording the implementation of BMPs identified in the SWPPP.
   - Identify all BMPs implemented at ARC. This list shall be included in the SWPPP and BMP Handbook.
   - An Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation) of all facilities with a potential pollutant sources will be conducted by EMD in accordance with the IGP.
3. Perform daily inspections of secondary containment units during storm events:
   - Check that the secondary containment is able to contain the rain water.
   - Check the rain water in the secondary containment structure for signs of contamination from industrial materials, such as an oily sheen.
   - If the rain water does not show any signs of contamination, it can be released to the ground. The valve used to release the water MUST be returned to the closed position after releasing the rain water.
   - Each time rain water is released from secondary containment, it must be recorded in a Rain Water Discharge Log.
   - Check the containment for debris or materials that could reduce the volume that can be contained.
   - Check the water in the containment area for signs of contamination such as an oily sheen.
   - Check that the containment drain valve is in the closed position.
   - A check for external corrosion and structural failure;
   - A check for spills and overfills due to operator error;
   - A check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves);
4. Perform weekly visual inspections of industrial facilities that are exposed to rain. Verify that measures used to eliminate storm water pollution are working effectively by inspecting the following:
   - Check for external corrosion and structural failure;
   - Check for spills and overfills due to operator error;
   - Check for failure of piping system (pipes, pumps, flanges, coupling, hoses and valves);

- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice-versa;
- Inspect tank foundations, connections, coatings, tank walls and exposed piping system. Look for corrosion, leaks, cracks, scratches and other physical damage that may weaken the tank or container system.

5. Check for proper labeling of the industrial materials stored in the facility.
6. Perform monthly visual inspections of industrial facilities that are exposed to rain. Verify that measures used to eliminate storm water pollution are working effectively by inspecting the following, in addition to the elements inspected on a weekly basis:
   - Check the interstitial space of a double-walled tank system. Check to see if moisture is accumulating in this space, which may indicate a leak of the inner tank, or a breach of the outer tank.
   - A visual inspection of the facility fire extinguisher. Look to see that the tank is pressurized and in good condition.
   - Check the spill kit. Inspect the contents of the spill kit for completeness, degradation, and usefulness.
   - Check that the Spill Log and Rain Water Discharge log are being updated as required by the IGP.
7. Visually inspect new tank or container installations for the following:
   - Loose fittings, valves;
   - Poor welding;
   - Improper or poorly fitted gaskets; and
   - Cracks or defects in the secondary containment.
8. Specific red flags to look for when visually inspecting industrial areas exposed to rain include:
   - Corroded drums;
   - Drums without plugs or covers;
   - Corroded or damaged tanks, tank supports or tank drain plugs;
   - Torn bags or bags exposed to rainwater;
   - Corroded or leaking pipes;
   - Leaking valves or fittings;
   - Leaking pumps / hose / nozzle connections;
   - Broken / cracked dikes, walls, or other containment systems;
   - Chemicals / dust / materials blown by wind;
   - Improperly maintained or defective dry chemical conveying systems; and
   - Recent or ongoing construction activities.
9. Records and internal reports are performed regularly as determined by the federal, state, and local standards. Maintain the BMP implementation records for a minimum of five (5) years. Formal inspections conducted for hazardous materials storage, or spill prevention programs are considered equivalent and therefore would fulfill this requirement.
   - BMP implementation records include such information as:
   - The location of stored materials are proper whether indoors or in a chemical storage locker;
   - Are all materials correctly segregated;
   - Are all containers labeled to identify the material / waste and hazard;
   - Is the secondary containment free of liquid or debris;
   - Are all containers in good condition;
   - Are SDSs available for all hazardous materials in inventory;
   - Spill logs;
   - Rain Water Discharge Logs;
   - Training records;
   - Spill Response Reports; and,
   - Any documents related to spill cleanup activities.

MINIMUM BMP:
SPILL AND LEAK PREVENTION AND RESPONSE

DESCRIPTION

This Best Management Practice provides spill clean-up procedures and necessary clean-up equipment based upon the quantities and locations of significant materials that may spill or leak. Spills and leaks together are one of the largest industrial sources of storm water pollutants, and in most cases are avoidable.

The most common causes of unintentional releases and spills include the following:

- Lack of awareness regarding proper hazardous materials handling procedures;
- External corrosion and structural failure of storage containers;
- Improper equipment or facility installation;
- Spills and overfills due to operator error;
- Failure of piping systems (pipes, pumps, couplings, hoses, valves); and
- Leaks during pumping of liquids or gases from trucks to a storage facility and vice-versa.

Establishing standard safety and spill prevention operating procedures coupled with an effective employee training program can reduce these accidental releases. Avoiding spills and leaks is preferable to cleaning them up after they occur, not only from an environmental standpoint, but also because spills cause increased operating costs and lower productivity.

TARGETED CONSTITUENTS

- Floatable Materials
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This Best Management Practice is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Establish procedures and/or controls to minimize spills and leaks;
    - Hazardous Substance Business Plans are available in facilities where hazardous materials are present. The Hazardous Substance Business Plan details the chemical inventory of the building, hazardous substance spill procedure, and hazardous chemicals training.
    - Post liquid transfer instructions at each site where liquids and gasses are pumped from trucks to a storage facility and vice-versa.
    - Take steps to immobilize transport trucks during liquid transfer activities.
    - Transport truck operators are required to perform a vehicle walk around prior to pulling away from the material transfer site.
2. Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the storm water conveyance system.
    - Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
    - In the event of a spill near a storm drain:
        - Block, dike, divert, and/or cover the storm drain to prevent a release from entering the storm water system.
    - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:
        - Spill could enter or has entered a storm drain or storm ditch;
        - Spill is a health hazard;
        - Spill is a fire hazard;
        - Spill may directly contaminate the environment or property; or,
        - If the spill cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.

- The NASA ARC Site Contingency Plan is the guideline for emergency response to incidents involving hazardous materials/hazardous waste and/or hazardous waste constituents. The emergency coordination and notification for incidents involving hazardous waste and/or hazardous materials shall be in accordance with federal, state, and local statutory and regulatory requirements. Contact the Environmental Management Division (EMD) at 650-604-1800 for additional information.

3. Identify and describe all necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures:
   - Hazardous materials are required to be segregated according to hazard class, stored in secondary containment to prevent accidental release, labeled according to the container's contents and the material's hazard, and accurately inventoried for reporting to the EMD, and to federal, state, and local regulatory agencies.
   - Hazardous materials storage areas are required to be equipped with emergency spill response equipment appropriate to the types of materials present.
   - The hazardous materials storage areas are required to be inspected weekly to ensure that storage requirements are being satisfied.
   - Each facility has a Hazardous Material Business Plan (HMBP), which details the chemical inventory of the building, hazardous substance spill procedure, and the locations of cleanup equipment.
4. Identify and train appropriate spill and leak response personnel.
   - It is the responsibility of managers and supervisors at ARC to ensure employees are trained in these areas and as outlined in the Employee Training Program BMP:
     - Safe handling of hazardous materials in the employee's work place including spill response, segregation, and secondary containment;
     - Proper disposal of hazardous waste including sewer discharge prohibitions;
     - Waste pickup procedures; and
     - Emergency Response and First Responder Training.

ADVANCED BMPS

Where the Minimum BMPs, as identified above are not effective, the implementation of Advanced BMPs shall be evaluated. Advanced BMPs generally consist of structural devices that reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

The following Advanced BMPs shall be implemented at ARC where appropriate:

- Control Devices
- Overhead Coverage
- Retention Ponds
- Secondary Containment Structures
- Water Treatment

ADVANCED BMP: CONTROL DEVICES

DESCRIPTION

This BMP includes berms or other devices that channel or route run-on and run-off storm water away from pollutant sources.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Identify conditions at ARC where control device channels or reroutes storm water.
2. Visually inspect and verify that the control device integrity has not been breached.
3. Maintain the storm water drainage system, both the east and west side drainage systems.
4. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES

ADVANCED BMP: OVERHEAD COVERAGE

DESCRIPTION

This BMP includes structures that provide horizontal coverage of materials, chemicals, and pollutant sources from contact with storm water and authorized non-storm water discharges. Materials spilled, leaked, or lost from storage containers may accumulate in soils or on the surfaces and be carried away by storm water run-off. It should be noted that the storage of reactive, ignitable, or flammable liquids must comply with fire codes.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC where materials are stored outdoors.

REQUIREMENTS

1. Identify horizontal covered structures at ARC that contain materials with the potential to contaminate storm water. This list shall be included in the SWPPP.
2. Prevent or reduce the discharge of pollutants to storm water from outdoor storage areas by installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.
3. Hazardous Material Business Plans (HMBP) are available at each building where hazardous materials are present. The HMBP details the chemical inventory of the building, hazardous substance spill procedure, and hazardous chemicals training.
4. Weekly inspections will be conducted for hazardous material storage locations. In particular attention will be given to storm water in these locations and proper disposal of storm water.
    - If rainwater accumulates in the covered area, but does not contain a visible sheen and has not come in contact with any industrial materials, it is permissible to discharge the accumulated water onto a grassy or otherwise vegetated area. The discharge of clean rain water must be recorded in a Rain Water Discharge Log.
    - If grassy or vegetated areas are not in the proximity of the covered area, it may be permissible for the water to be discharged to the sanitary sewer system. ARC's EMD must be notified and grant approval prior to any discharge of rainwater to the sanitary sewer system.
    - If water in the covered area does exhibit a visible sheen, or if the potential for pollutants is present, the water must be removed from the area and containerized in drums, tanks, totes, etc. Contact the ARC EMD to request sampling and analysis and proper disposal procedures.
    - In the event of spilled materials:
        - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:
            - Spill could enter a storm drain or storm ditch;
            - Spill is a health hazard;
            - Spill is a fire hazard;
            - Spill may directly contaminate the environment or property; or,
            - If the spill cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.
    - If the rainwater overflows the covered area:
        - Block, dike, divert, and/or cover the storm drain to prevent a release from entering the storm water system.

- Contact ARC EMD at 650-604-1800.
- Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if the rainwater has a visible sheen, or if the potential for pollutants is present.

5. In addition to the minimum BMPs, other applicable BMPs include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES

ADVANCED BMP: RETENTION PONDS

DESCRIPTION
This BMP includes basins, ponds, surface impoundments, bermed areas, etc., which do not allow storm water to discharge from the facility.

TARGETED CONSTITUENTS
- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY
This BMP is applicable to the Storm Water Settling Basin and the Storm Water Retention Ponds located on the northwest end of ARC.

REQUIREMENTS
1. The Storm Water Settling Basin passively treats storm water run-off. The storm water flows through the settling basin and pollutants are removed as they adhere to particulates in the water. These particulates then settle out and form sludge at the bottom of the settling basin. An absorbent boom is strung across the settling basin to help trap floating contaminates.
2. Maintenance of the Storm Water Settling Basin will include:
    - Removal of accumulated sediment should be cleaned before the wet weather season, by mid-August.
    - Sampling of the sediment and including the results in the Settling Basin Sludge Report.
    - Replacement of the absorbent boom when it is full of oil and visibly heavier, and floats lower in the water.
    - Sample storm water at the effluent location twice during the first half of the reporting year (July 1-December 31), and twice during the second half of the reporting year (January 1-June 30).
    - Results will be uploaded to the Storm Water Regional Control Board's (SWRCB's) Storm Water Multiple Application and Report Tracking System (SMARTS) web-based database via Ad Hoc reports within 30 days of receiving the analytical report. The Ad Hoc reports will be included in the Storm Water Annual Report.
3. The Storm Water Retention Pond collects and passively treats storm water run-off. It is essentially a small lake with rooted wetland vegetation along the perimeter. The permanent pool of water provides a quiescent volume for continued settling of particulate contaminants and uptake of dissolved contaminants by aquatic plants between storms. The wetland vegetation is present to improve the removal of dissolved contaminants and to reduce the formation of algal mats. The Storm Water Retention Pond helps where the removal of the dissolved constituent fraction is of concern, particularly nutrients and metals. Dissolved contaminants are removed by a combination of processes: physical adsorption to bottom sediments and suspended fine sediments, natural chemical flocculation, and uptake by aquatic plants.
4. In addition to the minimum BMPs, other applicable BMPs include:
    - CONTROL DEVICES
    - WATER TREATMENT

ADVANCED BMP: SECONDARY CONTAINMENT STRUCTURES

DESCRIPTION

This BMP includes containment structures around storage tanks and other areas for the purpose of collecting any leaks or spills. Secondary containment is defined as a level of containment external to, and separate from, the primary containment.

The Santa Clara County Hazardous Materials Storage Ordinance promotes the protection of life, health, resources, and property through prevention and control of unauthorized discharges of hazardous materials. An integral portion of this ordinance involves the use of secondary containment. Complying with local regulations and adopting the requirements listed on the following page to ensure secondary containment areas are clean and pollutant-free and enable the discharge of rainwater from these areas with minimal effort. If operators have any questions or concerns regarding secondary containment, or removal of rainwater from secondary containment, contact the NASA ARC EMD at 650-604-1800.

TARGETED CONSTITUENTS

Listed below are the targeted constituents that should be prevented from contaminating rainwater that enters secondary containments.

- Heavy Metals
- Toxic/Hazardous Materials
- Oil and Grease
- Oxygen Demanding Substances
- Heavy, Solid, Fibrous Matter, or Viscous Substances

APPLICABILITY

This BMP is applicable to all locations where secondary containments exist throughout ARC.

REQUIREMENTS

The following procedures have been developed to ensure that rainwater, which collects in secondary containment, is handled in an appropriate manner. Operators must follow these procedures to ensure that any discharges of rainwater from secondary containments to the environment comply with all applicable regulations:

1. All primary containment must be product-tight.
2. In the case of an installation with one primary container, the secondary containment must be large enough to contain at least 110 percent of the volume of the primary container.
3. In the case of a storage facility with multiple primary containers, the secondary container must be large enough to contain 150 percent of the volume of the largest primary container placed in it, or ten percent of the aggregate internal volume of all primary containers in the storage facility, whichever is greater.
4. If the storage facility is open to rainfall, then the secondary containment must be able to additionally accommodate the volume of a 24-hour rainfall as determined by a 100-year storm history. National Oceanic and Atmospheric Administration (NOAA) estimates this to be 4 inches using reported data from the Moffett Field weather station.
5. Laminated, coated, or clad materials are single-walled and must not be considered to fulfill the requirements of both primary and secondary containment.
6. Rainwater that accumulates in secondary containments shall be removed as soon as possible, pursuant to local regulatory requirements:
    - If rainwater accumulates in secondary containment, but does not contain a visible oily sheen and has not come in contact with any other contaminants, it is permissible to discharge the accumulated water onto a grassy or otherwise vegetated area.
    - A Rain Water Discharge Log must be maintained on site and each release of rain water must be recorded on the log.
    - The disposal of rainwater from secondary containment areas into the sanitary sewer system must be approved by the EMD and the local regulatory agency.

- If grassy or vegetated areas are not in the proximity of the secondary containment structure, it may be permissible for the water to be discharged to the sanitary sewer system. However, EMD must be notified and a permit to discharge must be granted prior to any discharge of rainwater to the sanitary sewer.
- If water in the secondary containment does exhibit a visible sheen, or if the potential for pollutants is present, the water shall be removed from the secondary containment and containerized in drums, tanks, totes, etc. Contact the EMD at 650-604-1800 to request sampling and analysis and proper disposal procedures.

7. In some cases, advanced secondary containment devices may be incorporated within a facility's storm drainage system. These containment devices must receive prior approval by the EMD and shall be identified with distinctive markings. An inline BMP management plan must be submitted to EMD prior to installing the inline BMP.
8. Protect hazardous materials and hazardous material storage areas from rainfall, run-off, and wind dispersal when possible.
9. Perform regular inspections to ensure that secondary containment areas are free of spilled materials, trash, and rubbish.
10. Train personnel in good housekeeping techniques, standard operating procedures and any other training which may apply.
11. In the event of spilled materials:
    - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:
        - Spill could enter or has entered a storm drain or storm ditch;
        - Spill is a health hazard;
        - Spill is a fire hazard;
        - Spill may directly contaminate the environment or property; or,
        - If the spill cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.
    - If the rainwater overflows the covered area:
        - Block, dike, divert, and/or cover the storm drain to prevent a release from entering the storm water system.
        - Contact ARC EMD at 650-604-1800.
        - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if the rainwater has a visible sheen, or if the potential for pollutants is present.
12. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - SOURCE REDUCTION

ADVANCED BMP: WATER TREATMENT

DESCRIPTION

This BMP includes groundwater treatment systems, inlet controls, infiltration devices, oil/water separators, retention ponds, vegetative swales, etc., that reduce the pollutants in storm water discharges and authorized non-storm water discharges.

TARGETED CONSTITUENTS

- Sediments
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Identify buildings, facilities, and conditions at ARC that have a potential for malfunction and contaminate storm water. This list shall be included in the SWPPP.
2. Control potential pollutants before discharging water to the storm drain system with the use of oil-absorbent booms. The absorbent material preferentially absorbs oil, and does not fill with water. It can be used on storm water with small concentrations of oily materials. When the boom is spent, it is full of oil and visibly heavier, and floats lower in the water. The booms are inexpensive enough that they may easily be replaced whenever the absorbent is saturated.
3. Maintain oil/water separators regularly to retain its effectiveness and to avoid spilling oily wastes. The separator should be pumped out periodically and replaced with clean water. The separator should be cleaned once before the wet weather season, by mid-September, and then periodically between storms. For inlets that don't carry much flow, three cleanings per year are sufficient: once before the rainy season to remove materials that have accumulated; once after the first major storm; and once at the end of the rainy season to prevent slow loss or evaporation of the collected oily wastes. If flows are heavy, monthly cleaning may be necessary.
4. Effluent from groundwater treatment systems that discharge to the storm drain system must comply with general National Pollutant Discharge Elimination System (NPDES) permit requirements.
    - Inspect the facility weekly for external corrosion, structural failure, failure of piping system, leaks or spills, loose fittings, loose valves, and other physical damage that may weaken the treatment system;
    - Functional tests should be performed regularly on equipment to ensure that alarm systems are working properly; and,
    - Sampling of influent and effluent waters for constituents of concern shall be done regularly per NPDES permit requirements.
5. Building 191, Gate 14A, and Gate 14B pump stations are located along North Patrol Road Ditch, which runs parallel to the Northern Channel. During normal operations, storm and surface waters are pumped out of the Building 191 concrete vault and into the eastward-flowing Northern Channel. During large rain events, pumps located at Gates 14A and 14B will be used to pump water directly into the Northern Channel to avoid flooding. Building 191 operates with one main and one auxiliary pump, Gate 14A operates with one main pump, and Gate 14B operates with one main pump and one auxiliary pump. Water level dictates how many pumps are operated.
    - Immediately alert EMD if the pumps at Gate 14A or 14B are activated.
    - Inspect the facility daily for equipment failure, failure of the piping system, leaks or spills, loose fittings, loose valves, and other physical damage that may weaken the pumping system;
    - Functional tests should be performed regularly to ensure that systems are working properly.

- Sample storm water at the effluent locations twice during the first half of the reporting year (July 1-December 31), and twice during the second half of the reporting year (January 1-June 30).
- Results will be uploaded to the SWRCB's SMARTS web-based database via Ad Hoc reports within 30 days of receiving the analytical report. The Ad Hoc reports will be included in the Storm Water Annual Report.

6. In addition to the minimum BMPs, other applicable BMPs include
   - CONTROL DEVICES
   - SOURCE REDUCTION

SITE-SPECIFIC BMPS

As of August 2022, 22 industrial activities with a potential for contaminating storm water have been identified at ARC. Site-Specific BMPs consist of industrial activities that could affect the quality of storm water. Table A summarizes each industrial activity, potential pollutants, potential pollutant sources, and assigns BMP(s) to minimize or eliminate any pollutant discharges. Each Site-Specific BMP includes a description of the associated industrial activity, a list of associated targeted pollutants, a description of the applicability of the BMP, and an outline of the BMP requirements.

The following Site-Specific BMPs shall be implemented at ARC when applicable:

- Aircraft Exhaust and Fueling
- Aircraft Maintenance
- Aircraft Washing and Rinsing
- Building and Grounds Maintenance
- Building Repair, Remodeling, and Construction
- Construction, Demolition, and Excavation Operations That Disturb Ground Surfaces Less Than One Acre
- Dewatering: Groundwater
- Dewatering: Utility Vault
- Elimination of Non-Storm Water Discharges
- Fire Department Equipment Testing and Training
- Fleet Parking
- Fuel Tank Vehicles
- Golf Course Maintenance
- Outdoor Process Equipment Operations and Maintenance
- Project Closeout Requirements
- Source Reduction
- Small Spill Cleanup Procedures
- Transportation Control Measures
- Vehicle and Equipment Fueling
- Vehicle and Equipment Maintenance and Repair
- Vehicle and Equipment Washing
- Washing and Rinsing of Outdoor Equipment, Materials, and displays
- Washing of Exterior Building Surfaces and Fixed Outdoor Equipment

SITE-SPECIFIC BMP: AIRCRAFT EXHAUST AND FUELING

DESCRIPTION

Spills from fueling aircraft or from the transfer of fuels to storage tanks can be a significant source of pollution. Fuels carry contaminants of particular concern to human health and wildlife, such as heavy metals, toxic materials, and oil and grease, which are not easily removed by storm water treatment devices. Consequently, control at the source is particularly important. Adequate control can be achieved with careful design of the initial installations, retrofitting of existing installations, and proper spill control and cleanup procedures.

TARGETED CONSTITUENTS

- Oil and Grease
- Petroleum Products
- Antifreeze
- Toxic Materials
- Heavy Metals

LOCATION

- NASA Fueling Pits
- High Speed Fueling Hydrants
- Aircraft Tarmac

REQUIREMENTS

1. Prevent fuel spills and leaks and reduce their impacts to storm water.
    - For all aircraft fueling, with the exception of over-the wing fueling of the aircraft, will use single point closed fueling equipment. This equipment prevents vapor release during fueling.
    - All aircraft fueling activities will take place on the concrete ramp to provide protection to the environment in case of spills or leaks.
    - Storm drains located in the vicinity of aircraft fueling activities shall be equipped with safety valves that remain in the normally closed position. During rain events, catch basins will be visually inspected for contaminants prior to opening the valve to release rainwater. Document discharges of storm water from secondary containment devices in accordance with the Minimum BMP: Quality Assurance and Recordkeeping.
    - Mobile fueling trucks provide fuel the H211 aircraft but all fueling activities will take place on the concrete ramp.
    - Clean up of any fuel overflows and spills are done by using dry cleanup methods. Spills are characterized by the actual cleanup requirements and size of spill. Only persons trained in fuel spill cleanup can provide spill response.
    - Post signs that instruct pump operators not to "top off" or overfill gas tanks. Keep dry cleanup materials in the fueling area and instruct employees in the dry cleanup methods described in Sections 4, 5, and 6, as seen below.
    - Assign someone responsibility to visually inspect the area daily for gasoline, motor oil, or other fluids that may have leaked.
2. NASA Aircraft Fueling and Defueling
    - Follow NASA aircraft fueling and defueling procedures.
    - Block any storm drains in the vicinity with appropriate BMPs.
3. AvPorts aircraft fueling operations
    - Adhere to the National Air Transportation Association Refueling and Quality Control Procedures for Airport Service and Support Operations.
    - Fuel Spills/Leaks: preventative measures, response, and reporting (Refer to HR Employee Training Records, Section C, and PV-MFA SPCC):
        - Preventative measures-Safety & Spill Equipment and Training;

- Drain cover over storm drain 24/7 except during rain-back up cover located in Emergency Spill Cart.
- Emergency Spill Cart stocked with enough supplies and equipment to contain and clean up a 300-gal fuel spill.
- Air Powered Fuel Vacuum connected to 55-gal steel drum.
- Refueling Trucks contain their own spill kit that can contain and clean up a 100-gal fuel spill.
- Airport vehicles 1, 2, and 3 also contain their own 100-gal spill kits.
- Additional 55 gal drums, spill mats, absorbent, etc. located in the Haz-Mat building and Conex Box 1 & 3.
- 25-gal mixing tubs, drip pans, 5-gal buckets, 2-gal pails.
- First Aid-each refueler and vehicle contain a first aid kit and portable eyewash bottles.
- Five 150 lb. halon fire extinguishers located between each refueler with additional located along the ramp.
- Each refueler has two 20 lb. PK fire extinguishers on board and readily available.
- Each vehicle has a 10 lb. ABC fire extinguisher on board and readily available.
- Refuelers Inspected, PM, QC, and stocked daily, weekly, monthly, and annually.
- Hazmat Building-secondary containment.
- Bi-Annual NATA Safety 1st Professional Line Service & Line Fuel Service Certification.
- Training Fueling Procedures, Fuel QC, Fueling Safety, Fuel Spill Control, Fire Safety.
- Annual Fire Extinguisher training and certification.
- Annual Hazmat Communication-compliance, documentation & reporting, storage, cleanup & prevention.
- Airfield Maintenance Personnel are responsible for all fuel transfers, QC, Maintenance, Compliance, & Training.

- Response to a spill;
  - Immediately STOP fueling operation: release “dead-man control”, close all valves, and activate emergency shutoff.
  - Generously and quickly apply spill kit materials to contain and prevent flow to storm drain and environment.
  - NO call for help if spill/leak can be contained, controlled, and cleaned up by two people in under 30 min.
  - Immediately call for help if cannot contain, control, or clean up and/or enters storm drain or environment;
    - NASA Dispatch 650-604-5555
    - Moffett Air Traffic Control 650-603-9868 or VHF 119.55 or UHF Ch. 1
    - AvPORTS Airfield Operations 650-386-0677 or UHF Ch. 2 or 3
    - Command Consulting Group 650-386-0700 or UHF Ch. 4 or 5
    - Clean Harbors Emergency Spill Response & Recovery 800-645-8265
  - Soiled spill kit materials will be cleaned up/swept up and then transferred to drums with lids secured.
  - Drums will be stored in the Haz-Mat Building.
  - Immediately place Hazmat labels on drums-include start date, contact and address, description of contents.
  - Contact Environmental Vendor, Clean Harbors to schedule pickup.
- Reporting (Refer to Spill Log SOP and PV-MFA SPCC).
  - All spills/leaks will be recorded in the Spill Report Log.
  - Reportable Spills/Leaks and Incident Reporting are those requiring an Immediate call for help if cannot contain control, or clean up and/or enters storm drain or environment.
  - Retain Reports and Records for SPCC, SWPPP, EPA, and other Agency compliance and notifications.

4. Reportable Spill

- A reportable spill is any actual or threatened release of a hazardous material that enters the environment. Examples include:
  - A spill enters a storm drain or ditch.
  - A spill enters the sanitary sewer.

    - A spill contacts soil.
    - Potential injury
  - A spill that results in real or potential injury to persons or the environment is considered reportable.
  - A release of a gas, mist or fume which impacts soil, water, or biota.
  - A spill that cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.
5. In the Event of a Reportable Spill
  - Evacuate and deny entry to the affected area. Create barriers or designate guards to control access and traffic.
  - Call 911 or 650-604-5555 and provide all available information. NASA Dispatch will dispatch the on-site spill response team.
  - NASA Dispatch will also notify the EMD, who will make the necessary regulatory agency notifications.
6. Non-Reportable Spill
  - A non-reportable hazardous materials spill is one that:
    - Does not escape to the environment.
    - Will not pose a health risk to individuals in the immediate area.
    - Can be controlled and contained with on-hand spill response materials appropriate to the task.
    - The properties of the material are well known to the person(s) who will be controlling and containing the spill.
    - The person(s) controlling and containing the spill have had appropriate training.
    - To control and contain the spill requires less than 1/2 hour for two people.
    - Record the event.
  - In the event of a small, non-reportable, (but still recordable) spill:
    - Contain and control the spill with available appropriate spill response equipment.
    - Manage spill containment materials as hazardous waste.
    - Record the event.
7. In addition to the minimum BMPs, other applicable BMPs include:
  - ELIMINATION OF NON-STORM WATER DISCHARGES
  - SOURCE REDUCTION

SITE-SPECIFIC BMP: AIRCRAFT MAINTENANCE

DESCRIPTION

Aircraft maintenance is performed both indoors and outdoors in various locations throughout ARC. This Best Management Practice addresses aircraft maintenance activities performed at ARC, including aircraft operations at N248, AvPorts airport operations at M158 and N211, and CANG aircraft operations at the 129th Rescue Wing facilities.

TARGETED CONSTITUENTS

- Heavy Metals
- Toxic Materials
- Hydraulic Fuel
- Oil and Grease
- Petroleum Products
- Antifreeze

APPLICABILITY

- N-249 - OARF
- M158
- M662

REQUIREMENTS

1. Prevent fuel spills and leaks, and reduce their impacts to storm water by:
   - Install vapor recovery nozzles to help control drips as well as air pollution;
   - Use a paved area or provide a concrete slab for the fueling area. Concrete is preferred because fuel and oils cause asphalt to deteriorate;
   - Clean up fuel overflows and spills using dry methods;
   - Do not allow spills to run off or evaporate;
   - Do not flush the spill away with a hose. Spread adsorbent material, sweep it up with a broom, and dispose of it as hazardous waste;
   - Keep dry cleanup materials in the fueling area, and instruct employees in the dry clean up methods described below; and
   - Assign someone responsibility to check the area every day for jet fuel, gasoline, motor oil or other fluids that may have leaked.
2. Comply with the Spill and Leak Prevention and Response BMP.
   - **All** spills, regardless of size, must be recorded in the spill log. Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
   - In the event of a spill near a storm drain:
     - Block, dike, divert, and/or cover the storm drain to prevent a release from entering the storm water system.
   - **Small spills** are those which can be wiped up with a shop rag. Store shop rags in a covered rag bin indoors. Do not saturate rags with gasoline, solvents or other volatile liquids;
   - **Medium spills** are too large to wipe up with a rag.
     - Contain and soak up a liquid using dry absorbent material.
     - Absorbent “snakes” may be used as temporary booms to contain and soak up the liquid.
     - Sweep up the used absorbent and snakes and dispose of them appropriately
     - When sweeping up absorbent materials, be careful not to kick up dust, doing so may introduce contaminants into the atmosphere.
     - Do not use a leaf blower, or similar powered equipment to sweep up used spill kit materials.
   - **Large spills** must be contained and then cleaned up.
     - Shut off or plug storm drain inlets or sewer inlets where the spill may enter.
     - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:

  - Spill could enter a storm drain or storm ditch;
  - Spill is a health hazard;
  - Spill is a fire hazard;
  - Spill may directly contaminate the environment or property; or,
  - If the spill cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.
  - For non-hazardous spills, take steps to contain and clean up the liquid, and minimize the wash water used in cleanup.
- Report medium and large spills and leaks to the ARC EMD at 650-604-1800 immediately.

3. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
4. Follow facility operating procedures for fueling and defueling procedures.
5. In addition to the minimum BMPs, other appropriate Best Management Practices include:
   - AIRCRAFT FUELING
   - VEHICLE AND EQUIPMENT FUELING

SITE-SPECIFIC BMP: AIRCRAFT WASHING AND RINSING

DESCRIPTION

In order to ensure a high quality of storm water effluent at NASA ARC, the following BMP for the washing and rinsing of aircraft has been developed. If any questions arise concerning the following information, please contact the ARC EMD.

TARGETED CONSTITUENTS

Listed below are the targeted constituents that should be prevented from entering the storm drain system during washing procedures.

- Heavy Metals
- Toxic / Hazardous Materials
- Oxygen Demanding Substances

APPLICABILITY

This BMP is applicable to all locations where planes are washed throughout ARC.

REQUIREMENTS

The following procedures have been developed to ensure that no contaminants enter the storm drain system during the washing or rinsing of aircraft. Operators must follow these procedures to ensure that the quality of storm water discharges from ARC is not adversely impacted.

1. Train personnel in good housekeeping techniques, standard operating procedures, and any other training which may apply.
2. Protect all storm drain inlets from potentially contaminated run-off generated by washing. Storm drain inlets should be securely covered with visqueen, plastic or other such material, prior to any washing activities.
3. Follow the posted procedures for proper operation of the wash rack. This will ensure that the automatic valve will divert wash water to the sanitary sewer instead of the storm drainage system.
4. Use of soaps during washing activities is discouraged. If soap is necessary, use only biodegradable soap products. Contact the EMD, Code JQ, prior to use of any product so that the Safety Data Sheet (SDSs) may be reviewed.
    - Soap is **not** permitted to be discharged into the storm drain, even if it is biodegradable. Measures must be taken to protect the storm drain throughout the washing activities.
5. After washing/rinsing the aircraft, flush the run-off into the sanitary sewer. If the run-off is not properly rinsed into the sanitary sewer, the contaminants washed off the aircraft will sit on the pavement until the next rainfall and be washed down the storm drain, which is a violation of the Industrial General Permit.
6. If run-off from the washing activities enters the storm drainage system, call 911 immediately.
    - Report the event to NASA EMD, Code JQ, at 650-604-1800.
    - The Spill and Leak Prevention and Response BMP provides additional information on responding to a spill.
7. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
8. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - SOURCE REDUCTION

SITE-SPECIFIC BMP:
BUILDING AND GROUNDS MAINTENANCE

DESCRIPTION

This BMP includes taking care of landscaped areas around the facility, cleaning of parking lots and pavement other than in the areas of industrial activity, and the cleaning of the storm drainage system. Certain nominal maintenance activities can generate materials that must be properly disposed. Other maintenance activities can enhance water quality if they are carried out more frequently and/or in a more deliberate fashion.

General Maintenance at ARC is managed by the Plant Engineering Branch. Facility maintenance is performed in accordance with the guidelines Jacobs developed in its Environmental Pollutant Plan, a Maintenance Support Services, and Construction Report Requirement.

TARGETED CONSTITUENTS

- Heavy metals
- Oil and grease
- Nutrients
- Hydraulic fluid
- Fuel products
- Pesticides
- Herbicides
- Sediments

APPLICABILITY

This BMP is applicable to all landscaped and industrial activity areas at ARC.

REQUIREMENTS

1. Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.
2. No person shall:
    - Pollute water supplies or waterways while loading, mixing, or applying pesticides at ARC.
    - Transport, handle, store, load, apply, and dispose of any pesticides, containers, or apparatus in such a manner as to not pollute water supplies or waterways, or cause damage or injury to land, humans, plants, or animals.
3. Pesticide applicators must be licensed with the California Department of Pesticide Regulation and county agricultural commissioners.
4. Records of pesticide application location, date, product, and amount used are to be kept onsite and made available upon request.
    - Avoid application of pesticides/fertilizers during the wet season to avoid runoff to the storm water discharge. Follow manufacturer's instructions for proper application. Consider use of irrigation system instead of rainfall if watering is a required step in the application process.
5. Avoid over-watering not only to conserve water but also to avoid the discharge of water, which may have become contaminated with nutrients and pesticides.
6. Store pesticides and application equipment in a responsible manner and properly dispose of the used containers.
7. Use integrated pest management where appropriate.
8. Sweeping of main streets should be conducted monthly and sweeping of parking lots quarterly.
    - Sweeping should be conducted with a vacuum sweeper, rather than a mechanical brush sweeping which is not as effective at removing the fine particulates.
    - If using a blower or sweeper, debris must not be directed towards or into a storm drain.
9. Cleaning of catch basins and building laterals must be conducted annually.

10. Maintain painted stencils that mark storm drain inlets “No Dumping Flows to Bay” to minimize inadvertent dumping of liquid wastes.
11. Proper disposal of wash water, sweepings, and sediments is required.
12. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
13. Maintain equipment on a regular schedule to prevent the release of vehicle fluids (e.g. hydraulic oil, fuel, antifreeze).
14. In addition to the minimum BMPs, other applicable BMPs include:
    - VEHICLE/EQUIPMENT MAINTENANCE and REPAIR
    - VEHICLE AND EQUIPMENT WASHING
    - BUILDING REPAIR, REMODELING and CONSTRUCTION

SITE-SPECIFIC BMP: BUILDING REPAIR, REMODELING, AND CONSTRUCTION

DESCRIPTION

Building repair, remodeling, and/or construction activity may vary from minor and normal building repair to major remodeling or the installation of a new facility on currently open space. These activities can generate pollutants that can reach storm water if proper care is not taken. The sources of these contaminants may be solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues and old asbestos installation.

TARGETED CONSTITUENTS

- Sediment
- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all facilities at ARC.

REQUIREMENTS

1. Prevent or reduce the discharge of pollutants to storm water from building repair, remodeling and construction by using soil erosion controls, enclosing or covering building material storage areas, covering and/or diking storm drain catch basins, utilizing good housekeeping practices, using safer alternative products and training employees.
2. Each job site should be managed in such a manner to avoid discharges of prohibited substances to the storm drain system.
3. Routine inspection of job site should be performed to ensure that construction, demolition, and excavation materials (liquid or solid) are not entering the storm drain system.
4. Keep the job site tidy and clean up debris regularly.
5. Storm drain catch basins should be covered to prevent pollutants and sediments from entering the storm drain system.
6. Special precautions should be employed if rain is forecast or if water is applied. These precautions should include, but are not limited to:
    - Increased monitoring frequency for storm drains and to rectify ongoing releases or to identify and prevent any possible release; and,
    - Reduction in activities that can cause material to come into contact with rainwater.
7. Painting operations should follow:
    - Application of lead based paint is prohibited;
    - Treat a paint spill as a chemical spill. The Spill and Leak Prevention and Response BMP provides additional information on responding to a spill.
    - Painting operations should be properly enclosed or covered to avoid drift;
    - Use temporary scaffolding to hang drop cloths or draperies to prevent drift. Use application equipment that minimizes overspray;
    - If painting requires scraping or sand blasting of the existing surface, use a ground cloth to collect the chips. Dispose of the residue properly;
    - If the paint contains lead or tributyl tin, it requires classification as a hazardous waste. Contact ARC EMD at 650-604-0927 for proper disposal of paint (and materials used) classified as hazardous waste.
    - Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective. Dried paint will erode from a surface and be washed away by storms; and,

- Properly store or dispose leftover paints. Liquid chemicals must be stored inside of secondary containment.
- For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- **Prior to the closeout of this project all waste and materials must be removed from site and returned to original condition or approved condition per the project Record of Environmental Considerations (REC). Closeout approval from EMD is contingent on receiving notification from the project including pictures of all outdoor work/staging areas submitted to EMD.**

8. In addition to the minimum BMPs, other applicable BMPs include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES
   - SOURCE REDUCTION
   - PROJECT CLOSEOUT REQUIREMENTS

SITE-SPECIFIC BMP: CONSTRUCTION, DEMOLITION AND EXCAVATION OPERATIONS THAT DISTURB GROUND SURFACES LESS THAN ONE ACRE

DESCRIPTION

Construction, demolition and excavation projects generate a great deal of dust, debris, waste materials and wastewaters that when improperly managed can result in prohibited discharges to the storm drainage system. Various construction projects occur at ARC throughout the year. This BMP applies to construction, demolition, and excavation projects that disturb ground surfaces less than one acre. Projects that disturb ground surfaces equal to or greater than one acre must submit an NOI with the SWRCB and prepare a project-specific SWPPP that meets the requirements of NPDES General Permit No. CAS000002: State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

TARGETED CONSTITUENTS

- Sediment
- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oil and Grease
- Petroleum Products
- Contaminated Groundwater

APPLICABILITY

This BMP is applicable to all construction, demolition, and excavation activities at ARC that disturb ground surfaces less than one acre.

REQUIREMENTS

1. Provide a sign in sheet verifying SWPPP training within first two weeks of project. After the initial training, each construction project is required to provide sign in sheets quarterly and with annual updates. Contact the EMD, Code JQ for the latest version of the training program and to submit sign in sheets.
2. Each job site should be managed in such a manner to avoid discharges of prohibited substances to the storm drain system.
3. Routine inspection of the job site should be performed to ensure that construction, demolition, and excavation materials (liquid or solid) are not entering the storm drain system.
4. Cleaning equipment or tools over catch basins is prohibited.
5. Obtain Industrial Waste Water Sewer Discharge Training before discharging industrial waste water.
6. Keep the job site tidy and clean up debris regularly.
7. Storm drain catch basins shall be covered to prevent pollutants and sediments from entering the storm drain system.
8. Special precautions should be employed if rain is forecast or if water is applied. These precautions should include, but are not limited to:
    - Increased monitoring frequency for storm drains and to rectify ongoing releases or to identify and prevent any possible release; and
    - Reduction in activities that can cause material to come into contact with rain water.
9. Following all construction, demolition, and excavation activities; the job site should be swept to remove debris and residue. Catch basins should be vacuumed to remove sediment and debris, and any BMPs used to protect the storm drains must be removed at the end of the project.
10. Inspect and maintain BMPs used to protect storm drains, replace as needed.
11. Construction, demolition, and excavation materials (gravel, sand, lumber, cement, chemicals, contaminated equipment, etc.) shall be stored under a roof or structure or covered with a tarp or plastic visqueen. Covered items should be secured with ropes, sandbags, bricks, etc. to prevent or minimize

contact with rainwater. Place filtering media (e.g. straw bales, rocks, silt fences, etc.) around the base of each pile or at the storm drain inlet to remove these materials from rainwater run-off.

12. Do not locate stock piles or store items near catch basins.
13. Wet concrete and concrete cutting waters should be conducted to prevent discharge to the storm drains. Blocking off or plugging drains in the vicinity may be warranted. This can be done in a number of ways: placing weighted plastic visqueen over drain, using sandbags or spill control PIGS, etc.
14. Equipment and machinery that contain residual concrete and concrete/asphalt cutting effluent shall not be discharged to the storm drain. Concrete/asphalt trucks are not permitted to be washed off on-site unless the wash water that will be generated is properly contained and disposed of off-site. For information on proper disposal of concrete/asphalt wash water, contact ARC EMD at 650-604-1800.
15. Equipment and machinery that is stockpiled for later use shall be stored on pallets or other structure that prevents moisture from oxidizing the materials, and covered to protect against exposure to rain. Covers should be replaced when the material begins to break down, to avoid mobilization into the storm drainage system.
16. Outdoor concrete work should be postponed if rain is forecast unless precautions are taken to prevent discharge of wet concrete and other construction debris to the storm drain.
17. During paint scraping operations, use impermeable ground cloths, such as plastic sheeting, to collect dust, paint chips, etc.
18. Use impermeable ground cloths while painting. Place in-use paint buckets in a pan or over plastic sheeting to ensure that accidental spills are not discharged to the storm drain.
19. Mixing of paint should take place indoors or in a place that is not exposed to the elements.
20. At the end of the workday, store paint buckets and other equipment away from contact with storm water in a secured, secondarily contained area.
21. Treat a paint spill as a chemical spill.
    - Capture the material before it flows to the storm drain.
    - Clean it up promptly and if the spill could enter or has entered a storm drain, call 911 immediately.
    - Report the event to NASA EMD, Code JQ, at 650-604-1800.
    - The Spill and Leak Prevention and Response BMP provides additional information on responding to a spill.
22. Outdoor Sandblasting should comply with the following:
    - Tarpaulin or ground cloths should be placed beneath work area to capture the blasting medium and particles from the surface being cleaned;
    - Consider curtailing sandblasting on a windy day, or if rain is forecast, to minimize the amount of area that will require clean-up and to avoid sand waste from being washed into the storm drain; and
    - Vacuum work area when job is complete.
23. If sandblasting lead paint, comply with the following:
    - Obtain approval from ARC EMD and the Occupational Safety, Health and Medical Management Office, Code QH;
    - Follow measures outline in “Outdoor Sandblasting” listed above;
    - Air monitoring is required; and
    - Follow OSHA regulations for worker safety.
24. For broken lines, the operator shall immediately notify the NASA Emergency Response Team by calling 911, and initiate the following actions immediately:
    - Berm the area to prevent run-off to storm drain; and
    - Immediately block off adjacent storm drain catch basins.
25. Prior to the closeout of this project all waste and materials must be removed from site and returned to original condition or approved condition per the project Record of Environmental Considerations (REC). Closeout approval from EMD is contingent on receiving notification from the project including pictures of all outdoor work/staging areas submitted to EMD.
26. In addition to the minimum BMPs, other applicable BMPs include:
    - VEHICLE AND EQUIPMENT FUELING
    - PROJECT CLOSEOUT REQUIREMENTS
    - SOURCE REDUCTION

- All applicable BMPs listed in Table 1 of the State of California Department of Transportation's Construction Site Best Management Practice (BMP) Field Manual and Troubleshooting Guide.

SITE-SPECIFIC BMP:
DEWATERING: GROUNDWATER

DESCRIPTION

Groundwater at ARC varies in quality and levels of contamination. In certain locations, the concentrations of these contaminants in the groundwater are above water quality criteria for the protection of aquatic life. The presence of contaminated groundwater at ARC is at a depth of 5 to 35-feet below ground surface, and is therefore likely to be encountered during construction activities. These contaminants present a hazard that may disqualify it from discharge the storm drainage system. Therefore, this BMP was developed to keep ARC from having an Unauthorized NSWD.

TARGETED CONSTITUENTS

- Sediments
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This Best Management Practice is applicable to all locations at ARC.

REQUIREMENTS

1. Contact ARC EMD, Code JQ to determine if the construction footprint is in a known area of contamination.
   - The EMD must be notified at least one week in advance of any planned dewatering activities;
2. All dewatering activities must be containerized and disposed of properly:
   - Notify the EMD for sampling parameters and approval for the proper disposal of water;
   - If water has been determined to be sewerable by the EMD, pump the water to a sanitary sewer manhole; and
   - If the water has been determined to be non-sewerable by the EMD, the water must be properly disposed of off-site.
3. In certain circumstances, the EMD may determine that the water can be discharged to vegetation. If the groundwater is proven to be free of contamination that would pose a hazard to aquatic life the following applies:
   - Before beginning dewatering activities, all storm drains in the vicinity must be protected to prevent the possibility of sediments entering any storm drain;
   - Groundwater will not be allowed to enter the storm distribution system;
   - Groundwater discharge must not pose a hazard to ground-dwelling wildlife.
   - Groundwater must be pumped to a vegetated area with enough capacity to contain the water being discharged;
   - The flow of water must be monitored; if the water flows outside of the vegetated area, dewatering activities must stop immediately, and any groundwater must be containerized and disposed of properly. Contact the EMD to discuss disposal options; and
   - After the dewatering or construction activities are complete, materials used to protect the storm drain shall be removed so that any future rainfall can enter the storm drain system as designed and permitted.
4. If possible, postpone dewatering activities if rain is forecast.
5. In addition to the minimum BMPs, other appropriate Best Management Practices include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES

SITE-SPECIFIC BMP:
DEWATERING: UTILITY VAULT

DESCRIPTION

Utility Vaults are located throughout NASA ARC with the majority of them placed below ground surface. Rainwater, surface water, and groundwater can potentially flow into these utility vaults. Although utility vault dewatering in general is an allowable discharge some circumstances exist at ARC that may disqualify the vault water from being allowed to enter the storm drainage system. The A1 aquifer lies at a depth of 5 to 35-feet below ground surface and the groundwater infiltrates into the utility vaults. Many utility vaults are located in areas where the concentrations of contaminates in the groundwater are above water quality criteria for the protection of aquatic life. Therefore, this BMP was developed to keep ARC from having an Unauthorized NSWD.

TARGETED CONSTITUENTS

- Sediments
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This Best Management Practice is applicable to all locations where utility vaults exist throughout ARC.

REQUIREMENTS

6. Contact ARC EMD, Code JQ to determine if the utility vault is in a known area of contamination.
    - The EMD must be notified at least one week in advance of any planned dewatering of utility vaults;
7. All dewatering activities **inside** of the delimited zone must be containerized and disposed of properly:
    - Before beginning dewatering activities, all storm drains in the vicinity must be protected to prevent the possibility of sediments entering any storm drain;
    - During dewatering of the utility vault, pump to a holding container;
    - After the dewatering activities are complete, materials used to protect the storm drain should be removed so that any future rainfall can enter the storm drain system as designed and permitted;
    - Notify the EMD for sampling parameters and approval for the proper disposal of water;
    - If water has been determined to be sewerable by the EMD, pump the water to a sanitary sewer manhole; and
    - If the water has been determined by the EMD to be non-sewerable, the water must be properly disposed of off-site.
8. The following steps are required at vaults **outside** of the delimited zones as determined by the EMD:
    - Water in the vault must be inspected for the presence of oil (sheen). If there is any evidence of the presence of oil the water must be containerized and disposed of properly following the procedures dewatering activities inside of the delimited zone listed above;
    - Before beginning dewatering activities, all storm drains in the vicinity must be protected to prevent the possibility of sediments entering any storm drain;
    - Vault water will not be allowed to enter the storm distribution system;
    - Water must be pumped to a vegetated area with enough capacity to contain the water being removed from the vault;
    - The flow of water must be monitored; if the water flows outside of the vegetated area, dewatering activities must stop immediately, and any rainwater inside the vault must be containerized and disposed of properly; and
    - After the dewatering activities are complete, materials used to protect the storm drain should be removed so that any future rainfall can enter the storm drain system as designed and permitted.
9. If possible, postpone dewatering activities if rain is forecast.

10. In addition to the minimum BMPs, other appropriate Best Management Practices include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES

SITE-SPECIFIC BMP: ELIMINATION OF NON-STORM WATER DISCHARGES

DESCRIPTION

The IGP generally prohibits discharges of *anything but storm water* to the storm drainage system. There are many ways in which non-storm water from industrial plants can enter the storm drainage system. In most cases, the discharge results from practices, which are now illegal, even though they may be inadvertent or may have been permissible in the past. Industrial process water, building wastewater and water from other sources are prohibited, with a few exceptions. Inspect your work area(s) to be sure no unauthorized discharges enter the storm drains.

Unauthorized discharges take two forms. **Illicit connections** are improper permanent connections that allow wastewater to enter the storm drains, including some that may have been allowed in the past. Connections that allow sanitary or process wastewater to enter the storm drain are prohibited, including all storm drain connections from indoor drains and sinks. **Illegal dumping** is water that has been exposed to industrial activities, and then released to the properly connected storm drainage system. Pollutants may be introduced to the storm drains inadvertently, by routine practices that discharge water outdoors; or by routinely discharging wastes, wash water and other materials to storm drains, catch basins and other conveyance facilities. A large part of this improper discharge results from employees' lack of understanding, coupled with a lack of readily available proper routes of discharge.

Authorized Non-Storm Water Discharges (NSWDs) to the storm water collection system may include fire-hydrant and fire prevention or response system flushing, some potable water sources, air conditioning and compressor condensate; irrigation drainage and landscape watering provided all pesticides, herbicides and fertilizers have been applied in accordance with the manufacturer's label; uncontaminated groundwater; and incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower.

All other discharges of water to the storm drainage system is strictly prohibited by the IGP. Examples of non-storm water discharges at NASA ARC that are NOT permitted to discharge into the storm drainage system include: any water used directly in the manufacturing process (process water), cooling equipment condensate containing coolant, vehicle and equipment wash water, sanitary wastes or other wastewaters.

TARGETED CONSTITUENTS

- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at ARC.

REQUIREMENTS

1. Provide well-marked proper disposal or collection methods for wastewater wherever you frequently use wash water, discharge cooling water, or produce a liquid waste that might otherwise reach the storm drain.
2. Employee training should especially emphasize proper disposal of non-storm water. Educate employees to understand that storm drains connect directly to streams and the bay without treatment.
3. Maintain label on storm drain inlets and catch basins stating "No dumping – Flows to Bay."
4. Periodically inspect and maintain storm drain inlets. Full inspection of storm water conveyance system shall occur every five years.

5. Vacuum catch basins and building laterals annually and properly dispose of wastewater.
6. Illicit connections to the storm drain system must be corrected as soon as possible. Upon discovery of an illicit connection, immediately notify the ARC EMD. Report schedule for correcting illicit connections to the EMD. All illicit connections will be reported to the Regional Water Quality Control Board by the EMD.
7. Recommendations for Utilities Connected to the Storm Drain:
   - Plug all floor drains;
   - Remove obsolete sinks, equipment, etc.; and
   - Reroute required connections to the sanitary sewer. Notify the EMD of any industrial discharge to the sanitary sewer.
8. Ensure employees are properly trained and keep in mind that in general, the IGP prohibits discharges of anything but clean storm water to the storm drains.
9. In addition to the minimum BMPs, other applicable BMPs include
   - CONTROL DEVICES

SITE-SPECIFIC BMP: FIRE DEPARTMENT EQUIPMENT TESTING AND TRAINING

DESCRIPTION

The Fire Department is located at Moffett Federal Airfield Facility 580. Fire-fighting trucks and associated equipment are tested periodically for light water capability as part of MFFD's efforts to comply with Federal Aviation Administration (FAA) requirements. Water and Aqueous Film Forming Foam (AFFF) released during training and equipment testing exercises must be containerized and disposed of properly as outlined below.

TARGETED CONSTITUENTS

- Heavy Metals
- Oil and Grease
- Antifreeze
- Hydraulic Fuel
- Toxic/Hazardous Materials
- Floatable Materials
- Oxygen Demanding Substances
- Sediments

APPLICABILITY

This BMP is applicable to all areas associated with testing fire equipment and training activities at NASA ARC.

REQUIREMENTS

1. Prior to and following the testing or training exercise, the area should be swept to remove debris and residue.
2. All storm drains in the vicinity of the training exercise must be covered and blocked to prevent discharge of the water from fire suppression activities into the storm drain system.
3. For training exercises:
    - Avoid training and testing operations if rain is forecast.
    - During training and testing operations, contain the water (vacuum truck, visqueen plastic, and/or berms, etc.) and pump to a holding container.
    - Hazardous components should be removed before the training exercise is to commence.
    - Contact NASA Safety, Health and Medical Services Office, Code QH, to determine if structure has any hazardous components, i.e., PCB's, lead, and/or asbestos.
        - If structure has any hazardous components, the water must be contained, sampled, and analyzed for its hazardous components to evaluate the appropriate disposal method.
        - Notify the ARC EMD, in advance, to evaluate sampling requirements for purposes of determining the proper disposal method.
        - Samples collected will be analyzed to determine the appropriate disposal methods; and,
            - If water has been determined to be sewerable by the EMD, pump the water to a sanitary sewer manhole; and
            - If the water has been determined to be non-sewerable, contact the EMD to dispose of off-site.
            - If the training water has been inspected and determined by the EMD to be clean, training water may be discharged to vegetation where feasible. If discharge of the training water to vegetation is not feasible, contact the EMD to determine if the water is sewerable:
4. Immediately report to ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:

- Contaminated training water could enter or has entered a storm drain or storm ditch.
- Contaminated training water has or could directly contaminate the environment (dirt) or property.
- Any AFFF is unrecoverable or reaches the environment.

5. Occupants of buildings downwind of a training burn must be notified in advance since the smoke may pose a risk. Prevailing winds at ARC are from the north.
6. In addition to the minimum BMPs, other appropriate Best Management Practices include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES
   - OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE

SITE-SPECIFIC BMP: FIRE-FIGHTING ACTIVITIES

DESCRIPTION

The Fire Department is located at Moffett Federal Airfield Facility 580. Fire-fighting activities at NASA Ames expose the storm water distribution system to harmful pollutants and temperatures. Efforts to block nearby storm drains during fire-fighting activities will reduce ARC's impact on the sensitive wetland habitats nearby, including the onsite marshes, storm water retention pond, and the San Francisco Bay.

TARGETED CONSTITUENTS

- Heavy Metals
- Oil and Grease
- Antifreeze
- Hydraulic Fuel
- Toxic/Hazardous Materials
- Floatable Materials
- Oxygen Demanding Substances
- Sediments

APPLICABILITY

This BMP is applicable to all fire-fighting activities at NASA ARC.

REQUIREMENTS

7. For firefighting activities (if safe to do so):
    - Protect nearby storm drains.
    - Contact NASA Safety, Health and Medical Services Office, Code QH, to determine if structure has any hazardous components, i.e. PCB's, lead, and/or asbestos.
        - If structure has any hazardous components, the water must be contained, sampled, and analyzed for its hazardous components to evaluate the appropriate disposal method.
        - Notify the ARC EMD, to evaluate sampling requirements for purposes of determining the proper disposal method.
        - Samples collected will be analyzed to determine the appropriate disposal methods; and,
            - If water has been determined to be sewerable by the EMD, pump the water to a sanitary sewer manhole; and
            - If the water has been determined to be non-sewerable, contact the EMD to dispose of off-site.
8. Following fire-fighting activities, AFFF should be collected, containerized and the area should be swept to remove debris and residue.
9. Immediately report to ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:
    - Contaminated water and AFFF could enter or has entered a storm drain or storm ditch.
    - Contaminated water and AFFF water has or could directly contaminate the environment (dirt) or property.
    - Any AFFF is unrecoverable or reaches the environment.
10. In addition to the minimum BMPs, other appropriate Best Management Practices include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE

SITE-SPECIFIC BMP: FLEET PARKING

DESCRIPTION

Storm water can accumulate pollutants by exposure to numerous small leaks, spills, and other discharges of parked vehicles. A designated area should be proposed for the parking of fleet vehicles. Designated parking must be at a paved and (preferably) covered facility.

TARGETED CONSTITUENTS

- Oil and Grease
- Heavy Metals
- Antifreeze
- Petroleum Products

APPLICABILITY

This Best Management Practice (BMP) is applicable to all fleet parking at NASA ARC; including, but not limited to: N251, N255, N267, B146, B544, and B684.

REQUIREMENTS

1. Inspect vehicles and equipment in the yard for fluid leaks regularly:
   - Follow the Quality Assurance and Recordkeeping BMP for inspection schedules and documentation requirements.
2. Keep the equipment yard clean and clear of debris using dry sweeping methods. Do not hose off the area or wash with water:
   - Run-off from washing and rinsing activities is not an allowable discharge to the storm drain.
   - Refer to the Washing of Exterior Building Surfaces and Fixed Outdoor Equipment BMP for additional information.
3. Develop a routine for taking actions on the report, cleaning up the spill, and repairing the leak to prevent future spills.
   - Refer to the Spill and Leak Prevention and Response BMP for additional information.
   - If absorbent material is used on a spill, sweep and dispose of material in a timely manner.
4. Place equipment on an impermeable surface or install a drip pan beneath potential leak points.
5. Maintain the yard's storm catch basin inlet.
   - Clean the catch basin on a regular schedule, at least annually.
   - Pay attention to the kinds of potential pollutants that accumulate so that you can identify the source and take action to control the sources.
6. Construct a simple roof to minimize the amount of rainwater that contacts the equipment and install a berm to prevent run-on and run-off.
7. In addition to the minimum BMPs, other appropriate Best Management Practices include:
   - SOURCE REDUCTION

SITE-SPECIFIC BMP: FUEL TANK VEHICLES

DESCRIPTION

Releases from tank trucks during aircraft fueling, from the transfer of fuels to or from tank trucks, and from leaking equipment can be a significant source of pollution. Fuels carry contaminates of particular concern to human health and wildlife, such as heavy metals, toxic materials, and oil and grease, which are not easily removed by storm water BMPs. Consequently, control at the source is particularly important. Adequate control can be achieved through secondary containment of tank vehicles and proper spill control and cleanup procedures.

TARGETED CONSTITUENTS

- Hydraulic Fuel
- Oil and Grease
- Petroleum Products
- Antifreeze

APPLICABILITY

- NASA Fueling Pits
- Moffett Federal Airfield Fueling Pits
- Bldg. 141 - Tank Truck Filling Rack
- Bldg. 158 – Moffett Air Operations Facility

REQUIREMENTS

1. Prevent fuel spills and leaks, and reduce their impacts to storm water.
2. Do not park tank vehicles on unpaved surfaces.
3. Train employees in standard operating procedures and small spill cleanup techniques, as outlined in the Employee Training Program BMP.
    - It is the responsibility of managers and supervisors at ARC to be familiar with the Employee Training Program BMP, and to ensure employee training in these areas:
        - Safe handling of hazardous materials in the employee's work place including spill response, segregation and secondary containment;
        - Proper storage of industrial materials;
        - Proper disposal of hazardous waste including sewer discharge prohibitions; pickup procedures;
        - Spill Prevention Control and Countermeasures (when storing/transferring oil products);
        - Storm Water Pollution Prevention (when performing work outdoors); and,
        - Emergency Response and First Responder Training.
4. Spill kits must be readily available for use by trained personnel.
5. Bulk storage containers onboard a vehicle or being towed that are designed for or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, ground service equipment, or other oil storage containers must have a secondary containment system for the tank vehicle.
    - The secondary containment must be large enough to hold the entire capacity of the largest single container and to additionally accommodate the volume of a 24-hour rainfall as determined by a 100-year storm history. National Oceanic and Atmospheric Administration (NOAA) estimates this to be 4 inches using reported data from the Moffett Field weather station..
    - Containment systems such as tank truck parking "pads" may be purchased.
6. AvPorts Receiving Fuel Deliveries & Truck to Truck Transfers of Jet A Fuel
    - This BMP provides detailed instructions on receiving a fuel delivery of Jet A and "topping off" other Jet A Refueling Trucks via truck to truck transfer.
        - The Fuel Farm is the designated paved area located on the southwest portion of the airfield's west ramp. A dirt field occupies the area to the south, and a storm drain is located to the east. Surface flow is directed towards the east.
    - Capacity:

    - The refueler fleet consists of six trucks with a combined capacity of 40,000-gals of Jet A fuel. Four trucks with a capacity of 5,000-gals each are referred to as the 5K's and two trucks with a capacity of 10,000-gals each are referred to as the 10K's. **The 10K's are the ONLY trucks allowed to receive a fuel delivery!**
- Safety & Spill Equipment:
    - Verify that the Safe Drain valve is in the closed position;
    - Drain cover over storm drain with a backup cover located in Emergency Spill Cart;
    - Emergency Spill Cart stocked with enough supplies and equipment to contain and clean up a 300-gal fuel spill;
        - Air Powered Fuel Vacuum connected to 55-gal steel drum.
    - Refuelers contain their own spill kit that can contain and clean up a 100-gal fuel spill.
    - Airport vehicles 1, 2, and 3 also contain their own 100-gal spill kits.
    - Additional 55-gal drums, spill mats, absorbent, etc. located in the Haz-Mat Building and Conex Box 1 & 3;
        - Spill Supplies inspected monthly.
        - Hazmat Building has secondary containment.
    - Spill Containment Equipment;
        - 25-gal mixing tubs, drip pans, 5-gal buckets, 2-gal pails.
        - Fuel Delivery Transfer Hose.
    - PPE-safety shoes, appropriate clothing, chemical gloves, safety eyewear.
    - First Aid-each refueler and vehicle contain a first aid kit and portable eyewash bottles.
    - Five 150 lb. halon fire extinguishers located between each refueler with additional located along the ramp.
        - Each Refueler has two 20 lb. PK fire extinguishers on board and readily available.
        - Each vehicle has a 10 lb. ABC fire extinguisher on board and readily available.
- Standards, Staff Training, and Refueler PM, QC, & Testing:
    - FAA AC 150/5230-4B, ATA Spec 103, NFPA 407, NATA, PV-MFA SPCC.
    - Biannual NATA Safety 1st Professional Line Service & Line Fuel Service Certification;
        - Fueling Procedures, Fuel QC, Fueling Safety, Fuel Spill control, Fire Safety.
    - Annual fire Extinguisher training and certification.
    - Annual Hazmat Communication-compliance, documentation & reporting, storage, cleanup & prevention.
    - Airfield Maintenance Personnel are responsible for all fuel transfers, QC, Maintenance, Compliance, and Training.
    - Refuelers Inspected, PM, QC, and stocked on a daily, weekly, monthly, and annual basis.
- Failure to confirm 10K balance could lead to a catastrophic event resulting in Termination!
    - Jet A refueling trucks 5551 & 1682 are referred to as the 10K's and are the ONLY trucks allowed to receive a fuel load! Each 10K's capacity is approximately 9,800-gals and a fuel delivery approximately 8,000-gals. Thus, the minimum balance in a 10K needs to be less than 1,600-gals before you call in a load.
- Ordering Fuel:
    - Confirm the balance in the 10K;
        - Refer to your Record of Receipt and Delivery of Fuel to verify 10K balance.
        - Or as an option, use the Dipstick and Strapping Chart to verify the balance.
    - Call the fuel provider;
        - Request 8K-gals of Jet A, call back to confirm date and time of delivery.
        - ONLY pumper trucks will be used to conduct a delivery to a 10K.
- Pre-delivery **Follow the Product Receiving Record:
    - Prepare the 10K;
        - Daily morning sump-QC Inspections.
        - Run truck to ensure system air pressure reaches a minimum of 80 PSI.
        - It's ok to use battery only to receive fuel if air pressure is above 80 PSI.
        - If air pressure is below 80 PSI run the engine while receiving fuel.
    - Confirm spill kits are stocked and readily available.

- Confirm drain covered.
- Confirm and have PPE available (or worn), Fire Extinguishers, First Aid Kits, etc.
- Have drip pans, tubs, buckets, and pails ready.
- Inspect AvPORTS Transfer Hose and have ready;
  - Hose engineered for truck to truck transfer (10 yr. hose-production date stamped on hose).
  - Directs fuel from delivery trucks PTO pump to 10K bottom load.
- QC testing equipment ready-Hydrometer, Specific Gravity (API) Wheel, Graduated Cylinder, Eagle Eye Tester.

- Delivery **Follow the Product Receiving Record:
  - Confirm that the battery is on and 10K has 80 PSI minimum of system air pressure and if not, run truck for transfer.
  - Escort driver to the farm and assist with positioning his pumper truck next to the 10K.
  - Bond the trucks, Ask the delivery driver where to bond on his truck-"1st thing ON & Last Thing OFF".
  - Chock tires on both trucks.
  - Place tubs, drip pans, buckets, etc. at each hose connection.
  - Conduct Safety Review with driver and review truck-to-truck transfer and Bottom Load Pre-Check.
  - Review Bill of Lading (BOL), confirm and note Jet A, specific gravity API, temp F, and net gals;
    - Confirm placards and signage on delivery tanker (1863 DOT Placard, Jet Fuel Signage).
    - ASTM 1655 Standard & Specs Jet A (39-51 API standard w/avg. API .
  - QC Tests-White Bucket & API;
    - Driver uses the white 2-gal porcelain pail to take a sample from each compartment on his truck.
    - Place the pail in tub to minimize spills while conducting QC tests.
    - Visual Color test-clear to straw color (clear to beer in color).
    - Visual Free Water test-undissolved water detectability-Water Codes A, B, C, D.
    - Visual Particulate test-inspect vortex for particulates-Solids Codes 1, 2, 3, 4.
    - API test-Eagle Eye Tester, Hydrometer, API Wheel, Graduated Cylinder-reading within +/-1 compared to BOL.
    - Optional Dissolved Water & Clear/Bright Tests-Monthly QC tests using the Velcon Hydrokit (Mason Jar Test).
    - Sample passes all tests-accept load and dispose of remaining sample to Reclaim Trailer.
    - If Sample does not pass-reject load and dispose of sample in Hazmat Building container.
  - Inspect Delivery Truck's Supply Hose;
    - Look for debris and abnormal wear.
    - Supply hose connects to trucks PTO pump.
  - Confirm all valves closed and connect hoses;
    - Driver connects supply hose.
    - Connect AvPORTS transfer hose to 10K bottom load.
    - Delivery Driver connects the other end to their PTO pump.
  - Open Valves;
    - AvPORTS personnel will OPEN 10K bottom load valve first.
    - Delivery driver will then OPEN their truck's valves.
  - Engage PTO Pump and start transferring fuel;
    - Driver will slowly engage his pump to start transferring fuel.
    - If no issues, conduct bottom load Pre-Check.
  - Bottom Load Pre-Check (Safety Reviewed With Driver H.6.). Driver must be prepared to immediately place pump into neutral, stopping the transfer of fuel. Failure to engage neutral could lead to excess hose pressure causing hose connection failure resulting in a catastrophic event!
    - Move Pre-Check valve to the closed position and fuel transfer will slowly stop (30 sec. &/or 80 PSI).

    - Open valve to continue fuel transfer.
    - Record readings.
  - Fuel Transfer takes about 45 min to 1 hr.;
    - The driver may have to switch between compartments allowing air to be pumped into the tank causing a loud sound, this is normal and you can continue the transfer.
  - Transfer is complete when the pumper truck starts pumping air into the 10K;
    - Driver removes any residual fuel from both hoses and directs personnel to close the bottom load valve.
    - Driver places PTO pump in neutral and closes his transfer valve.
    - Hoses are disconnected and put away.
    - Remove bonding wire and chocks-"1st thing ON & Last Thing OFF".
    - Clean and return all tubs and buckets.
    - Dispose of used rags to Hazmat Building.
    - Secure the 10K.
- Post Delivery **Follow the Product Receiving Record:
  - Review and double check your paperwork before the driver leaves.
  - Ensure you have both signed copies of the BOL and Certificate of Analysis.
  - Update the Record of Receipt and Delivery of Fuel to reflect the new balance.
  - Ensure everything is cleaned up and put away on both trucks before the driver pulls away.
  - Ensure driver leaves safely out the gate and gate secures behind them.
  - Input delivery into TOTAL FBO (Refer to TFBO Fuel Delivery SOP).
- Refueler Truck to Refueler Truck Transfer:
  - Confirm the Balance in the Refueler needing a "Top Off".
    - Refer to your Record of Receipt and Delivery of Fuel to verify balance.
    - Optional-"Dipstick" the Refueler tank and use the Strapping Chart to verify the balance.
  - Prepare the Trucks for Transfer;
    - Daily morning sump-QC Inspections.
    - Run truck to ensure system air pressure reaches a minimum of 80 PSI.
    - It is ok to use battery only to receive fuel if air pressure is above 80 PSI.
    - If air pressure is below 80 PSI run the engine while receiving fuel.
    - Confirm spill kits are stocked and readily available.
    - Confirm drain is covered.
    - Confirm and have available/wearing PPE, Fire Extinguishers, First Aid Kits, etc.
    - Have drip pans, tubs, buckets, and pails ready.
    - Position trucks for transfer.
  - Transfer;
    - Have both trucks running and ensure 80 PSI minimum of system air pressure.
    - Bond and Chock the trucks-"111st Thing ON & Last Thing OFF".
    - Place tubs, drip pans, buckets, etc. at each hose connection.
    - Confirm all valves closed then connect hose.
    - Use single point hose from the transferring refueler to connect the bottom load of the receiving refueler.
    - Note meter start numbers on Record of Receipt and Delivery of Fuel for both refueler.
    - Open Valves.
    - Engage PTO Pump and start transferring fuel by activating the "Deadman Controller".
    - Perform Bottom Load Pre-Check on the receiving refueler and record.
    - Record differential pressure, nozzle pressure, and flow rate from the transfer refueler.
    - Transfer fuel until transferring refueler stops pumping.
    - Disconnect hose and return to transfer truck.
    - Remove bonding wire and chocks-"1st Thing ON & Last Thing OFF".
  - Post Transfer;
    - Record stop meter numbers from each refueler and input on their respective Record of Receipt and Delivery of Fuel to reflect the new balance.
    - Ensure everything is cleaned up and put away on both trucks.
    - Secure the trucks.

  - Clean and return all tubs and buckets.
  - Dispose of used rags to Hazmat Building.
  - Input transfers into TOTAL FBO (Refer to RFBO SOP).
- Fuel Spills/Leaks: preventative measures, response, and reporting (Refer to HR Employee Training Records, Section C, and PV-MFA SPCC):
  - Preventative measures-Safety & Spill Equipment and Training;
    - Drain cover over storm drain 24/7 except during rain-back up cover located in Emergency Spill Cart.
    - Emergency Spill Cart stocked with enough supplies and equipment to contain and clean up a 300-gal fuel spill.
    - Air Powered Fuel Vacuum connected to 55-gal steel drum.
    - Refueling Trucks contain their own spill kit that can contain and clean up a 100-gal fuel spill.
    - Airport vehicles 1, 2, and 3 also contain their own 100-gal spill kits.
    - Additional 55 gal drums, spill mats, absorbent, etc. located in the Haz-Mat building and Conex Box 1 & 3.
    - 25-gal mixing tubs, drip pans, 5-gal buckets, 2-gal pails.
    - First Aid-each refueler and vehicle contain a first aid kit and portable eyewash bottles.
    - Five 150 lb. halon fire extinguishers located between each refueler with additional located along the ramp.
    - Each refueler has two 20 lb. PK fire extinguishers on board and readily available.
    - Each vehicle has a 10 lb. ABC fire extinguisher on board and readily available.
    - Refuelers Inspected, PM, QC, and stocked daily, weekly, monthly, and annually.
    - Hazmat Building-secondary containment.
    - Bi-Annual NATA Safety 1st Professional Line Service & Line Fuel Service Certification.
    - Training Fueling Procedures, Fuel QC, Fueling Safety, Fuel Spill Control, Fire Safety.
    - Annual Fire Extinguisher training and certification.
    - Annual Hazmat Communication-compliance, documentation & reporting, storage, cleanup & prevention.
    - Airfield Maintenance Personnel are responsible for all fuel transfers, QC, Maintenance, Compliance, & Training.
  - Response to a spill;
    - Immediately STOP fueling operation: release “dead-man control”, close all valves, and activate emergency shutoff.
    - Generously and quickly apply spill kit materials to contain and prevent flow to storm drain and environment.
    - NO call for help if spill/leak can be contained, controlled, and cleaned up by two people in under 30 min.
    - Immediately call for help if cannot contain, control, or clean up and/or enters storm drain or environment;
      - NASA Dispatch 650-604-5555
      - Moffett Air Traffic Control 650-603-9868 or VHF 119.55 or UHF Ch. 1
      - AvPORTS Airfield Operations 650-386-0677 or UHF Ch. 2 or 3
      - Command Consulting Group 650-386-0700 or UHF Ch. 4 or 5
      - Clean Harbors Emergency Spill Response & Recovery 800-645-8265
    - Soiled spill kit materials will be cleaned up/swept up and then transferred to drums with lids secured.
    - Drums will be stored in the Haz-Mat Building.
    - Immediately place Hazmat labels on drums-include start date, contact and address, description of contents.
    - Contact Environmental Vendor, Clean Harbors to schedule pickup.
  - Reporting (Refer to Spill Log SOP and PV-MFA SPCC).
    - All spills/leaks will be recorded in the Spill Report Log.
    - Reportable Spills/Leaks and Incident Reporting are those requiring an Immediate call for help if cannot contain control, or clean up and/or enters storm drain or environment.

    - Retain Reports and Records for SPCC, SWPPP, EPA, and other Agency compliance and notifications.

7. Perform regular inspections as described in the Quality Assurance and Record Keeping BMP.
8. Call NASA Ames Research Center (ARC) Dispatch at 911 or 650-604-5555 immediately for hazardous materials spills that:
    - Cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene;
    - Could enter a storm drain or storm ditch;
    - Presents a health hazard;
    - Presents a fire hazard; or,
    - May directly contaminate the environment (spill to ground or water) or property.
9. For non-hazardous spills, take steps to contain and clean up the liquid, and minimize the wash water used in cleanup.
    - Shut off or plug storm drain inlets or sewer inlets where the spill may enter, do not allow any wash water to enter these inlets.
    - For all other hazardous materials spills contact ARC EMD at 650-604-1800**.**
10. In addition to the minimum BMPs, other appropriate Best Management Practices include:
    - AIRCRAFT FUELING
    - VEHICLE AND EQUIPMENT FUELING

SITE-SPECIFIC BMP: GOLF COURSE MAINTENANCE

DESCRIPTION

Planetary Ventures maintains the golf course and performs maintenance on golf course vehicles and equipment. The golf course maintenance yard is located at Facility 359.

TARGETED CONSTITUENTS

- Heavy metals
- Oil and grease
- Nutrients
- Hydraulic fluid
- Fuel products
- Pesticides
- Herbicides
- Sediment

APPLICABILITY

This BMP is applicable to the golf course at NASA ARC.

REQUIREMENTS

1. Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.
2. Protect storm drains within the maintenance facility to eliminate non-storm water discharges during maintenance activities.
3. Pesticide applicators must be licensed with the California Department of Pesticide Regulation and county agricultural commissioners.
4. No person shall:
   - Pollute water supplies or waterways while loading, mixing, or applying pesticides at ARC.
   - Transport, handle, store, load, apply, or dispose of any pesticide, container, or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, humans, plants, or animals.
5. Pesticides/fertilizers should not be applied during the wet season as they may be carried from the site by the next storm.
6. Avoid over-watering not only to conserve water but also to avoid the discharge of water, which may have become contaminated with nutrients and pesticides.
7. Store pesticides and application equipment in a responsible manner and properly dispose of the used containers.
8. Use integrated pest management where appropriate.
9. Wash water, sweepings, and sediments shall be properly disposed of..
10. Maintain equipment regularly to prevent the release of vehicle fluids (e.g. hydraulic oil, fuel, antifreeze).
11. Follow Vehicle and Equipment Fueling BMPfor fueling and defueling storage tanks and equipment.
12. In addition to the minimum BMPs, other applicable Best Management Practices include:
    - VEHICLE/EQUIPMENT MAINTENANCE and REPAIR
    - VEHICLE AND EQUIPMENT WASHING
    - VEHICLE AND EQUIPMENT FUELING
    - BUILDING AND GROUNDS MAINTENANCE

SITE-SPECIFIC BMP: OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE

DESCRIPTION

Outdoor equipment includes rooftop cooling towers or air conditioners, rooftop air vents for industrial equipment, outdoor air compressors and other service equipment. Indoor wet processes where leaks or discharges may discharge to outdoor areas, and material transfer areas, such as loading areas where forklifts or trucks may carry pollutants outdoors on their tires. Ordinary precautions, such as those below, may suffice for smaller equipment.

TARGETED CONSTITUENTS

- Oil and Grease
- Heavy Metals
- Antifreeze

APPLICABILITY

This BMP is applicable to all areas with outside process equipment at NASA ARC.

REQUIREMENTS

1. Inspect equipment on a regular basis for leaks malfunctions, and staining on and around the equipment, and other evidence of leaks and discharges.
2. The person inspecting the equipment is responsible for promptly reporting a spill, or equipment maintenance issues.
3. Develop a routine for taking actions on the report; reporting maintenance issues before they lead to a spill, cleaning up the spill (if safe to do so), and repairing the leak to prevent future spills.
4. If absorbent material is used on a spill, dispose of the material in a timely manner.
    - Refer to the Material Handling and Waste Management BMP for guidance on proper disposal of spill control/cleanup materials.
5. Place equipment on an impermeable surface or install a drip pan beneath potential leak points.
6. Construct a simple roof to minimize the amount of rainwater that contacts the equipment and install a berm to prevent run-on and run-off.
7. Air compressors and other equipment produce small quantities of automatic blow-down water, which commonly contains lubricating oil or other potential pollutants. Blow-down water may not be discharged to any outside areas or to the storm drain system. Blow-down water must be discharged to the sanitary sewer. Contact the ARC EMD at 650-604-1800 for guidance on the proper disposal of industrial wastewater.
8. Electrical Equipment should be managed to:
    - Take care in tapping oil-containing equipment;
    - Avoid drips and leaks whenever possible;
    - Place a drip pan or under electrical equipment prior to tapping. An absorbent pad with the impervious lining side down may be used instead of a drip pan as long as it is sufficient enough to capture any potential leaks.
    - Properly dispose of oil-contaminated materials.
        - Oil-contaminated materials must be bagged, labeled, and disposed of properly.
        - Any PCB contaminated absorbent materials must be bagged, labeled, and disposed of in accordance with 40 CFR 761; and
    - For all PCB containing electrical equipment, follow ARC for PCB Management. If you have any questions regarding the PCB Program, call ARC Environmental Management Department at 650-604-0927.
9. In addition to the minimum BMPs, other applicable BMPs include
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - CONTROL DEVICES
    - SOURCE REDUCTION

SITE-SPECIFIC BMP:
PROJECT CLOSEOUT REQUIREMENTS

DESCRIPTION
Construction, demolition and excavation projects generate waste materials and when improperly managed can result in prohibited discharges to the storm drainage system. Debris and storm water BMPs left on site after the project is complete will deteriorate over time and contribute to storm water pollution runoff. Various construction and maintenance projects occur at ARC throughout the year, this BMP applies to all construction, repair, remodeling, demolition, and excavation projects at ARC.

TARGETED CONSTITUENTS
- Sediments
- Nutrients
- Floatable Materials
- Oxygen Demanding Substances
- Heavy Metals
- Toxic Materials
- Oil and Grease

APPLICABILITY
This BMP is applicable to all construction, repair, remodeling, demolition, and excavation activities at NASA ARC.

REQUIREMENTS
1. Final inspection of the job site should be performed to ensure that construction, demolition, and excavation materials (liquid or solid), and storm water BMPs have been removed from site. Areas to inspect include but are not limited to:
   - Storm water discharge locations;
   - Drainage areas;
   - Conveyance systems;
   - Waste handling/disposal areas; and,
   - Perimeter areas impacted by off-facility materials or storm water run-on to determine housekeeping needs.
   - Storage and laydown areas

2. Any identified debris, waste, spills, tracked materials, or leaked materials shall be cleaned and disposed of properly prior to departure from site.
3. Chemical substances, including hazardous materials and pollutants stored on-site for the duration of the project must be removed from site or disposed of properly.
4. Following all construction, demolition, and excavation activities; the job site should be swept to remove debris and residue. Catch basins should be vacuumed to remove sediment and debris, and any BMPs used to protect the storm drains must be removed at the end of the project.
5. Demobilization activities should be managed in such a manner to avoid discharges of prohibited substances to the storm drain system.
6. Do not dump waste paints, concrete washouts, or other waste liquids down the storm drain. Nothing but clean rainwater may enter the storm drainage system.
7. Cleaning equipment or tools over catch basins or onto the ground is prohibited.
8. Keep the job site tidy and clean up debris regularly.
9. Materials or equipment cannot be left at the project site or at other areas of Ames after project completion without EMD approval.
10. In addition to the minimum BMPs, other applicable BMPs include:
    - GOOD HOUSEKEEPING
    - VEHICLE AND EQUIPMENT FUELING
    - SOURCE REDUCTION

- All applicable BMPs listed in Table 1 of the State of California Department of Transportation's Construction Site Best Management Practice (BMP) Field Manual and Troubleshooting Guide.

SITE-SPECIFIC BMP: SOURCE REDUCTION

DESCRIPTION

Reducing pollutants at the source is one of the most direct ways of reducing storm water pollution. Source control BMPs are operational practices that prevent pollution by reducing potential pollutants at the source. They typically do not require maintenance or construction. Source reduction can be achieved through source control; inventory control, material substitutions, and a Hazardous Waste Source Reduction Plan.

TARGETED CONSTITUENTS

- Nutrients
- Toxic Materials
- Oil and Grease

APPLICABILITY

This BMP is applicable to all industrial activities at NASA ARC.

REQUIREMENTS

1. Source control BMPs are operational practices that prevent pollution by reducing potential pollutants at the source. At a minimum, they include:
   - Good housekeeping,
   - Preventative maintenance,
   - Spill and leak prevention and response,
   - Material handling and waste management,
   - Erosion and sediment controls, and
   - Employee Training Program.
2. Inventory control and procurement of hazardous materials at ARC is managed by the EMD. Considerations given to hazardous materials procurement include materials substitution and “just-in-time” ordering.
   - Material substitution is recommended by the Hazardous Materials/Hazardous Waste Specialist.
3. The Hazardous Materials/Hazardous Waste Specialist reviews hazardous materials procurement to ensure that a less hazardous or a non-hazardous material is used in place of hazardous material whenever possible.
   - Order chemicals occurs as they are needed.
   - Choose cleaning agents that can be recycled.
   - Avoid bulk orders to reduce the amount of hazardous materials and waste present on the facility.
4. Many solvent cleaners are harmful and must be disposed of as hazardous waste.
   - Clean without using liquid cleaners (e.g., wire brush) whenever possible reduces waste.
   - Perform all liquid cleaning at a centralized station so the solvents and residues stay in one area, reducing or eliminating the chance of spills to the floor.
5. Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for re-use.
6. If possible, eliminate or reduce the amount of hazardous materials and waste by substituting with non-hazardous or less hazardous materials.
   - Use non-caustic detergents instead of caustic cleaning agents for parts cleaning.
   - Use non-caustic detergents and cleaning systems instead of caustic or organic solvent degreasers and cleaning systems;
   - Replace chlorinated organic solvents (1, 1, 1-trichloroethane, methylene chloride, etc.) with non-chlorinated solvents:
     - Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly.
     - Check the list of active ingredients to see whether it contains chlorinated solvents.
     - The "chlor" term indicates that the solvent is chlorinated.
7. In addition to the minimum BMPs, other appropriate Best Management Practices include:

- ELIMINATION OF NON-STORM WATER DISCHARGES

SITE-SPECIFIC BMP:
SMALL MOTOR OIL SPILL RESPONSE PROCEDURES

DESCRIPTION
This BMP applies to small spills (less than one gallon) of motor oil only. Spills of all other materials must be performed by trained personnel.

Motor oil spills and leaks in parking lots can pose a hazard to human health and the environment when rain or landscape irrigation water washes small spills from the pavement into the storm water drainage system. Motor oils carry contaminants of particular concern to human and wildlife, such as heavy metals and oil and grease, which are not easily removed by storm water treatment devices. Swift deployment of appropriate cleanup procedures can prevent motor oil from entering the environment.

TARGETED CONSTITUENTS
- Oil and Grease
- Heavy Metals

APPLICABILITY
This BMP is applicable to all areas at ARC.

REQUIREMENTS
1. Training
   - : Cleanup activities must be performed by personnel who are familiar with the hazards of motor oil (refer to product Safety Data Sheet for specific information)
   - Personnel must be current in the use of Personal Protective Equipment (PPE)
   - Impacted personnel must check to determine if their employer has any additional training requirements before undertaking any cleanup activities
2. Equipment
   - Clean Up Equipment/Materials
     - Dry Absorbent Material (non-clumping kitty litter, vermiculite, absorbent pads, rags, or other commercially available product designed to absorb motor oil)
     - **DO NOT USE WET PRODUCTS TO CLEAN MOTOR OIL SPILLS**
     - Stiff-bristled broom
     - Dustpan or scoop
     - Heavy-duty waste bag or bucket with sealable lid
     - Appropriate hazardous waste labels
   - PPE
     - Personnel performing cleanup activities must check with their health and safety representative for a list of appropriate PPE
     - PPE items to consider include disposable nitrile gloves, disposable shoe covers to avoid contaminant tracking, disposable coveralls, and safety glasses
     - Respiratory protection must be evaluated by a health and safety representative
3. Spill Cleanup
   - General considerations
     - Delineate spill area to isolate from unauthorized personnel and to avoid spreading the contamination
     - Placing berm of absorbent material around the spill will reduce the possibility of spreading contamination
     - Protect all storm drains in the area. **Nothing but clean storm water may enter a storm drain**.
     - Minimize contact with the spill and clean up materials

    - If possible, perform cleanup activities when wind is calm to avoid spreading contamination through wind dispersal
- Cleanup Procedures
    - If gross contamination is present (pooled, mobile oil), use absorbent pads or rags to absorb easily removed product
    - Liberally apply absorbent to the spill
    - Work absorbent into the oil using a stiff-bristled broom being careful not to generate dust
    - leave in place for several hours or-if possible-overnight to allow time for the oil to be absorbed
    - Sweep up absorbent and containerize for proper disposal
    - Repeat if necessary, allowing the absorbent to work for 24 to 48 hours
    - If a thin film of oil remains after absorbents are used, a light dusting of Portland cement may be useful. Follow above procedures for application
- Waste Collection/Disposal
    - Place absorbent material in a suitable container such as a thick plastic trash bag (double lined for strength), bucket with locking lid, or recovery drums
    - Do not overload the capacity of any container used to store contaminated absorbents
    - Container must be securely sealed and clearly marked to indicate its contents
    - Markings must comply with appropriate waste disposal regulations according to the proper disposal method as determined by the Environmental Management Division (EMD) or resident agencies' waste disposal team.
    - Contaminated PPE and other disposable equipment must be placed in a separate container with the contents clearly identified on the label/markings
    - Waste storage/disposal must comply with applicable laws/regulations. Check with the appropriate waste disposal team for further guidance (Ames EMD or resident agencies'-specific environmental management team)

4. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - SOURCE REDUCTION

SITE-SPECIFIC BMP: TRANSPORTATION CONTROL MEASURES

DESCRIPTION

NASA ARC has developed a Commute Alternatives Program, which offers employees a variety of commute alternatives including bicycle commuting, carpooling, shuttle services, and subsidies for using mass transit. Implementation of Transportation Control Measures (TCMs) aims to reduce pollutant loading from urban transportation to storm water, as well as reduce air pollution and traffic congestion.

TARGETED CONSTITUENTS

- Oil and Grease
- Petroleum Products
- Antifreeze

APPLICABILITY

This BMP is applicable to all areas at ARC.

REQUIREMENTS

5. Bicycling:
    - The ARC Bicycle Program is outlined in APD 6711.1.
    - The ARC bicycle advisory committee works to make bicycle commuting to and around ARC safer and easier.
    - Bicycle storage lockers and racks are available for use throughout ARC.
    - A fleet of bicycles are placed throughout ARC for employees to use around the campus.
6. Carpooling:
    - 511 RideMatch is the regional rideshare program that connects Bay Area commuters looking to carpool.
        - 511 can be utilized by dialing 511 on your phone, or by downloading the 511 Rideshare smartphone app.
        - 511 Rideshare offers incentives for use of their program.
7. Mass Transit Subsidy:
    - NASA employees can be reimbursed for mass transit expenses through the Ames Commute Alternatives Program (ACAP).
8. A Shuttle Service:
    - A commuter shuttle service between ARC and the VTA Bayshore, and the CalTrain Mountain View Stations is provided during peak commuting hours.

SITE-SPECIFIC BMP:
VEHICLE AND EQUIPMENT FUELING

DESCRIPTION

Spills from fueling or from the transfer of fuels to storage tanks can be a significant source of pollution. Fuels carry contaminants of particular concern to human and wildlife, such as heavy metals, toxic materials and oil and grease, which are not easily removed by storm water treatment devices. Consequently, control at the source is particularly important. Adequate control can be achieved with careful design of the initial installations, retrofitting of existing installations, and proper spill prevention, control, and cleanup procedures.

TARGETED CONSTITUENTS

- Heavy Metals
- Toxic Materials
- Hydraulic Fuel
- Oil and Grease
- Petroleum Products
- Antifreeze

APPLICABILITY

- N-251 – NASA Motor Pool
- Bldg. 141 – DESC Truck Filling Station
- Bldg. 146 – DESC Filling Station

REQUIREMENTS

1. To prevent fuel spills and leaks, and reduce their impacts to storm water:
   - Install vapor recovery nozzles to help control drips as well as air pollution;
   - Use a paved area or provide a concrete slab for the fueling area. Concrete is preferred because fuel and oils cause asphalt to deteriorate;
   - Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas;
   - Clean up gasoline overflows and spills using dry methods;
   - Do not allow spills to run off or evaporate;
   - Do not flush the spill away with a hose. Spread adsorbent material, sweep it up with a broom, and dispose of it as hazardous waste;
   - Post signs that instruct pump operators not to “top off” or overfill gas tanks;
   - Keep dry cleanup materials in the fueling area, and instruct employees in the dry cleanup methods described below;
   - Assign someone responsibility to check the area every day for gasoline, motor oil or other fluids that may have leaked; and
   - Use a damp cloth to clean the pumps and a damp mop to clean the pavement during routine cleaning rather than spraying with a hose to minimize run-off of water to the storm drain.
2. Spill cleanup from vehicle and equipment fueling should be performed in the following manner:
   - **Small spills** are those which can be wiped up with a shop rag. Store shop rags in a covered rag bin indoor. Do not saturate rags with gasoline, solvents or other volatile liquids;
   - **Medium spills** are too large to wipe up with a rag. Contain and soak up a liquid using dry absorbent material. Absorbent “snakes” may be used as temporary booms to contain and soak up the liquid. Sweep up the used adsorbent and snakes and dispose of them appropriately. Contact ARC EMD for disposal information;
   - **Large spills** must be contained and then cleaned up. If safe to do so, take steps to contain and clean up the liquid, and minimize the wash water used in cleanup. Shut off or plug storm drain inlets or sewer inlets where the spill may enter.
3. Comply with the Spill and Leak Prevention and Response Best Management Practice.

- For hazardous materials spills that cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene, call NASA ARC Dispatch at 911 or 650-604-5555 immediately. For all other hazardous materials spills contact the EMD at 650-604-1800.

4. AvPorts Receiving Fuel Deliveries & Truck to Truck Transfers of Jet A Fuel must adhere to the AvPORTS/Planetary Ventures Moffett Field-NUQ Standard Operating Procedures as outlined in requirement 6 of the Fuel Tank Vehicles BMP.
5. In addition to the minimum BMPs, other applicable BMPs include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES
   - SOURCE REDUCTION

SITE-SPECIFIC BMP: VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR

DESCRIPTION

Vehicle or equipment maintenance is a potentially significant source of storm water pollution at NASA ARC. Activities that can contaminate storm water include engine repair and service (parts cleaning, spilled fuel, oil, etc.), replacement of fluids, and outdoor equipment storage and parking (dripping engines).

TARGETED CONSTITUENTS

- Heavy Metals
- Toxic Materials
- Oil and Grease

LOCATION

- N-251
- N-255
- Bldg. 146
- Bldg. 544
- Bldg. 684

REQUIREMENTS

1. Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance and repair by running a dry shop.
2. Train employees in standard operating procedures and small spill cleanup techniques, as outlined in the Employee Training Program BMP.
    - It is the responsibility of managers and supervisors at ARC to be familiar with the Employee Training Program BMP, and to ensure employee training in these areas:
        - Safe handling of hazardous materials in the employee's work place including spill response, segregation, and secondary containment;
        - Proper storage of industrial materials;
        - Proper disposal of hazardous waste including sewer discharge prohibitions; pickup procedures;
        - Spill Prevention Control and Countermeasures (when storing/transferring oil products);
        - Storm Water Pollution Prevention (when performing work outdoors);
        - Industrial Waste Water Sewer Discharge Training and,
        - Emergency Response and First Responder Training.
3. Eliminate/reduce the amount of hazardous materials and waste:
    - Clean without using liquid cleaners (e.g., wire brush) whenever possible to reduce waste. Prevent spills and drips of solvents and cleansers.
    - Perform all liquid cleaning at a centralized station so the solvents and residues stay in one area, reducing or eliminating the chance of spills to the floor.
    - Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for re-use.
    - Choose non-hazardous or less hazardous materials;
    - Choose cleaning agents that can be recycled;
    - Use non-caustic detergents and cleaning systems instead of caustic or organic solvent degreasers and cleaning systems;
    - Replace chlorinated organic solvents (1, 1, 1-trichloroethane, methylene chloride, etc.) with non-chlorinated solvents:
        - Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly.
        - Check the list of active ingredients to see whether it contains chlorinated solvents.

    - The "chlor" term indicates that the solvent is chlorinated.
- Reduce chemical inventory by utilizing a solvent that can perform more than one task wherever possible. This will make recycling easier and reduce hazardous waste management costs.
- Do not mix waste streams. This allows for recycling of some waste streams and may reduce disposal costs.
    - Keep hazardous and non-hazardous wastes separate.
    - Do not mix use oil and solvents.
    - Keep chlorinated solvents (e.g. 1, 1, 1-trichloroethane) separate from non-chlorinated solvents (e.g. kerosene and mineral spirits).
    - Follow the Material Handling and Waste Management BMP to ensure proper storage, recycling, and waste management of hazardous materials.

4. Do not use water to clean leaks, drips, and other spills.
    - Use rags or dry absorbent for small spills,
    - Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
    - In the event of a spill near a storm drain:
        - Block, dike, divert, and/or cover the storm drain to prevent a release from entering the storm water system.
    - Immediately call ARC Dispatch by dialing 911 or 650-604-5555 from any phone if:
        - Spill could enter a storm drain or storm ditch;
        - Spill is a health hazard;
        - Spill is a fire hazard;
        - Spill may directly contaminate the environment or property; or,
        - If the spill cannot be cleaned up by two people within 1/2 hour with cleanup materials available on the scene.
        - For larger spills, immediately call 911 or 650-604-5555 from any phone.
        - Refer to the Spill and Leak Prevention and Response BMP for guidance on spill cleanup.
    - Contact the ARC EMD for more waste minimization ideas.
5. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
6. Keep equipment clean.
    - Don't allow excessive build-up of oil and grease that can be washed into the storm drainage system during a rain storm.
    - When possible, protect idle equipment from exposure to rain.
    - Inspect equipment for leaks according to the inspection requirements outlined in the Quality Assurance and Recordkeeping BMP.
7. Capture all drips and leaks.
    - Utilize drip pans or impermeable ground cloths.
        - Keeps leaks off the ground reduces the potential for storm water contamination and reduces cleanup time and costs.
    - Designate a special area, away from connections to the storm or sanitary sewer discharge systems, to drain and replace motor oil, coolant, and other fluids.
        - Use a vehicle maintenance area designed to prevent storm water pollution.
    - Check all incoming vehicles for leaking oil and fluids.
    - Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts to capture and isolate waste streams that may be recycled.
    - Use a funnel when transferring liquids from one container to another.
    - If the vehicle or equipment is to be stored outdoors, oil and other fluids should be drained prior to storage.
8. Promptly transfer used fluids to the proper waste or recycling drums.
    - Don't leave full drip pans or other open containers unsupervised.
    - Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
        - Used or leftover cleaning solutions, solvents, automotive fluids, and oil are toxic and should **not** be discharged to the sanitary sewer.

    - Discharges of process water or mop water must undergo an evaluation by the EMD before it can be discharged to the sewer. Contact the EMD at 650-604-1800 for more information.

9. Used batteries are considered hazardous waste, however, most types of batteries can be recycled.
    - Follow ARC's battery recycling program requirements.
    - Batteries must be fully discharged prior to turning them in to the EMD.
    - Contact the EMD at 4-0927 for additional information.
10. Used oil filters can be recycled, do not mix them in with hazardous waste. Contact EMD for additional information on recycling used oil and oil filters.
    - Place the oil filter in a funnel over the waste oil recycling or disposal collection tank to completely drain excess oil before crushing and recycling filter.
    - Store used oil filters in an appropriate container with a closed lid and proper markings.
    - Do not dispose of used oil filters in trash cans or dumpsters, they can leak oil and contaminate storm water.
11. In addition to the minimum BMPs, other appropriate Best Management Practices include:
    - VEHICLE AND EQUIPMENT FUELING
    - VEHICLE AND EQUIPMENT WASHING

SITE-SPECIFIC BMP:
VEHICLE AND EQUIPMENT WASHING

DESCRIPTION
Wash vehicles and equipment outdoors or in areas where wash water run-off can pollute storm water. Wash water can contain high concentrations of oil and grease, phosphates (detergents) and metals. These and other potentially harmful substances can pollute storm water when deposited on the ground where they can be picked up by rainfall run-off.

TARGETED CONSTITUENTS
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oil and Grease
- Petroleum Products
- Oxygen Demanding Substances

APPLICABILITY
This BMP is applicable to N-251, NASA Motor Pool Washrack; Bldg. 146, CANG Vehicle Washrack; and Bldg. 686, CANG Support Equipment Washrack.

REQUIREMENTS
1. Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment washing by implementation of the following:
   - Use designated wash areas, **do not** wash vehicles on the grass, or in parking lots, roads, or driveways;
   - Berm area to contain wash area;
   - Discharge wash water to sanitary sewer with permit from the local sewer authority. Coordinate discharge with the NASA EMD;
   - Filter wash water;
   - Educate employees on pollution prevention measures;
   - Prohibit wash water from entering the storm drain; and
   - Prohibit use of solvents.
2. Mobile Equipment that is being cleaned to be placed back into service should be washed at the following locations with permission from the EMD:
   - N-251, Motor Pool Wash Rack
   - Bldg. 146, CANG Vehicle Wash Rack
   - Golf Course Wash Rack
3. Obtain Industrial Waste Water Sewer Discharge Training before discharging wastewater.
4. Wash racks with automatic sanitary/sewer valves (N248E and B146)
   - PRIOR TO WASHING OPERATION:
     - Lubricate the drain valves by adding approximately 50 gallons of water to the small drain in the wastewater collection basin.
     - Verify the start selector is in the “OFF” position.
     - Verify the “POWER ON” and “STORM DRAIN” indicators are illuminated.
   - BEGIN WASHING OPERATION:
     - Turn the start selector to “WASH”. Water spigots will not flow until the switch is turned to wash.
     - Record the start/stop meter readings (gal) in the log provided. Each Washrack is equipped with its own meter and log.
     - Check that the “SANITARY DRAIN” indicator light comes on.
     - Check that the “STORM DRAIN” indicator light goes out.
   - DURING WASHING OPERATION:

- Do not wash during a rain event.
- Visually inspect the oil/water separator unit to make sure wash water is entering these vaults.
- Check that the "SANITARY DRAIN" indicator light comes on.

- POST WASHING OPERATION:
  - Wash down soap and other cleaning agents from wash rack ground surface area into the drain before switching the valve back to "STORM DRAIN" position. Failing to thoroughly rinse the Washrack area can result in permit violations, as contaminants could be discharged into the environment during the next rain event.
  - Turn the start selector to the "OFF" position.
  - Wait 15 minutes.
  - Check that the "STORM DRAIN" indicator light comes on.
  - Check that the "SANITARY DRAIN" indicator light goes out.
  - Verify the valve position before leaving the Washrack area.
- If the Washrack malfunctions, immediately cease operations and call the Airfield Manager.

5. Vehicle wash rack at N251
   - Pull the vehicle all the way inside of the wash rack bay.
   - If the vehicle is too large to fit inside of the wash rack bay:
     - Place barriers in the gutter outside of the wash rack to stop the flow of soapy water.
     - Wash one-half of the vehicle at a time (front/back).
     - Rinse water **must not be allowed** to flow outside of the wash rack bay.
     - If wash water leaves the wash rack, it must be sweep back into the wash rack.
     - Use fresh water to rinse the soapy water from the pavement, and sweep it into the wash rack.
6. In addition to the minimum BMPs, other applicable BMPs include:
   - ELIMINATION OF NON-STORM WATER DISCHARGES
   - SOURCE REDUCTION

SITE-SPECIFIC BMP: WASHING AND RINSING OF OUTDOOR EQUIPMENT, MATERIALS, AND DISPLAYS

DESCRIPTION

Wash water can contain high concentrations of oil and grease, phosphates (detergents) and metals. These and other potentially harmful substances can pollute storm water when deposited on the ground where they can be picked up by rainfall run-off. The following procedures were developed to ensure that no contaminants enter the storm drain system during the washing of equipment, materials, and displays. Operators must follow these procedures to ensure that the quality of storm water discharges from NASA Ames Research Center (ARC) is not adversely impacted.

TARGETED CONSTITUENTS

Listed below are the targeted constituents that should be prevented from entering the storm drain system during washing procedures.

- Heavy Metals
- Toxic/Hazardous Materials
- Oil and Grease
- Sediments
- Floatable Materials
- Oxygen Demanding Substances

APPLICABILITY

This BMP is applicable to washing outdoor equipment, materials, and any displays including but not limited to the display planes located west of Building 158 and west of Shenandoah Plaza.

REQUIREMENTS

1. Train personnel in good housekeeping techniques, standard operating procedures, and any other training which may apply.
2. Protect all storm drain inlets from potentially contaminated run-off generated by washing activities. Storm drain inlets should be securely covered with visqueen, plastic or other such material, prior to any washing activities.
3. Use of soaps during washing activities is discouraged. If soap is necessary, use only biodegradable soap products. Contact the ARC EMD at 650-604-1800 prior to use of any product so that the Safety Data Sheet (SDSs) may be reviewed.
    - Biodegradable soap is **not** permitted to be discharged into the storm drain. Measures must be taken to protect the storm drain throughout the washing activities.
4. If run-off from the washing activities accumulates on the storm water inlet, pump the material into an appropriate container. Contact the ARC EMD in order to ascertain the proper method of disposal.
5. Run-off from the washing activities must be treated as a chemical spill. Clean up run-off from the washing activities promptly and if the spill could enter a storm drain call 911 immediately.
    - Report the event to NASA EMD.
    - The Spill and Leak Prevention and Response BMP provides additional information on responding to a spill.
6. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
7. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - SOURCE REDUCTION

SITE-SPECIFIC BMP: WASHING OF EXTERIOR BUILDING SURFACES and FIXED OUTDOOR EQUIPMENT

DESCRIPTION

Washing exterior building surfaces and fixed outdoor equipment can introduce contaminants into storm water. In general, water from exterior building surfaces is an allowable discharge, but this BMP must be followed in order to avoid violating the provisions of the IGP.

TARGETED CCNSTITUENTS

- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances

APPLICABILITY

This BMP is applicable to all industrial activities associated with washing of exterior building surfaces and fixed outdoor equipment.

REQUIREMENTS

1. Contact the ARC EMD at 650-604-1800 to determine if directing the wash water to vegetation will be permitted.
2. Wash water is not permitted to be discharged directly into a storm drain.
3. If use of landscaping is not feasible estimate the amount of wastewater that will be generated during washing operation and arrange to have containers available.
4. If the wastewater is containerized;
    - Notify the ARC EMD, Code JQ, to schedule sampling and disposal of water;
    - During washing operations, contain the water (visqueen plastic and/or berms) and pump to a holding container.
    - If water has been determined to be sewerable by the ARC EMD, pump the water to a sanitary sewer connection.
    - If the water has been determined to be non-sewerable, contact the ARC EMD for proper disposal off-site.
5. Use of soaps during washing activities is discouraged and will not be permitted if the wash water is not containerized. If soap is necessary, use only biodegradable soap products. Contact the EMD, Code JQ, at 650-604-1800 prior to use of any product so that the Safety Data Sheet (SDSs) may be reviewed.
    - Biodegradable soap is not permitted to be discharged into the storm drain. Measures must be taken to protect the storm drain throughout the washing activities.
    - If soap is used, the wash water shall be containerized, tested, and disposed of properly.
    - Discharging soap into vegetation is not permitted, regardless of whether the soap is biodegradable or not.
6. If water must be contained, postpone washing operations if rain is forecast.
7. Following the washing operation, the area should be swept to remove debris and residue.
8. Washing of exterior building surfaces and fixed outdoor equipment should be postponed if rain is forecast.
9. Obtain Industrial Waste Water Sewer Discharge Training before discharging waste water.
10. In addition to the minimum BMPs, other applicable BMPs include:
    - ELIMINATION OF NON-STORM WATER DISCHARGES
    - SOURCE REDUCTION

APPENDIX D
LOCATIONS OF INDUSTRIAL ACTIVITIES

LOCATIONS of INDUSTRIAL ACTIVITIES
NASA AMES RESEARCH CENTER
2025-2026 REPORTING YEAR

BEST MANAGEMENT PRACTICES ASSOCIATED WITH INDUSTRIAL ACTIVITIES																															TARGETED CONTAMINANTS													
Code	Bldg. No.	Facility Name	Aircraft Exhaust and Fueling	Aircraft Maintenance	Aircraft Washing and Rinsing	Building and Grounds Maintenance	Building Repair, Remodeling, and Construction	Construction, Demolition, & Excavation Operations That Disturb Ground Surfaces Less Than One Acre	Dewatering: Groundwater	Dewatering: Utility Vault	Elimination of Non-Storm Water Discharges	Fire Department Equipment Testing and Training	Fire Fighting Activities	Fleet Parking	Fuel Tank Vehicles	Golf Course Maintenance	Outdoor Process Equipment Operation and Maintenance	Project Closeout Requirements	Small Motor Oil Spill Response Procedures	Source Reduction	Transportation Contol Measures	Vehicle and Equipment Fueling	Vehicle/Equipment Maintenance and Repair	Vehicle and Equipment Washing	Washing and Rinsing of Outdoor Equipment, Materials, and Displays	Washing of Exterior Building Surfaces and Fixed Outdoor Equipment	Sediment	Nutrients	Heavy Metals	Toxic Materials	Floatable Materials	Oxygen Demanding Substances	Petroleum Hydrocarbons	Oil and Grease	Bacteria and Viruses	Plume Contaminants	Temperature	pH
JCM	Gates 14A-B	Emergency Pumping Stations									X				X		X	X	X	X		X	X										X	X				
CANG	M047	Wash Rack			X						X							X	X	X										X			X	X				X
PV	M158	Airfield Operations	X	X	X						X			X	X		X	X	X	X		X	X	X	X	X			X	X			X	X	X			X
JCM	M191	191 Pump Station									X				X		X	X	X	X		X	X										X	X				
PV	M359	Grounds Maintenance Yard				X					X			X		X	X	X	X	X		X	X	X			X	X		X	X	X	X	X				
PV	M946	PV Fuel Farm									X			X	X		X	X	X	X		X	X	X									X	X				
JP	M580	Fire Department									X	X	X	X				X	X	X		X	X	X						X			X	X				
CANG	M662	Maintenance Operations									X			X	X		X	X	X	X		X	X	X					X	X			X	X				X
CANG	M679	Haz Mat Storage	X	X	X	X					X				X		X	X	X	X		X							X	X			X	X				X
CANG	M682	Haz Mat Storage									X						X	X	X	X									X	X			X	X				X
CANG	M684	Maintenance Operations									X			X	X		X	X	X	X		X	X	X					X	X			X	X				X
CANG	VMF	Vehicle Maintenance Facility									X			X	X		X	X	X	X		X	X	X					X	X			X	X		X		
JCM	N123	Portable Generator Storage and Equipment Laydown Yard									X			X	X		X	X	X	X		X	X				X		X	X	X	X	X	X				
JCM	N127C	Universal Waste Storage and Equipment Laydown Yard									X			X	X		X	X	X	X		X					X		X	X	X	X	X	X				
AO	N206	12' Wind Tunnel									X						X	X	X	X												X	X				
JO	N211	NASA Hangar	X	X	X						X				X			X	X	X										X			X	X				
U	N221	Wind Tunnel									X				X		X	X	X	X									X	X			X	X				X
U	N227	Unitary Wind Tunnel									X				X		X	X	X	X									X	X			X	X				X
TSF	N234B	ArcJet Boiler Plant									X						X	X	X	X									X	X								X
JO	N248, N248B-D	Aircraft operations and aircraft wash rack. N248B is not in use.	X	X	X						X			X	X		X	X	X	X													X	X				
JCM	M250-N	Maintenance Operations					X				X						X	X	X	X							X	X	X	X	X		X	X	X	X		
JCM	M250-S	Maintenance Operations					X				X						X	X	X	X			X				X	X	X	X	X		X	X	X	X		X
JSL	N226/N251	Auto Filling Station/ Motor Pool									X			X	X		X	X	X	X		X	X	X									X	X				
JS	N255	Supply Support									X			X				X	X	X			X							X			X	X				
JQ	N265	Haz Waste Storage									X						X	X	X	X									X	X			X	X	X			X
JCM	N267	DART Training Facility									X			X			X	X	X	X									X				X	X				
JCM	N271	Reverse Osmosis Plant									X						X	X	X	X									X				X	X				

LOCATIONS of INDUSTRIAL ACTIVITIES
NASA AMES RESEARCH CENTER
2025-2026 REPORTING YEAR

BEST MANAGEMENT PRACTICES ASSOCIATED WITH INDUSTRIAL ACTIVITIES																												TARGETED CONTAMINANTS											
Code	Bldg. No.	Facility Name	Aircraft Exhaust and Fueling	Aircraft Maintenance	Aircraft Washing and Rinsing	Building and Grounds Maintenance	Building Repair, Remodeling, and Construction	Construction, Demolition, & Excavation Operations That Disturb Ground Surfaces Less Than One Acre	Dewatering: Groundwater	Dewatering: Utility Vault	Elimination of Non-Storm Water Discharges	Fire Department Equipment Testing and Training	Fire Fighting Activities	Fleet Parking	Fuel Tank Vehicles	Golf Course Maintenance	Outdoor Process Equipment Operation and Maintenance	Project Closeout Requirements	Small Motor Oil Spill Response Procedures	Source Reduction	Transportation Contol Measures	Vehicle and Equipment Fueling	Vehicle/Equipment Maintenance and Repair	Vehicle and Equipment Washing	Washing and Rinsing of Outdoor Equipment, Materials, and Displays	Washing of Exterior Building Surfaces and Fixed Outdoor Equipment	Sediment	Nutrients	Heavy Metals	Toxic Materials	Floatable Materials	Oxygen Demanding Substances	Petroleum Hydrocarbons	Oil and Grease	Bacteria and Viruses	Plume Contaminants	Temperature	pH
JCM	VTOL Pad	Green Waste Mulching Area, Landscape Maintenance yard, and Haz Waste Storage Area				X					X			X			X	X	X	X		X					X	X			X	X	X	X				

APPENDIX E
HANGAR 1 SUMMARY REPORT

Navy IR Site 29 Hangar 1
2024 Long-Term Management Report

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA

October 2024

Ames RESEARCH CENTER
NASA
National Aeronautics and Space Administration
www.nasa.gov

National Aeronautics and Space Administration

Environmental Support Services Contract
80ARC020F0036
Navy IR Site 29 Hangar 1
2024 Long-Term Management Report
CDRL 13-001

Prepared for:
Environmental Management Division
NASA Ames Research Center
M/S 204-15
Building N204, Room 102B
Moffett Field, CA 94035-0001

October 2024

BB&E
CONSULTING ENGINEERS
& PROFESSIONALS

Table of Contents

1 INTRODUCTION 1

2 MANAGEMENT ACTIVITIES 2

2.1 COATING INSPECTION AND MAINTENANCE 2
2.2 INSTITUTIONAL CONTROLS 2
2.3 STORM DRAIN SEDIMENT SAMPLING AND ANALYSES 3
2.3.1 FY 2024 Inspections 3
2.3.2 Sediment Sample Collection and Analytical Results 4
2.3.3 Summary 5

3 REFERENCES 6

List of Tables

Table 1 Hangar 1 Storm Drain/Catch Basin Historic Sediment Sample Results
Table 2 2024 Settling Basin Overflow and Effluent Soil Analytical Results

List of Figures

Figure 1 Hangar 1 Storm Drain/Catch Basin Sediment Sample Locations

List of Attachments

Attachment 1 Field Inspection Photographs
Attachment 2 Field Inspection Sheets

List of Acronyms

CB	catch basin
EMD	Eastern Diked Marsh
FY	fiscal year
GCCA	General Coating Conditions Assessment
IR	Installation Restoration
LTMP	Long Term Monitoring Plan
LUCs	Land Use Controls
mg/kg	milligrams per kilogram
MFA	Moffett Federal Airfield
NASA	National Aeronautics and Space Administration
NTCRA	Non-Time-Critical Removal Action
PCB	polychlorinated biphenyl
PV	Planetary Ventures, Inc.
WATS	West-Side Aquifers Treatment System

1 Introduction

On behalf of the National Aeronautics and Space Administration (NASA) Ames Research Center (NASA Ames), BB&E has prepared this report to present the management activities conducted during fiscal year (FY) 2024 in accordance with the *Final Long Term Management Plan (LTMP) for Non-Time-Critical Removal Action (NTCRA) for Polychlorinated Biphenyl (PCB) Contamination at Installation Restoration (IR) Site 29 Hangar 1 at Former Naval Air Station Moffett Field, California* (AMEC, 2013a).

The LTMP identifies the following actions for the long-term management phase of the NTCRA for Navy IR Site 29 Hangar 1: (1) coating inspections and maintenance, (2) implementation of institutional controls, and (3) sampling of sediment from the storm drain system surrounding the hangar.

The Navy completed the first NTCRA in 2013 and conducted site monitoring in 2014 and 2015. NASA Ames has conducted site management since October 2015, when NASA Ames assumed lead agency responsibility for the site. In 2018, NASA Ames conducted long-term management activities to maintain institutional controls for the site and monitor the storm drain system for site chemicals of concern. Beginning in 2018, NASA Ames conducts quarterly inspections and sampling at the storm drain system surrounding the hangar. FY 2024 is the eleventh annual management period since completion of the first NTCRA.

The following sections detail the long-term management activities and results for FY2024.

2 Management Activities

2.1 Coating Inspection and Maintenance

The coating on the ground and mezzanine levels of the hangar structure was visually screened in April 2014 by Planetary Ventures, Inc. (PV) (ACC, 2015) in support of NASA's November 2014 lease agreement with PV for the Moffett Federal Airfield (MFA) Leasehold. In September 2014, the Navy completed spot repairs to the coating on the ground and mezzanine levels of the hangar structure (AMEC, 2014).

In June 2017, PV concluded testing methods to remove the coating and underlying paint from the hangar structure (ACC, 2017). Based on the pilot study results, PV agreed to implement a second NTCRA to remove the coating under the terms of the NASA-PV lease agreement for the MFA Leasehold and PV's 2017 Bona Fide Prospective Purchaser Agreement and Order on Consent with EPA. In late August/early September 2019, a General Coating Conditions Assessment (GCCA) was completed via drone as agreed upon during correspondence with the agencies on April 25, 2018 (Kim Finch). The *Final Hangar 1 Action Memorandum* (EKI, 2020) was approved in November 2020 and the *Final Hangar 1 NTCRA Work Plan* (EKI, 2022) was approved in March 2022. Full-scale abatement and recoating activities began in May 2022.

During First Quarter (Q1) of FY2022 (Q1 FY2022), Planetary Ventures removed the sandbag Hangar 1 (H-1) Sump Berm in preparation for the full-scale abatement and recoating activities. The H-1 sump pump was originally installed to ensure that the subgrade utility tunnel remained dry; however, there are no longer any active utilities remaining in the tunnel. The H-1 sump pump is connected to the West-Side Aquifers Treatment System (WATS). However, NASA suspended extraction from the H-1 sump in 2018. Pumping is not anticipated to begin again.

2.2 Institutional Controls

As land owner and lead agency, NASA implemented and maintains land use controls (LUCs), including institutional controls, for the site. The following LUCs are specified in the LTMP:

- Protect the coating through restrictions on site access, activities and use, including site development or modifications to the hangar structure;
- Incorporate LUCs into all current and prospective lease agreements;
- Ensure building inhabitants are notified of potential exposure hazards;
- Address worker exposure hazards and require post-construction repairs over the coating for building modifications; and
- Provide a restrictive covenant in the deed for conveyance of any portion of the Hangar 1 site to include LUCs.

Site 29 Hangar 1 is within the MFA Leasehold. NASA's lease agreement with PV requires compliance with all LUCs. Compliance with LUCs associated with PV's site development and use is implemented through the MFA Leasehold Environmental Issues Management Plan (EKI, August 2017) and includes regulatory agencies' and NASA review. PV has implemented site access controls including fencing, signs and pre-arranged access. The hangar structure remained unoccupied in FY 2024, however, remediation activities on the framework of Hangar 1 began in Q1 FY2022 and continued through Q4 FY2024.

2.3 Storm Drain Sediment Sampling and Analyses

Beginning in 2018, NASA Ames conducts quarterly inspections and, if necessary, sediment sampling at the storm drain system surrounding the hangar, including storm drain manhole SD-107. As shown in Figure 1, SD-107 is the first manhole located downstream from Hangar 1. All storm water that enters catch basins (CBs) surrounding the hangar is conveyed to SD-107.

If PCBs and/or lead are detected above established trigger levels (Table 1) in the SD-107 sediment sample, then additional sediment samples are to be collected from upstream CBs surrounding the hangar if sediment is available. The additional sediment samples are to be collected from SD-107 (confirmation sample) and all four quadrants of the storm water conveyance system (perimeter trench) surrounding the hangar from CBs 463D, 447A, 443B and 454D. Additional sediment samples are also to be collected from upstream catch basin CB-107F and manhole SD-442 (Figure 1). The perimeter trench CB samples are intended to identify potential releases of PCBs or lead from the four quadrants of the hangar.

2.3.1 FY 2024 Inspections

The manholes and CBs were inspected for the presence of accumulated sediment on the following dates during FY 2024:

- October 26, 2023 (Q1 FY2024)
- January 25, 2024 (Q2 FY2024)
- April 9, 2024 (Q3 FY2024)
- July 1, 2024 (Q4 FY2024)

Attachment 1, *Field Inspection Photographs*, contains photographs taken during the visual inspections. Attachment 2, *Field Inspection Sheets*, contains the notes from the quarterly visual inspections. The findings of the inspections are summarized below:

- During all four quarterly inspections, manhole SD-107 contained flowing water. This manhole normally has flowing water, even during the dry summer months, because it is immediately downstream from the West-Side Aquifers Treatment System (WATS) effluent discharge point into the storm drain system. Upstream storm drain SD-442 contained flowing water in all but Q1 FY2024. Both SD-107 and SD-442 did not contain adequate amounts of sediment for sampling during all four quarterly inspections during FY2024.

- During Q1 FY2024 all catch basins and storm drains were accessible and inspected, however no samples were taken due to trace sediment volumes.

- The Q2 and Q3 FY2024 inspections were obstructed by abatement activities which blocked access to catch basins CB-443B, CB-454D (southern end of Hangar 1), and CB-463D (northeast corner). Inspections of these catch basins were not able to be completed during these quarters.

- During Q4 FY2024, CB-443B, CB-447A, CB-454D and CB-463D were inaccessible due to Hangar 1 construction activities.

- CB-107F had minor amounts of sediment or gravel in each of the four quarters, but insufficient volumes for sample collection. During Q4 FY2024, trash was removed at the time of inspection.

2.3.2 Sediment Sample Collection and Analytical Results

No sediment samples were collected during FY 2024 due to insufficient sediment in catch basins and storm drains to gather the minimum sampling volume required for analysis.

Historic sampling results from the Hangar 1 catch basin sampling are presented in Table 1 - *Hangar 1 Storm Drain/Catch Basin Historic Sediment Sample Results*.

Table 1
Hangar 1 Storm Drain/Catch Basin Historic Sediment Sample Results

Sample Location	Sample Year	Sample ID	PCBs (Total) mg/kg	Lead mg/kg
SD-107	2013	SD-2013-01	5.9	450
SD-107	2013	SD-2013-02 (Confirmation Sample)	7.0	670
SD-107	2016	SD-107-2016	0.98	360
SD-107	2017	SD-107-2017	0.106	72
SD-107	2018	SD-107-2018a	0.83	190
CB-443B	2019	CG-443B-Q1	19 (Aroclor 1260)	1600
CB-447A	2019	CG-447A-Q1	4.4 (Aroclor 1260)	780
CB-463D	2019	CG-463D-Q1	4.4 (Aroclor 1260)	2300
CB-463D	2019	CB-463D	3.4 (Aroclor 1260) 7.4 (Aroclor 1268)	2800
----	----	**Trigger Levels**	**0.210**	**93.8**

PCBs – polychlorinated biphenyls
mg/kg – milligrams per kilogram
There are no historic sediment sample results for CB-454D, CB-107F and SD-442

2.3.3 Summary

Sediment samples were not able to be collected from the Hangar 1 storm drains and catch basins during FY2024.

However, results from the August 2024 sediment samples collected from the Eastern Diked Marsh (EDM) surface of Navy Site 25 at the settling basin overflow and effluent locations are summarized below in Table 2. A full discussion of the EDM sampling results can be found in the *Draft 2024 Annual Storm Water Settling Basin Monitoring Report, NASA Ames Research Center, Moffett Field, California* (BB&E, 2024). All storm water that enters the catch basins surrounding Hangar 1 is conveyed to SD-107, where it is ultimately directed to the settling basin.

Both the Overflow and Effluent soil samples contained zinc in excess of the Navy Site 25 cleanup level. Lead and PCBs were detected at concentrations within historical ranges and below cleanup levels. Organochlorine pesticides were not detected in either the Overflow or Effluent sample.

Table 2
2024 Settling Basin Overflow and Effluent Soil Analytical Results

Analyte	Overflow (OF) (mg/kg)	Effluent (EF) (mg/kg)	Site 25 Cleanup Levels (mg/kg)
Lead	70	36	93.8
Zinc	**490**	**320**	314
PCB 1260	0.083	0.031	0.210
PCB 1268	0.060	0.023	0.210
Organochlorine Pesticides (total)	<0.017	<0.017	0.109

mg/kg = milligrams per kilogram
= bolded values exceed Site 25 Cleanup Levels

3 References

ACC, 2015. *PCB, Lead, and Asbestos Sampling Report, Hangar 1 Moffett Federal Airfield, Mountain View, California.* February.

ACC, 2017. *Pilot Study Abatement Study of Hangar 1, Hangar One, Moffett Federal Airfield, Mountain View, California.* October.

AMEC Earth and Environmental, Inc. (AMEC), 2013a. *Final Long Term Management Plan for Non-Time-Critical Removal Action for PCB Contamination at Installation Restoration Site 29 (Hangar 1) at Former Naval Air Station Moffett Field, California*. June.

AMEC, 2013b. *Final After Action Completion Report for Non-Time-Critical Removal Action for PCB Contamination at Installation Restoration Site 29 (Hangar 1) at Former Naval Air Station Moffett Field, California*. November.

AMEC, 2014. *Coating Spot Repair Report, Hangar 1, Former Naval Air Station Moffett Field, California.*

BB&E, 2024. *Draft 2024 Annual Storm Water Settling Basin Monitoring Report, NASA Ames Research Center, Moffett Field, California*.

EKI, 2017. *MFA Leasehold Environmental Issues Management Plan, Moffett Field, California.* August.

EKI, 2020. *Final Hangar 1 Action Memorandum, Former Naval Air Station Moffett Field, California*. November.

EKI, 2022. *Final Hangar 1 NTCRA Work Plan, Former Naval Air Station Moffett Field, California*. March.

NAVFAC, 2015. *IR Site 29 Hangar 1 Long-Term Management Plan and WATS Protection Measures, 2014 Storm Water Monitoring Activities and WATS Protection Measures, Former NAS Moffett Field, California.* February.

N

Hangar 1
Navy IR Site 29

CB-454D
CB-443B
CB-463D
CB-447A
CB-107F
SD107
SD442
WATS

Manhole Sample Location
Catch Basin Sample Location
Storm System Pipes
Runway/Road
Building

0 125 250 500 Feet

Notes:

WATS - WEST-SIDE AQUIFERS TREATMENT SYSTEM

NASA Ames Research Center
Moffett Field, CA 94035

NASA Ames Research Center
Moffett Field, California

Figure 1

Hangar 1 Storm Drain/Catch Basin Sampling Locations

ATTACHMENT 1

Field Inspection Photographs

Q1 FY2024

October 26, 2023

Catch Basin CB-454D

Catch Basin CB-443B

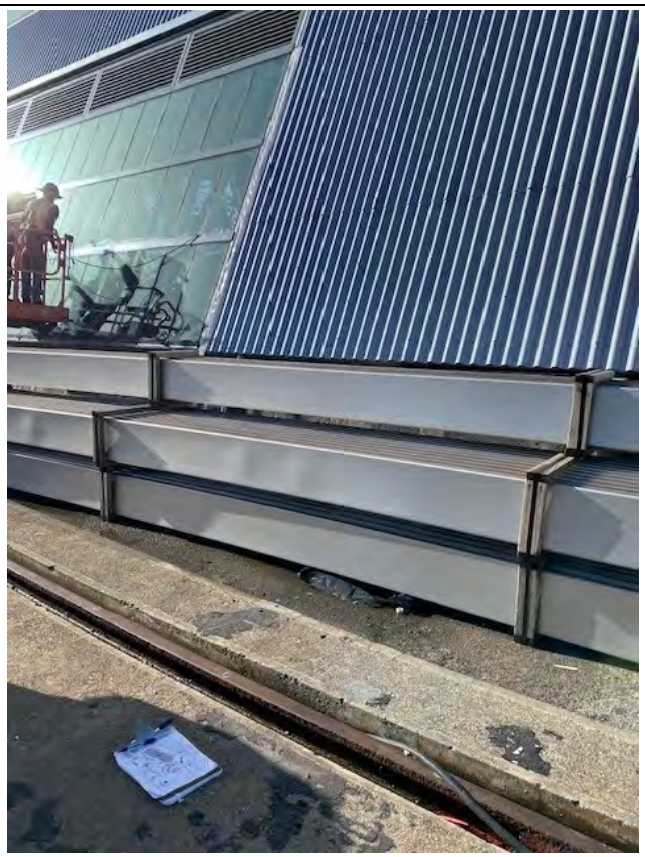
Catch Basin CB-107F

Storm Drain SD-107

Storm Drain SD-442

Q2 FY2024

January 25, 2024

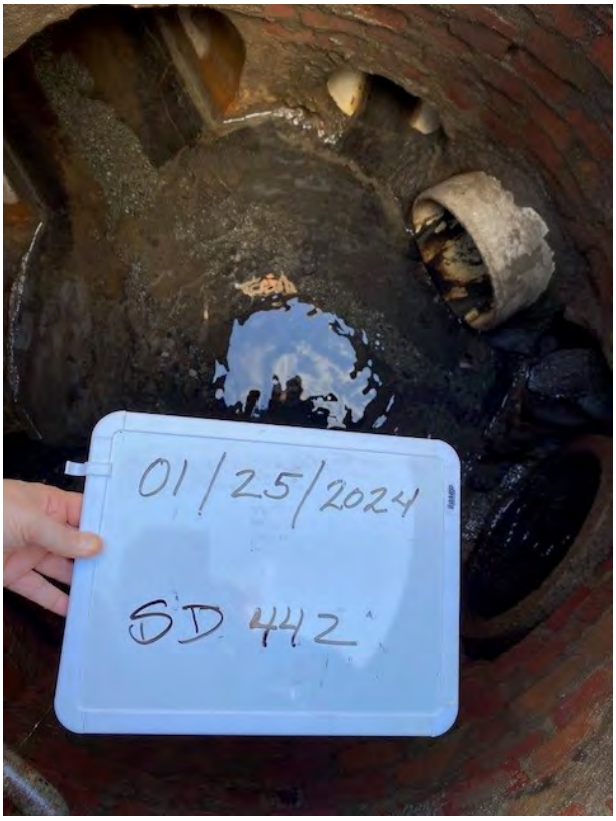


Catch Basin CB-463D

Catch Basin CB-443B

Catch Basin CB-107F

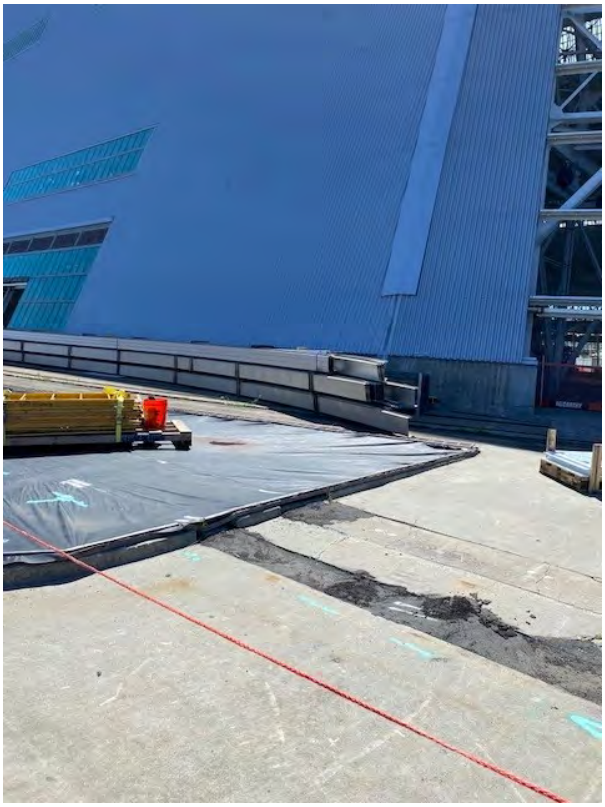
Storm Drain SD-107



Storm Drain SD-442

Q3 FY2024

April 9, 2024



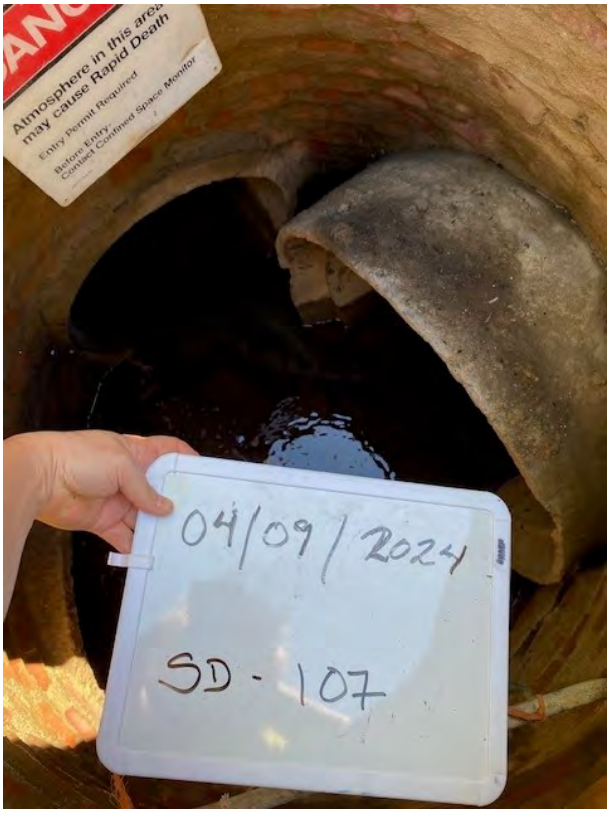
Catch Basin CB-463D

Catch Basin CB-447A

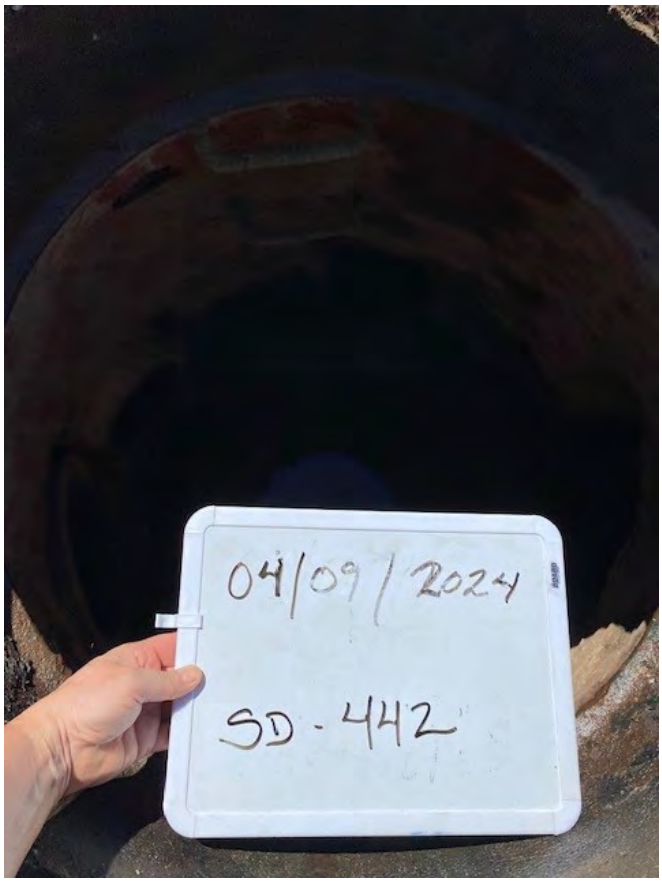
Catch Basin CB-454D

Catch Basin CB-443B

Catch Basin CB-107F



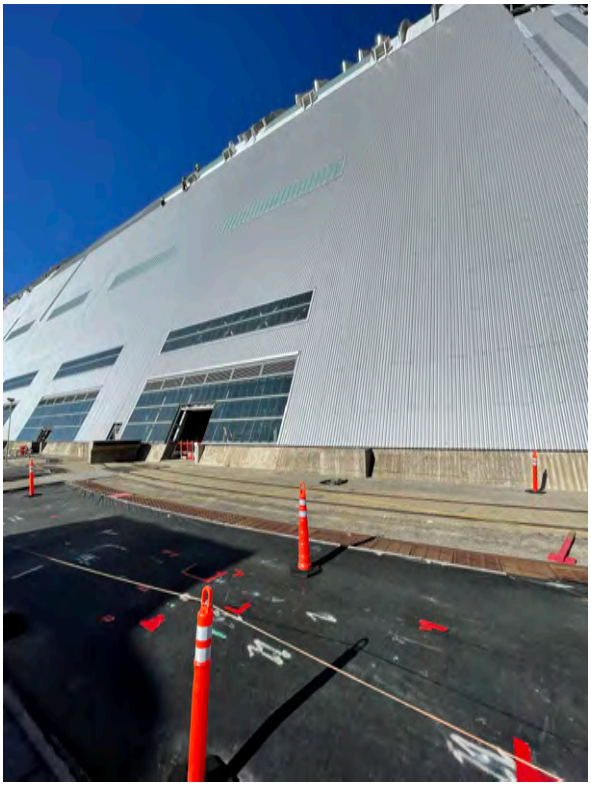
Storm Drain SD-107



Storm Drain SD-442

Q4 FY2024

July, 2024



Catch Basin CB-463D

Catch Basin CB-454D

Catch Basin CB-443B

Catch Basin CB-107F

Storm Drain SD-107

Storm Drain SD-442

ATTACHMENT 2

Field Inspection Sheets

HANGAR 1 CATCH BASIN & STORM DRAIN INSPECTION

DATE	10/26/2023	TIME	10:25 AM	STAFF	Deborah Varty (ERT), Mike Ninokata (ERT)

Location	Sediment	Water	Debris	Observations
CB-443B	Trace	None	Yes	Trace amount of sediment observed, but not enough was present for minimum sample volume required for analysis. A trace amount of organic debris present at the bottom of the CB.
CB-447A	Trace	None	Yes	Trace amount of sediment observed, but not enough was present for minimum sample volume required for analysis. A trace amount of organic debris present at the bottom of the CB.
CB-454D	Trace	None	Yes	Trace amount of sediment observed, but not enough was present for minimum sample volume required for analysis. A small amount of organic debris and gravel present at the bottom of the CB.
CB-463D	Trace	None	Yes	Trace amount of sediment observed, but not enough was present for minimum sample volume required for analysis. A small amount of organic debris and gravel were present at the bottom of the CB.
CB-107F	Small Amt	None	Yes	Small amount of sediment observed, but not enough was present for minimum sample volume required for analysis. Some organic debris and gravel were present at the bottom of the CB.
SD-107	None	Yes	None	Water flowing E to W into large pipe. No sediment observed*. No sample collected.
SD-442	Trace	None	None	SD was damp at the bottom, but no standing or flowing water was observed. A trace amount sediment observed. No sample collected.
H-1 Sump Berm	N/A	N/A	N/A	Berm removed by Planetary Ventures (PV) during Q1 FY 2022 in preparation for full-scale abatement and recoating activities. Access to this area was blocked due to Hangar 1 abatement activities. No photo was taken.
Photographs	N/A	N/A	N/A	Yes

Additional Notes
*Some gravel was observed at the bottom of SDs, however, there were no fines nor sediment present to sample.
Water levels in storm drains were lower than previous inspection (07/21/23).
Filter fabric was in place on the four CBs located immediately adjacent to Hangar 1 at the Northern and Southern ends.
Grate cover for CB-443B broken but functional.

HANGAR 1 CATCH BASIN (CB) & STORM DRAIN (SD) INSPECTION

DATE	1/25/2024	TIME	9:20 AM	STAFF	Deborah Varty (ERT), Mike Ninokata (ERT)

Location	Sediment	Water	Debris	Observations
CB-443B	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-447A	None	None	Small Amt	No sediment was observed. A small about of debris was present in the bottom of the CB. No sample collected.
CB-454D	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-463D	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-107F	Small Amt	None	Trace	A small amount of sediment observed, but not enough was present for minimum sample volume required for analysis. Trace organic debris was present at the bottom of the CB.
SD-107	None	Yes	None	Approximately 3" of water was observed flowing through the SD. No sediment observed and no sample collected.
SD-442	None	Yes	None	Approximately 4" of water was observed flowing through the SD. No sediment observed and no sample collected.
H-1 Sump Berm	N/A	N/A	N/A	Berm removed by Planetary Ventures (PV) during Q1 FY 2022 in preparation for full-scale abatement and recoating activities. Access to this area was blocked due to Hangar 1 abatement activities. No photo was taken.
Photographs	N/A	N/A	N/A	Yes

Additional Notes	
	Water levels in storm drains were higher than previous inspection (10/26/23).
	Filter fabric was in place at the one accessible CB located immediately adjacent to Hangar 1 (CB-447A).

HANGAR 1 CATCH BASIN (CB) & STORM DRAIN (SD) INSPECTION

DATE	4/9/2024	TIME	13:50:00 AM	STAFF	Deborah Varty (ERT), Mike Ninokata (ERT)

Location	Sediment	Water	Debris	Observations
CB-443B	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-447A	None	None	Small Amt	No sediment was observed. A small about of inorganic debris was present in the bottom of the CB. No sample collected.
CB-454D	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-463D	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities.
CB-107F	Small Amt	None	Trace	A small amount of sediment observed, but not enough was present for minimum sample volume required for analysis. Trace organic debris was present at the bottom of the CB.
SD-107	None	Yes	None	Approximately 1" of water was observed flowing through the SD. No sediment observed and no sample collected.
SD-442	None	Yes	None	Approximately 3" of water was observed flowing through the SD. No sediment observed and no sample collected.
H-1 Sump Berm	N/A	N/A	N/A	Berm removed by Planetary Ventures (PV) during Q1 FY 2022 in preparation for full-scale abatement and recoating activities. Access to this area was blocked due to Hangar 1 abatement activities. No photo was taken.
Photographs	N/A	N/A	N/A	Yes

Additional Notes	
	Water levels in storm drains were lower than previous inspection (01/25/24).
	Filter fabric was in place at the one accessible CB located immediately adjacent to Hangar 1 (CB-447A).

HANGAR 1 CATCH BASIN (CB) & STORM DRAIN (SD) INSPECTION

DATE	7/1/2024	TIME	8:30 AM	STAFF	Luke Metz (ERT), Mike Ninokata (ERT)

Location	Sediment	Water	Debris	Observations
CB-443B	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities. Covered by equipment and scaffolding. Photo Taken.
CB-447A	N/A	N/A	N/A	Inaccessable due to overhead work and potential falling objects. Photo taken.
CB-454D	N/A	N/A	N/A	CB was inaccessible due to Hangar 1 construction activities, project equipment and scaffolding Photo taken.
CB-463D	N/A	N/A	N/A	Inaccessable due to overhead work and potential falling objects. Photo taken.
CB-107F	None	None	Trace	Some gravel but no sediment observed for sampling. Trace organic debris was present at the bottom of the CB. Trash removed from CB.
SD-107	None	Yes	None	Approximately 1" of water was observed flowing through the SD. No sediment observed and no sample collected. Photo taken.
SD-442	None	Yes	None	Approximately 3" of standing water was observed in the SD. No sediment observed and no sample collected.
H-1 Sump Berm	N/A	N/A	N/A	Berm removed by Planetary Ventures (PV) during Q1 FY 2022 in preparation for full-scale abatement and recoating activities. Access to this area was blocked due to Hangar 1 abatement activities. No photo was taken.
Photographs	N/A	N/A	N/A	Yes

Additional Notes	
	Water levels in storm drains were similar to previous inspection (04/09/24).

APPENDIX F
TABLE B: LIST OF SIGNIFICANT SPILLS OR LEAKS

NASA Ames Research Center
Table B — List of Significant Spills or Leaks

Date	Location	Quantity And Substance Released	Description	Actions taken to correct, control or mitigate incident	Recommendations to prevent recurrence	Followup Actions
12/7/19	CANG Flight Line	Apx 3 gallons of JP-8	During the refueling of an aircraft, an estimated 3 gallons of jet fuel was spilled onto flight line Spot #2 and Spot #3. Due to inclement weather, an undetermined amount of the fuel was washed into a storm drain that leads to the San Francisco Bay. The release to the drain was unrecoverable. The fuel that remained on the surface area was recovered by on-site personnel with the use of absorbents. No fires or injuries were reported.	CANG notified EPA and OES and deployed a floating boom at the outfall of the Marriage Road Ditch BMP, which did not remain in place. Absorbent was used to clean the ground surface at the location of the spill.	Properly maintain equipment to guard against unplanned releases, protect nearby storm drains when performing material transfers, educate personnel on the refueling instructions.	---
12/18/19	Moffett Runway	Apx 3 gallons of JP-8	An airplane maintenance crew noticed a fuel leak while working on a C130. The fuel was captured within secondary containment, there was no release to the environment. NASA Fire responded, but did not deploy spill materials.	NASA Fire responded, but did not deploy spill materials.	Properly maintain equipment to guard against unplanned releases.	---
5/20/20	Boyd Road between N229A and N227A	An unknown amount of hydraulic fluid	On Wednesday, 5/20/2020, Recology truck driver notified janitorial supervisor (Bill Reyes) at approximately 6:45am. that his truck had stalled at building N227A parking lot and one of the hydraulic line burst, leaking fluid on the ground. Janitorial supervisor notified NASA Dispatch, COR and left a voice message to code-Q	Recology Manager (John Zirelli), was informed of the issue and will be sending a mechanic to cap-off the damage hose, so that the truck can be towed from site and Great America Towing Recovering will be arriving to clean up the hydraulic oil spill.	Properly maintain equipment to guard against unplanned releases.	---
9/9/20	M020	apx 30,000 gallons of potable water	Water main break. A small potable water leak was found beneath M020. The flow was reduced to 2 gpm for about 10 days during the repair process.	Water leak was isolated, line was repaired and returned to service.	Properly maintain infrastructure to guard against line breaks.	---
9/17/20	Ellis gate entrance	2 gallons of diesel fuel	Two gallons of diesel fuel from an unknown vehicle was discovered on the pavement.	The Moffett Fire Department responded to the spill and deployed kitty litter to clean up the spill. The spill did not enter the storm drain.	Properly maintain equipment to guard against unplanned releases.	---
1/25/21	Westcoat Road and Stewart Drive	An unknown amount of sewer water	A sewer backup at the Westcoat Housing overflowed into the storm system.	Storm drains were blocked, and the blockage was removed from the sewer line. Settling Basin was sampled, results were within normal parameters.	Properly maintain infrastructure to guard against line breaks.	---
1/29/21	M566	apx 5,000 gallons of potable water	Water main break.	Water leak was isolated, line was repaired and returned to service.	Properly maintain infrastructure to guard against line breaks.	---
2/2/21	N144	apx 12,000 gallons of potable water	Water main break.	Jacobs responded and isolated the leak.	Properly maintain infrastructure to guard against line breaks.	---
6/4/21	N229	<5 gallons oily water	Earlier today at N229, there was an oil spill noticed by a technician performing routine equipment inspections. The oil was coming from an air compressor. Total amount is less than 5 gallons. The supervisor for that equipment will fill out the spill log and send it to me. Once I get, I will forward it to you. Dispatch was not contacted due to the small amount and short time needed to clean it up.	It is stopped, contained, and cleaned up. It took only a few minutes to contain and clean it.	Inspect and maintain equipment, use spill containers where appropriate.	---
9/11/21	M025	apx 10,000 gallons of potable water	Water main break.	Water leak was isolated, line was repaired and returned to service.	Properly maintain infrastructure to guard against line breaks.	---
9/11/21	N220	apx 12,000 gallons of potable water	Water main break.	Water leak was isolated, line was repaired and returned to service.	Properly maintain infrastructure to guard against line breaks.	---
9/30/21	N271	Unknown amount of Sodium Hydroxide 30%.	The flange after the tank had a hairline crack and was not leaking when found. There was less than 1 milliliter of caustic on the concrete foundation of the tank.	The area was wiped clean and a thick layer of RTV was added to the crack.	Inspect and maintain equipment, use spill containers where appropriate. Repair/replace broken elements in a Timely manner. Perform followup inspections to avoid reoccurrance.	This tank has been removed from service. The system was redesigned to use a 55 gallon drum located indoors. This eliminates the potential for future impacts to the storm water discharge system.
11/11/21	Hangar 1	2nd spot on west ramp	N724JJ wanted top off, at 21042 gal mark on meter fuel started to overflow over wings. Told pilot and called ups for help. Pilot stated aircraft fuel valve was inoperable as it showed it was flowing into left wing but kept on fueling out of right wing. Over flow valve did not work causing the spill.	Blocked off drain, brought spill containment cart over, used SW mat, pig mats, cat, to coman spill. NASA Fire department was there to assist. Fuel was in the 2 yellow bins and 1 hazmat bin in hazmat container.	Inspect and maintain fuel gauges.	---
11/16/21	N211 Northeast Corner	Small amount of AFFF	The AFFF storage system overflowed and leaked onto the ground.	Moffett Field Fire Department contained the leak and addressed the problem.	Inspect and maintain equipment per manufacturer's specifications.	---

NASA Ames Research Center
Table B — List of Significant Spills or Leaks

Date	Location	Quantity And Substance Released	Description	Actions taken to correct, control or mitigate incident	Recommendations to prevent recurrence	Followup Actions
1/12/22	N229 High Bay	Small amount of oil	Attempted to transport a pump with a forklift using extenders. During transport, the pump fell over causing a casing to break open and oil to spill around the pump in the middle of Boyd Road.	The spill was cleaned up and materials were disposed of through ARC's Hazardous Waste facility.	Use proper equipment and properly secure loads while transporting and trnasfering materials.	---
4/6/22	N240A	Apx 11,500 gallons of potable water	Water main break.	Water leak was isolated, line was repaired and returned to service.	Properly maintain infrastructure to guard against line breaks.	---
4/11/22	Fifth Avenue Gate	less than 5 gallons of raw sewage and biocides	Portable toilet staged near the Fifth Avenue Gate was blown over by the wind. A 3'x3' wet stain was found on the pavement near the toppled portable toilet.	The portable toilet rental company arrived on site to clean up the waste. The unit was left in repose to avoid a repeat spill during the wind storm.	Prepare for high-wind events by locating and securing the portable toilet and other equipment that can be damaged or toppled by the wind.	---
4/22/22	N239A	less than .5 pint of hydraulic fluid	Hydraulic fluid was found leaking from an unused hudraulic tank.	Jacobs responded to clean up the spill and recover any remaining oil in the tank.	Perform monthly and Annual inspections on aboveground storage tanks containing oil.	---
5/24/22	Near M545	600 gallons of liquid oxygen.	A gasket broke while filling a liquid oxygen tank. About 600 gallons vaporized and was released into the atmosphere. No liquid entered the storm distribution system.	Moffett Field Fire Department responded and decided the safest thing to do is let the tank “bleed” and the oxygen dissipate.	Inspect and maintain equipment per manufacturer's specifications.	---
5/31/22	N234 Cooling Tower	apx 3,000 gallons of potable water treated with CL49 and CL5642	Overflow from cooling tower system	The nearby storm drain was blocked and the cooling tower was shut off for maintenance. The settling basin was visually monitored for signes of contamination The travel path from the cooling tower to the storm drain was cleaned, after area dried debris was swept to remove debris and solids from the event.	Properly maintain sustems to guard against line breaks Install BMPs to protect nearby storm drains during maintenance activities.	---
9/3/22	King Rd and Cooper Loop	apx 15,000 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks.	---
11/1/22	M580	2-3 gallons of water and AFFF	Approximately 0835 a small amount of AFFF mixed with water leaked from an AFFF apparatus leaked onto the pavement outside of M580.	Absorbant was used to clean up the spill from the pavement.	Properly maintain equipment to guard against equipment leaks. Inspect equipment regularly.	---
12/14/22	Outside N207	Approx 30,000 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
2/11/23	Fire Station Garage	A few drops of engine oil	Engine oil from a fire truck leaked onto the floor of the firehouse garage.	Spill kit was deployed to clean up the leak and capture additionall drips until equipment could be serviced.	Place drip pans beneath equipment to capture leaks that develop.	---
2/13/23	Storm Water Settling Basin Parking Lot	< .25 gal hydrolic fluid	A hydraulic-powered lift assist on a roll-off dumpster broke, leaking hydraulic fluid to the pavement.	Hazwaste personnel was onsite observing the subcontractor delivering the roll-off bin. Spill kit materials were deployed to clean up the spill.	Equipment should be inspected by subcontractors before delivering on-site. Damaged equipment should not be accepted by personnel.	A new roll-off bin with working hydraulic lifts was delivered.
4/17/23	N271	10,000 gallons of poptable water and sodium hydroxide	A fill line was left open, overtopping a tank.	TSF personnel closed the valve to stop the overflow.	Fill lines should be monitored visually or tank must be equipped with automatic shut-off sensors.	Requested additional information from TSF. Recommend retaking SWPP Training course.
5/24/23	N238	Approx 5,000 gallons of cooling tower water	Approx 50 to 100 gallons of cooling tower water entered a storm drainage catch basin on Hunsaker outside N265.	Storm drains were blocked, and the leak was stopped. Settling Basin was sampled, results are expected within one week.	Inspect and maintain equipment per manufacturer's specifications.	Currently evaluating installation of an advanced BMP to prevent the release of process water during Arc Jet operations. Performed field visit to evaluate potential BMPs, recommended installing a SafeDrain and curbing. JQ's recommendations are currently under review. Facility installed a series of sandbags to control flow of potential future releases to sanitary sewer. Sandbags must be maintained and replaced as needed.

NASA Ames Research Center
Table B — List of Significant Spills or Leaks

Date	Location	Quantity And Substance Released	Description	Actions taken to correct, control or mitigate incident	Recommendations to prevent recurrence	Followup Actions
5/25/23	N238	Approx 100 gallons of cooling tower water	A repeat event, storm drain was already blocked from the previous event.	Storm drains were immediately blocked, and the leak was stopped.	Inspect and maintain equipment per manufacturer's specifications.	Currently evaluating installation of an advanced BMP to prevent the release of process water during Arc Jet operations. Performed field visit to evaluate potential BMPs, recommended installing a SafeDrain and curbing. JQ's recommendations are currently under review. Facility installed a series of sandbags to control flow of potential future releases to sanitary sewer. Sandbags must be maintained and replaced as needed.
6/14/23	N234A Near Cooling Tower	Approx 90 gallons of cooling tower water	The leak occurred when an underground water pipe broke and water bubbled up from the ground. The underground water pipe takes water from the Arc Jet hot well to the cooling towers for cooling and reinsertion into our condenser system. The leak was noticed when the SVS crew found water bubbling up from the ground during routine watch standing activities.	The broken section of pipe was isolated to stop flow and allow for repairs to the line.	Perform routine preventative maintenance on system components and piping.	Verify repairs to pipe and preventive maintenance plan is in place.
6/26/23	M076	Approx 720 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
9/8/23	N227D	Approx 720 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
9/12/23	Hunsaker Rd. and Mark Ave	Approx 2 gallons of Universal Tractor Fluid (UTF)	Container fell while being transported.	Absorbant was used to clean up the spill from the pavement. Traffic was diverted during spill cleanup efforts to prevent vehicles from tracking spilled UTF.	Properly secure containers before transfering.	Verified spill was properly cleaned up.
9/13/23	N229	Approx 2,400 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
9/19/23	N234A	Approx 200 gallons of cooling tower water	During start-up, hotwell level controller glitched out. It spilled over.	We enforced barricade around storm drain and swept standing water on the ground.	Perform routine preventative maintenance on system components and piping. Evaluate current BMPs and consider installing additional BMPs to control flow of potential future releases.	This is an ongoing issue, TSF is working with JQ to design the appropriate spill prevention barriers/equipment. Facility installed a series of sandbags to control flow of potential future releases to sanitary sewer. Sandbags must be maintained and replaced as needed.
10/3/23	N234A	Approx 200 gallons of cooling tower water	Hotwell level controller failed spilling process water to ground.	Water was pumped to the wastewater system.	Perform routine preventative maintenance on system components and piping. Evaluate current BMPs and consider installing additional BMPs to control flow of potential future releases.	This is an ongoing issue, TSF is working with JQ to design the appropriate spill prevention barriers/equipment. Facility installed a series of sandbags to control flow of potential future releases to sanitary sewer. Sandbags must be maintained and replaced as needed.
6/28/23	M076	Approx 720 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
11/7/23	M0146	Approx 1,800 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
11/20/23	M684-686	Approx 15,000 gallons of potable water	Water main break.	Jacobs responded, isolated the leak, and patched the water main.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---

NASA Ames Research Center
Table B — List of Significant Spills or Leaks

Date	Location	Quantity And Substance Released	Description	Actions taken to correct, control or mitigate incident	Recommendations to prevent recurrence	Followup Actions
2/28/24	N234A	Approx 8,000 gallons of cooling tower and steam condensate water	Hotwell level controller failed spilling process water to ground.	Flow was blocked from entering the storm drainage system. Spill was pumped to the sewer wastewater system. No water entered the storm drainage system.	Perform routine preventative maintenance on system components and piping. Evaluate current BMPs and consider installing additional BMPs to control flow of potential future releases.	This is an ongoing issue, TSF is working with JQ to design the appropriate spill prevention barriers/equipment. Facility installed a series of sandbags to control flow of potential future releases to sanitary sewer. Sandbags must be maintained and replaced as needed.
8/8/24	N221 near entrance to the West Warehouse high-bay	Approximately .5 gal lead acid	An electrician was moving lead acid batteries from a sub-station using a forklift. When the forklift crossed the threshold the batteries tipped over.	The lead acid was contained and cleaned up immediately, materials were disposed of through the NFAC hazardous waste program.	Plan your route before transporting hazardous materials. Secure load to avoid tipping/falling/spills.	---
8/23/24	Golf Course	Unkown amount of sewage	A 10" sewer force main broke leaking sewage onto a vegetative area of the golf course.	The line was isolated to stop flow, repairs are in the planning stage.	Perform routine preventative maintenance on system components and piping. Evaluate current BMPs and consider installing additional BMPs to control flow of potential future releases.	---
8/27/24	N226 west side	Unknown amount of hydraulic oil	Hydraulic oil is slowly being released from bearings inside the abandoned Supersonic Wind Tunnel. Oil is accumulating beneath the tunnel.	Spill kit was deployed but has not been refreshed for some time. Plans to demolish the wind tunnel and investigate the subsurface are in development.	If equipment must be abandoned in place, enact safeguards to prevent spills to the environment. Funding for regular inspections, maintenance activities, and spill response must be included in the abandonment plan.	9/10/24-Inspected area, status remains the same. 10/24/24-Inspected area, status remains the same. 11/22/24-Inspected area, status remains the same. 12/19/24-Inspected area, status remains the same. 1/2/25-Inspected area, status remains the same. 2/5/25-Inspected area, status remains the same. 3/4/25-Inspected area, status remains the same. 4/9/25-Inspected area, status remains the same. 5/6/25-Inspected area, oil only absorbant mats and booms were deployed.
10/18/24	North of Building 018	Unkown amount of drinking water	A 10+ gpm leak from a valve under a fire hydrant.	The line was isolated to stop flow, repairs are **in the planning stage.**	Perform routine preventative maintenance on system components and piping. Evaluate current BMPs and consider installing additional BMPs to control flow of potential future releases.	Confirm repairs were completed.
1/6/25	Northwest corner of N226	Apx 60,000 potable water	A potable water line was unintentionally broken during construction activities.	The line was isolated to stop flow, repairs are in the planning stage.	Review utility mapping during daily tailgate briefing. Identify utility lines prior to commencing underground work. Follow Health & Safety standards for hand clearing around utility lines.	Confirm repairs were completed and mitigating measures are implemented
2/3/25	Near Ellis Gate	Apx 24,000 potable water	Water main break.	The line was isolated to stop flow, repairs are in the planning stage.	Properly maintain infrastructure to guard against line breaks. JCE requested funding to address aging infrastructure.	---
4/7/25	N211 Apron	Various small spills of hydraulic fluid	Unplanned releases during aircraft decommissioning activities	Spills are cleaned up using dry methods as they occur.	Use drop cloths and other containment methods.	---
5/12/25	N227A	160 gal of oil	The filter housing for a bearing had a damaged gasket that caused the oil to leak out.	The oil has been contained and cleaned up. No oil went into storm drains.	Perform routine preventative maintenance on system components and piping.	---

Note: This list includes significant spills or leaks that discharged to, or had the potential to discharge to the storm water system at NASA Ames as described in section X.G.1.d.ii of the Industrial General Permit.

APPENDIX G
EXAMPLE OF CHAIN OF CUSTODY FORM

ERT CHAIN OF CUSTODY

REPORT TO: Marcia Christlieb
ERT/BB&E/NASA Ames
Bldg. T20G/Room 142. M/S T20G-4
Moffett Field, CA 94035-1000
(650) 604-5360
marcia.j.christlieb@nasa.gov;
joann.k.moon@nasa.gov

LAB: **Torrent Labs**
483 Sinclair Frontage Road
Milpitas, CA 95035
408.263.5258

LAB ID #:

PROJECT NAME:
PROJECT NUMBER:
JOB DESCRIPTION

INVOICE TO: **BB&E, Inc.**
Accounts Payable
235 E. Main St, Suite 107
Northville, MI 48167

Field Conditions:
pH / Temp (C or F)
SBE /
191 /
RTJO /

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	ANALYSIS REQUESTED: 625,Diesel, JP4, JP5, JP8 Motor Oil, PCBs	TSS, N&N	BOD	NH3 (4500-NH3 B+C)	245.1, 200.8	Oil & Grease	624, TPH-gas	TOC	COD	TURN AROUND TIME	SPECIAL INSTRUCTIONS
		SBE.E5 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268
		SBE.E5 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
		SBE.E5 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
		SBE.E5 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
		SBE.E5 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
		SBE.E5 2024/2025- 6	Water	1 - Amber Liter	HCl						X				5 days	
		SBE.E5 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
		SBE.E5 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
		SBE.E5 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	
		RTJO.E5 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268
		RTJO.E5 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
		RTJO.E5 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
		RTJO.E5 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
		RTJO.E5 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
		RTJO.E5 2024/2025- 6	Water	1 - Amber Liter	HCl						X				5 days	
		RTJO.E5 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
		RTJO.E5 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
		RTJO.E5 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	
		191.E5 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268
		191.E5 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
		191.E5 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
		191.E5 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
		191.E5 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
		191.E5 2024/2025- 6	Water	1 - Amber Liter	HCl						X				5 days	
		191.E5 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
		191.E5 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
		191.E5 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	

SAMPLER:	DATE/TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED AT LAB BY:

Please send results to marcia.j.christlieb@nasa.gov and joann.k.moon@nasa.gov
Request Linko EDD

DRAFT

APPENDIX H
Storm Water Level 1 Exceedance Response Action (ERA) Evaluation for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

Storm Water Level 1 Exceedance Response Action Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA

October 2024

www.nasa.gov

Environmental Support Services Contract
80ARC020F0036
Storm Water Level 1 Exceedance Action Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

Prepared for:
Environmental Management Division
NASA Ames Research Center
M/S 204-15
Building N204, Room 102B
Moffett Field, CA 94035-0001

October 1, 2024

BB&E
CONSULTING ENGINEERS
& PROFESSIONALS

Table of Contents

Acronyms and Abreviations 5

1. Introduction 6

2. Background 7

3. Site Evaluation 11

4. Implementation Discussion 15

5. Conclusion 16

6. Plan Certification 17

Figure 1 18

Appendix A: Summary of Reporting Year 2023-2024 Storm Water Data Results 19

Appendix B: Analytical Reports 20

List of Tables

Table 1: Drainage Areas and Sample Locations 9

Table 2: Nitrate Plus Nitrite (as N) NAL Exceedances 11

Table 3: Potential Sources of NAL Exceedances 13

Table 4: QISP Evaluation Summary 13

Table 5: BMP Evaluation 14

Table 6: Additional BMPs Selected for Implementation 15

Table 7: Timeline for Completion and Delivery of Submittals 16

Acronyms and Abreviations

Name	Description
ACSCE	Annual Comprehensive Site Compliance Evaluation (ACSCE)
ARC	NASA Ames Research Center
BMP	Best Management Practice
ERA	Exceedance Response Action
ERT	Earth Resources Technology, Inc.
IGP	General Permit for Stormwater Discharges Associated with Industrial Activities
LRP	Legally Responsible Person
Mg/L	Milligrams per liter
MS4	Municipal separate stormwater sewer system
N/A	Not applicable
NAICS	North American Industry Classification System
NAL	Numeric Action Level
NPDES	National Pollutant Discharge Elimination System
PV	Planetary Ventures
QISP	Qualified Industrial Stormwater Practitioner
RY	Reporting Year
SIC	Standard Industrial Classification
SMARTS	Storm Water Multiple Application and Report Tracking System
SWPPP	Storm Water Pollution Prevention Plan

1. Introduction

This Level 1 Exceedance Response Action (ERA) Report presents an evaluation of potential pollutant sources that may have contributed to the Numeric Action Level (NAL) exceedance of nitrate plus nitrite (as N) (N+N as N) in storm water samples collected during the 2023-2024 Reporting Year (RY) at the RTJO outfall located at NASA Ames Research Park (ARC), Moffett Field, CA, 94035. This Level 1 ERA Evaluation was performed to explore potential pollutant sources related to an exceedance of N+N as N, evaluate the effectiveness of existing Best Management Practices (BMPs), and assess the need to develop and implement additional BMPs to address the exceedance. This ERA Report has been prepared in compliance with California's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activity—CAS000001, Water Quality Order: General Permit 2018-0028-DWQ (IGP).

Under the IGP, dischargers who exceed either the instantaneous or annual NAL for a parameter transition from Baseline status to Level 1 status on July 1 the following RY during which the exceedance occurred. An instantaneous maximum NAL exceedance occurs when two or more analytical results from samples taken for any single parameter within a RY exceed the instantaneous maximum NAL value for that parameter, as listed in Table 2 of the IGP. An annual NAL exceedance occurs when the average of all the analytical results for a parameter from samples taken within a RY exceeds the annual NAL value for that parameter, as listed in Table 2 of the IGP.

The IGP requires completion of the following Level 1 activities in response to all NAL exceedances as defined in the IGP:

- On July 1 of the following RY, a discharger's baseline status for any given parameter will change to Level 1 status if sample results indicate an NAL exceedance for that parameter.
- By October 1 following commencement of Level 1 status, the discharger must obtain the assistance of a QISP to evaluate industrial pollutant sources that may be related to the NAL exceedance, review existing BMPs and the Storm Water Pollution Prevention Plan (SWPPP), and evaluate potential implementation of additional BMPs to address the exceedance, if appropriate.
- By January 1 following the commencement of ERA Level 1 status, the discharger must prepare and submit a Level 1 ERA Report that describes the evaluation findings and recommendations.
- The facility's QISP must provide sufficient training to the appropriate team members assigned to perform activities required by the IGP.

During the 2023-2024 RY, ARC exceeded the NAL for N+N as N, thereby elevating ARC to Level 1 status for that parameter, effective July 1, 2024. In response, Marcia Christlieb, QISP (ERT, Inc.) conducted a Level 1 ERA Evaluation between August 6-September 27, 2024. The findings of the evaluation are presented in Section 3.0 of this report; Section 4.0 includes the proposed scope and schedule for implementation of additional BMPs and a detailed description of SWPPP updates.

2. Background

2.1. Site Information.

Facility Name	NASA Ames Research Center
Address	Environmental Management Division, Moffett Field, California, 94035
Waste Discharge Identification Number	2 431011003
Standard Industrial Classification Code (SIC)	3728-Aircraft Parts and Auxiliary Equipment, NEC
Designated Legally Responsible Person (LRP)	Jeanne Sabin
Discharger Contact Person	Jeanne Sabin
Phone Number	650-604-1800
Cell Number	650-582-7321
Email Address	jeanne.m.sabin@nasa.gov

ARC occupies approximately 421 acres of the 2,000-acre site that constitutes Moffett Federal Airfield and the NASA Research Park. Stewardship of the airfield and adjoining property was transferred to ARC in July of 1994, with the closure of the Naval Air Station (NAS) in response to the recommendation of the Defense Base Closure and Realignment Commission. Planetary Ventures assumed operations of Moffett Field, which includes both the airfield and the golf course, in April 2015. Planetary Ventures provides airfield fueling operations at Moffett Field.

ARC is located approximately one mile from the southwestern shoreline of San Francisco Bay, approximately 25 miles east of the Pacific Coast. The City of Mountain View is adjacent to the western and southern boundaries of the facility. The eastern and southern boundaries adjoin the City of Sunnyvale. Downtown San Jose is located approximately seven miles southeast and the City of San Francisco is located approximately 32 miles northwest of the site. U.S. Highway 101 passes south of the facility. ARC is bounded by Lockheed Martin to the east, Highway 101 to the south, Stevens Creek to the west, and the United States Fish and Wildlife Service (USFWS) salt ponds to the north.

The ARC campus consists of approximately 40 technical facilities and 48 other major supporting and administrative buildings and structures. The resident staff at ARC is roughly 2,300 employees which include approximately 1,200 civil service employees (temporary and permanent assignments) and 1,100 contract and subcontract employees. The mission of ARC is to conduct

research and development in the fields of nanotechnology, biotechnology, aeronautics, space science, life science, information science, and earth system science.

ARC generates potential storm water pollutants through multiple ongoing industrial activities. Storm water runoff from urban and industrial areas typically contains significant quantities of the same general types of pollutants found in industrial and wastewater point source discharges.

Areas with a potential to impact storm water quality include facilities where hazardous materials and/or hazardous waste are stored in outside locations or where outdoor processes pose a reasonable risk of release to the storm drainage system. As such, these locations were inspected in August and September annually as part of an Annual Comprehensive Site Compliance Evaluation (ACSCE). Information collected from this year's ACSCE is included in this ERA Report and discussed in section 4.

Figure 1—Storm Water Drainage and Discharge Areas depicts the facility boundaries; the outline of all storm water drainage areas within the facility boundaries; sample collection and observation locations, associated points of discharge; portions of the drainage area impacted by run-on from surrounding areas; direction of flow of each drainage area, on-site and nearby surface water bodies, the locations of the Caltrans Culverts; and the location of the Settling Basin and other in-line Advanced BMPs.

The SWPPP identifies the following potential pollutant sources for the RT Jones Road drainage area:

- Bacteria and Viruses
- Heavy Metals
- Nutrients
- Oil and Grease
- Oxygen Demanding Substances
- PCBs
- Priority Pollutants
- Sediment
- Specific Conductance

Table 1 outlines the RT Jones Road drainage area and sample point location. Inspections of this drainage area are conducted monthly in accordance with the IGP to ensure BMPs and corrective actions are effectively implemented.

Table 1: Drainage Areas and Sample Locations

Drainage Area Description	Sample Location
RT Jones Road RT Jones Road runs north-south along the western perimeter of ARC, was recently redeveloped to accommodate an increase of traffic to the newly constructed Planetary Ventures Bay View Campus. Storm water from RT Jones Road discharges onto NASA property. The RT Jones storm water system includes a series of bio-swales and two below-ground storm drainage treatment systems along RT Jones Road, terminating at the southwest corner of the western diked marsh.	**Sample Point RTJO:** Samples are collected from the access point at the terminating end of the storm distribution system.
Western Drainage System Runoff in the Western Drainage System is directed to a settling basin before discharging into the Western Diked Marsh and the Storm Water Retention Pond located along the northern portion of the property. Storm water sheet flows into a series of drop and curb inlets, then is conveyed to the settling basin through low-head piping ranging from 38 to 48 inches in diameter before reaching the settling basin. Industrial activities in this drainage system include a groundwater treatment plant, Hangar 1, resident and military housing, United States Geological Survey, the Full-Scale Aerodynamics Complex, the Unitary Wind Tunnel Complex, various research facilities, as well as run-on from Highway 101 and a PG&E electrical substation.	**Sample Point SBE:** Samples are collected from the effluent chamber of the settling basin.
Eastern Drainage System Runoff in the Eastern Drainage System is directed to the 191 Pump Station, located on the northern permitter of the property near the Moffett Field Runway and the Golf Club at Moffett Field. Storm water sheet flows from into a series of drop and curb inlets, then is conveyed to the settling basin through a combination of swales, ditches, and low-head piping before reaching the 191 Pump Station. Storm water is then pumped into the Northern Channel, where it flows to the Lockheed Pumping Station before it is pumped one more time from the Lockheed Channel to the Moffett Channel, the flow then meets up with the Guadalupe Slough and eventually, the San Francisco Bay. Industrial activities in this drainage system include Hangars 2 and 3, Moffett Federal Airfield, CA Air National Guard, Planetary Ventures (PV), and the Golf Club at Moffett Field. Approximately 11 acres of the Eastern Drainage System has been set aside for the PV Bus Parking Facility. PV maintains their own IGP coverage for activities associated with the bus parking facility which discharges into the Eastern Drainage System.	**Sample Point 191:** Samples are collected from the pump station inlet.

2.2. **QISP Information.**

The IGP requires the discharger to enlist the services of a QISP to assist with the Level 1 ERA Evaluation and prepare the Level 1 ERA Report. Information related to the QISP assisting with this evaluation and report is presented below.

Name	Marcia Christlieb
QISP Certification Number	#00620
Affiliation	Earth Resources Technology
Phone Number	650-604-5360
Email Address	marcia.j.christlieb@nasa.gov
Scope of Services Provided	Manages the development, implementation, and revisions to the SWPPP. Level 1 ERA Evaluation. Level 1 ERA Report. Storm water monthly and annual inspections. Storm Water Annual Report. Storm Water Monitoring Plan. Storm water sampling coordination.

2.3. **Summary of Numeric Action Level Exceedances.**

Table 2 summarizes the N+N as N NAL exceedance. RTJO only experienced two Qualifying Storm Events during the 2023-2024 RY. A summary of individual sampling events for RY 2023-2024 is provided in Appendix A. Laboratory reports for the 2023-2024 RY are presented as Appendix B.

Table 2: N+N as N NAL Exceedances

Sample Date	Sample Location	N+N (mg/L)	Instantaneous NAL (mg/L)	Annual N+N NAL (mg/L)
11/6/2023	191	1.4	N/A	0.68
	SBE	0.79		
1/9/2024	191	0.71		
	SBE	0.61		
	RTJO	0.85		
1/31/2024	191	1.8		
	SBE	0.55		
	RTJO	1.9		
3/11/2024	SBE	0.64		
4/4/2024	SBE	0.2		
2023-2024 Annual NAL Average		*0.945*	N/A	

Note:

mg/L	Milligrams per liter
N/A	Not Applicable
Italics	*NAL Exceedance*

3. Site Evaluation

3.1. **Potential Pollutant Sources.**

This section presents potential pollutant sources at ARC that may have contributed to N+N as N NAL exceedance in the 2023-2024 RY. ARC is a research facility, the primary activities are research and development of aerospace-based technologies (SIC Code 3728-Aircraft Parts and Auxiliary Equipment, NEC). Most activities at ARC are unlikely to contribute to an increased N+N as N in storm water discharge.

Fabrication Shops:
Several indoor metal fabrication shops are present at ARC but are not included in the evaluation because activities at these locations have no storm water exposure.

Cross-contamination:
Although low, cross-contamination is a possible contributing factor in elevated N+N as N sample results, if bottles preserved with Nitric Acid are handled before collecting the N+N as N sample. However, the samplers who collected the elevated N+N as N samples are aware of cross-contamination hazards and are trained in proper sample collection requirements. Therefore, cross-contamination is not likely to have contributed to the N+N as N NAL exceedance.

Artesian Well:
ARC is currently investigating a source of water, expected to be an artesianing abandoned agricultural well, which started percolating from below ground surface and running into the storm drain around the same time as the elevated N-N stormwater samples. Flowing water can scrub nutrients from soil; therefore, it is possible this water may have contributed to the N+N as N NAL exceedance. Additional investigation is needed to identify if this is actually contributing to the exceedance.

BMP Maintenance:
Rainwater at the RTJO outfall was designed to pump from an end-of-line sump and into the Western Diked Marsh over an engineered pathway. The engineered pathway has degraded enough that it is now sloped slightly towards the sump causing discharged storm water to flow back into the sump. This recirculation of the storm water over vegetation and soil can contribute to elevated nutrient load.

Grounds Maintenance:
Grounds Maintenance Yard and the Green Waste Mulching Area are located at the VTOL Pad within the Western Drainage System. These two activities are most likely to contribute to elevated N+N as N results. However, at the outdoor spaces managed by ARC, the application of fertilizers is minimal and not likely to have contributed to the elevated N+N as N results at the RTJO sample point.

Table 3: Potential Sources of NAL Exceedances

Activities	Source	Existing BMP(s)
Fabrication Shops	Industrial	Minimum BMPs
Groundskeeping, fertilizer application	Industrial	Employee Training Program Material Handling and Waste Management Building and Grounds Maintenance Elimination of Non-Storm Water Discharges
Cross-contamination	Industrial	Employee Training Program Quality Assurance and Record Keeping
Sediment control in storm water discharge system	Non-industrial	Erosion and Sediment Controls Good Housekeeping Preventive Maintenance Control Devices Building and Grounds Maintenance

Table 4 summarizes the primary activities evaluated by the QISP to identify the primary contributors to the NAL exceedance. Results from this focused evaluation will be used to develop a corrective action plan and to address deficiencies to avoid future exceedances.

Table 4: QISP Evaluation Summary

Topic	Observation
Visual inspections of RT Jones Road storm water discharge area	Irrigation runoff observed sheeting across road into storm drain along RT Jones Road.
Visual inspection of RT Jones Road storm water discharge point	Storm water discharge was observed flowing backwards into the sump after being discharged. Poor grading of the ground at the discharge location doesn't allow for discharged water to flow freely into the Western Diked Marsh. Recirculating discharge water could lead to increased nutrient load by washing over vegetation and surrounding soils.
Inspect gutters and catch basins for debris or signs of dumping	No signs of dumping along RT Jones Rd. However, water has been flowing from an unknown underground source into the storm water swales along RT Jones Road.
Sampling techniques	Cross-contamination from nitrite bottle could result in a false positive.

3.2. **BMP Evaluation.**

In addition to the Minimum BMPs required by the IGP, ARC has developed a set of Site Specific BMPs to address specific industrial activities and are implemented in addition to the Minimum and Advanced BMPs. A QISP review of these BMPs is presented in Table 5.

3.2.1. **Minimum BMPs**

Table 5: BMP Evaluation

Minimum BMP	**Deficiencies Noted**
Good Housekeeping	Observed growing dump sites consisting of waste debris, office furniture, and surplus equipment on the outskirts of ARC, suggesting a relaxed implementation of the Good Housekeeping BMPs. No deficiencies observed along the RT Jones Road drainage area.
Preventative Maintenance	Catch basins were not cleaned out during the 2022-2023 RY.
Spill and Leak Prevention and Response	Water has been discharging to the ground surface from an unverified source for several months while the source is currently under investigation.
Material Handling and Waste Management	Did not verify if fertilizer is applied according to manufacturer's instructions.
Erosion and Sediment Control	RTJO outfall is poorly graded leading to recirculation of discharged water lasting for several days after a rain event.
Employee Training	Training is provided annually for ARC employees and some tenants. However, access to training is not available to all tenants and residents onsite.
Relevant Site Specific BMPs	**Deficiencies Noted**
Building and Grounds Maintenance	Records are not maintained by ARC landscapers and not yet requested from tenant landscapers.
Elimination of Non-Stormwater Discharges	Non-stormwater discharges were observed from two sources: an unverified underground source, and a significant amount of irrigation water.

4. Implementation Discussion

4.1. **Additional BMPs Implemented.**

A schedule for additional BMP implementation is presented in Table 6.

Table 6: Additional BMPs Selected for Implementation

BMPs to be Implemented	Proposed Implementation Date/Frequency	Applicable SWPPP Section
Maintain log of fertilizer/pesticide application	October 31, 2024	Material Handling and Waste Management Building and Grounds Maintenance Elimination of Non-Stormwater Discharges
Install filter in catch basins along RT Jones Road across from PV Bay View Campus	November 1, 2024	Preventative Maintenance
Provide Storm Water Pollution Prevention training to tenants	February 2025 Provide annual training refreshers	Employee Training
Perform regular maintenance of storm distribution system including annual cleanouts	Catch basin cleanout activities were completed by August 20, 2024	Preventative Maintenance
Train ARC facilities about the importance of annual catch basin cleanouts for future RYs	January 1, 2025	Preventative Maintenance

4.2. **Stormwater Plan Review and Modifications.**

As part of the Level 1 ERA, the QISP conducted a review of the existing SWPPP. Additional BMPs noted in Table 6 are being integrated into the applicable sections and will be addressed int the ACSCE and integrated into the Storm Water Pollution Prevention employee training program.

This Level 1 ERA Evaluation included reviewing the SWPPP to assess compliance with requirements outlined in Section X of the IGP. This review included all sections of the SWPPP, including the Site Map, potential pollutant generating activities, and BMP selection and implementation. The review did not identify any deficiencies with the SWPPP; however, the SWPPP is being revised to incorporate changes to BMPs. The amended SWPPP will be uploaded to Storm Water Multiple Application and Report Tracking System (SMARTS).

5. Conclusion

As discussed in Section 4, ARC is implementing additional BMPs to mitigate the storm water NAL exceedance for N+N as N. ARC will implement, maintain, and monitor the BMPs to evaluate continued effectiveness. ARC is committed to continued monitoring and sampling in accordance with the IGP and continued improvements within the storm water pollution prevention program.

Per Section XII.D.4 of the IGP, Level 1 parameters may return to baseline status for a specific parameter if results from four subsequent consecutive Qualified Storm Events sampled indicate no additional NAL exceedances for that parameter. With proper implementation of the additional BMPs discussed in Table 6, concentrations of N+N as N is expected to be reduced, preventing future NAL exceedances at ARC.

Table 7: Timeline for Completion and Delivery of Submittals

Document	Expected Completion Date
Level 1 ERA Evaluation Completed	September 17, 2024
SWPPP Revisions	January 1, 2025
BMP Implementation	January 1, 2025
Level 1 ERA Report Certified and Submitted	January 1, 2025

6. Plan Certification

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 ensure 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."

_____	Jeanne M. Sabin
Authorized Signature	Print Name
October 1, 2024 _____	Water Compliance Program Manager
Date	Title

Figure 1

Legend

- Areas With Run-On
- Caltrans Culvert
- Direction of Flow
- Discharge Area Boundary
- Discharge Locations
- Drainage Areas
- Emergency Discharge Areas
- Facility Boundary
- Google Bus Parking
- Northern Channel
- NPDES Discharge Points
- Storm Drain Inlet
- Settling Basin

0 1,500 Feet

N

Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Storm Water Drainage and Discharge Areas

DWN:	DES.:	PROJECT NO.:
MJC	MJC	Level 1 ERA N+N
CHKD:	REV.:	FIGURE NO.:
JMS	1	1
DATE:	APPD:	
10/24	JMS	

Appendix A: Summary of Reporting Year 2023-2024 Storm Water Data Results

Sample Location	Sample Date	pH	TSS	O&G	Ammonia Total (as N)	N+N (as N)	BOD	COD
	Units:	pH SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Test Method:	Field	SM2540D	EPA 1664A	SM4500-NH3C	A4500NH	SM5210B	EPA 410.4
191								
	11/6/2023	7.7	3.3	*1*	0.27	1.4	3	21
	1/9/2024	7.79	13	*1*	0.16	0.71	2.0	32
	1/31/2024	7.69	7.4	*1*	0.15	1.8	3.0	120
SBE								
	11/6/2023	8.32	2.4	*1*	0.06	0.79	3.0	17
	1/9/2024	8.19	5.5	*1*	0.048	0.61	3.0	11
	1/31/2024	8.01	8.6	*1*	0.069	0.55	7.0	11
	3/11/2024	8.1	3.5	*1*	0.025	0.64	3	13
	4/4/2024	7.62	6	*4*	<0.1	0.2	5.7	<10
RTJO								
	1/9/2024	7.80	8.8	*1*	0.064	0.85	3.0	<7
	1/31/2024	7.67	6.8	*1*	0.029	1.9	3	<7
	Average:	---	7	*1*	0.11	**0.84**	3.6	32
Action Levels	**Industrial General Permit Action Levels**							
	NAL Average	**---**	**100**	**15**	**2.14**	**0.68**	**30**	**120**
	NAL Instantaneous	**6-9**	**400**	**25**	**---**	**---**	**---**	**---**

Appendix B: Analytical Reports

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

January 17, 2024

CLS Work Order #: 24A0540
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE2-2023 / 2024

Enclosed are the results of analyses for samples received by the laboratory on 01/10/24 17:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*50 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*102 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*42 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*122 %*		*35-114*	"	"	"	"	*QS-BN*
Surrogate: Phenol-d6			*34 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*84 %*		*33-141*	"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
2-Nitrophenol	ND	0.48	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.81	10	"	"	"	"	"	"	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Dimethyl phthalate	ND	0.61	4.0	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	0.57	10	"	"	"	"	"	"	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	

Surrogate: 2,4,6-Tribromophenol	*47 %*	*10-123*	"	"	"	"
Surrogate: 2-Fluorobiphenyl	*92 %*	*43-116*	"	"	"	"
Surrogate: 2-Fluorophenol	*37 %*	*21-110*	"	"	"	"
Surrogate: Nitrobenzene-d5	*111 %*	*35-114*	"	"	"	"
Surrogate: Phenol-d6	*29 %*	*10-110*	"	"	"	"
Surrogate: Terphenyl-dl4	*73 %*	*33-141*	"	"	"	"

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*49 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*96 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*39 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*115 %*		*35-114*	"	"	"	"	*QS-BN*
Surrogate: Phenol-d6			*31 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*82 %*		*33-141*	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.048**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	**11**	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	
Nitrate/Nitrite as N	**0.61**	0.0048	0.20	mg/L	2	2400411	01/16/24	01/16/24	SM4500-NO3 E	
Total Organic Carbon	ND	0.54	1.0	"	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.051**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	
Total Suspended Solids	**5.5**	3.3	3.3	"	"	2400373	01/15/24	01/16/24	SM2540D	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.16**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	**32**	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	**0.48**	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	J
Nitrate/Nitrite as N	**0.71**	0.012	0.50	mg/L	5	2400411	01/16/24	01/16/24	SM4500-NO3 E	
Total Organic Carbon	**1.7**	0.54	1.0	"	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.092**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	
Total Suspended Solids	**13**	3.6	3.6	"	"	2400373	01/15/24	01/16/24	SM2540D	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.064**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	ND	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	**0.37**	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	J
Nitrate/Nitrite as N	**0.85**	0.012	0.50	mg/L	5	2400411	01/16/24	01/16/24	SM4500-NO3 E	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Total Organic Carbon	ND	0.54	1.0	mg/L	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.027**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	J
Total Suspended Solids	**8.8**	3.4	3.4	"	"	2400373	01/15/24	01/16/24	SM2540D	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*120 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*78 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**	**Received: 01/10/24 17:15**								
Chromium	ND	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0012**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00081**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.012**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**	**Received: 01/10/24 17:15**								
Chromium	**0.0016**	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0073**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00051**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.0096**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**	**Received: 01/10/24 17:15**								
Chromium	**0.00051**	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0018**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00021**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.0045**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*91 %*	*50-150*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*81 %*	*50-150*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24A0540**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30 Received: 01/10/24 17:15**									
Aroclor 1268*	ND	0.084	0.50	µg/L	1	2400333	"	01/15/24	EPA 8082	
Surrogate: Decachlorobiphenyl			*82 %*		*50-150*		"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
trans-1,3-Dichloropropene	ND	0.12	0.50	µg/L	1	2400401	"	01/13/24	EPA 624.1	
Trichloroethene	ND	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*115 %*		*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*115 %*		*73-125*		"	"	"	"	
Surrogate: Toluene-d8			*83 %*		*72-125*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Chloromethane	ND	0.19	0.50	µg/L	1	2400401	"	01/13/24	EPA 624.1	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**3.2**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*116 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*117 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*82 %*		*72-125*		"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,3-Dichlorobenzene	ND	0.077	0.30	µg/L	1	2400401	"	01/13/24	EPA 624.1	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**5.4**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*110 %*		*65-135*		"	"	"	"
Surrogate: 4-Bromofluorobenzene			*110 %*		*73-125*		"	"	"	"
Surrogate: Toluene-d8			*85 %*		*72-125*		"	"	"	"

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**21**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*81 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**22**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*82 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**23**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*80 %*	*65-135*		"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	ND	0.51	5.0	µg/L							
Acenaphthylene	ND	0.62	10	"							
Anthracene	ND	0.50	5.0	"							
Benzidine	ND	2.2	40	"							
Benzo (a) anthracene	ND	0.81	10	"							
Benzo (b) fluoranthene	ND	1.4	10	"							
Benzo (k) fluoranthene	ND	0.96	7.0	"							
Benzo (g,h,i) perylene	ND	1.1	10	"							
Benzo (a) pyrene	ND	1.2	7.0	"							
Bis(2-chloroethoxy)methane	ND	0.51	10	"							
Bis(2-chloroethyl)ether	ND	0.49	10	"							
Bis(2-chloroisopropyl)ether	ND	0.52	10	"							
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"							
4-Bromophenyl phenyl ether	ND	0.62	5.0	"							
Butyl benzyl phthalate	ND	0.69	7.0	"							
2-Chloronaphthalene	ND	0.52	5.0	"							
4-Chlorophenyl phenyl ether	ND	0.58	10	"							
Chrysene	ND	0.60	7.0	"							
Dibenz (a,h) anthracene	ND	1.4	7.0	"							
Di-n-butyl phthalate	ND	0.61	7.0	"							
3,3´-Dichlorobenzidine	ND	0.89	20	"							
Diethyl phthalate	ND	0.59	5.0	"							
Dimethyl phthalate	ND	0.61	4.0	"							
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"							
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"							
Di-n-octyl phthalate	ND	0.98	7.0	"							
Fluoranthene	ND	0.61	6.0	"							
Fluorene	ND	0.60	5.0	"							
Hexachlorobenzene	ND	0.74	5.0	"							
Hexachlorobutadiene	ND	0.55	2.7	"							
Hexachlorocyclopentadiene	ND	0.78	10	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Hexachloroethane	ND	0.49	4.0	µg/L							
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"							
Isophorone	ND	0.52	6.0	"							
Naphthalene	ND	0.52	4.0	"							
Nitrobenzene (NB)	ND	0.42	5.0	"							
N-Nitrosodimethylamine	ND	0.64	10	"							
N-Nitrosodiphenylamine	ND	0.57	10	"							
N-Nitrosodi-n-propylamine	ND	0.51	10	"							
Phenanthrene	ND	0.52	10	"							
Pyrene	ND	0.61	5.0	"							
1,2,4-Trichlorobenzene	ND	0.55	5.0	"							
4-Chloro-3-methylphenol	ND	0.45	9.0	"							
2-Chlorophenol	ND	0.46	9.0	"							
2,4-Dichlorophenol	ND	0.50	8.0	"							
2,4-Dimethylphenol	ND	0.56	8.0	"							
4,6-Dinitro-2-methylphenol	ND	0.79	25	"							
2,4-Dinitrophenol	ND	0.47	25	"							
2-Nitrophenol	ND	0.48	10	"							
4-Nitrophenol	ND	0.73	7.0	"							
Pentachlorophenol	ND	0.77	10	"							
Phenol	ND	0.41	4.0	"							
2,4,6-Trichlorophenol	ND	0.60	8.0	"							
Benzyl alcohol*	ND	0.42	20	"							
4-Chloroaniline*	ND	0.39	20	"							
Dibenzofuran*	ND	0.54	10	"							
1,2-Dichlorobenzene*	ND	0.50	10	"							
1,3-Dichlorobenzene*	ND	0.51	10	"							
1,4-Dichlorobenzene*	ND	0.48	10	"							
2-Methylnaphthalene*	ND	0.52	10	"							
2-Nitroaniline*	ND	0.54	25	"							
3-Nitroaniline*	ND	0.68	25	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
4-Nitroaniline*	ND	0.81	25	µg/L							
Benzoic acid*	ND	1.1	25	"							
3 & 4-Methylphenol*	ND	0.48	10	"							
2,4,5-Trichlorophenol*	ND	0.58	10	"							
Pyridine *	ND	0.36	10	"							
2-Methylphenol*	ND	0.41	10	"							
Surrogate: 2-Fluorophenol	*30.6*			"	*50.0*		*61*	*21-110*			
Surrogate: Phenol-d6	*33.1*			"	*50.0*		*66*	*10-110*			
Surrogate: Nitrobenzene-d5	*63.0*			"	*50.0*		*126*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*53.2*			"	*50.0*		*106*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*28.1*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*50.8*			"	*50.0*		*102*	*33-141*			
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	16.9	0.51	5.0	µg/L	20.0		84	70-130			
Acenaphthylene	17.8	0.62	10	"	20.0		89	60-130			
Anthracene	16.2	0.50	5.0	"	20.0		81	58-130			
Benzo (a) anthracene	18.3	0.81	10	"	20.0		92	42-133			
Benzo (b) fluoranthene	21.7	1.4	10	"	20.0		108	42-140			
Benzo (k) fluoranthene	19.8	0.96	7.0	"	20.0		99	25-146			
Benzo (g,h,i) perylene	23.2	1.1	10	"	20.0		116	13-195			
Benzo (a) pyrene	18.6	1.2	7.0	"	20.0		93	32-148			
Bis(2-chloroethoxy)methane	17.4	0.51	10	"	20.0		87	52-164			
Bis(2-chloroisopropyl)ether	16.8	0.52	10	"	20.0		84	63-139			
Bis(2-ethylhexyl)phthalate	16.9	0.58	7.0	"	20.0		84	43-137			
4-Bromophenyl phenyl ether	17.7	0.62	5.0	"	20.0		88	70-130			
Butyl benzyl phthalate	17.5	0.69	7.0	"	20.0		88	43-140			
2-Chloronaphthalene	18.2	0.52	5.0	"	20.0		91	70-130			
4-Chlorophenyl phenyl ether	17.6	0.58	10	"	20.0		88	57-145			
Chrysene	18.3	0.60	7.0	"	20.0		92	44-140			
Dibenz (a,h) anthracene	22.6	1.4	7.0	"	20.0		113	13-200			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Di-n-butyl phthalate	17.5	0.61	7.0	µg/L	20.0		88	52-130			
3,3´-Dichlorobenzidine	13.4	0.89	20	"	20.0		67	47-130			J
Diethyl phthalate	17.4	0.59	5.0	"	20.0		87	47-130			
Dimethyl phthalate	18.5	0.61	4.0	"	20.0		92	50-130			
2,4-Dinitrotoluene (2,4-DNT)	18.1	0.50	10	"	20.0		91	53-130			
2,6-Dinitrotoluene (2,6-DNT)	18.6	0.56	5.0	"	20.0		93	68-137			
Di-n-octyl phthalate	18.6	0.98	7.0	"	20.0		93	21-132			
Fluoranthene	17.8	0.61	6.0	"	20.0		89	47-130			
Fluorene	17.6	0.60	5.0	"	20.0		88	70-130			
Hexachlorobenzene	17.9	0.74	5.0	"	20.0		90	38-142			
Hexachlorobutadiene	16.7	0.55	2.7	"	20.0		83	68-130			
Hexachloroethane	16.9	0.49	4.0	"	20.0		84	55-130			
Indeno (1,2,3-cd) pyrene	23.5	1.3	10	"	20.0		117	13-151			
Isophorone	7.51	0.52	6.0	"	20.0		38	52-180			QM-1
Naphthalene	17.1	0.52	4.0	"	20.0		85	70-130			
Nitrobenzene (NB)	17.8	0.42	5.0	"	20.0		89	54-158			
N-Nitrosodi-n-propylamine	18.0	0.51	10	"	20.0		90	59-170			
Phenanthrene	17.6	0.52	10	"	20.0		88	67-130			
Pyrene	17.2	0.61	5.0	"	20.0		86	70-130			
1,2,4-Trichlorobenzene	18.1	0.55	5.0	"	20.0		90	61-130			
4-Chloro-3-methylphenol	16.8	0.45	9.0	"	20.0		84	68-130			
2-Chlorophenol	16.4	0.46	9.0	"	20.0		82	55-130			
2,4-Dichlorophenol	18.3	0.50	8.0	"	20.0		92	64-130			
2,4-Dimethylphenol	17.6	0.56	8.0	"	20.0		88	58-130			
4,6-Dinitro-2-methylphenol	18.6	0.79	25	"	20.0		93	56-130			J
2,4-Dinitrophenol	20.9	0.47	25	"	20.0		105	39-173			J
2-Nitrophenol	18.4	0.48	10	"	20.0		92	61-163			
4-Nitrophenol	14.9	0.73	7.0	"	20.0		75	35-130			
Pentachlorophenol	16.5	0.77	10	"	20.0		82	42-152			
Phenol	16.1	0.41	4.0	"	20.0		81	48-130			
2,4,6-Trichlorophenol	16.9	0.60	8.0	"	20.0		85	69-130			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Surrogate: 2-Fluorophenol	*30.1*			*µg/L*	*50.0*		*60*	*21-110*			
Surrogate: Phenol-d6	*32.7*			*"*	*50.0*		*65*	*10-110*			
Surrogate: Nitrobenzene-d5	*61.3*			*"*	*50.0*		*123*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*55.6*			*"*	*50.0*		*111*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*33.2*			*"*	*50.0*		*66*	*10-123*			
Surrogate: Terphenyl-dl4	*53.4*			*"*	*50.0*		*107*	*33-141*			
LCS Dup (2400296-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	18.0	0.51	5.0	µg/L	20.0		90	70-130	6	30	
Acenaphthylene	19.0	0.62	10	"	20.0		95	60-130	6	30	
Anthracene	17.3	0.50	5.0	"	20.0		87	58-130	7	30	
Benzo (a) anthracene	19.8	0.81	10	"	20.0		99	42-133	8	30	
Benzo (b) fluoranthene	21.6	1.4	10	"	20.0		108	42-140	0.3	30	
Benzo (k) fluoranthene	20.0	0.96	7.0	"	20.0		100	25-146	1	30	
Benzo (g,h,i) perylene	24.3	1.1	10	"	20.0		121	13-195	5	30	
Benzo (a) pyrene	18.5	1.2	7.0	"	20.0		93	32-148	0.05	30	
Bis(2-chloroethoxy)methane	18.6	0.51	10	"	20.0		93	52-164	6	30	
Bis(2-chloroisopropyl)ether	17.9	0.52	10	"	20.0		90	63-139	6	30	
Bis(2-ethylhexyl)phthalate	17.2	0.58	7.0	"	20.0		86	43-137	2	30	
4-Bromophenyl phenyl ether	18.9	0.62	5.0	"	20.0		94	70-130	6	30	
Butyl benzyl phthalate	19.4	0.69	7.0	"	20.0		97	43-140	10	30	
2-Chloronaphthalene	19.1	0.52	5.0	"	20.0		96	70-130	5	30	
4-Chlorophenyl phenyl ether	18.7	0.58	10	"	20.0		94	57-145	7	30	
Chrysene	18.2	0.60	7.0	"	20.0		91	44-140	0.4	30	
Dibenz (a,h) anthracene	24.1	1.4	7.0	"	20.0		120	13-200	6	30	
Di-n-butyl phthalate	19.2	0.61	7.0	"	20.0		96	52-130	9	30	
3,3´-Dichlorobenzidine	13.6	0.89	20	"	20.0		68	47-130	1	30	J
Diethyl phthalate	18.5	0.59	5.0	"	20.0		93	47-130	6	30	
Dimethyl phthalate	19.8	0.61	4.0	"	20.0		99	50-130	7	30	
2,4-Dinitrotoluene (2,4-DNT)	19.6	0.50	10	"	20.0		98	53-130	8	30	
2,6-Dinitrotoluene (2,6-DNT)	19.6	0.56	5.0	"	20.0		98	68-137	5	30	
Di-n-octyl phthalate	19.0	0.98	7.0	"	20.0		95	21-132	2	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS Dup (2400296-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Fluoranthene	19.5	0.61	6.0	µg/L	20.0		98	47-130	9	30	
Fluorene	18.8	0.60	5.0	"	20.0		94	70-130	7	30	
Hexachlorobenzene	18.9	0.74	5.0	"	20.0		94	38-142	5	30	
Hexachlorobutadiene	17.8	0.55	2.7	"	20.0		89	68-130	7	30	
Hexachloroethane	17.8	0.49	4.0	"	20.0		89	55-130	5	30	
Indeno (1,2,3-cd) pyrene	25.0	1.3	10	"	20.0		125	13-151	6	30	
Isophorone	7.88	0.52	6.0	"	20.0		39	52-180	5	30	QM-1
Naphthalene	18.2	0.52	4.0	"	20.0		91	70-130	6	30	
Nitrobenzene (NB)	18.8	0.42	5.0	"	20.0		94	54-158	6	30	
N-Nitrosodi-n-propylamine	19.0	0.51	10	"	20.0		95	59-170	6	30	
Phenanthrene	18.9	0.52	10	"	20.0		94	67-130	7	30	
Pyrene	19.1	0.61	5.0	"	20.0		96	70-130	10	30	
1,2,4-Trichlorobenzene	19.3	0.55	5.0	"	20.0		96	61-130	6	30	
4-Chloro-3-methylphenol	14.4	0.45	9.0	"	20.0		72	68-130	16	30	
2-Chlorophenol	16.7	0.46	9.0	"	20.0		84	55-130	2	30	
2,4-Dichlorophenol	15.8	0.50	8.0	"	20.0		79	64-130	15	30	
2,4-Dimethylphenol	17.7	0.56	8.0	"	20.0		89	58-130	0.8	30	
4,6-Dinitro-2-methylphenol	18.4	0.79	25	"	20.0		92	56-130	1	30	J
2,4-Dinitrophenol	20.2	0.47	25	"	20.0		101	39-173	3	30	J
2-Nitrophenol	19.3	0.48	10	"	20.0		96	61-163	5	30	
4-Nitrophenol	12.7	0.73	7.0	"	20.0		64	35-130	16	30	
Pentachlorophenol	13.6	0.77	10	"	20.0		68	42-152	19	30	
Phenol	16.8	0.41	4.0	"	20.0		84	48-130	4	30	
2,4,6-Trichlorophenol	16.4	0.60	8.0	"	20.0		82	69-130	3	30	
Surrogate: 2-Fluorophenol	*28.9*			"	*50.0*		*58*	*21-110*			
Surrogate: Phenol-d6	*31.0*			"	*50.0*		*62*	*10-110*			
Surrogate: Nitrobenzene-d5	*59.5*			"	*50.0*		*119*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*55.3*			"	*50.0*		*111*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*27.8*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*53.7*			"	*50.0*		*107*	*33-141*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike (2400296-MS1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Acenaphthene	716	20	200	µg/L	800	ND	90	47-145			
Acenaphthylene	727	25	400	"	800	ND	91	33-145			
Anthracene	652	20	200	"	800	ND	82	27-133			
Benzo (a) anthracene	516	32	400	"	800	ND	65	33-143			
Benzo (b) fluoranthene	1230	56	400	"	800	ND	154	24-159			
Benzo (k) fluoranthene	999	38	280	"	800	ND	125	11-162			
Benzo (g,h,i) perylene	851	44	400	"	800	ND	106	1-219			
Benzo (a) pyrene	906	48	280	"	800	ND	113	17-163			
Bis(2-chloroethoxy)methane	749	20	400	"	800	ND	94	33-184			
Bis(2-chloroisopropyl)ether	695	21	400	"	800	ND	87	36-166			
Bis(2-ethylhexyl)phthalate	1600	23	280	"	800	ND	200	8-158			QM-5
4-Bromophenyl phenyl ether	718	25	200	"	800	ND	90	53-127			
Butyl benzyl phthalate	491	28	280	"	800	ND	61	1-152			
2-Chloronaphthalene	758	21	200	"	800	ND	95	60-120			
4-Chlorophenyl phenyl ether	744	23	400	"	800	ND	93	25-158			
Chrysene	1180	24	280	"	800	ND	147	17-168			
Dibenz (a,h) anthracene	819	56	280	"	800	ND	102	1-227			
Di-n-butyl phthalate	714	24	280	"	800	ND	89	1-120			
3,3´-Dichlorobenzidine	ND	36	800	"	800	ND		1-262			QM-5
Diethyl phthalate	344	24	200	"	800	ND	43	1-120			
Dimethyl phthalate	58.4	24	160	"	800	ND	7	1-120			J
2,4-Dinitrotoluene (2,4-DNT)	744	20	400	"	800	ND	93	39-139			
2,6-Dinitrotoluene (2,6-DNT)	777	22	200	"	800	ND	97	50-158			
Di-n-octyl phthalate	923	39	280	"	800	ND	115	4-146			
Fluoranthene	646	24	240	"	800	ND	81	26-137			
Fluorene	741	24	200	"	800	ND	93	59-121			
Hexachlorobenzene	720	30	200	"	800	ND	90	1-152			
Hexachlorobutadiene	642	22	110	"	800	ND	80	24-120			
Hexachloroethane	308	20	160	"	800	ND	39	40-120			QM-5
Indeno (1,2,3-cd) pyrene	853	52	400	"	800	ND	107	1-171			
Isophorone	326	21	240	"	800	ND	41	21-196			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike (2400296-MS1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Naphthalene	677	21	160	µg/L	800	ND	85	21-133			
Nitrobenzene (NB)	752	17	200	"	800	ND	94	35-180			
N-Nitrosodi-n-propylamine	812	20	400	"	800	ND	102	1-230			
Phenanthrene	735	21	400	"	800	ND	92	54-120			
Pyrene	438	24	200	"	800	ND	55	52-120			
1,2,4-Trichlorobenzene	736	22	200	"	800	ND	92	44-142			
4-Chloro-3-methylphenol	735	18	360	"	800	ND	92	22-147			
2-Chlorophenol	593	18	360	"	800	ND	74	23-134			
2,4-Dichlorophenol	757	20	320	"	800	ND	95	39-135			
2,4-Dimethylphenol	654	22	320	"	800	ND	82	32-120			
4,6-Dinitro-2-methylphenol	361	32	1000	"	800	ND	45	1-181			J
2,4-Dinitrophenol	208	19	1000	"	800	ND	26	1-191			J
2-Nitrophenol	693	19	400	"	800	ND	87	29-182			
4-Nitrophenol	228	29	280	"	800	ND	29	1-132			J
Pentachlorophenol	276	31	400	"	800	ND	34	14-176			J
Phenol	638	16	160	"	800	ND	80	5-120			
2,4,6-Trichlorophenol	680	24	320	"	800	ND	85	37-144			
Surrogate: 2-Fluorophenol	*827*			"	*2000*		*41*	*21-110*			
Surrogate: Phenol-d6	*696*			"	*2000*		*35*	*10-110*			
Surrogate: Nitrobenzene-d5	*2620*			"	*2000*		*131*	*35-114*			*QS-4*
Surrogate: 2-Fluorobiphenyl	*2490*			"	*2000*		*125*	*43-116*			*QS-4*
Surrogate: 2,4,6-Tribromophenol	*1200*			"	*2000*		*60*	*10-123*			
Surrogate: Terphenyl-dl4	*1970*			"	*2000*		*99*	*33-141*			
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Acenaphthene	673	20	200	µg/L	800	ND	84	47-145	6	48	
Acenaphthylene	676	25	400	"	800	ND	85	33-145	7	74	
Anthracene	622	20	200	"	800	ND	78	27-133	5	66	
Benzo (a) anthracene	387	32	400	"	800	ND	48	33-143	29	53	J
Benzo (b) fluoranthene	772	56	400	"	800	ND	97	24-159	46	71	
Benzo (k) fluoranthene	670	38	280	"	800	ND	84	11-162	39	63	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Benzo (g,h,i) perylene	814	44	400	µg/L	800	ND	102	1-219	4	97	
Benzo (a) pyrene	605	48	280	"	800	ND	76	17-163	40	72	
Bis(2-chloroethoxy)methane	731	20	400	"	800	ND	91	33-184	2	54	
Bis(2-chloroisopropyl)ether	671	21	400	"	800	ND	84	36-166	3	76	
Bis(2-ethylhexyl)phthalate	1200	23	280	"	800	ND	150	8-158	28	82	
4-Bromophenyl phenyl ether	663	25	200	"	800	ND	83	53-127	8	43	
Butyl benzyl phthalate	406	28	280	"	800	ND	51	1-152	19	60	
2-Chloronaphthalene	711	21	200	"	800	ND	89	60-120	6	24	
4-Chlorophenyl phenyl ether	686	23	400	"	800	ND	86	25-158	8	61	
Chrysene	925	24	280	"	800	ND	116	17-168	24	87	
Dibenz (a,h) anthracene	782	56	280	"	800	ND	98	1-227	5	126	
Di-n-butyl phthalate	672	24	280	"	800	ND	84	1-120	6	47	
3,3´-Dichlorobenzidine	ND	36	800	"	800	ND		1-262		108	QM-5
Diethyl phthalate	331	24	200	"	800	ND	41	1-120	4	100	
Dimethyl phthalate	53.2	24	160	"	800	ND	7	1-120	9	183	J
2,4-Dinitrotoluene (2,4-DNT)	681	20	400	"	800	ND	85	39-139	9	42	
2,6-Dinitrotoluene (2,6-DNT)	735	22	200	"	800	ND	92	50-158	6	48	
Di-n-octyl phthalate	681	39	280	"	800	ND	85	4-146	30	69	
Fluoranthene	587	24	240	"	800	ND	73	26-137	9	66	
Fluorene	690	24	200	"	800	ND	86	59-121	7	38	
Hexachlorobenzene	664	30	200	"	800	ND	83	1-152	8	55	
Hexachlorobutadiene	610	22	110	"	800	ND	76	24-120	5	62	
Hexachloroethane	275	20	160	"	800	ND	34	40-120	11	52	QM-5
Indeno (1,2,3-cd) pyrene	823	52	400	"	800	ND	103	1-171	4	99	
Isophorone	312	21	240	"	800	ND	39	21-196	4	93	
Naphthalene	646	21	160	"	800	ND	81	21-133	5	65	
Nitrobenzene (NB)	742	17	200	"	800	ND	93	35-180	1	62	
N-Nitrosodi-n-propylamine	787	20	400	"	800	ND	98	1-230	3	87	
Phenanthrene	686	21	400	"	800	ND	86	54-120	7	39	
Pyrene	387	24	200	"	800	ND	48	52-120	12	49	QM-5
1,2,4-Trichlorobenzene	710	22	200	"	800	ND	89	44-142	4	50	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
4-Chloro-3-methylphenol	724	18	360	µg/L	800	ND	90	22-147	2	73	
2-Chlorophenol	552	18	360	"	800	ND	69	23-134	7	61	
2,4-Dichlorophenol	692	20	320	"	800	ND	87	39-135	9	50	
2,4-Dimethylphenol	629	22	320	"	800	ND	79	32-120	4	58	
4,6-Dinitro-2-methylphenol	275	32	1000	"	800	ND	34	1-181	27	203	J
2,4-Dinitrophenol	176	19	1000	"	800	ND	22	1-191	17	132	J
2-Nitrophenol	616	19	400	"	800	ND	77	29-182	12	55	
4-Nitrophenol	181	29	280	"	800	ND	23	1-132	23	131	J
Pentachlorophenol	207	31	400	"	800	ND	26	14-176	28	86	J
Phenol	612	16	160	"	800	ND	76	5-120	4	64	
2,4,6-Trichlorophenol	538	24	320	"	800	ND	67	37-144	23	58	
Surrogate: 2-Fluorophenol	*597*			"	*2000*		*30*	*21-110*			
Surrogate: Phenol-d6	*582*			"	*2000*		*29*	*10-110*			
Surrogate: Nitrobenzene-d5	*2360*			"	*2000*		*118*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*2150*			"	*2000*		*108*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*829*			"	*2000*		*41*	*10-123*			
Surrogate: Terphenyl-dl4	*1640*			"	*2000*		*82*	*33-141*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400274 - General											
Blank (2400274-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2400274-BS1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	211	2.0	3.0	mg/L	167		126	83-138			
LCS Dup (2400274-BSD1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	210	2.0	3.0	mg/L	167		126	83-138	0.2	21	
Batch 2400275 - Solvent Extract											
Blank (2400275-BLK1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2400275-BS1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	37.9	0.66	1.0	mg/L	40.0		95	78-114			
LCS Dup (2400275-BSD1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	38.2	0.66	1.0	mg/L	40.0		96	78-114	0.8	18	
Batch 2400285 - General Preparation											
Blank (2400285-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2400285-BS1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.337	0.023	0.050	mg/L	0.300		112	80-120			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400285 - General Preparation											
LCS Dup (2400285-BSD1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.318	0.023	0.050	mg/L	0.300		106	80-120	6	25	
Matrix Spike (2400285-MS1)			**Source: 24A0385-01**		Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.877	0.023	0.050	mg/L	0.300	0.570	102	75-125			
Matrix Spike Dup (2400285-MSD1)			**Source: 24A0385-01**		Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.908	0.023	0.050	mg/L	0.300	0.570	113	75-125	3	30	
Batch 2400369 - General Prep											
Blank (2400369-BLK1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2400369-BS1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	9.92	0.29	1.0	µg/L	10.0		99	80-120			
LCS Dup (2400369-BSD1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	9.96	0.29	1.0	µg/L	10.0		100	80-120	0.3	20	
Matrix Spike (2400369-MS1)			**Source: 24A0538-01**		Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	ND	102	80-120			
Matrix Spike Dup (2400369-MSD1)			**Source: 24A0538-01**		Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	ND	102	80-120	0.3	20	
Batch 2400373 - General Preparation											
Blank (2400373-BLK1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	ND	2.5	2.5	mg/L							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400373 - General Preparation											
LCS (2400373-BS1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	94.2	2.5	2.5	mg/L	100		94	80-120			
LCS Dup (2400373-BSD1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	93.6	2.5	2.5	mg/L	100		94	80-120	0.6	200	
Duplicate (2400373-DUP1)			**Source: 24A0496-01**		Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	76.7	21	21	mg/L		75.0			2	20	
Batch 2400378 - General Preparation											
Blank (2400378-BLK1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	ND	0.54	1.0	mg/L							
LCS (2400378-BS1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.57	0.54	1.0	mg/L	10.0		96	75-125			
LCS Dup (2400378-BSD1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.55	0.54	1.0	mg/L	10.0		95	75-125	0.2	25	
Matrix Spike (2400378-MS1)			**Source: 24A0533-01**		Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.93	0.54	1.0	mg/L	10.0	1.39	85	75-125			
Matrix Spike Dup (2400378-MSD1)			**Source: 24A0533-01**		Prepared & Analyzed: 01/15/24						
Total Organic Carbon	10.4	0.54	1.0	mg/L	10.0	1.39	90	75-125	5	25	
Batch 2400399 - General Preparation											
Blank (2400399-BLK1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	ND	0.025	0.10	mg/L							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400399 - General Preparation											
LCS (2400399-BS1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	0.545	0.025	0.10	mg/L	0.500		109	80-120			
LCS Dup (2400399-BSD1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	0.518	0.025	0.10	mg/L	0.500		104	80-120	5	25	
Matrix Spike (2400399-MS1)			**Source: 24A0423-04**		Prepared & Analyzed: 01/15/24						
Ammonia as N	0.712	0.025	0.10	mg/L	0.500	0.177	107	75-125			
Matrix Spike Dup (2400399-MSD1)			**Source: 24A0423-04**		Prepared & Analyzed: 01/15/24						
Ammonia as N	0.695	0.025	0.10	mg/L	0.500	0.177	104	75-125	2	25	
Batch 2400407 - General Preparation											
Blank (2400407-BLK1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2400407-BS1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	51.4	6.6	7.0	mg/L	50.0		103	80-120			
LCS Dup (2400407-BSD1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	47.1	6.6	7.0	mg/L	50.0		94	80-120	9	25	
Matrix Spike (2400407-MS1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	94.3	6.6	7.0	mg/L	50.0	32.1	125	75-125			
Matrix Spike Dup (2400407-MSD1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	92.2	6.6	7.0	mg/L	50.0	32.1	120	75-125	2	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400411 - General Preparation											
Blank (2400411-BLK1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.0507	0.0024	0.10	mg/L							J
LCS (2400411-BS1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.287	0.0024	0.10	mg/L	0.250		115	80-120			
LCS Dup (2400411-BSD1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.272	0.0024	0.10	mg/L	0.250		109	80-120	5	20	
Matrix Spike (2400411-MS1)			**Source: 24A0444-04**		Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.390	0.0024	0.10	mg/L	0.250	ND	156	75-125			QM-7
Matrix Spike Dup (2400411-MSD1)			**Source: 24A0444-04**		Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.383	0.0024	0.10	mg/L	0.250	ND	153	75-125	2	25	QM-7

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400428 - EPA 3510B GCNV											
Blank (2400428-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0308*			*"*	*0.0250*		*123*	*65-135*			
LCS (2400428-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	3.30	0.0021	0.050	mg/L	2.50		132	65-135			
Surrogate: o-Terphenyl	*0.0307*			*"*	*0.0250*		*123*	*65-135*			
LCS Dup (2400428-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	3.11	0.0021	0.050	mg/L	2.50		124	65-135	6	30	
Surrogate: o-Terphenyl	*0.0278*			*"*	*0.0250*		*111*	*65-135*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400280 - EPA 200 Series											
Blank (2400280-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Chromium	0.000143	0.00014	0.0010	mg/L							
Aluminum	ND	0.0016	0.050	"							
Copper	ND	0.000090	0.010	"							
Lead	ND	0.000020	0.0050	"							
Zinc	ND	0.00027	0.020	"							
LCS (2400280-BS1)					Prepared & Analyzed: 01/11/24						
Chromium	0.101	0.00014	0.0010	mg/L	0.100		101	85-115			
Aluminum	0.522	0.0016	0.050	"	0.500		104	85-115			
Copper	0.0996	0.000090	0.010	"	0.100		100	85-115			
Lead	0.100	0.000020	0.0050	"	0.100		100	85-115			
Zinc	0.0963	0.00027	0.020	"	0.100		96	85-115			
Matrix Spike (2400280-MS1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/11/24						
Chromium	0.101	0.00014	0.0010	mg/L	0.100	0.00354	98	70-130			
Aluminum	0.768	0.0016	0.050	"	0.500	0.189	116	70-130			
Copper	0.107	0.000090	0.010	"	0.100	0.00665	100	70-130			
Lead	0.104	0.000020	0.0050	"	0.100	0.00126	103	70-130			
Zinc	0.184	0.00027	0.020	"	0.100	0.0828	101	70-130			
Matrix Spike (2400280-MS2)			**Source: 24A0559-05**		Prepared & Analyzed: 01/11/24						
Chromium	0.0994	0.00014	0.0010	mg/L	0.100	0.00197	97	70-130			
Aluminum	0.521	0.0016	0.050	"	0.500	ND	104	70-130			
Copper	0.0982	0.000090	0.010	"	0.100	ND	98	70-130			
Lead	0.0991	0.000020	0.0050	"	0.100	ND	99	70-130			
Zinc	0.0960	0.00027	0.020	"	0.100	ND	96	70-130			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400294 - EPA 7470A											
Blank (2400294-BLK1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	ND	0.15	0.20	µg/L							
LCS (2400294-BS1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.46	0.15	0.20	µg/L	5.00		89	85-115			
Matrix Spike (2400294-MS1)			**Source: 24A0308-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.33	0.15	0.20	µg/L	5.00	ND	87	70-130			
Matrix Spike (2400294-MS2)			**Source: 24A0526-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.68	0.15	0.20	µg/L	5.00	ND	94	70-130			
Matrix Spike Dup (2400294-MSD1)			**Source: 24A0308-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.50	0.15	0.20	µg/L	5.00	ND	90	70-130	4	25	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400333 - EPA 3510B GCNV											
Blank (2400333-BLK1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.257*			"	*0.250*		*103*	*50-150*			
LCS (2400333-BS1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1260	2.58	0.052	0.50	µg/L	2.50		103	31-138			
Surrogate: Decachlorobiphenyl	*0.260*			"	*0.250*		*104*	*50-150*			
LCS Dup (2400333-BSD1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1260	2.34	0.052	0.50	µg/L	2.50		94	31-138	10	30	
Surrogate: Decachlorobiphenyl	*0.241*			"	*0.250*		*97*	*50-150*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Blank (2400401-BLK1)					Prepared & Analyzed: 01/13/24						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Blank (2400401-BLK1)					Prepared & Analyzed: 01/13/24						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Methyl tert-butyl ether*	ND	0.069	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*9.61*			"	*10.0*		*96*	*65-135*			
Surrogate: Toluene-d8	*8.36*			"	*10.0*		*84*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*11.3*			"	*10.0*		*113*	*73-125*			
LCS (2400401-BS1)					Prepared & Analyzed: 01/13/24						
Benzene	21.6	0.096	0.30	µg/L	20.0		108	65-135			
Bromodichloromethane	17.6	0.058	0.50	"	20.0		88	65-135			
Bromoform	17.5	0.072	0.50	"	20.0		87	70-130			
Bromomethane	18.3	0.19	0.50	"	20.0		91	15-185			
Carbon tetrachloride	17.2	0.10	0.50	"	20.0		86	70-130			
Chlorobenzene	22.0	0.088	0.30	"	20.0		110	63-135			
Chloroethane	22.0	0.18	0.50	"	20.0		110	40-160			
Chloroform	18.6	0.079	0.50	"	20.0		93	70-135			
Chloromethane	19.3	0.19	0.50	"	20.0		96	1-472			
Dibromochloromethane	17.0	0.052	0.50	"	20.0		85	70-135			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0		96	65-135			
1,3-Dichlorobenzene	20.1	0.077	0.30	"	20.0		101	70-130			
1,4-Dichlorobenzene	19.2	0.26	0.30	"	20.0		96	65-135			
1,1-Dichloroethane	17.2	0.080	0.50	"	20.0		86	70-130			
1,2-Dichloroethane	16.6	0.060	0.50	"	20.0		83	50-150			
1,1-Dichloroethene	18.5	0.12	0.50	"	20.0		92	70-130			
trans-1,2-Dichloroethene	17.8	0.11	0.50	"	20.0		89	35-165			
1,2-Dichloropropane	22.8	0.066	0.50	"	20.0		114	5-210			
cis-1,3-Dichloropropene	16.6	0.058	0.50	"	20.0		83	25-175			
trans-1,3-Dichloropropene	14.5	0.12	0.50	"	20.0		73	50-150			
Ethylbenzene	21.2	0.098	0.30	"	20.0		106	60-140			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
LCS (2400401-BS1)					Prepared & Analyzed: 01/13/24						
Methylene chloride	21.8	0.076	0.50	µg/L	20.0		109	60-140			
1,1,2,2-Tetrachloroethane	16.2	0.049	0.50	"	20.0		81	60-140			
Tetrachloroethene	17.9	0.11	0.50	"	20.0		89	70-130			
Toluene	18.9	0.070	0.30	"	20.0		95	70-130			
1,1,1-Trichloroethane	16.2	0.060	0.50	"	20.0		81	70-130			
1,1,2-Trichloroethane	19.6	0.068	0.50	"	20.0		98	70-130			
Trichloroethene	16.6	0.082	0.50	"	20.0		83	65-135			
Trichlorofluoromethane	21.9	0.13	0.50	"	20.0		109	50-150			
Vinyl chloride	22.6	0.12	0.50	"	20.0		113	5-195			
Surrogate: 1,2-Dichloroethane-d4	*8.88*			*"*	*10.0*		*89*	*65-135*			
Surrogate: Toluene-d8	*10.9*			*"*	*10.0*		*109*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.97*			*"*	*10.0*		*90*	*73-125*			
LCS Dup (2400401-BSD1)					Prepared & Analyzed: 01/13/24						
Benzene	21.0	0.096	0.30	µg/L	20.0		105	65-135	2	30	
Bromodichloromethane	18.4	0.058	0.50	"	20.0		92	65-135	5	30	
Bromoform	17.0	0.072	0.50	"	20.0		85	70-130	3	30	
Bromomethane	20.0	0.19	0.50	"	20.0		100	15-185	9	30	
Carbon tetrachloride	16.6	0.10	0.50	"	20.0		83	70-130	3	30	
Chlorobenzene	21.9	0.088	0.30	"	20.0		110	63-135	0.5	30	
Chloroethane	22.0	0.18	0.50	"	20.0		110	40-160	0	30	
Chloroform	18.7	0.079	0.50	"	20.0		93	70-135	0.3	30	
Chloromethane	19.1	0.19	0.50	"	20.0		95	1-472	0.9	30	
Dibromochloromethane	17.8	0.052	0.50	"	20.0		89	70-135	4	30	
1,2-Dichlorobenzene	19.5	0.059	0.30	"	20.0		98	65-135	2	30	
1,3-Dichlorobenzene	19.8	0.077	0.30	"	20.0		99	70-130	1	30	
1,4-Dichlorobenzene	19.2	0.26	0.30	"	20.0		96	65-135	0.3	30	
1,1-Dichloroethane	20.1	0.080	0.50	"	20.0		100	70-130	16	30	
1,2-Dichloroethane	17.5	0.060	0.50	"	20.0		87	50-150	5	30	
1,1-Dichloroethene	17.8	0.12	0.50	"	20.0		89	70-130	3	30	
trans-1,2-Dichloroethene	17.7	0.11	0.50	"	20.0		88	35-165	0.6	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
LCS Dup (2400401-BSD1)					Prepared & Analyzed: 01/13/24						
1,2-Dichloropropane	22.4	0.066	0.50	µg/L	20.0		112	5-210	2	30	
cis-1,3-Dichloropropene	16.4	0.058	0.50	"	20.0		82	25-175	1	30	
trans-1,3-Dichloropropene	14.9	0.12	0.50	"	20.0		74	50-150	2	30	
Ethylbenzene	23.2	0.098	0.30	"	20.0		116	60-140	9	30	
Methylene chloride	21.3	0.076	0.50	"	20.0		107	60-140	2	30	
1,1,2,2-Tetrachloroethane	16.0	0.049	0.50	"	20.0		80	60-140	1	30	
Tetrachloroethene	18.0	0.11	0.50	"	20.0		90	70-130	0.6	30	
Toluene	19.2	0.070	0.30	"	20.0		96	70-130	1	30	
1,1,1-Trichloroethane	15.7	0.060	0.50	"	20.0		79	70-130	3	30	
1,1,2-Trichloroethane	20.7	0.068	0.50	"	20.0		104	70-130	5	30	
Trichloroethene	16.6	0.082	0.50	"	20.0		83	65-135	0.2	30	
Trichlorofluoromethane	16.1	0.13	0.50	"	20.0		81	50-150	30	30	
Vinyl chloride	20.3	0.12	0.50	"	20.0		102	5-195	11	30	
Surrogate: 1,2-Dichloroethane-d4	*9.24*			*"*	*10.0*		*92*	*65-135*			
Surrogate: Toluene-d8	*11.5*			*"*	*10.0*		*115*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.71*			*"*	*10.0*		*87*	*73-125*			
Matrix Spike (2400401-MS1)				**Source: 24A0540-01**	Prepared: 01/13/24	Analyzed: 01/15/24					
Benzene	18.6	0.096	0.30	µg/L	20.0	ND	93	37-151			
Bromodichloromethane	17.1	0.058	0.50	"	20.0	ND	85	35-155			
Bromoform	16.2	0.072	0.50	"	20.0	ND	81	45-169			
Bromomethane	15.6	0.19	0.50	"	20.0	ND	78	1-242			
Carbon tetrachloride	15.4	0.10	0.50	"	20.0	ND	77	70-140			
Chlorobenzene	25.1	0.088	0.30	"	20.0	ND	125	37-163			
Chloroethane	19.1	0.18	0.50	"	20.0	ND	95	14-230			
Chloroform	18.2	0.079	0.50	"	20.0	ND	91	51-138			
Chloromethane	18.6	0.19	0.50	"	20.0	ND	93	1-273			
Dibromochloromethane	17.2	0.052	0.50	"	20.0	ND	86	53-149			
1,2-Dichlorobenzene	16.3	0.059	0.30	"	20.0	ND	82	18-190			
1,3-Dichlorobenzene	16.5	0.077	0.30	"	20.0	ND	83	59-156			
1,4-Dichlorobenzene	16.0	0.26	0.30	"	20.0	ND	80	18-190			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Matrix Spike (2400401-MS1)			**Source: 24A0540-01**		Prepared: 01/13/24	Analyzed: 01/15/24					
1,1-Dichloroethane	21.5	0.080	0.50	µg/L	20.0	ND	108	59-155			
1,2-Dichloroethane	17.7	0.060	0.50	"	20.0	ND	89	49-155			
1,1-Dichloroethene	16.7	0.12	0.50	"	20.0	ND	83	1-234			
trans-1,2-Dichloroethene	18.5	0.11	0.50	"	20.0	ND	92	54-156			
1,2-Dichloropropane	21.2	0.066	0.50	"	20.0	ND	106	1-210			
cis-1,3-Dichloropropene	14.0	0.058	0.50	"	20.0	ND	70	1-227			
trans-1,3-Dichloropropene	13.1	0.12	0.50	"	20.0	ND	66	17-183			
Ethylbenzene	20.5	0.098	0.30	"	20.0	ND	103	37-162			
Methylene chloride	19.5	0.076	0.50	"	20.0	ND	98	1-221			
1,1,2,2-Tetrachloroethane	17.9	0.049	0.50	"	20.0	ND	90	46-148			
Tetrachloroethene	16.4	0.11	0.50	"	20.0	ND	82	64-148			
Toluene	18.8	0.070	0.30	"	20.0	ND	94	47-150			
1,1,1-Trichloroethane	16.5	0.060	0.50	"	20.0	ND	83	52-162			
1,1,2-Trichloroethane	19.2	0.068	0.50	"	20.0	ND	96	52-150			
Trichloroethene	15.4	0.082	0.50	"	20.0	ND	77	71-157			
Trichlorofluoromethane	15.2	0.13	0.50	"	20.0	ND	76	17-181			
Vinyl chloride	19.7	0.12	0.50	"	20.0	ND	99	10-251			
Surrogate: 1,2-Dichloroethane-d4	*10.4*			*"*	*10.0*		*104*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.93*			*"*	*10.0*		*99*	*73-125*			
Matrix Spike Dup (2400401-MSD1)			**Source: 24A0540-01**		Prepared: 01/13/24	Analyzed: 01/15/24					
Benzene	18.5	0.096	0.30	µg/L	20.0	ND	92	37-151	1	61	
Bromodichloromethane	17.1	0.058	0.50	"	20.0	ND	86	35-155	0.1	56	
Bromoform	16.2	0.072	0.50	"	20.0	ND	81	45-169	0.4	42	
Bromomethane	18.0	0.19	0.50	"	20.0	ND	90	1-242	14	61	
Carbon tetrachloride	15.2	0.10	0.50	"	20.0	ND	76	70-140	2	41	
Chlorobenzene	23.4	0.088	0.30	"	20.0	ND	117	37-163	7	53	
Chloroethane	20.0	0.18	0.50	"	20.0	ND	100	14-230	5	78	
Chloroform	17.8	0.079	0.50	"	20.0	ND	89	51-138	2	54	
Chloromethane	20.6	0.19	0.50	"	20.0	ND	103	1-273	10	60	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Matrix Spike Dup (2400401-MSD1)			**Source: 24A0540-01**	Prepared: 01/13/24 Analyzed: 01/15/24							
Dibromochloromethane	16.6	0.052	0.50	µg/L	20.0	ND	83	53-149	4	50	
1,2-Dichlorobenzene	15.9	0.059	0.30	"	20.0	ND	80	18-190	3	57	
1,3-Dichlorobenzene	15.8	0.077	0.30	"	20.0	ND	79	59-156	5	43	
1,4-Dichlorobenzene	15.2	0.26	0.30	"	20.0	ND	76	18-190	5	57	
1,1-Dichloroethane	21.9	0.080	0.50	"	20.0	ND	109	59-155	2	40	
1,2-Dichloroethane	17.3	0.060	0.50	"	20.0	ND	87	49-155	3	49	
1,1-Dichloroethene	16.8	0.12	0.50	"	20.0	ND	84	1-234	0.5	32	
trans-1,2-Dichloroethene	22.3	0.11	0.50	"	20.0	ND	111	54-156	19	45	
1,2-Dichloropropane	20.7	0.066	0.50	"	20.0	ND	104	1-210	2	55	
cis-1,3-Dichloropropene	13.8	0.058	0.50	"	20.0	ND	69	1-227	1	58	
trans-1,3-Dichloropropene	13.1	0.12	0.50	"	20.0	ND	66	17-183	0.08	86	
Ethylbenzene	18.4	0.098	0.30	"	20.0	ND	92	37-162	11	63	
Methylene chloride	35.0	0.076	0.50	"	20.0	ND	175	1-221	57	28	QM-7
1,1,2,2-Tetrachloroethane	18.5	0.049	0.50	"	20.0	ND	93	46-148	3	61	
Tetrachloroethene	15.7	0.11	0.50	"	20.0	ND	79	64-148	4	39	
Toluene	17.0	0.070	0.30	"	20.0	ND	85	47-150	10	41	
1,1,1-Trichloroethane	16.1	0.060	0.50	"	20.0	ND	81	52-162	3	36	
1,1,2-Trichloroethane	19.1	0.068	0.50	"	20.0	ND	95	52-150	0.7	46	
Trichloroethene	14.9	0.082	0.50	"	20.0	ND	75	71-157	3	48	
Trichlorofluoromethane	15.9	0.13	0.50	"	20.0	ND	80	17-181	4	84	
Vinyl chloride	22.3	0.12	0.50	"	20.0	ND	111	10-251	12	66	
Surrogate: 1,2-Dichloroethane-d4	*9.90*			*"*	*10.0*		*99*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.85*			*"*	*10.0*		*99*	*73-125*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400366 - EPA 5030 Water GC											
Blank (2400366-BLK1)					Prepared & Analyzed: 01/15/24						
JP-4	29.9		50	µg/L							
Gasoline	13.7	10	50	"							J
Surrogate: o-Chlorotoluene (Gas)	*16.2*			*"*	*20.0*		*81*	*65-135*			
LCS (2400366-BS1)					Prepared & Analyzed: 01/15/24						
Gasoline	545	10	50	µg/L	500		109	70-130			
Surrogate: o-Chlorotoluene (Gas)	*16.5*			*"*	*20.0*		*83*	*65-135*			
LCS Dup (2400366-BSD1)					Prepared & Analyzed: 01/15/24						
Gasoline	526	10	50	µg/L	500		105	70-130	4	30	
Surrogate: o-Chlorotoluene (Gas)	*15.9*			*"*	*20.0*		*80*	*65-135*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24A0540**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QS-BN	Base/Neutral surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two base/neutral surrogates.
QS-4	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QRL-2	Elevated reporting limits due to limited sample volume.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-1	The spike recovery was outside acceptance limits for the LCS or LCSD. The batch was accepted based on acceptable MS/MSD recoveries & RPD's.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

24A0540

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb **ERT/BB&E/NASA Ames** Bldg. T20G/Room 142. M/S T20G-4 Moffett Field, CA 94035-1000 (650) 604-5360 marcia.j.christlieb@nasa.gov	LAB:	CLS **3249 Fitzgerald Rd.** Rancho Cordova, CA 95742 (916)638-7301
PROJECT NAME:	QSE2-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #2		235 E. Main St, Suite 107 Northville, MI 48167

Field Conditions:

	pH	/ Temp (C or F)
SBE	8.19	/ 59.6
191	7.79	/ 60.7
RTJO	7.80	/ 61.0

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	ANALYSIS REQUESTED: 625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
1/9/2024	4:30 PM	SBE.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	4:30 PM	SBE.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	4:30 PM	SBE.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	4:00 PM	191.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	4:00 PM	191.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	3:30 PM	RTJO.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	3:30 PM	RTJO.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	

Please send results to marcia.j.christlieb@nasa.gov Brian.l.kawashima@nasa.gov

Request Limited DQ

SAMPLER:	Brian Kawashima	DATE/TIME:	1/9/2024 1200H	RECEIVED BY:	
RELINQUISHED BY:		DATE/TIME:	1/10/24 1715H	RECEIVED BY:	
RELINQUISHED BY:		DATE/TIME:		RECEIVED BY:	

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

February 16, 2024

CLS Work Order #: 24B0080
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE2-2023 / 2024

Enclosed are the results of analyses for samples received by the laboratory on 02/01/24 16:00. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	**1.2**	0.41	4.0	"	"	"	"	"	"	J
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*40 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*89 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*39 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*96 %*		*35-114*	"	"	"	"	
Surrogate: Phenol-d6			*32 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*41 %*		*33-141*	"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
2-Nitrophenol	ND	0.48	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.81	10	"	"	"	"	"	"	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Dimethyl phthalate	ND	0.61	4.0	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	0.57	10	"	"	"	"	"	"	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	**1.3**	0.41	4.0	"	"	"	"	"	"	J
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	

Surrogate: 2,4,6-Tribromophenol	*31 %*	*10-123*	"	"	"	"
Surrogate: 2-Fluorobiphenyl	*88 %*	*43-116*	"	"	"	"
Surrogate: 2-Fluorophenol	*33 %*	*21-110*	"	"	"	"
Surrogate: Nitrobenzene-d5	*95 %*	*35-114*	"	"	"	"
Surrogate: Phenol-d6	*26 %*	*10-110*	"	"	"	"
Surrogate: Terphenyl-dl4	*55 %*	*33-141*	"	"	"	"

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*44 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*98 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*42 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*107 %*		*35-114*	"	"	"	"	
Surrogate: Phenol-d6			*36 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*64 %*		*33-141*	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.069**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	**11**	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	
Nitrate/Nitrite as N	**0.55**	0.0048	0.20	mg/L	2	2401061	02/08/24	02/08/24	SM4500-NO3 E	
Total Organic Carbon	**3.6**	0.54	1.0	"	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.056**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**8.6**	3.1	3.1	"	"	2400982	02/06/24	02/07/24	SM2540D	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.15**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	**120**	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	**0.52**	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	J
Nitrate/Nitrite as N	**1.8**	0.012	0.50	mg/L	5	2401061	02/08/24	02/08/24	SM4500-NO3 E	
Total Organic Carbon	**15**	0.54	1.0	"	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.060**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**7.4**	3.4	3.4	"	"	2400982	02/06/24	02/07/24	SM2540D	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.029**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	ND	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	**0.32**	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	J
Nitrate/Nitrite as N	**1.9**	0.012	0.50	mg/L	5	2401061	02/08/24	02/08/24	SM4500-NO3 E	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Total Organic Carbon	ND	0.54	1.0	mg/L	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.054**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**6.8**	3.5	3.5	"	"	2400982	02/06/24	02/07/24	SM2540D	

02/16/24 16:36

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water Sampled: 01/31/24 16:00 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*101 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water Sampled: 01/31/24 16:15 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*95 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water Sampled: 01/31/24 16:30 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*116 %*	*65-135*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**	**Received: 02/01/24 16:00**								
Chromium	**0.00036**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.00062**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.00023**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.0050**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**	**Received: 02/01/24 16:00**								
Chromium	**0.0018**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.0086**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.00026**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.014**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**	**Received: 02/01/24 16:00**								
Chromium	**0.0014**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.0017**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.000049**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.0073**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2401029	02/07/24	02/08/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*53 %*	*50-150*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2401029	02/07/24	02/08/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*66 %*	*50-150*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
trans-1,3-Dichloropropene	ND	0.12	0.50	µg/L	1	2400942	"	02/02/24	EPA 624.1	
Trichloroethene	ND	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*96 %*		*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*114 %*		*73-125*		"	"	"	"	
Surrogate: Toluene-d8			*93 %*		*72-125*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Chloromethane	ND	0.19	0.50	µg/L	1	2400942	"	02/02/24	EPA 624.1	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**1.1**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*108 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*110 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*90 %*		*72-125*		"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,3-Dichlorobenzene	ND	0.077	0.30	µg/L	1	2400942	"	02/02/24	EPA 624.1	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**1.5**	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**8.4**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*119 %*		*65-135*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*112 %*		*73-125*	"	"	"	"	
Surrogate: Toluene-d8			*90 %*		*72-125*	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**22**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*86 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**24**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*89 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**23**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*77 %*	*65-135*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	ND	0.51	5.0	µg/L							
Acenaphthylene	ND	0.62	10	"							
Anthracene	ND	0.50	5.0	"							
Benzidine	ND	2.2	40	"							
Benzo (a) anthracene	ND	0.81	10	"							
Benzo (b) fluoranthene	ND	1.4	10	"							
Benzo (k) fluoranthene	ND	0.96	7.0	"							
Benzo (g,h,i) perylene	ND	1.1	10	"							
Benzo (a) pyrene	ND	1.2	7.0	"							
Bis(2-chloroethoxy)methane	ND	0.51	10	"							
Bis(2-chloroethyl)ether	ND	0.49	10	"							
Bis(2-chloroisopropyl)ether	ND	0.52	10	"							
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"							
4-Bromophenyl phenyl ether	ND	0.62	5.0	"							
Butyl benzyl phthalate	ND	0.69	7.0	"							
2-Chloronaphthalene	ND	0.52	5.0	"							
4-Chlorophenyl phenyl ether	ND	0.58	10	"							
Chrysene	ND	0.60	7.0	"							
Dibenz (a,h) anthracene	ND	1.4	7.0	"							
Di-n-butyl phthalate	ND	0.61	7.0	"							
3,3´-Dichlorobenzidine	ND	0.89	20	"							
Diethyl phthalate	ND	0.59	5.0	"							
Dimethyl phthalate	ND	0.61	4.0	"							
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"							
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"							
Di-n-octyl phthalate	ND	0.98	7.0	"							
Fluoranthene	ND	0.61	6.0	"							
Fluorene	ND	0.60	5.0	"							
Hexachlorobenzene	ND	0.74	5.0	"							
Hexachlorobutadiene	ND	0.55	2.7	"							
Hexachlorocyclopentadiene	ND	0.78	10	"							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Hexachloroethane	ND	0.49	4.0	µg/L							
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"							
Isophorone	ND	0.52	6.0	"							
Naphthalene	ND	0.52	4.0	"							
Nitrobenzene (NB)	ND	0.42	5.0	"							
N-Nitrosodimethylamine	ND	0.64	10	"							
N-Nitrosodiphenylamine	ND	0.57	10	"							
N-Nitrosodi-n-propylamine	ND	0.51	10	"							
Phenanthrene	ND	0.52	10	"							
Pyrene	ND	0.61	5.0	"							
1,2,4-Trichlorobenzene	ND	0.55	5.0	"							
4-Chloro-3-methylphenol	ND	0.45	9.0	"							
2-Chlorophenol	ND	0.46	9.0	"							
2,4-Dichlorophenol	ND	0.50	8.0	"							
2,4-Dimethylphenol	ND	0.56	8.0	"							
4,6-Dinitro-2-methylphenol	ND	0.79	25	"							
2,4-Dinitrophenol	ND	0.47	25	"							
2-Nitrophenol	ND	0.48	10	"							
4-Nitrophenol	ND	0.73	7.0	"							
Pentachlorophenol	ND	0.77	10	"							
Phenol	ND	0.41	4.0	"							
2,4,6-Trichlorophenol	ND	0.60	8.0	"							
Benzyl alcohol*	ND	0.42	20	"							
4-Chloroaniline*	ND	0.39	20	"							
Dibenzofuran*	ND	0.54	10	"							
1,2-Dichlorobenzene*	ND	0.50	10	"							
1,3-Dichlorobenzene*	ND	0.51	10	"							
1,4-Dichlorobenzene*	ND	0.48	10	"							
2-Methylnaphthalene*	ND	0.52	10	"							
2-Nitroaniline*	ND	0.54	25	"							
3-Nitroaniline*	ND	0.68	25	"							

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
4-Nitroaniline*	ND	0.81	25	µg/L							
Benzoic acid*	ND	1.1	25	"							
3 & 4-Methylphenol*	ND	0.48	10	"							
2,4,5-Trichlorophenol*	ND	0.58	10	"							
Pyridine *	ND	0.36	10	"							
2-Methylphenol*	ND	0.41	10	"							
Surrogate: 2-Fluorophenol	*19.9*			"	*50.0*		*40*	*21-110*			
Surrogate: Phenol-d6	*28.0*			"	*50.0*		*56*	*10-110*			
Surrogate: Nitrobenzene-d5	*45.2*			"	*50.0*		*90*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*41.8*			"	*50.0*		*84*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*18.5*			"	*50.0*		*37*	*10-123*			
Surrogate: Terphenyl-dl4	*42.5*			"	*50.0*		*85*	*33-141*			
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	17.8	0.51	5.0	µg/L	20.0		89	70-130			
Acenaphthylene	17.5	0.62	10	"	20.0		88	60-130			
Anthracene	15.8	0.50	5.0	"	20.0		79	58-130			
Benzo (a) anthracene	14.6	0.81	10	"	20.0		73	42-133			
Benzo (b) fluoranthene	14.7	1.4	10	"	20.0		73	42-140			
Benzo (k) fluoranthene	16.1	0.96	7.0	"	20.0		81	25-146			
Benzo (g,h,i) perylene	14.9	1.1	10	"	20.0		74	13-195			
Benzo (a) pyrene	12.2	1.2	7.0	"	20.0		61	32-148			
Bis(2-chloroethoxy)methane	20.8	0.51	10	"	20.0		104	52-164			
Bis(2-chloroisopropyl)ether	21.3	0.52	10	"	20.0		106	63-139			
Bis(2-ethylhexyl)phthalate	16.2	0.58	7.0	"	20.0		81	43-137			
4-Bromophenyl phenyl ether	17.1	0.62	5.0	"	20.0		85	70-130			
Butyl benzyl phthalate	15.7	0.69	7.0	"	20.0		78	43-140			
2-Chloronaphthalene	17.9	0.52	5.0	"	20.0		89	70-130			
4-Chlorophenyl phenyl ether	18.7	0.58	10	"	20.0		93	57-145			
Chrysene	14.6	0.60	7.0	"	20.0		73	44-140			
Dibenz (a,h) anthracene	16.0	1.4	7.0	"	20.0		80	13-200			

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Di-n-butyl phthalate	17.4	0.61	7.0	µg/L	20.0		87	52-130			
3,3´-Dichlorobenzidine	12.1	0.89	20	"	20.0		61	47-130			J
Diethyl phthalate	17.7	0.59	5.0	"	20.0		89	47-130			
Dimethyl phthalate	16.8	0.61	4.0	"	20.0		84	50-130			
2,4-Dinitrotoluene (2,4-DNT)	16.6	0.50	10	"	20.0		83	53-130			
2,6-Dinitrotoluene (2,6-DNT)	16.6	0.56	5.0	"	20.0		83	68-137			
Di-n-octyl phthalate	13.5	0.98	7.0	"	20.0		67	21-132			
Fluoranthene	16.3	0.61	6.0	"	20.0		82	47-130			
Fluorene	18.2	0.60	5.0	"	20.0		91	70-130			
Hexachlorobenzene	17.1	0.74	5.0	"	20.0		86	38-142			
Hexachlorobutadiene	17.1	0.55	2.7	"	20.0		86	68-130			
Hexachloroethane	20.7	0.49	4.0	"	20.0		103	55-130			
Indeno (1,2,3-cd) pyrene	16.0	1.3	10	"	20.0		80	13-151			
Isophorone	12.2	0.52	6.0	"	20.0		61	52-180			
Naphthalene	18.5	0.52	4.0	"	20.0		92	70-130			
Nitrobenzene (NB)	20.2	0.42	5.0	"	20.0		101	54-158			
N-Nitrosodi-n-propylamine	21.0	0.51	10	"	20.0		105	59-170			
Phenanthrene	17.5	0.52	10	"	20.0		87	67-130			
Pyrene	16.6	0.61	5.0	"	20.0		83	70-130			
1,2,4-Trichlorobenzene	20.9	0.55	5.0	"	20.0		104	61-130			
4-Chloro-3-methylphenol	17.7	0.45	9.0	"	20.0		89	68-130			
2-Chlorophenol	17.7	0.46	9.0	"	20.0		89	55-130			
2,4-Dichlorophenol	21.6	0.50	8.0	"	20.0		108	64-130			
2,4-Dimethylphenol	21.5	0.56	8.0	"	20.0		107	58-130			
4,6-Dinitro-2-methylphenol	13.9	0.79	25	"	20.0		69	56-130			J
2,4-Dinitrophenol	13.3	0.47	25	"	20.0		67	39-173			J
2-Nitrophenol	19.6	0.48	10	"	20.0		98	61-163			
4-Nitrophenol	16.4	0.73	7.0	"	20.0		82	35-130			
Pentachlorophenol	14.6	0.77	10	"	20.0		73	42-152			
Phenol	16.7	0.41	4.0	"	20.0		84	48-130			
2,4,6-Trichlorophenol	16.5	0.60	8.0	"	20.0		82	69-130			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Surrogate: 2-Fluorophenol	*32.6*			*µg/L*	*50.0*		*65*	*21-110*			
Surrogate: Phenol-d6	*28.9*			*"*	*50.0*		*58*	*10-110*			
Surrogate: Nitrobenzene-d5	*56.9*			*"*	*50.0*		*114*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*47.1*			*"*	*50.0*		*94*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*25.5*			*"*	*50.0*		*51*	*10-123*			
Surrogate: Terphenyl-dl4	*43.6*			*"*	*50.0*		*87*	*33-141*			
LCS Dup (2400953-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	18.1	0.51	5.0	µg/L	20.0		91	70-130	2	30	
Acenaphthylene	18.1	0.62	10	"	20.0		90	60-130	3	30	
Anthracene	16.4	0.50	5.0	"	20.0		82	58-130	4	30	
Benzo (a) anthracene	16.6	0.81	10	"	20.0		83	42-133	13	30	
Benzo (b) fluoranthene	15.1	1.4	10	"	20.0		76	42-140	3	30	
Benzo (k) fluoranthene	16.8	0.96	7.0	"	20.0		84	25-146	4	30	
Benzo (g,h,i) perylene	16.7	1.1	10	"	20.0		83	13-195	12	30	
Benzo (a) pyrene	12.8	1.2	7.0	"	20.0		64	32-148	5	30	
Bis(2-chloroethoxy)methane	18.3	0.51	10	"	20.0		92	52-164	13	30	
Bis(2-chloroisopropyl)ether	18.5	0.52	10	"	20.0		93	63-139	14	30	
Bis(2-ethylhexyl)phthalate	17.0	0.58	7.0	"	20.0		85	43-137	5	30	
4-Bromophenyl phenyl ether	18.2	0.62	5.0	"	20.0		91	70-130	7	30	
Butyl benzyl phthalate	17.8	0.69	7.0	"	20.0		89	43-140	13	30	
2-Chloronaphthalene	18.1	0.52	5.0	"	20.0		91	70-130	1	30	
4-Chlorophenyl phenyl ether	18.5	0.58	10	"	20.0		93	57-145	0.9	30	
Chrysene	14.8	0.60	7.0	"	20.0		74	44-140	1	30	
Dibenz (a,h) anthracene	18.1	1.4	7.0	"	20.0		91	13-200	12	30	
Di-n-butyl phthalate	18.4	0.61	7.0	"	20.0		92	52-130	6	30	
3,3´-Dichlorobenzidine	9.64	0.89	20	"	20.0		48	47-130	23	30	J
Diethyl phthalate	18.8	0.59	5.0	"	20.0		94	47-130	6	30	
Dimethyl phthalate	17.5	0.61	4.0	"	20.0		88	50-130	4	30	
2,4-Dinitrotoluene (2,4-DNT)	17.4	0.50	10	"	20.0		87	53-130	5	30	
2,6-Dinitrotoluene (2,6-DNT)	17.4	0.56	5.0	"	20.0		87	68-137	5	30	
Di-n-octyl phthalate	14.1	0.98	7.0	"	20.0		70	21-132	4	30	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS Dup (2400953-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Fluoranthene	17.8	0.61	6.0	µg/L	20.0		89	47-130	9	30	
Fluorene	19.0	0.60	5.0	"	20.0		95	70-130	4	30	
Hexachlorobenzene	17.9	0.74	5.0	"	20.0		90	38-142	4	30	
Hexachlorobutadiene	17.6	0.55	2.7	"	20.0		88	68-130	3	30	
Hexachloroethane	18.2	0.49	4.0	"	20.0		91	55-130	13	30	
Indeno (1,2,3-cd) pyrene	17.8	1.3	10	"	20.0		89	13-151	11	30	
Isophorone	10.6	0.52	6.0	"	20.0		53	52-180	14	30	
Naphthalene	18.8	0.52	4.0	"	20.0		94	70-130	2	30	
Nitrobenzene (NB)	17.9	0.42	5.0	"	20.0		89	54-158	12	30	
N-Nitrosodi-n-propylamine	18.7	0.51	10	"	20.0		93	59-170	12	30	
Phenanthrene	18.1	0.52	10	"	20.0		90	67-130	3	30	
Pyrene	18.3	0.61	5.0	"	20.0		92	70-130	10	30	
1,2,4-Trichlorobenzene	18.5	0.55	5.0	"	20.0		93	61-130	12	30	
4-Chloro-3-methylphenol	17.9	0.45	9.0	"	20.0		89	68-130	0.9	30	
2-Chlorophenol	19.0	0.46	9.0	"	20.0		95	55-130	7	30	
2,4-Dichlorophenol	19.2	0.50	8.0	"	20.0		96	64-130	12	30	
2,4-Dimethylphenol	18.7	0.56	8.0	"	20.0		93	58-130	14	30	
4,6-Dinitro-2-methylphenol	14.9	0.79	25	"	20.0		75	56-130	7	30	J
2,4-Dinitrophenol	13.8	0.47	25	"	20.0		69	39-173	3	30	J
2-Nitrophenol	17.3	0.48	10	"	20.0		87	61-163	12	30	
4-Nitrophenol	17.4	0.73	7.0	"	20.0		87	35-130	5	30	
Pentachlorophenol	15.2	0.77	10	"	20.0		76	42-152	4	30	
Phenol	18.2	0.41	4.0	"	20.0		91	48-130	8	30	
2,4,6-Trichlorophenol	16.9	0.60	8.0	"	20.0		84	69-130	2	30	
Surrogate: 2-Fluorophenol	*30.0*			"	*50.0*		*60*	*21-110*			
Surrogate: Phenol-d6	*32.6*			"	*50.0*		*65*	*10-110*			
Surrogate: Nitrobenzene-d5	*52.5*			"	*50.0*		*105*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*50.3*			"	*50.0*		*101*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*27.9*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*49.0*			"	*50.0*		*98*	*33-141*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike (2400953-MS1)				**Source: 24B0080-01**	Prepared: 02/05/24	Analyzed: 02/07/24					
Acenaphthene	16.4	0.51	5.0	µg/L	20.0	ND	82	47-145			
Acenaphthylene	16.7	0.62	10	"	20.0	ND	84	33-145			
Anthracene	14.3	0.50	5.0	"	20.0	ND	72	27-133			
Benzo (a) anthracene	12.6	0.81	10	"	20.0	ND	63	33-143			
Benzo (b) fluoranthene	11.8	1.4	10	"	20.0	ND	59	24-159			
Benzo (k) fluoranthene	12.9	0.96	7.0	"	20.0	ND	64	11-162			
Benzo (g,h,i) perylene	13.3	1.1	10	"	20.0	ND	67	1-219			
Benzo (a) pyrene	9.92	1.2	7.0	"	20.0	ND	50	17-163			
Bis(2-chloroethoxy)methane	17.1	0.51	10	"	20.0	ND	85	33-184			
Bis(2-chloroisopropyl)ether	17.3	0.52	10	"	20.0	ND	86	36-166			
Bis(2-ethylhexyl)phthalate	13.9	0.58	7.0	"	20.0	ND	69	8-158			
4-Bromophenyl phenyl ether	15.8	0.62	5.0	"	20.0	ND	79	53-127			
Butyl benzyl phthalate	14.1	0.69	7.0	"	20.0	ND	71	1-152			
2-Chloronaphthalene	16.6	0.52	5.0	"	20.0	ND	83	60-120			
4-Chlorophenyl phenyl ether	17.2	0.58	10	"	20.0	ND	86	25-158			
Chrysene	12.3	0.60	7.0	"	20.0	ND	62	17-168			
Dibenz (a,h) anthracene	15.2	1.4	7.0	"	20.0	ND	76	1-227			
Di-n-butyl phthalate	16.3	0.61	7.0	"	20.0	ND	81	1-120			
3,3´-Dichlorobenzidine	7.18	0.89	20	"	20.0	ND	36	1-262			J
Diethyl phthalate	13.3	0.59	5.0	"	20.0	ND	67	1-120			
Dimethyl phthalate	6.63	0.61	4.0	"	20.0	ND	33	1-120			
2,4-Dinitrotoluene (2,4-DNT)	16.1	0.50	10	"	20.0	ND	81	39-139			
2,6-Dinitrotoluene (2,6-DNT)	16.3	0.56	5.0	"	20.0	ND	81	50-158			
Di-n-octyl phthalate	11.7	0.98	7.0	"	20.0	ND	58	4-146			
Fluoranthene	14.1	0.61	6.0	"	20.0	ND	71	26-137			
Fluorene	17.5	0.60	5.0	"	20.0	ND	88	59-121			
Hexachlorobenzene	15.5	0.74	5.0	"	20.0	ND	77	1-152			
Hexachlorobutadiene	12.0	0.55	2.7	"	20.0	ND	60	24-120			
Hexachloroethane	13.6	0.49	4.0	"	20.0	ND	68	40-120			
Indeno (1,2,3-cd) pyrene	14.5	1.3	10	"	20.0	ND	72	1-171			
Isophorone	7.02	0.52	6.0	"	20.0	ND	35	21-196			

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike (2400953-MS1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
Naphthalene	16.5	0.52	4.0	µg/L	20.0	ND	82	21-133			
Nitrobenzene (NB)	16.7	0.42	5.0	"	20.0	ND	83	35-180			
N-Nitrosodi-n-propylamine	17.6	0.51	10	"	20.0	ND	88	1-230			
Phenanthrene	16.1	0.52	10	"	20.0	ND	80	54-120			
Pyrene	14.7	0.61	5.0	"	20.0	ND	74	52-120			
1,2,4-Trichlorobenzene	15.7	0.55	5.0	"	20.0	ND	78	44-142			
4-Chloro-3-methylphenol	16.4	0.45	9.0	"	20.0	ND	82	22-147			
2-Chlorophenol	16.0	0.46	9.0	"	20.0	ND	80	23-134			
2,4-Dichlorophenol	16.1	0.50	8.0	"	20.0	ND	81	39-135			
2,4-Dimethylphenol	14.2	0.56	8.0	"	20.0	ND	71	32-120			
4,6-Dinitro-2-methylphenol	10.9	0.79	25	"	20.0	ND	55	1-181			J
2,4-Dinitrophenol	10.2	0.47	25	"	20.0	ND	51	1-191			J
2-Nitrophenol	14.6	0.48	10	"	20.0	ND	73	29-182			
4-Nitrophenol	21.9	0.73	7.0	"	20.0	ND	110	1-132			
Pentachlorophenol	7.28	0.77	10	"	20.0	ND	36	14-176			J
Phenol	11.9	0.41	4.0	"	20.0	1.24	53	5-120			
2,4,6-Trichlorophenol	13.2	0.60	8.0	"	20.0	ND	66	37-144			
Surrogate: 2-Fluorophenol	*18.8*			"	*50.0*		*38*	*21-110*			
Surrogate: Phenol-d6	*16.7*			"	*50.0*		*33*	*10-110*			
Surrogate: Nitrobenzene-d5	*47.6*			"	*50.0*		*95*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*45.5*			"	*50.0*		*91*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*19.6*			"	*50.0*		*39*	*10-123*			
Surrogate: Terphenyl-dl4	*22.4*			"	*50.0*		*45*	*33-141*			
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
Acenaphthene	16.7	0.51	5.0	µg/L	20.0	ND	84	47-145	2	48	
Acenaphthylene	17.1	0.62	10	"	20.0	ND	86	33-145	2	74	
Anthracene	14.3	0.50	5.0	"	20.0	ND	72	27-133	0.1	66	
Benzo (a) anthracene	12.2	0.81	10	"	20.0	ND	61	33-143	3	53	
Benzo (b) fluoranthene	11.8	1.4	10	"	20.0	ND	59	24-159	0.2	71	
Benzo (k) fluoranthene	12.6	0.96	7.0	"	20.0	ND	63	11-162	2	63	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**	Prepared: 02/05/24 Analyzed: 02/07/24							
Benzo (g,h,i) perylene	13.3	1.1	10	µg/L	20.0	ND	66	1-219	0.2	97	
Benzo (a) pyrene	9.87	1.2	7.0	"	20.0	ND	49	17-163	0.5	72	
Bis(2-chloroethoxy)methane	17.5	0.51	10	"	20.0	ND	87	33-184	2	54	
Bis(2-chloroisopropyl)ether	17.9	0.52	10	"	20.0	ND	90	36-166	3	76	
Bis(2-ethylhexyl)phthalate	13.3	0.58	7.0	"	20.0	ND	66	8-158	5	82	
4-Bromophenyl phenyl ether	16.2	0.62	5.0	"	20.0	ND	81	53-127	3	43	
Butyl benzyl phthalate	13.5	0.69	7.0	"	20.0	ND	68	1-152	4	60	
2-Chloronaphthalene	17.0	0.52	5.0	"	20.0	ND	85	60-120	3	24	
4-Chlorophenyl phenyl ether	17.5	0.58	10	"	20.0	ND	87	25-158	2	61	
Chrysene	12.2	0.60	7.0	"	20.0	ND	61	17-168	1	87	
Dibenz (a,h) anthracene	15.2	1.4	7.0	"	20.0	ND	76	1-227	0.3	126	
Di-n-butyl phthalate	16.0	0.61	7.0	"	20.0	ND	80	1-120	2	47	
3,3´-Dichlorobenzidine	6.91	0.89	20	"	20.0	ND	35	1-262	4	108	J
Diethyl phthalate	13.4	0.59	5.0	"	20.0	ND	67	1-120	0.2	100	
Dimethyl phthalate	6.49	0.61	4.0	"	20.0	ND	32	1-120	2	183	
2,4-Dinitrotoluene (2,4-DNT)	16.3	0.50	10	"	20.0	ND	82	39-139	1	42	
2,6-Dinitrotoluene (2,6-DNT)	16.6	0.56	5.0	"	20.0	ND	83	50-158	2	48	
Di-n-octyl phthalate	11.2	0.98	7.0	"	20.0	ND	56	4-146	5	69	
Fluoranthene	14.1	0.61	6.0	"	20.0	ND	71	26-137	0.07	66	
Fluorene	17.8	0.60	5.0	"	20.0	ND	89	59-121	1	38	
Hexachlorobenzene	15.3	0.74	5.0	"	20.0	ND	76	1-152	1	55	
Hexachlorobutadiene	12.6	0.55	2.7	"	20.0	ND	63	24-120	5	62	
Hexachloroethane	14.3	0.49	4.0	"	20.0	ND	71	40-120	5	52	
Indeno (1,2,3-cd) pyrene	14.3	1.3	10	"	20.0	ND	72	1-171	1	99	
Isophorone	7.03	0.52	6.0	"	20.0	ND	35	21-196	0.1	93	
Naphthalene	17.0	0.52	4.0	"	20.0	ND	85	21-133	3	65	
Nitrobenzene (NB)	17.4	0.42	5.0	"	20.0	ND	87	35-180	4	62	
N-Nitrosodi-n-propylamine	18.0	0.51	10	"	20.0	ND	90	1-230	2	87	
Phenanthrene	16.1	0.52	10	"	20.0	ND	81	54-120	0.5	39	
Pyrene	14.6	0.61	5.0	"	20.0	ND	73	52-120	0.7	49	
1,2,4-Trichlorobenzene	16.4	0.55	5.0	"	20.0	ND	82	44-142	4	50	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
4-Chloro-3-methylphenol	17.3	0.45	9.0	µg/L	20.0	ND	86	22-147	5	73	
2-Chlorophenol	17.5	0.46	9.0	"	20.0	ND	88	23-134	9	61	
2,4-Dichlorophenol	17.9	0.50	8.0	"	20.0	ND	89	39-135	10	50	
2,4-Dimethylphenol	14.2	0.56	8.0	"	20.0	ND	71	32-120	0.07	58	
4,6-Dinitro-2-methylphenol	12.7	0.79	25	"	20.0	ND	63	1-181	15	203	J
2,4-Dinitrophenol	10.4	0.47	25	"	20.0	ND	52	1-191	2	132	J
2-Nitrophenol	16.5	0.48	10	"	20.0	ND	82	29-182	12	55	
4-Nitrophenol	23.3	0.73	7.0	"	20.0	ND	116	1-132	6	131	
Pentachlorophenol	7.63	0.77	10	"	20.0	ND	38	14-176	5	86	J
Phenol	11.4	0.41	4.0	"	20.0	1.24	51	5-120	4	64	
2,4,6-Trichlorophenol	15.1	0.60	8.0	"	20.0	ND	76	37-144	13	58	
Surrogate: 2-Fluorophenol	*22.8*			"	*50.0*		*46*	*21-110*			
Surrogate: Phenol-d6	*18.8*			"	*50.0*		*38*	*10-110*			
Surrogate: Nitrobenzene-d5	*54.6*			"	*50.0*		*109*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*50.8*			"	*50.0*		*102*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*24.4*			"	*50.0*		*49*	*10-123*			
Surrogate: Terphenyl-dl4	*25.7*			"	*50.0*		*51*	*33-141*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400886 - General											
Blank (2400886-BLK1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2400886-BS1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	184	2.0	3.0	mg/L	167		110	83-138			A-COM
LCS Dup (2400886-BSD1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	184	2.0	3.0	mg/L	167		110	83-138	0	21	A-COM
Batch 2400919 - Solvent Extract											
Blank (2400919-BLK1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2400919-BS1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	39.6	0.66	1.0	mg/L	40.0		99	78-114			
LCS Dup (2400919-BSD1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	38.2	0.66	1.0	mg/L	40.0		96	78-114	4	18	
Batch 2400939 - General Preparation											
Blank (2400939-BLK1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2400939-BS1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	51.4	6.6	7.0	mg/L	50.0		103	80-120			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400939 - General Preparation											
LCS Dup (2400939-BSD1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	47.1	6.6	7.0	mg/L	50.0		94	80-120	9	25	
Matrix Spike (2400939-MS1)			**Source: 24B0056-01**		Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	77.2	6.6	7.0	mg/L	50.0	8.45	137	75-125			QM-7
Matrix Spike Dup (2400939-MSD1)			**Source: 24B0056-01**		Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	64.3	6.6	7.0	mg/L	50.0	8.45	112	75-125	18	30	
Batch 2400968 - General Preparation											
Blank (2400968-BLK1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2400968-BS1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.328	0.023	0.050	mg/L	0.300		109	80-120			
LCS Dup (2400968-BSD1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.307	0.023	0.050	mg/L	0.300		102	80-120	7	25	
Matrix Spike (2400968-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.380	0.023	0.050	mg/L	0.300	0.0560	108	75-125			
Matrix Spike Dup (2400968-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.404	0.023	0.050	mg/L	0.300	0.0560	116	75-125	6	30	
Batch 2400982 - General Preparation											
Blank (2400982-BLK1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	ND	2.5	2.5	mg/L							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400982 - General Preparation											
LCS (2400982-BS1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	97.9	2.5	2.5	mg/L	100		98	80-120			
LCS Dup (2400982-BSD1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	97.4	2.5	2.5	mg/L	100		97	80-120	0.5	200	
Duplicate (2400982-DUP1)			**Source: 24B0100-01**		Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	51.8	5.6	5.6	mg/L		51.3			1	20	
Batch 2401004 - General Preparation											
Blank (2401004-BLK1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	ND	0.025	0.10	mg/L							
LCS (2401004-BS1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	0.456	0.025	0.10	mg/L	0.500		91	80-120			
LCS Dup (2401004-BSD1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	0.458	0.025	0.10	mg/L	0.500		92	80-120	0.4	25	
Matrix Spike (2401004-MS1)			**Source: 24B0129-02**		Prepared & Analyzed: 02/06/24						
Ammonia as N	0.663	0.025	0.10	mg/L	0.500	0.156	101	75-125			
Matrix Spike Dup (2401004-MSD1)			**Source: 24B0129-02**		Prepared & Analyzed: 02/06/24						
Ammonia as N	0.604	0.025	0.10	mg/L	0.500	0.156	90	75-125	9	25	
Batch 2401052 - General Preparation											
Blank (2401052-BLK1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	ND	0.54	1.0	mg/L							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401052 - General Preparation											
LCS (2401052-BS1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	8.79	0.54	1.0	mg/L	10.0		88	75-125			
LCS Dup (2401052-BSD1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	9.40	0.54	1.0	mg/L	10.0		94	75-125	7	25	
Matrix Spike (2401052-MS1)			**Source: 24B0310-04**		Prepared & Analyzed: 02/07/24						
Total Organic Carbon	28.3	0.54	1.0	mg/L	10.0	22.9	54	75-125			QM-7
Matrix Spike Dup (2401052-MSD1)			**Source: 24B0310-04**		Prepared & Analyzed: 02/07/24						
Total Organic Carbon	28.8	0.54	1.0	mg/L	10.0	22.9	59	75-125	2	25	QM-7
Batch 2401061 - General Preparation											
Blank (2401061-BLK1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	ND	0.0024	0.10	mg/L							
LCS (2401061-BS1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	0.241	0.0024	0.10	mg/L	0.250		96	80-120			
LCS Dup (2401061-BSD1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	0.236	0.0024	0.10	mg/L	0.250		94	80-120	2	20	
Matrix Spike (2401061-MS1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	2.30	0.012	0.50	mg/L	0.250	1.90	160	75-125			QM-7
Matrix Spike Dup (2401061-MSD1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	2.34	0.012	0.50	mg/L	0.250	1.90	175	75-125	2	25	QM-7

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401169 - General Prep											
Blank (2401169-BLK1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2401169-BS1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.0	0.29	1.0	µg/L	10.0		100	80-120			
LCS Dup (2401169-BSD1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	9.89	0.29	1.0	µg/L	10.0		99	80-120	1	20	
Matrix Spike (2401169-MS1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	0.324	98	80-120			
Matrix Spike Dup (2401169-MSD1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	0.324	101	80-120	3	20	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400948 - EPA 3510B GCNV											
Blank (2400948-BLK1)					Prepared & Analyzed: 02/05/24						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0198*			*"*	*0.0250*		*79*	*65-135*			
LCS (2400948-BS1)					Prepared & Analyzed: 02/05/24						
Diesel	1.90	0.0021	0.050	mg/L	2.50		76	65-135			
Surrogate: o-Terphenyl	*0.0227*			*"*	*0.0250*		*91*	*65-135*			
LCS Dup (2400948-BSD1)					Prepared & Analyzed: 02/05/24						
Diesel	2.44	0.0021	0.050	mg/L	2.50		98	65-135	25	30	
Surrogate: o-Terphenyl	*0.0236*			*"*	*0.0250*		*94*	*65-135*			
Matrix Spike (2400948-MS1)			**Source: 24A1466-01**		Prepared & Analyzed: 02/05/24						
Diesel	1.92	0.0021	0.050	mg/L	2.50	ND	77	46-137			
Surrogate: o-Terphenyl	*0.0231*			*"*	*0.0250*		*92*	*65-135*			
Matrix Spike Dup (2400948-MSD1)			**Source: 24A1466-01**		Prepared & Analyzed: 02/05/24						
Diesel	1.75	0.0021	0.050	mg/L	2.50	ND	70	46-137	9	30	
Surrogate: o-Terphenyl	*0.0187*			*"*	*0.0250*		*75*	*65-135*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400937 - EPA 200 Series											
Blank (2400937-BLK1)					Prepared & Analyzed: 02/05/24						
Chromium	0.000865	0.00014	0.0010	mg/L							
Aluminum	0.00266	0.0016	0.050	"							J
Copper	ND	0.000090	0.010	"							
Lead	ND	0.000020	0.0050	"							
Zinc	ND	0.00027	0.020	"							
LCS (2400937-BS1)					Prepared & Analyzed: 02/05/24						
Chromium	0.103	0.00014	0.0010	mg/L	0.100		103	85-115			
Aluminum	0.541	0.0016	0.050	"	0.500		108	85-115			
Copper	0.103	0.000090	0.010	"	0.100		103	85-115			
Lead	0.104	0.000020	0.0050	"	0.100		104	85-115			
Zinc	0.104	0.00027	0.020	"	0.100		104	85-115			
Matrix Spike (2400937-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/05/24						
Chromium	0.104	0.00014	0.0010	mg/L	0.100	0.000355	104	70-130			
Aluminum	0.534	0.0016	0.050	"	0.500	0.00661	105	70-130			
Copper	0.102	0.000090	0.010	"	0.100	0.000615	101	70-130			
Lead	0.105	0.000020	0.0050	"	0.100	0.000231	105	70-130			
Zinc	0.107	0.00027	0.020	"	0.100	0.00499	102	70-130			
Matrix Spike (2400937-MS2)			**Source: 24B0171-03**		Prepared & Analyzed: 02/05/24						
Chromium	0.107	0.00014	0.0010	mg/L	0.100	0.000566	107	70-130			
Aluminum	0.561	0.0016	0.050	"	0.500	0.00233	112	70-130			
Copper	0.109	0.000090	0.010	"	0.100	ND	109	70-130			
Lead	0.107	0.000020	0.0050	"	0.100	ND	107	70-130			
Zinc	0.128	0.00027	0.020	"	0.100	0.00218	125	70-130			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400981 - EPA 7470A											
Blank (2400981-BLK1)					Prepared & Analyzed: 02/06/24						
Mercury	ND	0.15	0.20	µg/L							
LCS (2400981-BS1)					Prepared & Analyzed: 02/06/24						
Mercury	4.11	0.15	0.20	µg/L	5.00		82	85-115			QM-1
Matrix Spike (2400981-MS1)			**Source: 24B0066-01**		Prepared & Analyzed: 02/06/24						
Mercury	3.59	0.15	0.20	µg/L	5.00	ND	72	70-130			
Matrix Spike Dup (2400981-MSD1)			**Source: 24B0066-01**		Prepared & Analyzed: 02/06/24						
Mercury	3.69	0.15	0.20	µg/L	5.00	ND	74	70-130	3	25	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401029 - EPA 3510B GCNV											
Blank (2401029-BLK1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.258*			"	*0.250*		*103*	*50-150*			
LCS (2401029-BS1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1260	2.73	0.052	0.50	µg/L	2.50		109	31-138			
Surrogate: Decachlorobiphenyl	*0.253*			"	*0.250*		*101*	*50-150*			
LCS Dup (2401029-BSD1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1260	2.66	0.052	0.50	µg/L	2.50		106	31-138	3	30	
Surrogate: Decachlorobiphenyl	*0.242*			"	*0.250*		*97*	*50-150*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Blank (2400942-BLK1)					Prepared & Analyzed: 02/02/24						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Blank (2400942-BLK1)					Prepared & Analyzed: 02/02/24						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Methyl tert-butyl ether*	ND	0.069	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*9.36*			"	*10.0*		*94*	*65-135*			
Surrogate: Toluene-d8	*8.31*			"	*10.0*		*83*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*11.7*			"	*10.0*		*117*	*73-125*			
LCS (2400942-BS1)					Prepared & Analyzed: 02/02/24						
Benzene	19.6	0.096	0.30	µg/L	20.0		98	65-135			
Bromodichloromethane	19.7	0.058	0.50	"	20.0		98	65-135			
Bromoform	19.2	0.072	0.50	"	20.0		96	70-130			
Bromomethane	21.4	0.19	0.50	"	20.0		107	15-185			
Carbon tetrachloride	19.4	0.10	0.50	"	20.0		97	70-130			
Chlorobenzene	19.2	0.088	0.30	"	20.0		96	63-135			
Chloroethane	20.4	0.18	0.50	"	20.0		102	40-160			
Chloroform	17.3	0.079	0.50	"	20.0		86	70-135			
Chloromethane	18.9	0.19	0.50	"	20.0		94	1-472			
Dibromochloromethane	20.4	0.052	0.50	"	20.0		102	70-135			
1,2-Dichlorobenzene	17.4	0.059	0.30	"	20.0		87	65-135			
1,3-Dichlorobenzene	17.8	0.077	0.30	"	20.0		89	70-130			
1,4-Dichlorobenzene	17.8	0.26	0.30	"	20.0		89	65-135			
1,1-Dichloroethane	20.1	0.080	0.50	"	20.0		100	70-130			
1,2-Dichloroethane	16.8	0.060	0.50	"	20.0		84	50-150			
1,1-Dichloroethene	16.5	0.12	0.50	"	20.0		82	70-130			
trans-1,2-Dichloroethene	20.7	0.11	0.50	"	20.0		103	35-165			
1,2-Dichloropropane	20.4	0.066	0.50	"	20.0		102	5-210			
cis-1,3-Dichloropropene	20.8	0.058	0.50	"	20.0		104	25-175			
trans-1,3-Dichloropropene	16.6	0.12	0.50	"	20.0		83	50-150			
Ethylbenzene	21.8	0.098	0.30	"	20.0		109	60-140			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
LCS (2400942-BS1)					Prepared & Analyzed: 02/02/24						
Methylene chloride	17.2	0.076	0.50	µg/L	20.0		86	60-140			
1,1,2,2-Tetrachloroethane	18.4	0.049	0.50	"	20.0		92	60-140			
Tetrachloroethene	20.1	0.11	0.50	"	20.0		101	70-130			
Toluene	21.1	0.070	0.30	"	20.0		106	70-130			
1,1,1-Trichloroethane	17.8	0.060	0.50	"	20.0		89	70-130			
1,1,2-Trichloroethane	18.5	0.068	0.50	"	20.0		93	70-130			
Trichloroethene	21.5	0.082	0.50	"	20.0		108	65-135			
Trichlorofluoromethane	20.4	0.13	0.50	"	20.0		102	50-150			
Vinyl chloride	21.3	0.12	0.50	"	20.0		106	5-195			
Surrogate: 1,2-Dichloroethane-d4	*11.1*			*"*	*10.0*		*111*	*65-135*			
Surrogate: Toluene-d8	*11.7*			*"*	*10.0*		*117*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.21*			*"*	*10.0*		*92*	*73-125*			
LCS Dup (2400942-BSD1)					Prepared & Analyzed: 02/02/24						
Benzene	20.1	0.096	0.30	µg/L	20.0		101	65-135	3	30	
Bromodichloromethane	20.1	0.058	0.50	"	20.0		101	65-135	2	30	
Bromoform	16.4	0.072	0.50	"	20.0		82	70-130	16	30	
Bromomethane	18.6	0.19	0.50	"	20.0		93	15-185	14	30	
Carbon tetrachloride	20.0	0.10	0.50	"	20.0		100	70-130	3	30	
Chlorobenzene	16.0	0.088	0.30	"	20.0		80	63-135	18	30	
Chloroethane	18.9	0.18	0.50	"	20.0		95	40-160	8	30	
Chloroform	17.4	0.079	0.50	"	20.0		87	70-135	0.7	30	
Chloromethane	16.2	0.19	0.50	"	20.0		81	1-472	15	30	
Dibromochloromethane	19.9	0.052	0.50	"	20.0		100	70-135	3	30	
1,2-Dichlorobenzene	17.2	0.059	0.30	"	20.0		86	65-135	1	30	
1,3-Dichlorobenzene	17.7	0.077	0.30	"	20.0		88	70-130	1	30	
1,4-Dichlorobenzene	17.5	0.26	0.30	"	20.0		87	65-135	2	30	
1,1-Dichloroethane	21.5	0.080	0.50	"	20.0		107	70-130	7	30	
1,2-Dichloroethane	17.3	0.060	0.50	"	20.0		86	50-150	3	30	
1,1-Dichloroethene	19.5	0.12	0.50	"	20.0		98	70-130	17	30	
trans-1,2-Dichloroethene	21.8	0.11	0.50	"	20.0		109	35-165	6	30	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
LCS Dup (2400942-BSD1)					Prepared & Analyzed: 02/02/24						
1,2-Dichloropropane	20.9	0.066	0.50	µg/L	20.0		104	5-210	2	30	
cis-1,3-Dichloropropene	20.0	0.058	0.50	"	20.0		100	25-175	4	30	
trans-1,3-Dichloropropene	15.4	0.12	0.50	"	20.0		77	50-150	7	30	
Ethylbenzene	21.5	0.098	0.30	"	20.0		108	60-140	1	30	
Methylene chloride	21.0	0.076	0.50	"	20.0		105	60-140	20	30	
1,1,2,2-Tetrachloroethane	16.8	0.049	0.50	"	20.0		84	60-140	9	30	
Tetrachloroethene	19.7	0.11	0.50	"	20.0		98	70-130	2	30	
Toluene	21.1	0.070	0.30	"	20.0		105	70-130	0.4	30	
1,1,1-Trichloroethane	18.9	0.060	0.50	"	20.0		94	70-130	6	30	
1,1,2-Trichloroethane	17.6	0.068	0.50	"	20.0		88	70-130	5	30	
Trichloroethene	21.3	0.082	0.50	"	20.0		106	65-135	1	30	
Trichlorofluoromethane	20.2	0.13	0.50	"	20.0		101	50-150	1	30	
Vinyl chloride	19.2	0.12	0.50	"	20.0		96	5-195	10	30	
Surrogate: 1,2-Dichloroethane-d4	*11.4*			*"*	*10.0*		*114*	*65-135*			
Surrogate: Toluene-d8	*11.3*			*"*	*10.0*		*113*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.78*			*"*	*10.0*		*88*	*73-125*			
Matrix Spike (2400942-MS1)				**Source: 24B0080-01**	Prepared & Analyzed: 02/02/24						
Benzene	19.2	0.096	0.30	µg/L	20.0	ND	96	37-151			
Bromodichloromethane	20.5	0.058	0.50	"	20.0	ND	103	35-155			
Bromoform	15.1	0.072	0.50	"	20.0	ND	76	45-169			
Bromomethane	22.6	0.19	0.50	"	20.0	ND	113	1-242			
Carbon tetrachloride	21.2	0.10	0.50	"	20.0	ND	106	70-140			
Chlorobenzene	15.9	0.088	0.30	"	20.0	ND	80	37-163			
Chloroethane	22.4	0.18	0.50	"	20.0	ND	112	14-230			
Chloroform	18.6	0.079	0.50	"	20.0	ND	93	51-138			
Chloromethane	25.4	0.19	0.50	"	20.0	ND	127	1-273			
Dibromochloromethane	21.3	0.052	0.50	"	20.0	ND	106	53-149			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0	ND	96	18-190			
1,3-Dichlorobenzene	19.4	0.077	0.30	"	20.0	ND	97	59-156			
1,4-Dichlorobenzene	19.0	0.26	0.30	"	20.0	ND	95	18-190			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Matrix Spike (2400942-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
1,1-Dichloroethane	19.4	0.080	0.50	µg/L	20.0	ND	97	59-155			
1,2-Dichloroethane	21.5	0.060	0.50	"	20.0	ND	107	49-155			
1,1-Dichloroethene	12.1	0.12	0.50	"	20.0	ND	61	1-234			
trans-1,2-Dichloroethene	16.9	0.11	0.50	"	20.0	ND	85	54-156			
1,2-Dichloropropane	20.8	0.066	0.50	"	20.0	ND	104	1-210			
cis-1,3-Dichloropropene	21.4	0.058	0.50	"	20.0	ND	107	1-227			
trans-1,3-Dichloropropene	16.9	0.12	0.50	"	20.0	ND	84	17-183			
Ethylbenzene	21.4	0.098	0.30	"	20.0	ND	107	37-162			
Methylene chloride	21.4	0.076	0.50	"	20.0	ND	107	1-221			
1,1,2,2-Tetrachloroethane	21.7	0.049	0.50	"	20.0	ND	108	46-148			
Tetrachloroethene	19.2	0.11	0.50	"	20.0	ND	96	64-148			
Toluene	23.6	0.070	0.30	"	20.0	ND	118	47-150			
1,1,1-Trichloroethane	20.4	0.060	0.50	"	20.0	ND	102	52-162			
1,1,2-Trichloroethane	19.8	0.068	0.50	"	20.0	ND	99	52-150			
Trichloroethene	20.6	0.082	0.50	"	20.0	ND	103	71-157			
Trichlorofluoromethane	22.5	0.13	0.50	"	20.0	ND	112	17-181			
Vinyl chloride	29.4	0.12	0.50	"	20.0	ND	147	10-251			
Surrogate: 1,2-Dichloroethane-d4	*10.6*			*"*	*10.0*		*106*	*65-135*			
Surrogate: Toluene-d8	*11.5*			*"*	*10.0*		*115*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.40*			*"*	*10.0*		*94*	*73-125*			
Matrix Spike Dup (2400942-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
Benzene	18.0	0.096	0.30	µg/L	20.0	ND	90	37-151	6	61	
Bromodichloromethane	18.3	0.058	0.50	"	20.0	ND	92	35-155	11	56	
Bromoform	14.5	0.072	0.50	"	20.0	ND	73	45-169	4	42	
Bromomethane	23.9	0.19	0.50	"	20.0	ND	119	1-242	5	61	
Carbon tetrachloride	19.7	0.10	0.50	"	20.0	ND	99	70-140	7	41	
Chlorobenzene	14.9	0.088	0.30	"	20.0	ND	75	37-163	6	53	
Chloroethane	23.1	0.18	0.50	"	20.0	ND	115	14-230	3	78	
Chloroform	17.0	0.079	0.50	"	20.0	ND	85	51-138	9	54	
Chloromethane	25.0	0.19	0.50	"	20.0	ND	125	1-273	1	60	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Matrix Spike Dup (2400942-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
Dibromochloromethane	19.0	0.052	0.50	µg/L	20.0	ND	95	53-149	11	50	
1,2-Dichlorobenzene	19.1	0.059	0.30	"	20.0	ND	96	18-190	0.4	57	
1,3-Dichlorobenzene	19.3	0.077	0.30	"	20.0	ND	97	59-156	0.1	43	
1,4-Dichlorobenzene	18.8	0.26	0.30	"	20.0	ND	94	18-190	0.6	57	
1,1-Dichloroethane	18.3	0.080	0.50	"	20.0	ND	92	59-155	6	40	
1,2-Dichloroethane	19.0	0.060	0.50	"	20.0	ND	95	49-155	12	49	
1,1-Dichloroethene	20.8	0.12	0.50	"	20.0	ND	104	1-234	53	32	QR-1
trans-1,2-Dichloroethene	15.3	0.11	0.50	"	20.0	ND	77	54-156	10	45	
1,2-Dichloropropane	18.8	0.066	0.50	"	20.0	ND	94	1-210	10	55	
cis-1,3-Dichloropropene	18.4	0.058	0.50	"	20.0	ND	92	1-227	15	58	
trans-1,3-Dichloropropene	15.0	0.12	0.50	"	20.0	ND	75	17-183	12	86	
Ethylbenzene	19.9	0.098	0.30	"	20.0	ND	100	37-162	7	63	
Methylene chloride	34.7	0.076	0.50	"	20.0	ND	174	1-221	48	28	QR-1
1,1,2,2-Tetrachloroethane	20.9	0.049	0.50	"	20.0	ND	105	46-148	4	61	
Tetrachloroethene	17.0	0.11	0.50	"	20.0	ND	85	64-148	12	39	
Toluene	20.8	0.070	0.30	"	20.0	ND	104	47-150	13	41	
1,1,1-Trichloroethane	18.9	0.060	0.50	"	20.0	ND	94	52-162	8	36	
1,1,2-Trichloroethane	17.3	0.068	0.50	"	20.0	ND	87	52-150	13	46	
Trichloroethene	18.5	0.082	0.50	"	20.0	ND	92	71-157	11	48	
Trichlorofluoromethane	21.1	0.13	0.50	"	20.0	ND	106	17-181	6	84	
Vinyl chloride	33.6	0.12	0.50	"	20.0	ND	168	10-251	13	66	
Surrogate: 1,2-Dichloroethane-d4	*9.81*			*"*	*10.0*		*98*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.06*			*"*	*10.0*		*91*	*73-125*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400941 - EPA 5030 Water GC											
Blank (2400941-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
JP-4	29.4		50	µg/L							
Gasoline	ND	10	50	"							
Surrogate: o-Chlorotoluene (Gas)	*16.6*			*"*	*20.0*		*83*	*65-135*			
LCS (2400941-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Gasoline	483	10	50	µg/L	500		97	70-130			
Surrogate: o-Chlorotoluene (Gas)	*16.4*			*"*	*20.0*		*82*	*65-135*			
LCS Dup (2400941-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Gasoline	539	10	50	µg/L	500		108	70-130	11	30	
Surrogate: o-Chlorotoluene (Gas)	*17.8*			*"*	*20.0*		*89*	*65-135*			

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QR-1	The RPD value for the sample duplicate or MS/MSD was outside of the QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
QM-1	The spike recovery was outside acceptance limits for the LCS or LCSD. The batch was accepted based on acceptable MS/MSD recoveries & RPD's.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
A-COM	Seed factor below control limit of 0.30 at 0.28
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

24B0080

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb **ERT/BB&E/NASA Ames** Bldg. T20G/Room 142. M/S T20G-4 Moffett Field, CA 94035-1000 (650) 604-5360 marcia.j.christlieb@nasa.gov	LAB:	CLS **3249 Fitzgerald Rd.** Rancho Cordova, CA 95742 (916)638-7301
PROJECT NAME:	QSE2-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #2		235 E. Main St, Suite 107 Northville, MI 48167

Field Conditions:

	pH / Temp (C or F)
SBE	8.01 / 60.1
191	7.69 / 61
RTJO	7.67 / 61.2

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	ANALYSIS REQUESTED: 625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
1/31/2024	4:00 PM	SBE.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:00 PM	SBE.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:00 PM	SBE.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:15 PM	191.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:15 PM	191.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:30 PM	RTJO.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:30 PM	RTJO.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	

SAMPLER: Brian Kawashima	DATE/TIME: 1/31/2024 2/1/24 1200	RECEIVED BY:	Please send results to marcia.j.christlieb@nasa.gov Brian.l.kawashima@nasa.gov Request Limited EDD
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	
RELINQUISHED BY:	DATE/TIME: 2/1/24 - 1600	RECEIVED AT LAB BY:	

2/1/24 1620 4.4 / 4.3

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

November 22, 2023

CLS Work Order #: 23K0465
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE1-2023/2024

Enclosed are the results of analyses for samples received by the laboratory on 11/08/23 17:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Ammonia as N	**0.060**	0.025	0.10	mg/L	1	2309548	11/10/23	11/10/23	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2309504	11/09/23	11/14/23	SM5210B	HT-1
Chemical Oxygen Demand	**17**	6.6	7.0	"	"	2309562	11/13/23	11/13/23	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2309614	11/14/23	11/14/23	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2309565	11/13/23	11/13/23	EPA 218.6	
Nitrate/Nitrite as N	**0.79**	0.0048	0.20	mg/L	2	2309584	11/13/23	11/13/23	SM4500-NO3 E	HT-NO3
Total Organic Carbon	**3.4**	0.54	1.0	"	1	2309561	11/13/23	11/13/23	SM5310B	
Total Phosphorus as P	ND	0.023	0.050	"	"	2309521	11/10/23	11/10/23	SM4500-P E	
Total Suspended Solids	**2.4**	2.2	2.2	"	"	2309543	11/10/23	11/14/23	SM2540D	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Ammonia as N	**0.27**	0.025	0.10	mg/L	1	2309548	11/10/23	11/10/23	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2309504	11/09/23	11/14/23	SM5210B	HT-1
Chemical Oxygen Demand	**21**	6.6	7.0	"	"	2309562	11/13/23	11/13/23	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2309614	11/14/23	11/14/23	EPA 1664B	
Hexavalent Chromium	**0.68**	0.29	1.0	µg/L	"	2309565	11/13/23	11/13/23	EPA 218.6	J
Nitrate/Nitrite as N	**1.4**	0.024	1.0	mg/L	10	2309584	11/13/23	11/13/23	SM4500-NO3 E	HT-NO3
Total Organic Carbon	ND	0.54	1.0	"	1	2309561	11/13/23	11/13/23	SM5310B	
Total Phosphorus as P	**0.035**	0.023	0.050	"	"	2309521	11/10/23	11/10/23	SM4500-P E	J
Total Suspended Solids	**3.3**	2.2	2.2	"	"	2309543	11/10/23	11/14/23	SM2540D	

11/22/23 14:01

BB&E, Inc c/o NASA Ames	Project: QSE1-2023/2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 23K0465**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2309503	11/09/23	11/09/23	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2309503	11/09/23	11/09/23	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Chromium	**0.0056**			mg/L	1	2309471	11/09/23	11/17/23	EPA 200.8	
Copper	**0.0050**	0.000090	0.010	"	"	"	"	11/14/23	"	J
Lead	**0.00025**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	**0.18**	0.15	0.20	µg/L	"	2309476	11/09/23	11/10/23	EPA 245.1	J
Zinc	**0.013**	0.00027	0.020	mg/L	"	2309471	11/09/23	11/14/23	EPA 200.8	J
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Chromium	**0.00097**			mg/L	1	2309471	11/09/23	11/17/23	EPA 200.8	
Copper	**0.0034**	0.000090	0.010	"	"	"	"	11/14/23	"	J
Lead	**0.000050**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	**0.20**	0.15	0.20	µg/L	"	2309476	11/09/23	11/20/23	EPA 245.1	J
Zinc	**0.0067**	0.00027	0.020	mg/L	"	2309471	11/09/23	11/14/23	EPA 200.8	J

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2309572	11/13/23	11/13/23	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*54 %*	*50-150*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2309572	11/13/23	11/13/23	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*82 %*	*50-150*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2309566	11/10/23	11/10/23	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Trichloroethene	ND	0.082	0.50	µg/L	1	2309566	"	11/10/23	EPA 624.1	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*114 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*106 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*93 %*		*72-125*		"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2309566	11/10/23	11/10/23	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
cis-1,2-Dichloroethene	ND	0.074	0.50	µg/L	1	2309566	"	11/10/23	EPA 624.1	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**1.9**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*119 %*		*65-135*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*97 %*		*73-125*	"	"	"	"	
Surrogate: Toluene-d8			*97 %*		*72-125*	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Gasoline	ND	10	50	µg/L	1	2309597	11/14/23	11/14/23	EPA 8015M	
JP-4	**3.3**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*94 %*	*65-135*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Gasoline	ND	10	50	µg/L	1	2309597	11/14/23	11/14/23	EPA 8015M	
JP-4	**5.2**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*87 %*	*65-135*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309504 - General											
Blank (2309504-BLK1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2309504-BS1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	190	2.0	3.0	mg/L	167		114	83-138			
LCS Dup (2309504-BSD1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	189	2.0	3.0	mg/L	167		113	83-138	0.8	21	
Batch 2309521 - General Preparation											
Blank (2309521-BLK1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2309521-BS1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.331	0.023	0.050	mg/L	0.300		110	80-120			
LCS Dup (2309521-BSD1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.349	0.023	0.050	mg/L	0.300		116	80-120	5	25	
Matrix Spike (2309521-MS1)			**Source: 23K0465-02**		Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.375	0.023	0.050	mg/L	0.300	0.0353	113	75-125			
Matrix Spike Dup (2309521-MSD1)			**Source: 23K0465-02**		Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.375	0.023	0.050	mg/L	0.300	0.0353	113	75-125	0	30	
Batch 2309543 - General Preparation											
Blank (2309543-BLK1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	ND	2.0	2.0	mg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309543 - General Preparation											
LCS (2309543-BS1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	97.3	2.0	2.0	mg/L	100		97	80-120			
LCS Dup (2309543-BSD1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	97.5	2.0	2.0	mg/L	100		98	80-120	0.2	200	
Duplicate (2309543-DUP1)			**Source: 23K0342-01**		Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	242	33	33	mg/L		243			0.4	20	
Batch 2309548 - General Preparation											
Blank (2309548-BLK1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	ND	0.025	0.10	mg/L							
LCS (2309548-BS1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	0.497	0.025	0.10	mg/L	0.500		99	80-120			
LCS Dup (2309548-BSD1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	0.520	0.025	0.10	mg/L	0.500		104	80-120	5	25	
Matrix Spike (2309548-MS1)			**Source: 23K0363-04**		Prepared & Analyzed: 11/10/23						
Ammonia as N	0.665	0.025	0.10	mg/L	0.500	0.195	94	75-125			
Matrix Spike Dup (2309548-MSD1)			**Source: 23K0363-04**		Prepared & Analyzed: 11/10/23						
Ammonia as N	0.661	0.025	0.10	mg/L	0.500	0.195	93	75-125	0.6	25	
Batch 2309561 - General Preparation											
Blank (2309561-BLK1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	ND	0.54	1.0	mg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309561 - General Preparation											
LCS (2309561-BS1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	11.2	0.54	1.0	mg/L	10.0		112	75-125			
LCS Dup (2309561-BSD1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	11.2	0.54	1.0	mg/L	10.0		112	75-125	0.3	25	
Matrix Spike (2309561-MS1)			**Source: 23K0331-04**		Prepared & Analyzed: 11/13/23						
Total Organic Carbon	23.9	0.54	1.0	mg/L	10.0	11.0	130	75-125			QM-7
Matrix Spike Dup (2309561-MSD1)			**Source: 23K0331-04**		Prepared & Analyzed: 11/13/23						
Total Organic Carbon	23.6	0.54	1.0	mg/L	10.0	11.0	126	75-125	1	25	QM-7
Batch 2309562 - General Preparation											
Blank (2309562-BLK1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2309562-BS1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	57.8	6.6	7.0	mg/L	50.0		116	80-120			
LCS Dup (2309562-BSD1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	57.8	6.6	7.0	mg/L	50.0		116	80-120	0	25	
Matrix Spike (2309562-MS1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	72.9	6.6	7.0	mg/L	50.0	17.0	112	75-125			
Matrix Spike Dup (2309562-MSD1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	68.6	6.6	7.0	mg/L	50.0	17.0	103	75-125	6	30	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309565 - General Prep											
Blank (2309565-BLK1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2309565-BS1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.1	0.29	1.0	µg/L	10.0		101	80-120			
LCS Dup (2309565-BSD1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	9.94	0.29	1.0	µg/L	10.0		99	80-120	2	20	
Matrix Spike (2309565-MS1)			**Source: 23K0441-01**		Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	1.43	90	80-120			
Matrix Spike Dup (2309565-MSD1)			**Source: 23K0441-01**		Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	1.43	89	80-120	0.4	20	
Batch 2309584 - General Preparation											
Blank (2309584-BLK1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	ND	0.0024	0.10	mg/L							
LCS (2309584-BS1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	0.242	0.0024	0.10	mg/L	0.250		97	80-120			
LCS Dup (2309584-BSD1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	0.251	0.0024	0.10	mg/L	0.250		100	80-120	4	20	
Matrix Spike (2309584-MS1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	1.15	0.0048	0.20	mg/L	0.250	0.789	144	75-125			QM-7

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309584 - General Preparation											
Matrix Spike Dup (2309584-MSD1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	1.10	0.0048	0.20	mg/L	0.250	0.789	124	75-125	4	25	
Batch 2309614 - Solvent Extract											
Blank (2309614-BLK1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2309614-BS1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	40.1	0.66	1.0	mg/L	40.0		100	78-114			
LCS Dup (2309614-BSD1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	38.5	0.66	1.0	mg/L	40.0		96	78-114	4	18	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309503 - EPA 3510B GCNV											
Blank (2309503-BLK1)					Prepared & Analyzed: 11/09/23						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0325*			*"*	*0.0250*		*130*	*65-135*			
LCS (2309503-BS1)					Prepared & Analyzed: 11/09/23						
Diesel	2.06	0.0021	0.050	mg/L	2.50		83	65-135			
Surrogate: o-Terphenyl	*0.0184*			*"*	*0.0250*		*74*	*65-135*			
LCS Dup (2309503-BSD1)					Prepared & Analyzed: 11/09/23						
Diesel	1.92	0.0021	0.050	mg/L	2.50		77	65-135	7	30	
Surrogate: o-Terphenyl	*0.0252*			*"*	*0.0250*		*101*	*65-135*			
Matrix Spike (2309503-MS1)				**Source: 23K0421-01**	Prepared & Analyzed: 11/09/23						
Diesel	2.11	0.0021	0.050	mg/L	2.50	ND	84	46-137			
Surrogate: o-Terphenyl	*0.0243*			*"*	*0.0250*		*97*	*65-135*			
Matrix Spike Dup (2309503-MSD1)				**Source: 23K0421-01**	Prepared & Analyzed: 11/09/23						
Diesel	2.11	0.0021	0.050	mg/L	2.50	ND	84	46-137	0.004	30	
Surrogate: o-Terphenyl	*0.0227*			*"*	*0.0250*		*91*	*65-135*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309471 - EPA 200 Series											
Blank (2309471-BLK1)					Prepared: 11/09/23 Analyzed: 11/17/23						
Chromium	0.000725			mg/L							
Copper	0.0000900	0.000090	0.010	"							J
Lead	0.0000300	0.000020	0.0050	"							J
Zinc	0.000590	0.00027	0.020	"							J
LCS (2309471-BS1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.111	0.00014	0.0010	mg/L	0.100		111	85-115			
Copper	0.0976	0.000090	0.010	"	0.100		98	85-115			
Lead	0.102	0.000020	0.0050	"	0.100		102	85-115			
Zinc	0.0934	0.00027	0.020	"	0.100		93	85-115			
Matrix Spike (2309471-MS1)			**Source: 23K0415-01**		Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.111	0.00014	0.0010	mg/L	0.100	0.0167	94	70-130			
Copper	0.104	0.000090	0.010	"	0.100	0.0147	89	70-130			
Lead	0.102	0.000020	0.0050	"	0.100	0.000230	102	70-130			
Zinc	0.591	0.00027	0.020	"	0.100	0.474	117	70-130			
Matrix Spike (2309471-MS2)			**Source: 23K0470-01**		Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.110	0.00014	0.0010	mg/L	0.100	0.0206	89	70-130			
Copper	0.0970	0.000090	0.010	"	0.100	0.00140	96	70-130			
Lead	0.103	0.000020	0.0050	"	0.100	0.0000300	103	70-130			
Zinc	0.181	0.00027	0.020	"	0.100	0.0973	84	70-130			
Batch 2309476 - EPA 7470A											
Blank (2309476-BLK1)					Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	ND	0.15	0.20	µg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309476 - EPA 7470A											
LCS (2309476-BS1)					Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.58	0.15	0.20	µg/L	5.00		92	85-115			
Matrix Spike (2309476-MS1)			**Source: 23K0419-02**		Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.57	0.15	0.20	µg/L	5.00	0.165	88	70-130			
Matrix Spike (2309476-MS2)			**Source: 23K0453-01**		Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.24	0.15	0.20	µg/L	5.00	0.151	82	70-130			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309572 - EPA 3510B GCNV											
Blank (2309572-BLK1)					Prepared & Analyzed: 11/13/23						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.236*			"	*0.250*		*94*	*50-150*			
LCS (2309572-BS1)					Prepared & Analyzed: 11/13/23						
Aroclor 1260	2.17	0.052	0.50	µg/L	2.50		87	31-138			
Surrogate: Decachlorobiphenyl	*0.253*			"	*0.250*		*101*	*50-150*			
LCS Dup (2309572-BSD1)					Prepared & Analyzed: 11/13/23						
Aroclor 1260	1.92	0.052	0.50	µg/L	2.50		77	31-138	12	30	
Surrogate: Decachlorobiphenyl	*0.251*			"	*0.250*		*100*	*50-150*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Blank (2309566-BLK1)					Prepared & Analyzed: 11/10/23						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Blank (2309566-BLK1)					Prepared & Analyzed: 11/10/23						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*10.7*			"	*10.0*		*107*	*65-135*			
Surrogate: Toluene-d8	*8.94*			"	*10.0*		*89*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.27*			"	*10.0*		*93*	*73-125*			
LCS (2309566-BS1)					Prepared & Analyzed: 11/10/23						
Benzene	19.5	0.096	0.30	µg/L	20.0		98	65-135			
Bromodichloromethane	18.8	0.058	0.50	"	20.0		94	65-135			
Bromoform	21.6	0.072	0.50	"	20.0		108	70-130			
Bromomethane	19.6	0.19	0.50	"	20.0		98	15-185			
Carbon tetrachloride	19.1	0.10	0.50	"	20.0		95	70-130			
Chlorobenzene	16.4	0.088	0.30	"	20.0		82	63-135			
Chloroethane	21.8	0.18	0.50	"	20.0		109	40-160			
Chloroform	18.0	0.079	0.50	"	20.0		90	70-135			
Chloromethane	22.6	0.19	0.50	"	20.0		113	1-472			
Dibromochloromethane	19.3	0.052	0.50	"	20.0		96	70-135			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0		96	65-135			
1,3-Dichlorobenzene	20.5	0.077	0.30	"	20.0		103	70-130			
1,4-Dichlorobenzene	19.9	0.26	0.30	"	20.0		100	65-135			
1,1-Dichloroethane	21.2	0.080	0.50	"	20.0		106	70-130			
1,2-Dichloroethane	19.9	0.060	0.50	"	20.0		99	50-150			
1,1-Dichloroethene	21.3	0.12	0.50	"	20.0		106	70-130			
trans-1,2-Dichloroethene	19.8	0.11	0.50	"	20.0		99	35-165			
1,2-Dichloropropane	18.5	0.066	0.50	"	20.0		92	5-210			
cis-1,3-Dichloropropene	17.6	0.058	0.50	"	20.0		88	25-175			
trans-1,3-Dichloropropene	17.1	0.12	0.50	"	20.0		86	50-150			
Ethylbenzene	22.8	0.098	0.30	"	20.0		114	60-140			
Methylene chloride	22.3	0.076	0.50	"	20.0		112	60-140			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
LCS (2309566-BS1)					Prepared & Analyzed: 11/10/23						
1,1,2,2-Tetrachloroethane	18.8	0.049	0.50	µg/L	20.0		94	60-140			
Tetrachloroethene	20.3	0.11	0.50	"	20.0		101	70-130			
Toluene	20.3	0.070	0.30	"	20.0		102	70-130			
1,1,1-Trichloroethane	19.2	0.060	0.50	"	20.0		96	70-130			
1,1,2-Trichloroethane	20.0	0.068	0.50	"	20.0		100	70-130			
Trichloroethene	17.7	0.082	0.50	"	20.0		89	65-135			
Trichlorofluoromethane	24.2	0.13	0.50	"	20.0		121	50-150			
Vinyl chloride	20.2	0.12	0.50	"	20.0		101	5-195			
Surrogate: 1,2-Dichloroethane-d4	*8.48*			*"*	*10.0*		*85*	*65-135*			
Surrogate: Toluene-d8	*10.2*			*"*	*10.0*		*102*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.14*			*"*	*10.0*		*81*	*73-125*			
LCS Dup (2309566-BSD1)					Prepared & Analyzed: 11/10/23						
Benzene	19.9	0.096	0.30	µg/L	20.0		99	65-135	2	30	
Bromodichloromethane	19.3	0.058	0.50	"	20.0		96	65-135	2	30	
Bromoform	21.2	0.072	0.50	"	20.0		106	70-130	2	30	
Bromomethane	17.4	0.19	0.50	"	20.0		87	15-185	12	30	
Carbon tetrachloride	19.7	0.10	0.50	"	20.0		99	70-130	3	30	
Chlorobenzene	16.4	0.088	0.30	"	20.0		82	63-135	0.4	30	
Chloroethane	16.3	0.18	0.50	"	20.0		82	40-160	29	30	
Chloroform	18.6	0.079	0.50	"	20.0		93	70-135	4	30	
Chloromethane	20.7	0.19	0.50	"	20.0		103	1-472	9	30	
Dibromochloromethane	20.5	0.052	0.50	"	20.0		102	70-135	6	30	
1,2-Dichlorobenzene	19.4	0.059	0.30	"	20.0		97	65-135	1	30	
1,3-Dichlorobenzene	20.3	0.077	0.30	"	20.0		101	70-130	1	30	
1,4-Dichlorobenzene	19.9	0.26	0.30	"	20.0		100	65-135	0.2	30	
1,1-Dichloroethane	21.4	0.080	0.50	"	20.0		107	70-130	0.8	30	
1,2-Dichloroethane	20.2	0.060	0.50	"	20.0		101	50-150	2	30	
1,1-Dichloroethene	21.9	0.12	0.50	"	20.0		110	70-130	3	30	
trans-1,2-Dichloroethene	20.2	0.11	0.50	"	20.0		101	35-165	2	30	
1,2-Dichloropropane	18.5	0.066	0.50	"	20.0		93	5-210	0.2	30	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
LCS Dup (2309566-BSD1)					Prepared & Analyzed: 11/10/23						
cis-1,3-Dichloropropene	18.4	0.058	0.50	µg/L	20.0		92	25-175	4	30	
trans-1,3-Dichloropropene	17.6	0.12	0.50	"	20.0		88	50-150	3	30	
Ethylbenzene	22.3	0.098	0.30	"	20.0		112	60-140	2	30	
Methylene chloride	22.2	0.076	0.50	"	20.0		111	60-140	0.4	30	
1,1,2,2-Tetrachloroethane	19.5	0.049	0.50	"	20.0		98	60-140	4	30	
Tetrachloroethene	20.8	0.11	0.50	"	20.0		104	70-130	2	30	
Toluene	20.1	0.070	0.30	"	20.0		101	70-130	1	30	
1,1,1-Trichloroethane	19.8	0.060	0.50	"	20.0		99	70-130	3	30	
1,1,2-Trichloroethane	20.9	0.068	0.50	"	20.0		104	70-130	4	30	
Trichloroethene	18.1	0.082	0.50	"	20.0		91	65-135	2	30	
Trichlorofluoromethane	20.6	0.13	0.50	"	20.0		103	50-150	16	30	
Vinyl chloride	22.4	0.12	0.50	"	20.0		112	5-195	10	30	
Surrogate: 1,2-Dichloroethane-d4	*8.44*			*"*	*10.0*		*84*	*65-135*			
Surrogate: Toluene-d8	*10.4*			*"*	*10.0*		*104*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.56*			*"*	*10.0*		*86*	*73-125*			
Matrix Spike (2309566-MS1)				**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23						
Benzene	21.7	0.096	0.30	µg/L	20.0	ND	108	37-151			
Bromodichloromethane	21.0	0.058	0.50	"	20.0	ND	105	35-155			
Bromoform	18.1	0.072	0.50	"	20.0	ND	91	45-169			
Bromomethane	15.8	0.19	0.50	"	20.0	ND	79	1-242			
Carbon tetrachloride	20.8	0.10	0.50	"	20.0	ND	104	70-140			
Chlorobenzene	16.4	0.088	0.30	"	20.0	ND	82	37-163			
Chloroethane	15.1	0.18	0.50	"	20.0	ND	76	14-230			
Chloroform	34.7	0.079	0.50	"	20.0	15.8	94	51-138			
Chloromethane	18.0	0.19	0.50	"	20.0	ND	90	1-273			
Dibromochloromethane	21.6	0.052	0.50	"	20.0	ND	108	53-149			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0	ND	96	18-190			
1,3-Dichlorobenzene	19.8	0.077	0.30	"	20.0	ND	99	59-156			
1,4-Dichlorobenzene	19.4	0.26	0.30	"	20.0	ND	97	18-190			
1,1-Dichloroethane	26.2	0.080	0.50	"	20.0	ND	131	59-155			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Matrix Spike (2309566-MS1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
1,2-Dichloroethane	24.5	0.060	0.50	µg/L	20.0	ND	123	49-155			
1,1-Dichloroethene	25.7	0.12	0.50	"	20.0	ND	129	1-234			
trans-1,2-Dichloroethene	24.0	0.11	0.50	"	20.0	ND	120	54-156			
1,2-Dichloropropane	20.0	0.066	0.50	"	20.0	ND	100	1-210			
cis-1,3-Dichloropropene	14.3	0.058	0.50	"	20.0	ND	72	1-227			
trans-1,3-Dichloropropene	15.8	0.12	0.50	"	20.0	ND	79	17-183			
Ethylbenzene	22.6	0.098	0.30	"	20.0	ND	113	37-162			
Methylene chloride	27.3	0.076	0.50	"	20.0	ND	137	1-221			
1,1,2,2-Tetrachloroethane	20.1	0.049	0.50	"	20.0	ND	101	46-148			
Tetrachloroethene	22.6	0.11	0.50	"	20.0	ND	113	64-148			
Toluene	22.8	0.070	0.30	"	20.0	ND	114	47-150			
1,1,1-Trichloroethane	24.2	0.060	0.50	"	20.0	ND	121	52-162			
1,1,2-Trichloroethane	24.3	0.068	0.50	"	20.0	ND	122	52-150			
Trichloroethene	19.7	0.082	0.50	"	20.0	ND	99	71-157			
Trichlorofluoromethane	30.5	0.13	0.50	"	20.0	ND	152	17-181			
Vinyl chloride	21.2	0.12	0.50	"	20.0	ND	106	10-251			
Surrogate: 1,2-Dichloroethane-d4	*11.0*			*"*	*10.0*		*110*	*65-135*			
Surrogate: Toluene-d8	*11.1*			*"*	*10.0*		*111*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.36*			*"*	*10.0*		*84*	*73-125*			
Matrix Spike Dup (2309566-MSD1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
Benzene	26.4	0.096	0.30	µg/L	20.0	ND	132	37-151	20	61	
Bromodichloromethane	24.8	0.058	0.50	"	20.0	ND	124	35-155	17	56	
Bromoform	15.7	0.072	0.50	"	20.0	ND	79	45-169	14	42	
Bromomethane	19.6	0.19	0.50	"	20.0	ND	98	1-242	22	61	
Carbon tetrachloride	23.4	0.10	0.50	"	20.0	ND	117	70-140	12	41	
Chlorobenzene	15.9	0.088	0.30	"	20.0	ND	80	37-163	3	53	
Chloroethane	16.5	0.18	0.50	"	20.0	ND	83	14-230	9	78	
Chloroform	33.3	0.079	0.50	"	20.0	15.8	87	51-138	4	54	
Chloromethane	21.7	0.19	0.50	"	20.0	ND	109	1-273	19	60	
Dibromochloromethane	25.1	0.052	0.50	"	20.0	ND	126	53-149	15	50	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Matrix Spike Dup (2309566-MSD1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
1,2-Dichlorobenzene	25.9	0.059	0.30	µg/L	20.0	ND	130	18-190	30	57	
1,3-Dichlorobenzene	27.3	0.077	0.30	"	20.0	ND	137	59-156	32	43	
1,4-Dichlorobenzene	26.6	0.26	0.30	"	20.0	ND	133	18-190	31	57	
1,1-Dichloroethane	25.5	0.080	0.50	"	20.0	ND	127	59-155	3	40	
1,2-Dichloroethane	21.4	0.060	0.50	"	20.0	ND	107	49-155	14	49	
1,1-Dichloroethene	26.6	0.12	0.50	"	20.0	ND	133	1-234	3	32	
trans-1,2-Dichloroethene	23.8	0.11	0.50	"	20.0	ND	119	54-156	0.9	45	
1,2-Dichloropropane	23.5	0.066	0.50	"	20.0	ND	117	1-210	16	55	
cis-1,3-Dichloropropene	16.9	0.058	0.50	"	20.0	ND	84	1-227	17	58	
trans-1,3-Dichloropropene	18.1	0.12	0.50	"	20.0	ND	90	17-183	13	86	
Ethylbenzene	22.5	0.098	0.30	"	20.0	ND	112	37-162	0.5	63	
Methylene chloride	25.6	0.076	0.50	"	20.0	ND	128	1-221	6	28	
1,1,2,2-Tetrachloroethane	25.8	0.049	0.50	"	20.0	ND	129	46-148	25	61	
Tetrachloroethene	28.5	0.11	0.50	"	20.0	ND	142	64-148	23	39	
Toluene	27.1	0.070	0.30	"	20.0	ND	135	47-150	17	41	
1,1,1-Trichloroethane	23.9	0.060	0.50	"	20.0	ND	119	52-162	1	36	
1,1,2-Trichloroethane	26.4	0.068	0.50	"	20.0	ND	132	52-150	8	46	
Trichloroethene	24.0	0.082	0.50	"	20.0	ND	120	71-157	19	48	
Trichlorofluoromethane	31.8	0.13	0.50	"	20.0	ND	159	17-181	4	84	
Vinyl chloride	25.9	0.12	0.50	"	20.0	ND	129	10-251	20	66	
Surrogate: 1,2-Dichloroethane-d4	*11.3*			*"*	*10.0*		*113*	*65-135*			
Surrogate: Toluene-d8	*10.5*			*"*	*10.0*		*105*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.22*			*"*	*10.0*		*82*	*73-125*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309597 - EPA 5030 Water GC											
Blank (2309597-BLK1)					Prepared & Analyzed: 11/14/23						
JP-4	6.76		50	µg/L							
Gasoline	16.7	10	50	"							J
Surrogate: o-Chlorotoluene (Gas)	*16.9*			*"*	*20.0*		*84*	*65-135*			
LCS (2309597-BS1)					Prepared & Analyzed: 11/14/23						
Gasoline	540	10	50	µg/L	500		108	70-130			
Surrogate: o-Chlorotoluene (Gas)	*18.9*			*"*	*20.0*		*95*	*65-135*			
LCS Dup (2309597-BSD1)					Prepared & Analyzed: 11/14/23						
Gasoline	536	10	50	µg/L	500		107	70-130	0.8	30	
Surrogate: o-Chlorotoluene (Gas)	*16.2*			*"*	*20.0*		*81*	*65-135*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames	Project: QSE1-2023/2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 23K0465**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
HT-NO3	The nitrite analysis was not performed. The nitrate plus nitrite result is reported as nitrate.
HT-1	The sample was received outside of the EPA recommended holding time.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

23K0465

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb	LAB:	CLS
	ERT/BB&E/NASA Ames		**3249 Fitzgerald Rd.**
	Bldg. T20G/Room 142. M/S T20G-4		Rancho Cordova, CA 95742
	Moffett Field, CA 94035-1000		(916)638-7301
	(650) 604-5360 marcia.j.christlieb@nasa.gov		
PROJECT NAME:	QSE1-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #1 2023		235 E. Main St, Suite 107
			Northville, MI 48167

Field Conditions:

	pH / Temp (C or F)
SBE	8.32 / 20.4
191	7.70 / 20.9
RTJO	

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
11/6/2023	11:20 AM	SBE.E4 2022/2023-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
11/6/2023	11:20 AM	SBE.E4 2022/2023-2	Water	1 - Amber 250 mL	Cold		X							5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-3	Water	1 - Poly Liter	Cold			X						5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
11/6/2023	11:20 AM	SBE.E4 2022/2023-7	Water	1 - Amber Liter	HCl							X		5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-8	Water	4 - Amber VOA	HCl								X	5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
11/6/2023	11:00 AM	191.E4 2022/2023-2	Water	1 - Amber 250 mL	Cold		X							5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-3	Water	1 - Poly Liter	Cold			X						5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
11/6/2023	11:00 AM	191.E4 2022/2023-7	Water	1 - Amber Liter	HCl							X		5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-8	Water	4 - Amber VOA	HCl								X	5 days	

SAMPLER: Brian Kawashima

RELINQUISHED BY: DATE/TIME: 11/6/2023 12:00PM

RELINQUISHED BY: DATE/TIME: 11/8/23 - 1715

RECEIVED BY: 11/8/23 - 1300

RECEIVED BY:

RECEIVED AT LAB BY: 11/8/23

2-4/2-3

Please send results to
marcia.j.christlieb@nasa.gov
Brian.l.kawashima@nasa.gov
Request Level II EDD

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 2311616

Report Created for: CLS Labs

3249 Fitzgerald Road
Rancho Cordova, CA 95742

Project Contact: CLS Sub email
Project P.O.:
Project: 23K0465

Project Received: 11/09/2023

Analytical Report reviewed & approved for release on 11/16/2023 by:

Yen Cao
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: CLS Labs **WorkOrder:** 2311616

Project: 23K0465

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CCV	Continuing Calibration Verification.
CCV REC (%)	% recovery of Continuing Calibration Verification.
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LCS2	Second LCS for the batch. Spike level is lower than that for the first LCS; applicable to method 1633.
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit [1]
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit [2]
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SNR	Surrogate is diluted out of the calibration range
SPK Val	Spike Value

[1] MDL is the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, 40CFR, Part 136, Appendix B, EPA 821-R-16-006, December 2016. Values are based upon our default extraction volume/amount and are subject to change.

[2] RL is the lowest level that can be reliably determined within specified limits of precision and accuracy during routine laboratory operating conditions. (The RL cannot be lower than the lowest calibration standard used in the initial calibration of the instrument and must be greater [illegible] L.) Values are based upon our default extraction volume/amount and are subject to change.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: CLS Labs **WorkOrder:** 2311616

Project: 23K0465

SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TNTC	“Too Numerous to Count;” greater than 250 colonies observed on the plate.
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

Analytical Qualifiers

J	Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.
S	Surrogate recovery outside accepted recovery limits.
c1	Surrogate recovery outside of the control limits due to the dilution of the sample.
c2	Surrogate recovery outside of the control limits due to suspected matrix interference.

Quality Control Qualifiers

F2	LCS/LCSD recovery and/or RPD/RSD is out of acceptance criteria.
F5	LCS/LCSD recovery is outside of acceptance limits; however, the data is acceptable based upon the TNI allowable marginal exceedances.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed
Acenaphthene	ND	0.0029	0.0050	1	11/10/2023 17:58
Acenaphthylene	ND	0.0018	0.0050	1	11/10/2023 17:58
Anthracene	ND	0.0020	0.0050	1	11/10/2023 17:58
Benzidine	ND	2.7	5.0	1	11/10/2023 17:58
Benzo (a) anthracene	ND	0.020	0.050	1	11/10/2023 17:58
Benzo (a) pyrene	ND	0.0050	0.0050	1	11/10/2023 17:58
Benzo (b) fluoranthene	ND	0.0053	0.0099	1	11/10/2023 17:58
Benzo (g,h,i) perylene	ND	0.0039	0.0099	1	11/10/2023 17:58
Benzo (k) fluoranthene	ND	0.0050	0.0099	1	11/10/2023 17:58
Benzyl Alcohol	ND	1.9	5.0	1	11/10/2023 17:58
Bis (2-chloroethoxy) Methane	ND	0.51	0.99	1	11/10/2023 17:58
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	1	11/10/2023 17:58
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.0099	1	11/10/2023 17:58
Bis (2-ethylhexyl) Adipate	ND	0.78	0.99	1	11/10/2023 17:58
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	1	11/10/2023 17:58
4-Bromophenyl Phenyl Ether	ND	0.29	0.99	1	11/10/2023 17:58
Butylbenzyl Phthalate	ND	0.080	0.25	1	11/10/2023 17:58
4-Chloroaniline	ND	0.0020	0.0050	1	11/10/2023 17:58
4-Chloro-3-methylphenol	ND	0.58	0.99	1	11/10/2023 17:58
2-Chloronaphthalene	ND	0.56	0.99	1	11/10/2023 17:58
2-Chlorophenol	ND	0.036	0.050	1	11/10/2023 17:58
4-Chlorophenyl Phenyl Ether	ND	0.49	0.99	1	11/10/2023 17:58
Carbazole	ND	0.42	0.99	1	11/10/2023 17:58
Chrysene	ND	0.0027	0.0050	1	11/10/2023 17:58
Dibenzo (a,h) anthracene	ND	0.0052	0.0099	1	11/10/2023 17:58
n-Decane	ND	0.68	0.99	1	11/10/2023 17:58
Dibenzofuran	ND	0.0014	0.0050	1	11/10/2023 17:58
Di-n-butyl Phthalate	ND	0.077	0.25	1	11/10/2023 17:58
1,2-Dichlorobenzene	ND	0.53	0.99	1	11/10/2023 17:58
1,3-Dichlorobenzene	ND	0.58	0.99	1	11/10/2023 17:58
1,4-Dichlorobenzene	ND	0.44	0.99	1	11/10/2023 17:58
3,3-Dichlorobenzidine	ND	0.0061	0.0099	1	11/10/2023 17:58
2,4-Dichlorophenol	ND	0.0056	0.0099	1	11/10/2023 17:58
Diethyl Phthalate	ND	0.021	0.050	1	11/10/2023 17:58
2,4-Dimethylphenol	ND	0.53	0.99	1	11/10/2023 17:58
Dimethyl Phthalate	ND	0.0058	0.0099	1	11/10/2023 17:58
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	1	11/10/2023 17:58

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed
2,4-Dinitrophenol	ND	0.67	0.99	1	11/10/2023 17:58
2,4-Dinitrotoluene	ND	0.027	0.050	1	11/10/2023 17:58
2,6-Dinitrotoluene	ND	0.030	0.050	1	11/10/2023 17:58
Di-n-octyl Phthalate	ND	1.2	2.5	1	11/10/2023 17:58
1,2-Diphenylhydrazine	ND	0.42	0.99	1	11/10/2023 17:58
Fluoranthene	ND	0.0038	0.0099	1	11/10/2023 17:58
Fluorene	ND	0.0018	0.0099	1	11/10/2023 17:58
Hexachlorobenzene	ND	0.0017	0.0050	1	11/10/2023 17:58
Hexachlorobutadiene	ND	0.0011	0.0050	1	11/10/2023 17:58
Hexachlorocyclopentadiene	ND	2.3	5.0	1	11/10/2023 17:58
Hexachloroethane	ND	0.0034	0.0099	1	11/10/2023 17:58
Indeno (1,2,3-cd) pyrene	ND	0.0069	0.0099	1	11/10/2023 17:58
Isophorone	ND	0.45	0.99	1	11/10/2023 17:58
2-Methylnaphthalene	ND	0.0022	0.0050	1	11/10/2023 17:58
2-Methylphenol (o-Cresol)	ND	0.62	0.99	1	11/10/2023 17:58
3 & 4-Methylphenol (m,p-Cresol)	ND	0.69	0.99	1	11/10/2023 17:58
Naphthalene	ND	0.0062	0.0099	1	11/10/2023 17:58
2-Nitroaniline	ND	3.0	5.0	1	11/10/2023 17:58
3-Nitroaniline	ND	3.9	5.0	1	11/10/2023 17:58
4-Nitroaniline	ND	2.4	5.0	1	11/10/2023 17:58
Nitrobenzene	ND	0.60	0.99	1	11/10/2023 17:58
2-Nitrophenol	ND	3.0	5.0	1	11/10/2023 17:58
4-Nitrophenol	ND	3.6	5.0	1	11/10/2023 17:58
N-Nitrosodimethylamine	ND	3.6	5.0	1	11/10/2023 17:58
N-Nitrosodiphenylamine	ND	0.36	0.99	1	11/10/2023 17:58
N-Nitrosodi-n-propylamine	ND	0.59	0.99	1	11/10/2023 17:58
n-Octadecane	ND	0.54	0.99	1	11/10/2023 17:58
Pentachlorophenol	ND	0.16	0.25	1	11/10/2023 17:58
Phenanthrene	ND	0.0036	0.0050	1	11/10/2023 17:58
Phenol	**0.048**	0.019	0.040	1	11/10/2023 17:58
Pyrene	ND	0.0028	0.0050	1	11/10/2023 17:58
Pyridine	ND	0.88	0.99	1	11/10/2023 17:58
1,2,4-Trichlorobenzene	ND	0.52	0.99	1	11/10/2023 17:58
2,4,5-Trichlorophenol	ND	0.0063	0.0099	1	11/10/2023 17:58
2,4,6-Trichlorophenol	ND	0.0053	0.0099	1	11/10/2023 17:58

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed

Surrogates	REC (%)	Qualifiers	Limits	
2-Fluorophenol	37		20-103	11/10/2023 17:58
Phenol-d5	29		20-120	11/10/2023 17:58
Nitrobenzene-d5	59	S	61-130	11/10/2023 17:58
2-Fluorobiphenyl	57	S	63-115	11/10/2023 17:58
2,4,6-Tribromophenol	72		48-149	11/10/2023 17:58
4-Terphenyl-d14	79		32-113	11/10/2023 17:58

Analyst(s): MV Analytical Comments: c2

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	2311616-002A	Water	11/06/2023 11:00	GC17 11102324.D	282074

Analytes	Result	MDL	RL	DF	Date Analyzed
Acenaphthene	ND	0.0060	0.010	2	11/10/2023 16:26
Acenaphthylene	ND	0.0037	0.010	2	11/10/2023 16:26
Anthracene	ND	0.0041	0.010	2	11/10/2023 16:26
Benzidine	ND	5.6	10	2	11/10/2023 16:26
Benzo (a) anthracene	ND	0.041	0.10	2	11/10/2023 16:26
Benzo (a) pyrene	ND	0.010	0.010	2	11/10/2023 16:26
Benzo (b) fluoranthene	ND	0.011	0.021	2	11/10/2023 16:26
Benzo (g,h,i) perylene	ND	0.0081	0.021	2	11/10/2023 16:26
Benzo (k) fluoranthene	ND	0.010	0.021	2	11/10/2023 16:26
Benzyl Alcohol	ND	3.9	10	2	11/10/2023 16:26
Bis (2-chloroethoxy) Methane	ND	1.1	2.1	2	11/10/2023 16:26
Bis (2-chloroethyl) Ether	ND	0.010	0.010	2	11/10/2023 16:26
Bis (2-chloroisopropyl) Ether	ND	0.010	0.021	2	11/10/2023 16:26
Bis (2-ethylhexyl) Adipate	ND	1.6	2.1	2	11/10/2023 16:26
Bis (2-ethylhexyl) Phthalate	ND	0.27	0.52	2	11/10/2023 16:26
4-Bromophenyl Phenyl Ether	ND	0.60	2.1	2	11/10/2023 16:26
Butylbenzyl Phthalate	ND	0.17	0.52	2	11/10/2023 16:26
4-Chloroaniline	ND	0.0041	0.010	2	11/10/2023 16:26
4-Chloro-3-methylphenol	ND	1.2	2.1	2	11/10/2023 16:26
2-Chloronaphthalene	ND	1.2	2.1	2	11/10/2023 16:26
2-Chlorophenol	ND	0.075	0.10	2	11/10/2023 16:26
4-Chlorophenyl Phenyl Ether	ND	1.0	2.1	2	11/10/2023 16:26
Carbazole	ND	0.87	2.1	2	11/10/2023 16:26
Chrysene	ND	0.0056	0.010	2	11/10/2023 16:26
Dibenzo (a,h) anthracene	ND	0.011	0.021	2	11/10/2023 16:26
n-Decane	ND	1.4	2.1	2	11/10/2023 16:26
Dibenzofuran	ND	0.0029	0.010	2	11/10/2023 16:26
Di-n-butyl Phthalate	ND	0.16	0.52	2	11/10/2023 16:26
1,2-Dichlorobenzene	ND	1.1	2.1	2	11/10/2023 16:26
1,3-Dichlorobenzene	ND	1.2	2.1	2	11/10/2023 16:26
1,4-Dichlorobenzene	ND	0.91	2.1	2	11/10/2023 16:26
3,3-Dichlorobenzidine	ND	0.013	0.021	2	11/10/2023 16:26
2,4-Dichlorophenol	ND	0.012	0.021	2	11/10/2023 16:26
Diethyl Phthalate	ND	0.043	0.10	2	11/10/2023 16:26
2,4-Dimethylphenol	ND	1.1	2.1	2	11/10/2023 16:26
Dimethyl Phthalate	ND	0.012	0.021	2	11/10/2023 16:26
4,6-Dinitro-2-methylphenol	ND	7.7	10	2	11/10/2023 16:26

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	2311616-002A	Water	11/06/2023 11:00	GC17 11102324.D	282074

Analytes	Result	MDL	RL	DF	Date Analyzed
2,4-Dinitrophenol	ND	1.4	2.1	2	11/10/2023 16:26
2,4-Dinitrotoluene	ND	0.056	0.10	2	11/10/2023 16:26
2,6-Dinitrotoluene	ND	0.062	0.10	2	11/10/2023 16:26
Di-n-octyl Phthalate	ND	2.5	5.2	2	11/10/2023 16:26
1,2-Diphenylhydrazine	ND	0.87	2.1	2	11/10/2023 16:26
Fluoranthene	ND	0.0079	0.021	2	11/10/2023 16:26
Fluorene	ND	0.0037	0.021	2	11/10/2023 16:26
Hexachlorobenzene	ND	0.0035	0.010	2	11/10/2023 16:26
Hexachlorobutadiene	ND	0.0023	0.010	2	11/10/2023 16:26
Hexachlorocyclopentadiene	ND	4.8	10	2	11/10/2023 16:26
Hexachloroethane	ND	0.0070	0.021	2	11/10/2023 16:26
Indeno (1,2,3-cd) pyrene	ND	0.014	0.021	2	11/10/2023 16:26
Isophorone	ND	0.93	2.1	2	11/10/2023 16:26
2-Methylnaphthalene	ND	0.0046	0.010	2	11/10/2023 16:26
2-Methylphenol (o-Cresol)	ND	1.3	2.1	2	11/10/2023 16:26
3 & 4-Methylphenol (m,p-Cresol)	ND	1.4	2.1	2	11/10/2023 16:26
Naphthalene	**0.034**	0.013	0.021	2	11/10/2023 16:26
2-Nitroaniline	ND	6.2	10	2	11/10/2023 16:26
3-Nitroaniline	ND	8.1	10	2	11/10/2023 16:26
4-Nitroaniline	ND	5.0	10	2	11/10/2023 16:26
Nitrobenzene	ND	1.3	2.1	2	11/10/2023 16:26
2-Nitrophenol	ND	6.2	10	2	11/10/2023 16:26
4-Nitrophenol	ND	7.5	10	2	11/10/2023 16:26
N-Nitrosodimethylamine	ND	7.5	10	2	11/10/2023 16:26
N-Nitrosodiphenylamine	ND	0.75	2.1	2	11/10/2023 16:26
N-Nitrosodi-n-propylamine	ND	1.2	2.1	2	11/10/2023 16:26
n-Octadecane	ND	1.1	2.1	2	11/10/2023 16:26
Pentachlorophenol	ND	0.33	0.52	2	11/10/2023 16:26
Phenanthrene	ND	0.0075	0.010	2	11/10/2023 16:26
Phenol	ND	0.039	0.083	2	11/10/2023 16:26
Pyrene	ND	0.0058	0.010	2	11/10/2023 16:26
Pyridine	ND	1.8	2.1	2	11/10/2023 16:26
1,2,4-Trichlorobenzene	ND	1.1	2.1	2	11/10/2023 16:26
2,4,5-Trichlorophenol	ND	0.013	0.021	2	11/10/2023 16:26
2,4,6-Trichlorophenol	ND	0.011	0.021	2	11/10/2023 16:26

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	**2311616-002A**	**Water**	**11/06/2023 11:00**	**GC17 11102324.D**	**282074**

Analytes	Result	MDL	RL	DF	Date Analyzed
Surrogates	**REC (%)**	**Qualifiers**	**Limits**		
2-Fluorophenol	27		20-103		11/10/2023 16:26
Phenol-d5	20		20-120		11/10/2023 16:26
Nitrobenzene-d5	54	S	61-130		11/10/2023 16:26
2-Fluorobiphenyl	61	S	63-115		11/10/2023 16:26
2,4,6-Tribromophenol	54		48-149		11/10/2023 16:26
4-Terphenyl-d14	70		32-113		11/10/2023 16:26

Analyst(s): AK Analytical Comments: c1

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acenaphthene	ND	0.0029	0.0050	-	-	-
Acenaphthylene	ND	0.0018	0.0050	-	-	-
Anthracene	ND	0.0020	0.0050	-	-	-
Benzidine	ND	2.7	5.0	-	-	-
Benzo (a) anthracene	ND	0.020	0.050	-	-	-
Benzo (a) pyrene	ND	0.0050	0.0050	-	-	-
Benzo (b) fluoranthene	ND	0.0053	0.010	-	-	-
Benzo (g,h,i) perylene	ND	0.0039	0.010	-	-	-
Benzo (k) fluoranthene	ND	0.0050	0.010	-	-	-
Benzyl Alcohol	ND	1.9	5.0	-	-	-
Bis (2-chloroethoxy) Methane	ND	0.51	1.0	-	-	-
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	-	-	-
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.010	-	-	-
Bis (2-ethylhexyl) Adipate	ND	0.79	1.0	-	-	-
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	-	-	-
4-Bromophenyl Phenyl Ether	ND	0.29	1.0	-	-	-
Butylbenzyl Phthalate	ND	0.081	0.25	-	-	-
4-Chloroaniline	ND	0.0020	0.0050	-	-	-
4-Chloro-3-methylphenol	ND	0.59	1.0	-	-	-
2-Chloronaphthalene	ND	0.56	1.0	-	-	-
2-Chlorophenol	ND	0.036	0.050	-	-	-
4-Chlorophenyl Phenyl Ether	ND	0.49	1.0	-	-	-
Carbazole	ND	0.42	1.0	-	-	-
Chrysene	ND	0.0027	0.0050	-	-	-
Dibenzo (a,h) anthracene	ND	0.0052	0.010	-	-	-
n-Decane	ND	0.69	1.0	-	-	-
Dibenzofuran	ND	0.0014	0.0050	-	-	-
Di-n-butyl Phthalate	ND	0.078	0.25	-	-	-
1,2-Dichlorobenzene	ND	0.53	1.0	-	-	-
1,3-Dichlorobenzene	ND	0.59	1.0	-	-	-
1,4-Dichlorobenzene	ND	0.44	1.0	-	-	-
3,3-Dichlorobenzidine	ND	0.0062	0.010	-	-	-
2,4-Dichlorophenol	ND	0.0056	0.010	-	-	-
Diethyl Phthalate	ND	0.021	0.050	-	-	-
2,4-Dimethylphenol	ND	0.53	1.0	-	-	-
Dimethyl Phthalate	ND	0.0059	0.010	-	-	-
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	-	-	-
2,4-Dinitrophenol	ND	0.68	1.0	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
2,4-Dinitrotoluene	ND	0.027	0.050	-	-	-
2,6-Dinitrotoluene	ND	0.030	0.050	-	-	-
Di-n-octyl Phthalate	ND	1.2	2.5	-	-	-
1,2-Diphenylhydrazine	ND	0.42	1.0	-	-	-
Fluoranthene	ND	0.0038	0.010	-	-	-
Fluorene	ND	0.0018	0.010	-	-	-
Hexachlorobenzene	ND	0.0017	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0011	0.0050	-	-	-
Hexachlorocyclopentadiene	ND	2.3	5.0	-	-	-
Hexachloroethane	ND	0.0034	0.010	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0070	0.010	-	-	-
1-Methylnaphthalene	ND	0.0021	0.0050	-	-	-
Isophorone	ND	0.45	1.0	-	-	-
2-Methylnaphthalene	ND	0.0022	0.0050	-	-	-
2-Methylphenol (o-Cresol)	ND	0.63	1.0	-	-	-
3 & 4-Methylphenol (m,p-Cresol)	ND	0.70	1.0	-	-	-
Naphthalene	ND	0.0063	0.010	-	-	-
2-Nitroaniline	ND	3.0	5.0	-	-	-
3-Nitroaniline	ND	3.9	5.0	-	-	-
4-Nitroaniline	ND	2.4	5.0	-	-	-
Nitrobenzene	ND	0.61	1.0	-	-	-
2-Nitrophenol	ND	3.0	5.0	-	-	-
4-Nitrophenol	ND	3.6	5.0	-	-	-
N-Nitrosodimethylamine	ND	3.6	5.0	-	-	-
N-Nitrosodiphenylamine	ND	0.36	1.0	-	-	-
N-Nitrosodi-n-propylamine	ND	0.60	1.0	-	-	-
n-Octadecane	ND	0.54	1.0	-	-	-
Pentachlorophenol	ND	0.16	0.25	-	-	-
Phenanthrene	ND	0.0036	0.0050	-	-	-
Phenol	ND	0.019	0.040	-	-	-
Pyrene	ND	0.0028	0.0050	-	-	-
Pyridine	ND	0.89	1.0	-	-	-
1,2,4-Trichlorobenzene	ND	0.52	1.0	-	-	-
2,4,5-Trichlorophenol	ND	0.0064	0.010	-	-	-
2,4,6-Trichlorophenol	ND	0.0053	0.010	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery						
2-Fluorophenol	4.2			5	84	20-103
Phenol-d5	4.2			5	83	20-120
Nitrobenzene-d5	3.4			5	68	61-130
2-Fluorobiphenyl	4.5			5	91	63-115
2,4,6-Tribromophenol	3.3			5	65	48-149
4-Terphenyl-d14	4.4			5	89	32-113

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acenaphthene	0.21	0.21	0.25	84	83	60-132	1.72	25
Acenaphthylene	0.18	0.18	0.25	71	71	54-126	0.550	25
Anthracene	0.19	0.18	0.25	76	73	60-130	4.00	25
Benzidine	6.0	7.8	25	24	31	20-130	27.1,F2	25
Benzo (a) anthracene	0.22	0.22	0.25	87	89	60-130	1.63	25
Benzo (a) pyrene	0.21	0.22	0.25	86	87	60-130	1.72	25
Benzo (b) fluoranthene	0.20	0.21	0.25	81	84	60-130	2.69	25
Benzo (g,h,i) perylene	0.23	0.22	0.25	92	90	50-130	1.89	25
Benzo (k) fluoranthene	0.23	0.23	0.25	94	92	60-130	2.43	25
Benzyl Alcohol	20	20	25	81	79	60-130	3.18	25
Bis (2-chloroethoxy) Methane	4.4	4.2	5	89	84	65-130	5.84	25
Bis (2-chloroethyl) Ether	0.19	0.19	0.25	77	75	60-130	3.48	25
Bis (2-chloroisopropyl) Ether	0.20	0.20	0.25	81	79	63-139	2.83	25
Bis (2-ethylhexyl) Adipate	4.2	4.6	5	84	92	60-130	8.60	25
Bis (2-ethylhexyl) Phthalate	0.19	0.21	0.25	78	85	60-130	8.90	25
4-Bromophenyl Phenyl Ether	4.1	4.0	5	83	80	65-120	3.69	25
Butylbenzyl Phthalate	0.20	0.22	0.25	82	87	60-140	6.82	25
4-Chloroaniline	0.17	0.17	0.25	69	68	60-130	1.52	25
4-Chloro-3-methylphenol	4.2	4.1	5	84	83	65-130	1.58	25
2-Chloronaphthalene	4.2	4.1	5	85	82	65-120	2.53	25
2-Chlorophenol	0.18	0.18	0.25	71	71	60-130	0.344	25
4-Chlorophenyl Phenyl Ether	4.2	4.1	5	84	82	65-130	3.15	25
Carbazole	4.2	4.2	5	84	83	70-130	1.26	25
Chrysene	0.21	0.21	0.25	84	84	70-130	0.320	25
Dibenzo (a,h) anthracene	0.24	0.23	0.25	95	90	50-130	4.72	25
n-Decane	3.9	3.7	5	79	73	30-130	7.28	25
Dibenzofuran	0.21	0.21	0.25	85	83	65-130	2.49	25
Di-n-butyl Phthalate	0.20	0.21	0.25	80	83	60-130	4.13	25
1,2-Dichlorobenzene	4.4	4.2	5	88	84	60-130	4.73	25
1,3-Dichlorobenzene	4.1	3.9	5	81	78	60-130	3.71	25
1,4-Dichlorobenzene	4.2	4.0	5	84	81	60-130	3.82	25
3,3-Dichlorobenzidine	0.19	0.20	0.25	76	79	60-130	4.75	25
2,4-Dichlorophenol	0.21	0.20	0.25	85	80	53-122	5.82	25
Diethyl Phthalate	0.20	0.21	0.25	81	83	65-130	3.12	25
2,4-Dimethylphenol	4.5	4.1	5	90	81	60-130	9.74	25
Dimethyl Phthalate	0.20	0.20	0.25	78	79	60-130	1.27	25
4,6-Dinitro-2-methylphenol	16	17	25	64	70	60-130	8.93	25
2,4-Dinitrophenol	3.7	4.3	5	73	86	50-130	16.1	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,4-Dinitrotoluene	0.17	0.19	0.25	69,F5	75	70-130	8.20	25
2,6-Dinitrotoluene	0.16	0.16	0.25	63,F5	66,F5	68-137	4.58	25
Di-n-octyl Phthalate	4.0	4.1	5	79	83	70-130	4.55	25
1,2-Diphenylhydrazine	4.2	4.2	5	85	83	65-130	2.10	25
Fluoranthene	0.21	0.21	0.25	82	82	65-130	0.156	25
Fluorene	0.21	0.20	0.25	82	79	70-120	3.93	25
Hexachlorobenzene	0.21	0.20	0.25	83	79	60-130	4.99	25
Hexachlorobutadiene	0.20	0.18	0.25	79	73	68-130	7.94	25
Hexachlorocyclopentadiene	20	20	25	81	80	50-130	1.92	25
Hexachloroethane	0.19	0.19	0.25	77	74	55-120	3.95	25
Indeno (1,2,3-cd) pyrene	0.22	0.22	0.25	89	87	50-130	2.62	25
1-Methylnaphthalene	0.21	0.20	0.25	86	82	65-130	4.71	25
Isophorone	4.2	4.1	5	85	83	52-130	2.27	25
2-Methylnaphthalene	0.21	0.19	0.25	82	78	60-130	5.71	25
2-Methylphenol (o-Cresol)	4.4	4.2	5	89	83	60-130	6.15	25
3 & 4-Methylphenol (m,p-Cresol)	4.2	4.2	5	84	84	60-130	0.672	25
Naphthalene	0.21	0.20	0.25	85	79	70-130	6.89	25
2-Nitroaniline	20	21	25	81	84	65-130	3.72	25
3-Nitroaniline	22	23	25	88	92	70-140	5.29	25
4-Nitroaniline	21	22	25	86	88	70-130	2.17	25
Nitrobenzene	4.0	3.9	5	80	79	60-130	1.16	25
2-Nitrophenol	19	20	25	77	78	70-130	1.10	25
4-Nitrophenol	23	23	25	91	90	30-130	0.531	25
N-Nitrosodimethylamine	20	19	25	79	74	30-130	5.81	25
N-Nitrosodiphenylamine	4.1	4.1	5	83	81	65-130	2.17	25
N-Nitrosodi-n-propylamine	4.1	4.1	5	82	82	59-130	0.672	25
n-Octadecane	4.3	4.2	5	87	84	60-130	3.07	25
Pentachlorophenol	0.62	0.66	1.25	49,F5	53,F5	60-130	6.46	25
Phenanthrene	0.21	0.21	0.25	86	84	65-120	1.45	25
Phenol	0.75	0.73	1	75	73	48-120	2.45	25
Pyrene	0.21	0.21	0.25	82	84	70-120	1.50	25
Pyridine	2.9	2.9	5	57	57	30-130	0.157	25
1,2,4-Trichlorobenzene	4.5	4.1	5	89	83	57-130	7.35	25
2,4,5-Trichlorophenol	0.19	0.19	0.25	76	75	65-130	1.73	25
2,4,6-Trichlorophenol	0.18	0.18	0.25	70	72	69-130	2.10	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
2-Fluorophenol	4.1	3.8	5	82	77	20-103	6.42	25
Phenol-d5	4.1	4.0	5	83	80	20-120	3.96	25
Nitrobenzene-d5	3.9	3.8	5	77	76	61-130	1.39	25
2-Fluorobiphenyl	4.2	3.9	5	83	79	63-115	5.22	25
2,4,6-Tribromophenol	4.5	4.2	5	89	84	48-149	5.27	25
4-Terphenyl-d14	4.4	4.4	5	89	87	32-113	1.19	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acenaphthene	ND	0.0029	0.0050	-	-	-
Acenaphthylene	ND	0.0018	0.0050	-	-	-
Acetochlor	ND	0.45	1.0	-	-	-
Anthracene	ND	0.0020	0.0050	-	-	-
Benzidine	ND	2.7	5.0	-	-	-
Benzo (a) anthracene	ND	0.020	0.050	-	-	-
Benzo (a) pyrene	ND	0.0050	0.0050	-	-	-
Benzo (b) fluoranthene	ND	0.0053	0.010	-	-	-
Benzo (g,h,i) perylene	ND	0.0039	0.010	-	-	-
Benzo (k) fluoranthene	ND	0.0050	0.010	-	-	-
Benzoic Acid	ND	1.6	5.0	-	-	-
Benzyl Alcohol	ND	1.9	5.0	-	-	-
1,1-Biphenyl	ND	0.019	0.050	-	-	-
Bis (2-chloroethoxy) Methane	ND	0.51	1.0	-	-	-
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	-	-	-
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.010	-	-	-
Bis (2-ethylhexyl) Adipate	ND	0.79	1.0	-	-	-
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	-	-	-
4-Bromophenyl Phenyl Ether	ND	0.29	1.0	-	-	-
Butylbenzyl Phthalate	ND	0.081	0.25	-	-	-
Carbazole	ND	0.42	1.0	-	-	-
4-Chloro-3-methylphenol	ND	0.59	1.0	-	-	-
4-Chloroaniline	ND	0.0020	0.0050	-	-	-
2-Chloronaphthalene	ND	0.56	1.0	-	-	-
2-Chlorophenol	ND	0.036	0.050	-	-	-
4-Chlorophenyl Phenyl Ether	ND	0.49	1.0	-	-	-
Chrysene	ND	0.0027	0.0050	-	-	-
Dibenzo (a,h) anthracene	ND	0.0052	0.010	-	-	-
Dibenzofuran	ND	0.0014	0.0050	-	-	-
Di-n-butyl Phthalate	ND	0.078	0.25	-	-	-
1,2-Dichlorobenzene	ND	0.53	1.0	-	-	-
1,3-Dichlorobenzene	ND	0.59	1.0	-	-	-
1,4-Dichlorobenzene	ND	0.44	1.0	-	-	-
3,3-Dichlorobenzidine	ND	0.0062	0.010	-	-	-
2,4-Dichlorophenol	ND	0.0056	0.010	-	-	-
Diethyl Phthalate	ND	0.021	0.050	-	-	-
2,4-Dimethylphenol	ND	0.53	1.0	-	-	-
Dimethyl Phthalate	ND	0.0059	0.010	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	-	-	-
2,4-Dinitrophenol	ND	0.68	1.0	-	-	-
2,4-Dinitrotoluene	ND	0.027	0.050	-	-	-
2,6-Dichlorophenol	ND	0.034	0.050	-	-	-
2,6-Dinitrotoluene	ND	0.030	0.050	-	-	-
Di-n-octyl Phthalate	ND	1.2	2.5	-	-	-
1,2-Diphenylhydrazine	ND	0.42	1.0	-	-	-
Fluoranthene	ND	0.0038	0.010	-	-	-
Fluorene	ND	0.0018	0.010	-	-	-
Hexachlorobenzene	ND	0.0017	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0011	0.0050	-	-	-
Hexachlorocyclopentadiene	ND	2.3	5.0	-	-	-
Hexachloroethane	ND	0.0034	0.010	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0070	0.010	-	-	-
Isophorone	ND	0.45	1.0	-	-	-
1-Methylnaphthalene	ND	0.0021	0.0050	-	-	-
2-Methylnaphthalene	ND	0.0022	0.0050	-	-	-
2-Methylphenol (o-Cresol)	ND	0.63	1.0	-	-	-
3 & 4-Methylphenol (m,p-Cresol)	ND	0.70	1.0	-	-	-
Naphthalene	ND	0.0063	0.010	-	-	-
n-Decane	ND	0.69	1.0	-	-	-
2-Nitroaniline	ND	3.0	5.0	-	-	-
3-Nitroaniline	ND	3.9	5.0	-	-	-
4-Nitroaniline	ND	2.4	5.0	-	-	-
Nitrobenzene	ND	0.61	1.0	-	-	-
2-Nitrophenol	ND	3.0	5.0	-	-	-
4-Nitrophenol	ND	3.6	5.0	-	-	-
N-Nitrosodimethylamine	ND	3.6	5.0	-	-	-
N-Nitrosodi-n-propylamine	ND	0.60	1.0	-	-	-
N-Nitrosodiphenylamine	ND	0.36	1.0	-	-	-
n-Octadecane	ND	0.54	1.0	-	-	-
Pentachlorophenol	ND	0.16	0.25	-	-	-
Phenanthrene	ND	0.0036	0.0050	-	-	-
Phenol	ND	0.019	0.040	-	-	-
Pyrene	0.0036,J	0.0028	0.0050	-	-	-
Pyridine	ND	0.89	1.0	-	-	-
2,3,4,6-Tetrachlorophenol	ND	0.78	1.0	-	-	-
1,2,4-Trichlorobenzene	ND	0.52	1.0	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
2,4,5-Trichlorophenol	ND	0.0064	0.010	-	-	-
2,4,6-Trichlorophenol	ND	0.0053	0.010	-	-	-
Surrogate Recovery						
2-Fluorophenol	4.3			5	86	20-103
Phenol-d5	4.1			5	82	20-120
Nitrobenzene-d5	3.9			5	78	61-130
2-Fluorobiphenyl	4.0			5	80	63-115
2,4,6-Tribromophenol	3.4			5	68	48-149
4-Terphenyl-d14	4.3			5	86	32-113

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acenaphthene	0.19	0.19	0.25	75	76	60-132	1.54	25
Acenaphthylene	0.18	0.19	0.25	74	76	54-126	2.92	25
Anthracene	0.18	0.19	0.25	74	76	60-130	3.02	25
Benzidine	5.0	4.0	25	20	16,F5	20-130	22.6	25
Benzo (a) anthracene	0.21	0.22	0.25	84	87	60-130	3.86	25
Benzo (a) pyrene	0.20	0.21	0.25	79	84	60-130	6.18	25
Benzo (b) fluoranthene	0.21	0.21	0.25	83	85	60-130	1.87	25
Benzo (g,h,i) perylene	0.19	0.20	0.25	76	80	50-130	5.64	25
Benzo (k) fluoranthene	0.22	0.23	0.25	88	91	60-130	3.11	25
Benzyl Alcohol	18	18	25	72	73	60-130	0.177	25
Bis (2-chloroethoxy) Methane	3.8	3.9	5	76	78	65-130	2.08	25
Bis (2-chloroethyl) Ether	0.18	0.18	0.25	71	71	60-130	0.439	25
Bis (2-chloroisopropyl) Ether	0.17	0.19	0.25	66	76	63-139	13.9	25
Bis (2-ethylhexyl) Adipate	4.1	4.4	5	82	88	60-130	6.19	25
Bis (2-ethylhexyl) Phthalate	0.18	0.19	0.25	72	74	60-130	3.10	25
4-Bromophenyl Phenyl Ether	4.4	4.4	5	87	89	65-120	1.93	25
Butylbenzyl Phthalate	0.19	0.20	0.25	77	80	60-140	3.68	25
Carbazole	4.1	4.4	5	81	87	70-130	6.76	25
4-Chloro-3-methylphenol	4.2	4.3	5	84	86	65-130	2.58	25
4-Chloroaniline	0.18	0.19	0.25	73	77	60-130	5.74	25
2-Chloronaphthalene	3.9	4.0	5	79	80	65-120	2.02	25
2-Chlorophenol	0.18	0.18	0.25	71	74	60-130	3.81	25
4-Chlorophenyl Phenyl Ether	4.2	4.3	5	83	86	65-130	3.27	25
Chrysene	0.20	0.21	0.25	80	84	70-130	4.91	25
Dibenzo (a,h) anthracene	0.18	0.20	0.25	71	78	50-130	9.98	25
Dibenzofuran	0.19	0.20	0.25	77	79	65-130	2.79	25
Di-n-butyl Phthalate	0.19	0.20	0.25	75	80	60-130	5.58	25
1,2-Dichlorobenzene	4.2	4.1	5	84	83	60-130	1.23	25
1,3-Dichlorobenzene	3.8	3.9	5	76	78	60-130	1.95	25
1,4-Dichlorobenzene	3.9	3.9	5	77	78	60-130	1.45	25
3,3-Dichlorobenzidine	0.19	0.20	0.25	75	79	60-130	4.99	25
2,4-Dichlorophenol	0.22	0.23	0.25	86	93	53-122	7.47	25
Diethyl Phthalate	0.19	0.20	0.25	76	79	65-130	4.24	25
2,4-Dimethylphenol	3.9	3.7	5	78	74	60-130	5.21	25
Dimethyl Phthalate	0.19	0.20	0.25	76	79	60-130	4.79	25
4,6-Dinitro-2-methylphenol	20	21	25	79	84	60-130	5.83	25
2,4-Dinitrophenol	4.6	4.9	5	93	98	50-130	5.06	25
2,4-Dinitrotoluene	0.21	0.22	0.25	85	90	70-130	5.60	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,6-Dinitrotoluene	0.20	0.21	0.25	80	82	68-137	3.58	25
Di-n-octyl Phthalate	3.9	3.9	5	78	79	70-130	0.861	25
1,2-Diphenylhydrazine	3.6	3.7	5	72	75	65-130	3.35	25
Fluoranthene	0.20	0.22	0.25	81	87	65-130	7.37	25
Fluorene	0.19	0.20	0.25	77	80	70-120	4.02	25
Hexachlorobenzene	0.23	0.24	0.25	93	96	60-130	3.12	25
Hexachlorobutadiene	0.20	0.21	0.25	81	84	68-130	3.30	25
Hexachlorocyclopentadiene	19	20	25	75	78	50-130	3.54	25
Hexachloroethane	0.17	0.19	0.25	69	75	55-120	7.16	25
Indeno (1,2,3-cd) pyrene	0.18	0.21	0.25	72	83	50-130	13.8	25
Isophorone	3.6	3.8	5	72	77	52-130	5.92	25
1-Methylnaphthalene	0.19	0.20	0.25	77	80	65-130	4.28	25
2-Methylnaphthalene	0.20	0.21	0.25	81	84	60-130	3.86	25
2-Methylphenol (o-Cresol)	4.0	4.2	5	80	84	60-130	5.18	25
3 & 4-Methylphenol (m,p-Cresol)	4.1	4.0	5	82	80	60-130	2.77	25
Naphthalene	0.19	0.20	0.25	75	80	70-130	5.99	25
n-Decane	3.0	3.2	5	61	63	30-130	4.34	25
2-Nitroaniline	21	22	25	85	90	65-130	5.94	25
3-Nitroaniline	23	24	25	91	94	70-140	3.51	25
4-Nitroaniline	23	24	25	92	96	70-130	5.19	25
Nitrobenzene	3.8	4.4	5	76	89	60-130	15.2	25
2-Nitrophenol	23	25	25	91	99	70-130	8.46	25
4-Nitrophenol	22	25	25	88	98	30-130	11.2	25
N-Nitrosodimethylamine	17	17	25	68	70	30-130	2.07	25
N-Nitrosodi-n-propylamine	3.3	3.5	5	66	69	59-130	4.07	25
N-Nitrosodiphenylamine	3.9	4.0	5	78	81	65-130	3.08	25
n-Octadecane	3.4	3.6	5	67	71	60-130	5.69	25
Pentachlorophenol	0.82	0.83	1.25	65	66	60-130	0.862	25
Phenanthrene	0.20	0.21	0.25	82	85	65-120	4.46	25
Phenol	0.73	0.74	1	73	74	48-120	1.13	25
Pyrene	0.20	0.21	0.25	79	83	70-120	5.27	25
Pyridine	2.5	2.6	5	50	52	30-130	5.02	25
1,2,4-Trichlorobenzene	4.1	4.3	5	82	87	57-130	5.54	25
2,4,5-Trichlorophenol	0.21	0.22	0.25	84	89	65-130	5.69	25
2,4,6-Trichlorophenol	0.18	0.19	0.25	74	77	69-130	3.41	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
2-Fluorophenol	3.9	4.3	5	78	87	20-103	10.0	25
Phenol-d5	4.0	4.4	5	80	88	20-120	9.59	25
Nitrobenzene-d5	3.8	4.6	5	77	92	61-130	17.7	25
2-Fluorobiphenyl	4.2	4.4	5	83	88	63-115	6.11	25
2,4,6-Tribromophenol	3.8	4.3	5	76	86	48-149	12.4	25
4-Terphenyl-d14	4.2	4.6	5	83	92	32-113	9.27	25

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 2311616 **ClientCode: CLSR** **QuoteID: 224283**

☐ WaterTrax ☐ CLIP ☐ EDF ☑ EQuIS ☑ Dry-Weight ☑ Email ☐ HardCopy ☐ ThirdParty ☑ J-flag
☑ Detection Summary ☐ Excel

Report to:
CLS Sub email
CLS Labs
3249 Fitzgerald Road
Rancho Cordova, CA 95742
(916) 638-7301 FAX: (916) 638-4510

Email: sub@californialab.com
cc/3rd Party:
PO:
Project: 23K0465

Bill to:
Accounts Payable
CLS Labs
3249 Fitzgerald Road
Rancho Cordova, CA 95742

Requested TAT: **5 days;**

Date Received: **11/09/2023**
Date Logged: **11/09/2023**

Lab ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
2311616-001	SBE.E4 2022/2023	Water	11/6/2023 11:20	☐	A	A										
2311616-002	191.E4 2022/2023	Water	11/6/2023 11:00	☐	A	A										

Test Legend:

1	625_SCSM_W	2	PRDisposal Fee	3		4	
5		6		7		8	
9		10		11		12	

Project Manager: Susan Thompson **Prepared by: Lilly Ortiz**

Comments: MAI OPB is ok for OPB per MS 5/7/2020.. Do not sent partials, even when TCDD is ordered per email 4/1/22.

NOTE: Soil samples are discarded 60 days after receipt unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

WORK ORDER SUMMARY

Client Name: CLS LABS
Client Contact: CLS Sub email
Contact's Email: sub@californialab.com

Project: 23K0465
Comments MAI OPB is ok for OPB per MS 5/7/2020.. Do not sent partials, even when TCDD is ordered per email 4/1/22.

Work Order: 2311616
QC Level: LEVEL 2
Date Logged: 11/9/2023

☐ WaterTrax ☐ CLIP ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☑ J-flag

LabID	ClientSampID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
001A	SBE.E4 2022/2023	Water	E625.1 (SVOCs)	2	1LA, Unpres	☐	☐	☐	11/6/2023 11:20	5 days	11/16/2023	Present	☐	☐
002A	191.E4 2022/2023	Water	E625.1 (SVOCs)	2	1LA, Unpres	☐	☐	☐	11/6/2023 11:00	5 days	11/16/2023	Present	☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Q: 224287

SUBCONTRACT ORDER

23K0465

23/16/10

SENDING LABORATORY:

CLS Labs
3249 Fitzgerald Rd.
Rancho Cordova, CA 95742
Phone: 916-638-7301
Fax: 916-638-4510
Project Manager: [redacted] client service
Project: Rain Event #1 2023

RECEIVING LABORATORY:

McCampbell Analytical Inc.
1534 Willow Pass Road
Pittsburg, CA 94565-1701
Phone :(925) 252-9262
Fax: (925) 252-9269

Analysis	TAT	Due	Expires	Laboratory ID	Sample Date	Received	Matrix
625.1 Semivolatiles (SUB)	5	11/16/23 12:00	11/13/23 11:20	23K0465-01	11/06/23 11:20	11/08/23 17:15	Water

Client sample ID: SBE.E4 2022/2023
Laboratory sample ID: 23K0465-01
Please use client sample ID on all reports
Sampler: [redacted]

Containers Supplied:
1L Amber- Unpres. (A) 1L Amber- Unpres. (B)

Analysis	TAT	Due	Expires	Laboratory ID	Sample Date	Received	Matrix
625.1 Semivolatiles (SUB)	5	11/16/23 12:00	11/13/23 11:00	23K0465-02	11/06/23 11:00	11/08/23 17:15	Water

Client sample ID: 191.E4 2022/2023
Laboratory sample ID: 23K0465-02
Please use client sample ID on all reports
Sampler: [redacted]

Containers Supplied:
1L Amber- Unpres. (A) 1L Amber- Unpres. (B)

Relinquished By	Date 11/9/23	Received By	Date 11/9/23-0700
Relinquished By	Date 11/9/23 1700	Received By	Date 1220 11/9/23
Shipped By	Airbill Number		

Page 1 of 1

Subcontract Sample Receipt Checklist

CLS Work Order Number: 23K0465

Chain of Custody (COC) Information

Carrier Name CLS				
Chain of custody present?	Yes	☒	☐	No
Chain of custody signed when relinquished and received?	Yes	☒	☐	No
Chain of custody agrees with sample labels?	Yes	☒	☐	No
			☐	Non-Compliant

Sample Receipt Information

Shipping container/cooler in good condition?	Yes	☒	☐	No	Not Present	☐
Samples in proper container/bottle?	Yes	☒	☐	Non-Compliant		
Sample containers intact?	Yes	☒	☐	No		
Sufficient sample volume for indicated test?	Yes	☒	☐	No		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☒	☐	No
Temperature upon receipt: _____ C				
Wet Ice present in Cooler?	Yes	☐	☐	No
Blue Ice present in Cooler?	Yes	☐	☐	No

Analytical Requirement Information

Are non-Standard of Modified methods requested?	Yes	☐	☐	No
Subcontract Lab CERTIFIED for the various methods requested?	Yes	☐	☐	No
Will Subcontract Lab be able to meet the turn-around time (TAT) requirements?	Yes	☐	☐	No

Subcontract Lab Information

Work Order Number assigned by Subcontract Lab _____

Date received at Subcontract Lab _____

If any items are check marked NO or are non-compliant, a phone call back to California Laboratory Services is required immediately. If all items are acceptable, a faxed copy of the signed sub chain of custody (COC) and the completed sample receipt check list is required within 24 hours of sample receipt.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Sample Receipt Checklist

Client Name:	CLS Labs	Date and Time Received:	11/9/2023 12:20
Project:	23K0465	Date Logged:	11/9/2023
		Received by:	Lilly Ortiz
WorkOrder №:	2311616 Matrix: Water	Logged by:	Lilly Ortiz
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐		
Sample IDs noted by Client on COC?	Yes	☑	No	☐		
Date and Time of collection noted by Client on COC?	Yes	☑	No	☐		
Sampler's name noted on COC?	Yes	☑	No	☐		
COC agrees with Quote?	Yes	☑	No	☐	NA	☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes	☐	No	☐	NA	☑
Custody seals intact on sample bottles?	Yes	☐	No	☐	NA	☑
Shipping container/cooler in good condition?	Yes	☑	No	☐		
Samples in proper containers/bottles?	Yes	☑	No	☐		
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☑	No	☐	NA	☐
Samples Received on Ice?	Yes	☑	No	☐		
(Ice Type: WET ICE)						
Sample/Temp Blank temperature	Temp: 0.9°C				NA	☐
ZHS conditional analyses: VOA meets zero headspace requirement (VOCs, TPHg/BTEX, RSK)?	Yes	☐	No	☐	NA	☑
Sample labels checked for correct preservation?	Yes	☑	No	☐		
pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO3: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA	☑
UCMR Samples:						
pH tested and acceptable upon receipt (200.7: ≤2; 533: 6 - 8; 537.1: 6 - 8)?	Yes	☐	No	☐	NA	☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L) [not applicable to 200.7]?	Yes	☐	No	☐	NA	☑

Comments:

APPENDIX I
Storm Water Level 1 Exceedance Response Action (ERA) Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

Storm Water Level 1 Exceedance Response Action Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA

January 2025

www.nasa.gov

Environmental Support Services Contract
80ARC020F0036
Storm Water Level 1 Exceedance Action Report for Nitrate Plus Nitrite (as N), 2024-2025 Reporting Year

Prepared for:
Environmental Management Division
NASA Ames Research Center
M/S 204-15
Building N204, Room 102B
Moffett Field, CA 94035-0001

January 2025

BB&E
CONSULTING ENGINEERS
& PROFESSIONALS

Table of Contents

Acronyms and Abreviations 4

1. Introduction 5

2. Background 6

3. Site Evaluation 10

4. Implementation Discussion 14

5. Conclusion 15

6. Plan Certification 16

Figure 1 17

Appendix A: Summary of Reporting Year 2023-2024 Storm Water Data Results 18

Appendix B: Analytical Reports 19

List of Tables

Table 1: Drainage Areas and Sample Locations 8

Table 2: Nitrate Plus Nitrite (as N) NAL Exceedances 10

Table 3: Potential Sources of NAL Exceedances 12

Table 4: QISP Evaluation Summary 12

Table 5: BMP Evaluation 13

Table 6: Additional BMPs Selected for Implementation 14

Table 7: Timeline for Completion and Delivery of Submittals 15

Acronyms and Abreviations

Name	Description
ACSCE	Annual Comprehensive Site Compliance Evaluation (ACSCE)
ARC	NASA Ames Research Center
BMP	Best Management Practice
ERA	Exceedance Response Action
ERT	Earth Resources Technology, Inc.
IGP	General Permit for Stormwater Discharges Associated with Industrial Activities
LRP	Legally Responsible Person
mg/L	Milligrams per liter
MS4	Municipal separate stormwater sewer system
N/A	Not applicable
NAICS	North American Industry Classification System
NAL	Numeric Action Level
NPDES	National Pollutant Discharge Elimination System
PV	Planetary Ventures
QISP	Qualified Industrial Stormwater Practitioner
RY	Reporting Year
SIC	Standard Industrial Classification
SMARTS	Storm Water Multiple Application and Report Tracking System
SWPPP	Storm Water Pollution Prevention Plan

1. Introduction

This Level 1 Exceedance Response Action (ERA) Report presents an evaluation of potential pollutant sources that may have contributed to the Numeric Action Level (NAL) exceedance of nitrate plus nitrite (as N) (N+N as N) in storm water samples collected during the 2023-2024 Reporting Year (RY) at the RTJO outfall located at NASA Ames Research Park (ARC), Moffett Field, CA, 94035. This Level 1 ERA Evaluation was performed to explore potential pollutant sources related to an exceedance of N+N as N, evaluate the effectiveness of existing Best Management Practices (BMPs), and assess the need to develop and implement additional BMPs to address the exceedance. This ERA Report has been prepared in compliance with California's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activity—CAS000001, Water Quality Order: General Permit 2018-0028-DWQ (IGP).

Under the IGP, dischargers who exceed either the instantaneous or annual NAL for a parameter transition from Baseline status to Level 1 status on July 1 the following RY during which the exceedance occurred. An instantaneous maximum NAL exceedance occurs when two or more analytical results from samples taken for any single parameter within a RY exceed the instantaneous maximum NAL value for that parameter, as listed in Table 2 of the IGP. An annual NAL exceedance occurs when the average of all the analytical results for a parameter from samples taken within a RY exceeds the annual NAL value for that parameter, as listed in Table 2 of the IGP.

The IGP requires completion of the following Level 1 activities in response to all NAL exceedances as defined in the IGP:

- On July 1 of the following RY, a discharger's baseline status for any given parameter will change to Level 1 status if sample results indicate an NAL exceedance for that parameter.
- By October 1 following commencement of Level 1 status, the discharger must obtain the assistance of a QISP to evaluate industrial pollutant sources that may be related to the NAL exceedance, review existing BMPs and the Storm Water Pollution Prevention Plan (SWPPP), and evaluate potential implementation of additional BMPs to address the exceedance, if appropriate.
- By January 1 following the commencement of ERA Level 1 status, the discharger must prepare and submit a Level 1 ERA Report that describes the evaluation findings and recommendations.
- The facility's QISP must provide sufficient training to the appropriate team members assigned to perform activities required by the IGP.

During the 2023-2024 RY, ARC exceeded the NAL for N+N as N, thereby elevating ARC to Level 1 status for that parameter, effective July 1, 2024. In response, Marcia Christlieb, QISP (ERT, Inc.) conducted a Level 1 ERA Evaluation between August 6-September 27, 2024. The findings of the evaluation are presented in Section 3.0 of this report; Section 4.0 includes the proposed scope and schedule for implementation of additional BMPs and a detailed description of SWPPP updates.

2. Background

2.1. Site Information.

Facility Name	NASA Ames Research Center
Address	Environmental Management Division, Moffett Field, California, 94035
Waste Discharge Identification Number	2 431011003
Standard Industrial Classification Code (SIC)	3728-Aircraft Parts and Auxiliary Equipment, NEC
Designated Legally Responsible Person (LRP)	Jeanne Sabin
Discharger Contact Person	Jeanne Sabin
Phone Number	650-604-1800
Cell Number	650-582-7321
Email Address	jeanne.m.sabin@nasa.gov

ARC occupies approximately 421 acres of the 2,000-acre site that constitutes Moffett Federal Airfield and the NASA Research Park. Stewardship of the airfield and adjoining property was transferred to ARC in July of 1994, with the closure of the Naval Air Station (NAS) in response to the recommendation of the Defense Base Closure and Realignment Commission. Planetary Ventures assumed operations of Moffett Field, which includes both the airfield and the golf course, in April 2015. Planetary Ventures provides airfield fueling operations at Moffett Field.

ARC is located approximately one mile from the southwestern shoreline of San Francisco Bay, approximately 25 miles east of the Pacific Coast. The City of Mountain View is adjacent to the western and southern boundaries of the facility. The eastern and southern boundaries adjoin the City of Sunnyvale. Downtown San Jose is located approximately seven miles southeast and the City of San Francisco is located approximately 32 miles northwest of the site. U.S. Highway 101 passes south of the facility. ARC is bounded by Lockheed Martin to the east, Highway 101 to the south, Stevens Creek to the west, and the United States Fish and Wildlife Service (USFWS) salt ponds to the north.

The ARC campus consists of approximately 40 technical facilities and 48 other major supporting and administrative buildings and structures. The resident staff at ARC is roughly 2,300 employees which include approximately 1,200 civil service employees (temporary and permanent assignments) and 1,100 contract and subcontract employees. The mission of ARC is to conduct

research and development in the fields of nanotechnology, biotechnology, aeronautics, space science, life science, information science, and earth system science.

ARC generates potential storm water pollutants through multiple ongoing industrial activities. Storm water runoff from urban and industrial areas typically contains significant quantities of the same general types of pollutants found in industrial and wastewater point source discharges.

Areas with a potential to impact storm water quality include facilities where hazardous materials and/or hazardous waste are stored in outside locations or where outdoor processes pose a reasonable risk of release to the storm drainage system. As such, these locations were inspected in August and September annually as part of an Annual Comprehensive Site Compliance Evaluation (ACSCE). Information collected from this year's ACSCE is included in this ERA Report and discussed in section 4.

Figure 1—Storm Water Drainage and Discharge Areas depicts the facility boundaries; the outline of all storm water drainage areas within the facility boundaries; sample collection and observation locations, associated points of discharge; portions of the drainage area impacted by run-on from surrounding areas; direction of flow of each drainage area, on-site and nearby surface water bodies, the locations of the Caltrans Culverts; and the location of the Settling Basin and other in-line Advanced BMPs.

The SWPPP identifies the following potential pollutant sources for the RT Jones Road drainage area:

- Bacteria and Viruses
- Heavy Metals
- Nutrients
- Oil and Grease
- Oxygen Demanding Substances
- PCBs
- Priority Pollutants
- Sediment
- Specific Conductance

Table 1 outlines the RT Jones Road drainage area and sample point location. Inspections of this drainage area are conducted monthly in accordance with the IGP to ensure BMPs and corrective actions are effectively implemented.

Table 1: Drainage Areas and Sample Locations

Drainage Area Description	Sample Location
RT Jones Road RT Jones Road runs north-south along the western perimeter of ARC, was recently redeveloped to accommodate an increase of traffic to the newly constructed Planetary Ventures Bay View Campus. Storm water from RT Jones Road discharges onto NASA property. The RT Jones storm water system includes a series of bio-swales and two below-ground storm drainage treatment systems along RT Jones Road, terminating at the southwest corner of the western diked marsh.	**Sample Point RTJO:** Samples are collected from the access point at the terminating end of the storm distribution system.
Western Drainage System Runoff in the Western Drainage System is directed to a settling basin before discharging into the Western Diked Marsh and the Storm Water Retention Pond located along the northern portion of the property. Storm water sheet flows into a series of drop and curb inlets, then is conveyed to the settling basin through low-head piping ranging from 38 to 48 inches in diameter before reaching the settling basin. Industrial activities in this drainage system include a groundwater treatment plant, Hangar 1, resident and military housing, United States Geological Survey, the Full-Scale Aerodynamics Complex, the Unitary Wind Tunnel Complex, various research facilities, as well as run-on from Highway 101 and a PG&E electrical substation.	**Sample Point SBE:** Samples are collected from the effluent chamber of the settling basin.
Eastern Drainage System Runoff in the Eastern Drainage System is directed to the 191 Pump Station, located on the northern permitter of the property near the Moffett Field Runway and the Golf Club at Moffett Field. Storm water sheet flows from into a series of drop and curb inlets, then is conveyed to the settling basin through a combination of swales, ditches, and low-head piping before reaching the 191 Pump Station. Storm water is then pumped into the Northern Channel, where it flows to the Lockheed Pumping Station before it is pumped one more time from the Lockheed Channel to the Moffett Channel, the flow then meets up with the Guadalupe Slough and eventually, the San Francisco Bay. Industrial activities in this drainage system include Hangars 2 and 3, Moffett Federal Airfield, CA Air National Guard, Planetary Ventures (PV), and the Golf Club at Moffett Field. Approximately 11 acres of the Eastern Drainage System has been set aside for the PV Bus Parking Facility. PV maintains their own IGP coverage for activities associated with the bus parking facility which discharges into the Eastern Drainage System.	**Sample Point 191:** Samples are collected from the pump station inlet.

2.2. **QISP Information.**

The IGP requires the discharger to enlist the services of a QISP to assist with the Level 1 ERA Evaluation and prepare the Level 1 ERA Report. Information related to the QISP assisting with this evaluation and report is presented below.

Name	Marcia Christlieb
QISP Certification Number	#00620
Affiliation	Earth Resources Technology
Phone Number	650-604-5360
Email Address	marcia.j.christlieb@nasa.gov
Scope of Services Provided	Manages the development, implementation, and revisions to the SWPPP. Level 1 ERA Evaluation. Level 1 ERA Report. Storm water monthly and annual inspections. Storm Water Annual Report. Storm Water Monitoring Plan. Storm water sampling coordination.

2.3. **Summary of Numeric Action Level Exceedances.**

Table 2 summarizes the N+N as N NAL exceedance. RTJO only experienced two Qualifying Storm Events during the 2023-2024 RY. A summary of individual sampling events for RY 2023-2024 is provided in Appendix A. Laboratory reports for the 2023-2024 RY are presented as Appendix B.

Table 2: N+N as N NAL Exceedances

Sample Date	Sample Location	N+N (mg/L)	Instantaneous NAL (mg/L)	Annual N+N NAL (mg/L)
2023-2024 RY				
11/6/2023	191	1.4	N/A	0.68
	SBE	0.79		
1/9/2024	191	0.71		
	SBE	0.61		
	RTJO	0.85		
1/31/2024	191	1.8		
	SBE	0.55		
	RTJO	1.9		
3/11/2024	SBE	0.64		
4/4/2024	SBE	0.2		
Annual NAL Average RY 2023-2024		*0.945*		
2024-2025 RY				
11/25/2024	191	1.01	N/A	0.68
	SBE	0.443		
	RTJO	1.49		
Annual NAL Average RY 2024-2025		*0.981*		

Note:

mg/L	*Milligrams per liter*
N/A	*Not Applicable*
Italics	*NAL Exceedance*

3. Site Evaluation

3.1. **Potential Pollutant Sources.**

This section presents potential pollutant sources at ARC that may have contributed to N+N as N NAL exceedance in the 2023-2024 RY. ARC is a research facility, the primary activities are research and development of aerospace-based technologies (SIC Code 3728-Aircraft Parts and Auxiliary Equipment, NEC). Most activities at ARC are unlikely to contribute to an increased N+N as N in storm water discharge.

Fabrication Shops:
Several indoor metal fabrication shops are present at ARC but are not included in the evaluation because activities at these locations have no storm water exposure.

Cross-contamination:

Although low, cross-contamination is a possible contributing factor in elevated N+N as N sample results, if bottles preserved with Nitric Acid are handled before collecting the N+N as N sample. However, the samplers who collected the elevated N+N as N samples are aware of cross-contamination hazards and are trained in proper sample collection requirements. Although cross-contamination is not likely to have contributed to the N+N as N NAL exceedance, all storm water samplers at ARC attended an in-depth, hands-on training event this year.

Artesian Well:
ARC is currently investigating a source of water, expected to be an artesianing abandoned agricultural well, which started percolating from below ground surface and running into the bioswales along RT Jones Road around the same time as the elevated N=N stormwater samples. Flowing water can scrub nutrients from soil; therefore, it is possible this water may have contributed to the N+N as N NAL exceedance. Additional investigation is needed to identify if this is actually contributing to the exceedance.

BMP Maintenance:
Rainwater at the RTJO outfall was designed to pump from an end-of-line sump and into the Western Diked Marsh over an engineered pathway. The engineered pathway has degraded enough that it is now sloped slightly towards the sump causing discharged storm water to flow back into the sump. This recirculation of the storm water over vegetation and soil can contribute to elevated nutrient load.

Grounds Maintenance:
Grounds Maintenance Yard and the Green Waste Mulching Area are located at the VTOL Pad within the Western Drainage System. These two activities are most likely to contribute to elevated N+N as N results. However, at the outdoor spaces managed by ARC, the application of fertilizers is minimal and not likely to have contributed to the elevated N+N as N results at the RTJO sample point. To address this potential contribution, the Grounds Maintenance BMP was updated to include documentation of pesticide/fertilizer application type, date, and amounts. Application documentation is required to be maintained onsite for a minimum of five (5) years.

Table 3: Potential Sources of NAL Exceedances

Activities	Source	Existing BMP(s)
Fabrication Shops	Industrial	Minimum BMPs
Groundskeeping, fertilizer application	Industrial	Employee Training Program Material Handling and Waste Management Building and Grounds Maintenance Elimination of Non-Storm Water Discharges
Cross-contamination	Industrial	Employee Training Program Quality Assurance and Record Keeping
Sediment control in storm water discharge system	Non-industrial	Erosion and Sediment Controls Good Housekeeping Preventive Maintenance Control Devices Building and Grounds Maintenance

Table 4 summarizes the primary activities evaluated by the QISP to identify the primary contributors to the NAL exceedance. Results from this focused evaluation will be used to develop a corrective action plan and to address deficiencies to avoid future exceedances.

Table 4: QISP Evaluation Summary

Topic	Observation
Visual inspections of RT Jones Road storm water discharge area	Irrigation runoff observed sheeting across road into storm drain along RT Jones Road.
Visual inspection of RT Jones Road storm water discharge point	Storm water discharge was observed flowing backwards into the sump after being discharged. Poor grading of the ground at the discharge location doesn't allow for discharged water to flow freely into the Western Diked Marsh. Recirculating discharge water could lead to increased nutrient load by washing over vegetation and surrounding soils.
Inspect gutters and catch basins for debris or signs of dumping	No signs of dumping along RT Jones Rd. However, water has been flowing from an unknown underground source into the storm water swales along RT Jones Road.
Review of preventive maintenance activities	Catch basins were not cleaned out during the 2022-2023 RY, causing increased accumulation of vegetative debris throughout the storm drainage system.
Sampling techniques	Cross-contamination from nitrite bottle could result in a false positive.

3.2. **BMP Evaluation.**

In addition to the Minimum BMPs required by the IGP, ARC has developed a set of Site Specific BMPs to address specific industrial activities and are implemented in addition to the Minimum and Advanced BMPs. A QISP review of these BMPs is presented in Table 5.

3.2.1. **Minimum BMPs**

Table 5: BMP Evaluation

Minimum BMP	**Deficiencies Noted**
Good Housekeeping	Observed growing dump sites consisting of waste debris, office furniture, and surplus equipment on the outskirts of ARC, suggesting a relaxed implementation of the Good Housekeeping BMPs. No deficiencies observed along the RT Jones Road drainage area.
Preventative Maintenance	Catch basins were not cleaned out during the 2022-2023 RY.
Spill and Leak Prevention and Response	Water has been discharging to the ground surface from an unknown source for several months while the source is currently under investigation.
Material Handling and Waste Management	Did not verify if fertilizer is applied according to manufacturer's instructions.
Erosion and Sediment Control	RTJO outfall is poorly graded leading to recirculation of discharged water lasting for several days after a rain event.
Employee Training	Training is provided annually for ARC employees and some tenants. However, access to training is not available to all tenants and residents onsite.
Relevant Site Specific BMPs	**Deficiencies Noted**
Building and Grounds Maintenance	Records are not maintained by ARC landscapers and not yet requested from tenant landscapers.
Elimination of Non-Stormwater Discharges	Non-stormwater discharges were observed from two sources: an unverified underground source, and a significant amount of irrigation water.

4. Implementation Discussion

4.1. **Additional BMPs Implemented.**

A schedule for additional BMP implementation is presented in Table 6.

Table 6: Additional BMPs Selected for Implementation

BMPs to be Implemented	Proposed Implementation Date/Frequency	Applicable SWPPP Section
Maintain log of fertilizer/pesticide application	January 1, 2025	Material Handling and Waste Management Building and Grounds Maintenance Elimination of Non-Stormwater Discharges
Install filter in catch basins along RT Jones Road across from PV Bay View Campus and prior to the 191 outfall	January 1, 2025 Currently evaluating best available advanced BMPs	Preventative Maintenance
Provide Storm Water Pollution Prevention training to tenants	January 2025 Provide in-person annual training refresher for all groups involved in grounds maintenance activities	Employee Training
Perform regular maintenance of storm distribution system including annual cleanouts	Catch basin cleanout activities were completed by August 20, 2025	Preventative Maintenance
Train ARC facilities about the importance of annual catch basin cleanouts for future RYs	January 1, 2025	Preventative Maintenance

4.2. **Stormwater Plan Review and Modifications.**

As part of the Level 1 ERA, the QISP conducted a review of the existing SWPPP. Additional BMPs noted in Table 6 are being integrated into the applicable sections and will be addressed int the ACSCE and integrated into the Storm Water Pollution Prevention employee training program.

This Level 1 ERA Evaluation included reviewing the SWPPP to assess compliance with requirements outlined in Section X of the IGP. This review included all sections of the SWPPP, including the Site Map, potential pollutant generating activities, and BMP selection and implementation. The review did not identify any deficiencies with the SWPPP; however, the SWPPP is being revised to incorporate changes to BMPs. The amended SWPPP will be uploaded to Storm Water Multiple Application and Report Tracking System (SMARTS).

5. Conclusion

As discussed in Section 4, ARC is implementing additional BMPs to mitigate the storm water NAL exceedance for N+N as N. ARC will implement, maintain, and monitor the BMPs to evaluate continued effectiveness. ARC is committed to continued monitoring and sampling in accordance with the IGP and continued improvements within the storm water pollution prevention program.

Per Section XII.D.4 of the IGP, Level 1 parameters may return to baseline status for a specific parameter if results from four subsequent consecutive Qualified Storm Events sampled indicate no additional NAL exceedances for that parameter. With proper implementation of the additional BMPs discussed in Table 6, concentrations of N+N as N is expected to be reduced, preventing future NAL exceedances at ARC.

Table 7: Timeline for Completion and Delivery of Submittals

Document	Expected Completion Date
Level 1 ERA Evaluation Completed	September 17, 2024
SWPPP Revisions	January 1, 2025
BMP Implementation	January 1, 2025
Level 1 ERA Report Certified and Submitted	January 1, 2025

6. Plan Certification

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 ensure 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."

_____	Jeanne M. Sabin
Authorized Signature	Print Name
12/31/2024_____	Water Compliance Program Manager
Date	Title

Figure 1

Legend

- Areas With Run-On
- Caltrans Culvert
- Direction of Flow
- Discharge Area Boundary
- Discharge Locations
- Drainage Areas
- Emergency Discharge Areas
- Facility Boundary
- Google Bus Parking
- Northern Channel
- NPDES Discharge Points
- Storm Drain Inlet
- Settling Basin

0 1,500 Feet

N

Ames Research Center
Moffett Field, CA 94035

TITLE:

Storm Water Pollution Prevention Plan
Storm Water Drainage and Discharge Areas

DWN:	DES.:	PROJECT NO.:
MJC	MJC	Level 1 ERA N+N
CHKD:	REV.:	FIGURE NO.:
JMS	1	1
DATE:	APPD:	
10/24	JMS	

Appendix A: Summary of Reporting Year 2023-2024 Storm Water Data Results

Sample Location	Sample Date	pH	TSS	O&G	Ammonia Total (as N)	N+N (as N)	BOD	COD
	Units:	pH SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Test Method:	Field	SM2540D	EPA 1664A	SM4500-NH3C	A4500NH	SM5210B	EPA 410.4
191								
	11/6/2023	7.7	3.3	*1*	0.27	1.4	3	21
	1/9/2024	7.79	13	*1*	0.16	0.71	2.0	32
	1/31/2024	7.69	7.4	*1*	0.15	1.8	3.0	120
SBE								
	11/6/2023	8.32	2.4	*1*	0.06	0.79	3.0	17
	1/9/2024	8.19	5.5	*1*	0.048	0.61	3.0	11
	1/31/2024	8.01	8.6	*1*	0.069	0.55	7.0	11
	3/11/2024	8.1	3.5	*1*	0.025	0.64	3	13
	4/4/2024	7.62	6	*4*	<0.1	0.2	5.7	<10
RTJO								
	1/9/2024	7.80	8.8	*1*	0.064	0.85	3.0	<7
	1/31/2024	7.67	6.8	*1*	0.029	1.9	3	<7
	Average:	---	7	*1*	0.11	**0.945**	3.6	32
Action Levels	**Industrial General Permit Action Levels**							
	NAL Average	**---**	**100**	**15**	**2.14**	**0.68**	**30**	**120**
	NAL Instantaneous	**6-9**	**400**	**25**	**---**	**---**	**---**	**---**

Appendix B: Analytical Reports

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

January 17, 2024

CLS Work Order #: 24A0540
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE2-2023 / 2024

Enclosed are the results of analyses for samples received by the laboratory on 01/10/24 17:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*50 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*102 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*42 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*122 %*		*35-114*	"	"	"	"	*QS-BN*
Surrogate: Phenol-d6			*34 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*84 %*		*33-141*	"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
2-Nitrophenol	ND	0.48	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.81	10	"	"	"	"	"	"	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Dimethyl phthalate	ND	0.61	4.0	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	0.57	10	"	"	"	"	"	"	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	

Surrogate: 2,4,6-Tribromophenol	*47 %*	*10-123*	"	"	"	"
Surrogate: 2-Fluorobiphenyl	*92 %*	*43-116*	"	"	"	"
Surrogate: 2-Fluorophenol	*37 %*	*21-110*	"	"	"	"
Surrogate: Nitrobenzene-d5	*111 %*	*35-114*	"	"	"	"
Surrogate: Phenol-d6	*29 %*	*10-110*	"	"	"	"
Surrogate: Terphenyl-dl4	*73 %*	*33-141*	"	"	"	"

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400296	01/11/24	01/17/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400296	"	01/17/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*49 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*96 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*39 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*115 %*		*35-114*	"	"	"	"	*QS-BN*
Surrogate: Phenol-d6			*31 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*82 %*		*33-141*	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.048**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	**11**	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	
Nitrate/Nitrite as N	**0.61**	0.0048	0.20	mg/L	2	2400411	01/16/24	01/16/24	SM4500-NO3 E	
Total Organic Carbon	ND	0.54	1.0	"	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.051**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	
Total Suspended Solids	**5.5**	3.3	3.3	"	"	2400373	01/15/24	01/16/24	SM2540D	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.16**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	**32**	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	**0.48**	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	J
Nitrate/Nitrite as N	**0.71**	0.012	0.50	mg/L	5	2400411	01/16/24	01/16/24	SM4500-NO3 E	
Total Organic Carbon	**1.7**	0.54	1.0	"	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.092**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	
Total Suspended Solids	**13**	3.6	3.6	"	"	2400373	01/15/24	01/16/24	SM2540D	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Ammonia as N	**0.064**	0.025	0.10	mg/L	1	2400399	01/15/24	01/15/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400274	01/11/24	01/16/24	SM5210B	
Chemical Oxygen Demand	ND	6.6	7.0	"	"	2400407	01/16/24	01/16/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400275	01/11/24	01/12/24	EPA 1664B	
Hexavalent Chromium	**0.37**	0.29	1.0	µg/L	"	2400369	01/15/24	01/15/24	EPA 218.6	J
Nitrate/Nitrite as N	**0.85**	0.012	0.50	mg/L	5	2400411	01/16/24	01/16/24	SM4500-NO3 E	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Total Organic Carbon	ND	0.54	1.0	mg/L	1	2400378	01/15/24	01/15/24	SM5310B	
Total Phosphorus as P	**0.027**	0.023	0.050	"	"	2400285	01/11/24	01/16/24	SM4500-P E	J
Total Suspended Solids	**8.8**	3.4	3.4	"	"	2400373	01/15/24	01/16/24	SM2540D	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*120 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*78 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2400428	01/11/24	01/17/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**	**Received: 01/10/24 17:15**								
Chromium	ND	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0012**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00081**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.012**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**	**Received: 01/10/24 17:15**								
Chromium	**0.0016**	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0073**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00051**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.0096**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**	**Received: 01/10/24 17:15**								
Chromium	**0.00051**	0.00014	0.0010	mg/L	1	2400280	01/11/24	01/16/24	EPA 200.8	
Copper	**0.0018**	0.000090	0.010	"	"	"	"	01/11/24	"	J
Lead	**0.00021**	0.000020	0.0050	"	"	"	"	01/12/24	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400294	01/11/24	01/12/24	EPA 245.1	
Zinc	**0.0045**	0.00027	0.020	mg/L	"	2400280	01/11/24	01/11/24	EPA 200.8	J

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*91 %*	*50-150*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*81 %*	*50-150*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2400333	01/12/24	01/15/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24A0540**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30 Received: 01/10/24 17:15**									
Aroclor 1268*	ND	0.084	0.50	µg/L	1	2400333	"	01/15/24	EPA 8082	
Surrogate: Decachlorobiphenyl			*82 %*		*50-150*		"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
trans-1,3-Dichloropropene	ND	0.12	0.50	µg/L	1	2400401	"	01/13/24	EPA 624.1	
Trichloroethene	ND	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*115 %*		*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*115 %*		*73-125*		"	"	"	"	
Surrogate: Toluene-d8			*83 %*		*72-125*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Chloromethane	ND	0.19	0.50	µg/L	1	2400401	"	01/13/24	EPA 624.1	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**3.2**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*116 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*117 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*82 %*		*72-125*		"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400401	01/13/24	01/13/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
1,3-Dichlorobenzene	ND	0.077	0.30	µg/L	1	2400401	"	01/13/24	EPA 624.1	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**5.4**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*110 %*		*65-135*		"	"	"	"
Surrogate: 4-Bromofluorobenzene			*110 %*		*73-125*		"	"	"	"
Surrogate: Toluene-d8			*85 %*		*72-125*		"	"	"	"

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24A0540-01) Water	**Sampled: 01/09/24 16:30**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**21**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*81 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24A0540-02) Water	**Sampled: 01/09/24 16:00**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**22**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*82 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24A0540-03) Water	**Sampled: 01/09/24 15:30**		**Received: 01/10/24 17:15**							
Gasoline	ND	10	50	µg/L	1	2400366	01/15/24	01/15/24	EPA 8015M	
JP-4	**23**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*80 %*	*65-135*		"	"	"	"	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	ND	0.51	5.0	µg/L							
Acenaphthylene	ND	0.62	10	"							
Anthracene	ND	0.50	5.0	"							
Benzidine	ND	2.2	40	"							
Benzo (a) anthracene	ND	0.81	10	"							
Benzo (b) fluoranthene	ND	1.4	10	"							
Benzo (k) fluoranthene	ND	0.96	7.0	"							
Benzo (g,h,i) perylene	ND	1.1	10	"							
Benzo (a) pyrene	ND	1.2	7.0	"							
Bis(2-chloroethoxy)methane	ND	0.51	10	"							
Bis(2-chloroethyl)ether	ND	0.49	10	"							
Bis(2-chloroisopropyl)ether	ND	0.52	10	"							
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"							
4-Bromophenyl phenyl ether	ND	0.62	5.0	"							
Butyl benzyl phthalate	ND	0.69	7.0	"							
2-Chloronaphthalene	ND	0.52	5.0	"							
4-Chlorophenyl phenyl ether	ND	0.58	10	"							
Chrysene	ND	0.60	7.0	"							
Dibenz (a,h) anthracene	ND	1.4	7.0	"							
Di-n-butyl phthalate	ND	0.61	7.0	"							
3,3´-Dichlorobenzidine	ND	0.89	20	"							
Diethyl phthalate	ND	0.59	5.0	"							
Dimethyl phthalate	ND	0.61	4.0	"							
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"							
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"							
Di-n-octyl phthalate	ND	0.98	7.0	"							
Fluoranthene	ND	0.61	6.0	"							
Fluorene	ND	0.60	5.0	"							
Hexachlorobenzene	ND	0.74	5.0	"							
Hexachlorobutadiene	ND	0.55	2.7	"							
Hexachlorocyclopentadiene	ND	0.78	10	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Hexachloroethane	ND	0.49	4.0	µg/L							
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"							
Isophorone	ND	0.52	6.0	"							
Naphthalene	ND	0.52	4.0	"							
Nitrobenzene (NB)	ND	0.42	5.0	"							
N-Nitrosodimethylamine	ND	0.64	10	"							
N-Nitrosodiphenylamine	ND	0.57	10	"							
N-Nitrosodi-n-propylamine	ND	0.51	10	"							
Phenanthrene	ND	0.52	10	"							
Pyrene	ND	0.61	5.0	"							
1,2,4-Trichlorobenzene	ND	0.55	5.0	"							
4-Chloro-3-methylphenol	ND	0.45	9.0	"							
2-Chlorophenol	ND	0.46	9.0	"							
2,4-Dichlorophenol	ND	0.50	8.0	"							
2,4-Dimethylphenol	ND	0.56	8.0	"							
4,6-Dinitro-2-methylphenol	ND	0.79	25	"							
2,4-Dinitrophenol	ND	0.47	25	"							
2-Nitrophenol	ND	0.48	10	"							
4-Nitrophenol	ND	0.73	7.0	"							
Pentachlorophenol	ND	0.77	10	"							
Phenol	ND	0.41	4.0	"							
2,4,6-Trichlorophenol	ND	0.60	8.0	"							
Benzyl alcohol*	ND	0.42	20	"							
4-Chloroaniline*	ND	0.39	20	"							
Dibenzofuran*	ND	0.54	10	"							
1,2-Dichlorobenzene*	ND	0.50	10	"							
1,3-Dichlorobenzene*	ND	0.51	10	"							
1,4-Dichlorobenzene*	ND	0.48	10	"							
2-Methylnaphthalene*	ND	0.52	10	"							
2-Nitroaniline*	ND	0.54	25	"							
3-Nitroaniline*	ND	0.68	25	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Blank (2400296-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
4-Nitroaniline*	ND	0.81	25	µg/L							
Benzoic acid*	ND	1.1	25	"							
3 & 4-Methylphenol*	ND	0.48	10	"							
2,4,5-Trichlorophenol*	ND	0.58	10	"							
Pyridine *	ND	0.36	10	"							
2-Methylphenol*	ND	0.41	10	"							
Surrogate: 2-Fluorophenol	*30.6*			"	*50.0*		*61*	*21-110*			
Surrogate: Phenol-d6	*33.1*			"	*50.0*		*66*	*10-110*			
Surrogate: Nitrobenzene-d5	*63.0*			"	*50.0*		*126*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*53.2*			"	*50.0*		*106*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*28.1*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*50.8*			"	*50.0*		*102*	*33-141*			
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	16.9	0.51	5.0	µg/L	20.0		84	70-130			
Acenaphthylene	17.8	0.62	10	"	20.0		89	60-130			
Anthracene	16.2	0.50	5.0	"	20.0		81	58-130			
Benzo (a) anthracene	18.3	0.81	10	"	20.0		92	42-133			
Benzo (b) fluoranthene	21.7	1.4	10	"	20.0		108	42-140			
Benzo (k) fluoranthene	19.8	0.96	7.0	"	20.0		99	25-146			
Benzo (g,h,i) perylene	23.2	1.1	10	"	20.0		116	13-195			
Benzo (a) pyrene	18.6	1.2	7.0	"	20.0		93	32-148			
Bis(2-chloroethoxy)methane	17.4	0.51	10	"	20.0		87	52-164			
Bis(2-chloroisopropyl)ether	16.8	0.52	10	"	20.0		84	63-139			
Bis(2-ethylhexyl)phthalate	16.9	0.58	7.0	"	20.0		84	43-137			
4-Bromophenyl phenyl ether	17.7	0.62	5.0	"	20.0		88	70-130			
Butyl benzyl phthalate	17.5	0.69	7.0	"	20.0		88	43-140			
2-Chloronaphthalene	18.2	0.52	5.0	"	20.0		91	70-130			
4-Chlorophenyl phenyl ether	17.6	0.58	10	"	20.0		88	57-145			
Chrysene	18.3	0.60	7.0	"	20.0		92	44-140			
Dibenz (a,h) anthracene	22.6	1.4	7.0	"	20.0		113	13-200			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Di-n-butyl phthalate	17.5	0.61	7.0	µg/L	20.0		88	52-130			
3,3´-Dichlorobenzidine	13.4	0.89	20	"	20.0		67	47-130			J
Diethyl phthalate	17.4	0.59	5.0	"	20.0		87	47-130			
Dimethyl phthalate	18.5	0.61	4.0	"	20.0		92	50-130			
2,4-Dinitrotoluene (2,4-DNT)	18.1	0.50	10	"	20.0		91	53-130			
2,6-Dinitrotoluene (2,6-DNT)	18.6	0.56	5.0	"	20.0		93	68-137			
Di-n-octyl phthalate	18.6	0.98	7.0	"	20.0		93	21-132			
Fluoranthene	17.8	0.61	6.0	"	20.0		89	47-130			
Fluorene	17.6	0.60	5.0	"	20.0		88	70-130			
Hexachlorobenzene	17.9	0.74	5.0	"	20.0		90	38-142			
Hexachlorobutadiene	16.7	0.55	2.7	"	20.0		83	68-130			
Hexachloroethane	16.9	0.49	4.0	"	20.0		84	55-130			
Indeno (1,2,3-cd) pyrene	23.5	1.3	10	"	20.0		117	13-151			
Isophorone	7.51	0.52	6.0	"	20.0		38	52-180			QM-1
Naphthalene	17.1	0.52	4.0	"	20.0		85	70-130			
Nitrobenzene (NB)	17.8	0.42	5.0	"	20.0		89	54-158			
N-Nitrosodi-n-propylamine	18.0	0.51	10	"	20.0		90	59-170			
Phenanthrene	17.6	0.52	10	"	20.0		88	67-130			
Pyrene	17.2	0.61	5.0	"	20.0		86	70-130			
1,2,4-Trichlorobenzene	18.1	0.55	5.0	"	20.0		90	61-130			
4-Chloro-3-methylphenol	16.8	0.45	9.0	"	20.0		84	68-130			
2-Chlorophenol	16.4	0.46	9.0	"	20.0		82	55-130			
2,4-Dichlorophenol	18.3	0.50	8.0	"	20.0		92	64-130			
2,4-Dimethylphenol	17.6	0.56	8.0	"	20.0		88	58-130			
4,6-Dinitro-2-methylphenol	18.6	0.79	25	"	20.0		93	56-130			J
2,4-Dinitrophenol	20.9	0.47	25	"	20.0		105	39-173			J
2-Nitrophenol	18.4	0.48	10	"	20.0		92	61-163			
4-Nitrophenol	14.9	0.73	7.0	"	20.0		75	35-130			
Pentachlorophenol	16.5	0.77	10	"	20.0		82	42-152			
Phenol	16.1	0.41	4.0	"	20.0		81	48-130			
2,4,6-Trichlorophenol	16.9	0.60	8.0	"	20.0		85	69-130			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS (2400296-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Surrogate: 2-Fluorophenol	*30.1*			*µg/L*	*50.0*		*60*	*21-110*			
Surrogate: Phenol-d6	*32.7*			*"*	*50.0*		*65*	*10-110*			
Surrogate: Nitrobenzene-d5	*61.3*			*"*	*50.0*		*123*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*55.6*			*"*	*50.0*		*111*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*33.2*			*"*	*50.0*		*66*	*10-123*			
Surrogate: Terphenyl-dl4	*53.4*			*"*	*50.0*		*107*	*33-141*			
LCS Dup (2400296-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Acenaphthene	18.0	0.51	5.0	µg/L	20.0		90	70-130	6	30	
Acenaphthylene	19.0	0.62	10	"	20.0		95	60-130	6	30	
Anthracene	17.3	0.50	5.0	"	20.0		87	58-130	7	30	
Benzo (a) anthracene	19.8	0.81	10	"	20.0		99	42-133	8	30	
Benzo (b) fluoranthene	21.6	1.4	10	"	20.0		108	42-140	0.3	30	
Benzo (k) fluoranthene	20.0	0.96	7.0	"	20.0		100	25-146	1	30	
Benzo (g,h,i) perylene	24.3	1.1	10	"	20.0		121	13-195	5	30	
Benzo (a) pyrene	18.5	1.2	7.0	"	20.0		93	32-148	0.05	30	
Bis(2-chloroethoxy)methane	18.6	0.51	10	"	20.0		93	52-164	6	30	
Bis(2-chloroisopropyl)ether	17.9	0.52	10	"	20.0		90	63-139	6	30	
Bis(2-ethylhexyl)phthalate	17.2	0.58	7.0	"	20.0		86	43-137	2	30	
4-Bromophenyl phenyl ether	18.9	0.62	5.0	"	20.0		94	70-130	6	30	
Butyl benzyl phthalate	19.4	0.69	7.0	"	20.0		97	43-140	10	30	
2-Chloronaphthalene	19.1	0.52	5.0	"	20.0		96	70-130	5	30	
4-Chlorophenyl phenyl ether	18.7	0.58	10	"	20.0		94	57-145	7	30	
Chrysene	18.2	0.60	7.0	"	20.0		91	44-140	0.4	30	
Dibenz (a,h) anthracene	24.1	1.4	7.0	"	20.0		120	13-200	6	30	
Di-n-butyl phthalate	19.2	0.61	7.0	"	20.0		96	52-130	9	30	
3,3´-Dichlorobenzidine	13.6	0.89	20	"	20.0		68	47-130	1	30	J
Diethyl phthalate	18.5	0.59	5.0	"	20.0		93	47-130	6	30	
Dimethyl phthalate	19.8	0.61	4.0	"	20.0		99	50-130	7	30	
2,4-Dinitrotoluene (2,4-DNT)	19.6	0.50	10	"	20.0		98	53-130	8	30	
2,6-Dinitrotoluene (2,6-DNT)	19.6	0.56	5.0	"	20.0		98	68-137	5	30	
Di-n-octyl phthalate	19.0	0.98	7.0	"	20.0		95	21-132	2	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
LCS Dup (2400296-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Fluoranthene	19.5	0.61	6.0	µg/L	20.0		98	47-130	9	30	
Fluorene	18.8	0.60	5.0	"	20.0		94	70-130	7	30	
Hexachlorobenzene	18.9	0.74	5.0	"	20.0		94	38-142	5	30	
Hexachlorobutadiene	17.8	0.55	2.7	"	20.0		89	68-130	7	30	
Hexachloroethane	17.8	0.49	4.0	"	20.0		89	55-130	5	30	
Indeno (1,2,3-cd) pyrene	25.0	1.3	10	"	20.0		125	13-151	6	30	
Isophorone	7.88	0.52	6.0	"	20.0		39	52-180	5	30	QM-1
Naphthalene	18.2	0.52	4.0	"	20.0		91	70-130	6	30	
Nitrobenzene (NB)	18.8	0.42	5.0	"	20.0		94	54-158	6	30	
N-Nitrosodi-n-propylamine	19.0	0.51	10	"	20.0		95	59-170	6	30	
Phenanthrene	18.9	0.52	10	"	20.0		94	67-130	7	30	
Pyrene	19.1	0.61	5.0	"	20.0		96	70-130	10	30	
1,2,4-Trichlorobenzene	19.3	0.55	5.0	"	20.0		96	61-130	6	30	
4-Chloro-3-methylphenol	14.4	0.45	9.0	"	20.0		72	68-130	16	30	
2-Chlorophenol	16.7	0.46	9.0	"	20.0		84	55-130	2	30	
2,4-Dichlorophenol	15.8	0.50	8.0	"	20.0		79	64-130	15	30	
2,4-Dimethylphenol	17.7	0.56	8.0	"	20.0		89	58-130	0.8	30	
4,6-Dinitro-2-methylphenol	18.4	0.79	25	"	20.0		92	56-130	1	30	J
2,4-Dinitrophenol	20.2	0.47	25	"	20.0		101	39-173	3	30	J
2-Nitrophenol	19.3	0.48	10	"	20.0		96	61-163	5	30	
4-Nitrophenol	12.7	0.73	7.0	"	20.0		64	35-130	16	30	
Pentachlorophenol	13.6	0.77	10	"	20.0		68	42-152	19	30	
Phenol	16.8	0.41	4.0	"	20.0		84	48-130	4	30	
2,4,6-Trichlorophenol	16.4	0.60	8.0	"	20.0		82	69-130	3	30	
Surrogate: 2-Fluorophenol	*28.9*			"	*50.0*		*58*	*21-110*			
Surrogate: Phenol-d6	*31.0*			"	*50.0*		*62*	*10-110*			
Surrogate: Nitrobenzene-d5	*59.5*			"	*50.0*		*119*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*55.3*			"	*50.0*		*111*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*27.8*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*53.7*			"	*50.0*		*107*	*33-141*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike (2400296-MS1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Acenaphthene	716	20	200	µg/L	800	ND	90	47-145			
Acenaphthylene	727	25	400	"	800	ND	91	33-145			
Anthracene	652	20	200	"	800	ND	82	27-133			
Benzo (a) anthracene	516	32	400	"	800	ND	65	33-143			
Benzo (b) fluoranthene	1230	56	400	"	800	ND	154	24-159			
Benzo (k) fluoranthene	999	38	280	"	800	ND	125	11-162			
Benzo (g,h,i) perylene	851	44	400	"	800	ND	106	1-219			
Benzo (a) pyrene	906	48	280	"	800	ND	113	17-163			
Bis(2-chloroethoxy)methane	749	20	400	"	800	ND	94	33-184			
Bis(2-chloroisopropyl)ether	695	21	400	"	800	ND	87	36-166			
Bis(2-ethylhexyl)phthalate	1600	23	280	"	800	ND	200	8-158			QM-5
4-Bromophenyl phenyl ether	718	25	200	"	800	ND	90	53-127			
Butyl benzyl phthalate	491	28	280	"	800	ND	61	1-152			
2-Chloronaphthalene	758	21	200	"	800	ND	95	60-120			
4-Chlorophenyl phenyl ether	744	23	400	"	800	ND	93	25-158			
Chrysene	1180	24	280	"	800	ND	147	17-168			
Dibenz (a,h) anthracene	819	56	280	"	800	ND	102	1-227			
Di-n-butyl phthalate	714	24	280	"	800	ND	89	1-120			
3,3´-Dichlorobenzidine	ND	36	800	"	800	ND		1-262			QM-5
Diethyl phthalate	344	24	200	"	800	ND	43	1-120			
Dimethyl phthalate	58.4	24	160	"	800	ND	7	1-120			J
2,4-Dinitrotoluene (2,4-DNT)	744	20	400	"	800	ND	93	39-139			
2,6-Dinitrotoluene (2,6-DNT)	777	22	200	"	800	ND	97	50-158			
Di-n-octyl phthalate	923	39	280	"	800	ND	115	4-146			
Fluoranthene	646	24	240	"	800	ND	81	26-137			
Fluorene	741	24	200	"	800	ND	93	59-121			
Hexachlorobenzene	720	30	200	"	800	ND	90	1-152			
Hexachlorobutadiene	642	22	110	"	800	ND	80	24-120			
Hexachloroethane	308	20	160	"	800	ND	39	40-120			QM-5
Indeno (1,2,3-cd) pyrene	853	52	400	"	800	ND	107	1-171			
Isophorone	326	21	240	"	800	ND	41	21-196			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike (2400296-MS1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Naphthalene	677	21	160	µg/L	800	ND	85	21-133			
Nitrobenzene (NB)	752	17	200	"	800	ND	94	35-180			
N-Nitrosodi-n-propylamine	812	20	400	"	800	ND	102	1-230			
Phenanthrene	735	21	400	"	800	ND	92	54-120			
Pyrene	438	24	200	"	800	ND	55	52-120			
1,2,4-Trichlorobenzene	736	22	200	"	800	ND	92	44-142			
4-Chloro-3-methylphenol	735	18	360	"	800	ND	92	22-147			
2-Chlorophenol	593	18	360	"	800	ND	74	23-134			
2,4-Dichlorophenol	757	20	320	"	800	ND	95	39-135			
2,4-Dimethylphenol	654	22	320	"	800	ND	82	32-120			
4,6-Dinitro-2-methylphenol	361	32	1000	"	800	ND	45	1-181			J
2,4-Dinitrophenol	208	19	1000	"	800	ND	26	1-191			J
2-Nitrophenol	693	19	400	"	800	ND	87	29-182			
4-Nitrophenol	228	29	280	"	800	ND	29	1-132			J
Pentachlorophenol	276	31	400	"	800	ND	34	14-176			J
Phenol	638	16	160	"	800	ND	80	5-120			
2,4,6-Trichlorophenol	680	24	320	"	800	ND	85	37-144			
Surrogate: 2-Fluorophenol	*827*			"	*2000*		*41*	*21-110*			
Surrogate: Phenol-d6	*696*			"	*2000*		*35*	*10-110*			
Surrogate: Nitrobenzene-d5	*2620*			"	*2000*		*131*	*35-114*			*QS-4*
Surrogate: 2-Fluorobiphenyl	*2490*			"	*2000*		*125*	*43-116*			*QS-4*
Surrogate: 2,4,6-Tribromophenol	*1200*			"	*2000*		*60*	*10-123*			
Surrogate: Terphenyl-dl4	*1970*			"	*2000*		*99*	*33-141*			
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Acenaphthene	673	20	200	µg/L	800	ND	84	47-145	6	48	
Acenaphthylene	676	25	400	"	800	ND	85	33-145	7	74	
Anthracene	622	20	200	"	800	ND	78	27-133	5	66	
Benzo (a) anthracene	387	32	400	"	800	ND	48	33-143	29	53	J
Benzo (b) fluoranthene	772	56	400	"	800	ND	97	24-159	46	71	
Benzo (k) fluoranthene	670	38	280	"	800	ND	84	11-162	39	63	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
Benzo (g,h,i) perylene	814	44	400	µg/L	800	ND	102	1-219	4	97	
Benzo (a) pyrene	605	48	280	"	800	ND	76	17-163	40	72	
Bis(2-chloroethoxy)methane	731	20	400	"	800	ND	91	33-184	2	54	
Bis(2-chloroisopropyl)ether	671	21	400	"	800	ND	84	36-166	3	76	
Bis(2-ethylhexyl)phthalate	1200	23	280	"	800	ND	150	8-158	28	82	
4-Bromophenyl phenyl ether	663	25	200	"	800	ND	83	53-127	8	43	
Butyl benzyl phthalate	406	28	280	"	800	ND	51	1-152	19	60	
2-Chloronaphthalene	711	21	200	"	800	ND	89	60-120	6	24	
4-Chlorophenyl phenyl ether	686	23	400	"	800	ND	86	25-158	8	61	
Chrysene	925	24	280	"	800	ND	116	17-168	24	87	
Dibenz (a,h) anthracene	782	56	280	"	800	ND	98	1-227	5	126	
Di-n-butyl phthalate	672	24	280	"	800	ND	84	1-120	6	47	
3,3´-Dichlorobenzidine	ND	36	800	"	800	ND		1-262		108	QM-5
Diethyl phthalate	331	24	200	"	800	ND	41	1-120	4	100	
Dimethyl phthalate	53.2	24	160	"	800	ND	7	1-120	9	183	J
2,4-Dinitrotoluene (2,4-DNT)	681	20	400	"	800	ND	85	39-139	9	42	
2,6-Dinitrotoluene (2,6-DNT)	735	22	200	"	800	ND	92	50-158	6	48	
Di-n-octyl phthalate	681	39	280	"	800	ND	85	4-146	30	69	
Fluoranthene	587	24	240	"	800	ND	73	26-137	9	66	
Fluorene	690	24	200	"	800	ND	86	59-121	7	38	
Hexachlorobenzene	664	30	200	"	800	ND	83	1-152	8	55	
Hexachlorobutadiene	610	22	110	"	800	ND	76	24-120	5	62	
Hexachloroethane	275	20	160	"	800	ND	34	40-120	11	52	QM-5
Indeno (1,2,3-cd) pyrene	823	52	400	"	800	ND	103	1-171	4	99	
Isophorone	312	21	240	"	800	ND	39	21-196	4	93	
Naphthalene	646	21	160	"	800	ND	81	21-133	5	65	
Nitrobenzene (NB)	742	17	200	"	800	ND	93	35-180	1	62	
N-Nitrosodi-n-propylamine	787	20	400	"	800	ND	98	1-230	3	87	
Phenanthrene	686	21	400	"	800	ND	86	54-120	7	39	
Pyrene	387	24	200	"	800	ND	48	52-120	12	49	QM-5
1,2,4-Trichlorobenzene	710	22	200	"	800	ND	89	44-142	4	50	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400296 - EPA 3510B GCMS											
Matrix Spike Dup (2400296-MSD1)			**Source: 24A0541-01**	Prepared: 01/11/24 Analyzed: 01/17/24							**QRL-2**
4-Chloro-3-methylphenol	724	18	360	µg/L	800	ND	90	22-147	2	73	
2-Chlorophenol	552	18	360	"	800	ND	69	23-134	7	61	
2,4-Dichlorophenol	692	20	320	"	800	ND	87	39-135	9	50	
2,4-Dimethylphenol	629	22	320	"	800	ND	79	32-120	4	58	
4,6-Dinitro-2-methylphenol	275	32	1000	"	800	ND	34	1-181	27	203	J
2,4-Dinitrophenol	176	19	1000	"	800	ND	22	1-191	17	132	J
2-Nitrophenol	616	19	400	"	800	ND	77	29-182	12	55	
4-Nitrophenol	181	29	280	"	800	ND	23	1-132	23	131	J
Pentachlorophenol	207	31	400	"	800	ND	26	14-176	28	86	J
Phenol	612	16	160	"	800	ND	76	5-120	4	64	
2,4,6-Trichlorophenol	538	24	320	"	800	ND	67	37-144	23	58	
Surrogate: 2-Fluorophenol	*597*			"	*2000*		*30*	*21-110*			
Surrogate: Phenol-d6	*582*			"	*2000*		*29*	*10-110*			
Surrogate: Nitrobenzene-d5	*2360*			"	*2000*		*118*	*35-114*			*QS-BN*
Surrogate: 2-Fluorobiphenyl	*2150*			"	*2000*		*108*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*829*			"	*2000*		*41*	*10-123*			
Surrogate: Terphenyl-dl4	*1640*			"	*2000*		*82*	*33-141*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400274 - General											
Blank (2400274-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2400274-BS1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	211	2.0	3.0	mg/L	167		126	83-138			
LCS Dup (2400274-BSD1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Biochemical Oxygen Demand	210	2.0	3.0	mg/L	167		126	83-138	0.2	21	
Batch 2400275 - Solvent Extract											
Blank (2400275-BLK1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2400275-BS1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	37.9	0.66	1.0	mg/L	40.0		95	78-114			
LCS Dup (2400275-BSD1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Hexane Extractable Material (HEM, Oil & Grease)	38.2	0.66	1.0	mg/L	40.0		96	78-114	0.8	18	
Batch 2400285 - General Preparation											
Blank (2400285-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2400285-BS1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.337	0.023	0.050	mg/L	0.300		112	80-120			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400285 - General Preparation											
LCS Dup (2400285-BSD1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.318	0.023	0.050	mg/L	0.300		106	80-120	6	25	
Matrix Spike (2400285-MS1)			**Source: 24A0385-01**		Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.877	0.023	0.050	mg/L	0.300	0.570	102	75-125			
Matrix Spike Dup (2400285-MSD1)			**Source: 24A0385-01**		Prepared: 01/11/24 Analyzed: 01/16/24						
Total Phosphorus as P	0.908	0.023	0.050	mg/L	0.300	0.570	113	75-125	3	30	
Batch 2400369 - General Prep											
Blank (2400369-BLK1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2400369-BS1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	9.92	0.29	1.0	µg/L	10.0		99	80-120			
LCS Dup (2400369-BSD1)					Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	9.96	0.29	1.0	µg/L	10.0		100	80-120	0.3	20	
Matrix Spike (2400369-MS1)			**Source: 24A0538-01**		Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	ND	102	80-120			
Matrix Spike Dup (2400369-MSD1)			**Source: 24A0538-01**		Prepared & Analyzed: 01/15/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	ND	102	80-120	0.3	20	
Batch 2400373 - General Preparation											
Blank (2400373-BLK1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	ND	2.5	2.5	mg/L							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400373 - General Preparation											
LCS (2400373-BS1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	94.2	2.5	2.5	mg/L	100		94	80-120			
LCS Dup (2400373-BSD1)					Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	93.6	2.5	2.5	mg/L	100		94	80-120	0.6	200	
Duplicate (2400373-DUP1)			**Source: 24A0496-01**		Prepared: 01/15/24 Analyzed: 01/16/24						
Total Suspended Solids	76.7	21	21	mg/L		75.0			2	20	
Batch 2400378 - General Preparation											
Blank (2400378-BLK1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	ND	0.54	1.0	mg/L							
LCS (2400378-BS1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.57	0.54	1.0	mg/L	10.0		96	75-125			
LCS Dup (2400378-BSD1)					Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.55	0.54	1.0	mg/L	10.0		95	75-125	0.2	25	
Matrix Spike (2400378-MS1)			**Source: 24A0533-01**		Prepared & Analyzed: 01/15/24						
Total Organic Carbon	9.93	0.54	1.0	mg/L	10.0	1.39	85	75-125			
Matrix Spike Dup (2400378-MSD1)			**Source: 24A0533-01**		Prepared & Analyzed: 01/15/24						
Total Organic Carbon	10.4	0.54	1.0	mg/L	10.0	1.39	90	75-125	5	25	
Batch 2400399 - General Preparation											
Blank (2400399-BLK1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	ND	0.025	0.10	mg/L							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400399 - General Preparation											
LCS (2400399-BS1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	0.545	0.025	0.10	mg/L	0.500		109	80-120			
LCS Dup (2400399-BSD1)					Prepared & Analyzed: 01/15/24						
Ammonia as N	0.518	0.025	0.10	mg/L	0.500		104	80-120	5	25	
Matrix Spike (2400399-MS1)			**Source: 24A0423-04**		Prepared & Analyzed: 01/15/24						
Ammonia as N	0.712	0.025	0.10	mg/L	0.500	0.177	107	75-125			
Matrix Spike Dup (2400399-MSD1)			**Source: 24A0423-04**		Prepared & Analyzed: 01/15/24						
Ammonia as N	0.695	0.025	0.10	mg/L	0.500	0.177	104	75-125	2	25	
Batch 2400407 - General Preparation											
Blank (2400407-BLK1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2400407-BS1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	51.4	6.6	7.0	mg/L	50.0		103	80-120			
LCS Dup (2400407-BSD1)					Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	47.1	6.6	7.0	mg/L	50.0		94	80-120	9	25	
Matrix Spike (2400407-MS1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	94.3	6.6	7.0	mg/L	50.0	32.1	125	75-125			
Matrix Spike Dup (2400407-MSD1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/16/24						
Chemical Oxygen Demand	92.2	6.6	7.0	mg/L	50.0	32.1	120	75-125	2	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400411 - General Preparation											
Blank (2400411-BLK1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.0507	0.0024	0.10	mg/L							J
LCS (2400411-BS1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.287	0.0024	0.10	mg/L	0.250		115	80-120			
LCS Dup (2400411-BSD1)					Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.272	0.0024	0.10	mg/L	0.250		109	80-120	5	20	
Matrix Spike (2400411-MS1)			**Source: 24A0444-04**		Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.390	0.0024	0.10	mg/L	0.250	ND	156	75-125			QM-7
Matrix Spike Dup (2400411-MSD1)			**Source: 24A0444-04**		Prepared & Analyzed: 01/16/24						
Nitrate/Nitrite as N	0.383	0.0024	0.10	mg/L	0.250	ND	153	75-125	2	25	QM-7

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400428 - EPA 3510B GCNV											
Blank (2400428-BLK1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0308*			*"*	*0.0250*		*123*	*65-135*			
LCS (2400428-BS1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	3.30	0.0021	0.050	mg/L	2.50		132	65-135			
Surrogate: o-Terphenyl	*0.0307*			*"*	*0.0250*		*123*	*65-135*			
LCS Dup (2400428-BSD1)					Prepared: 01/11/24 Analyzed: 01/17/24						
Diesel	3.11	0.0021	0.050	mg/L	2.50		124	65-135	6	30	
Surrogate: o-Terphenyl	*0.0278*			*"*	*0.0250*		*111*	*65-135*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400280 - EPA 200 Series											
Blank (2400280-BLK1)					Prepared: 01/11/24 Analyzed: 01/16/24						
Chromium	0.000143	0.00014	0.0010	mg/L							
Aluminum	ND	0.0016	0.050	"							
Copper	ND	0.000090	0.010	"							
Lead	ND	0.000020	0.0050	"							
Zinc	ND	0.00027	0.020	"							
LCS (2400280-BS1)					Prepared & Analyzed: 01/11/24						
Chromium	0.101	0.00014	0.0010	mg/L	0.100		101	85-115			
Aluminum	0.522	0.0016	0.050	"	0.500		104	85-115			
Copper	0.0996	0.000090	0.010	"	0.100		100	85-115			
Lead	0.100	0.000020	0.0050	"	0.100		100	85-115			
Zinc	0.0963	0.00027	0.020	"	0.100		96	85-115			
Matrix Spike (2400280-MS1)			**Source: 24A0509-01**		Prepared & Analyzed: 01/11/24						
Chromium	0.101	0.00014	0.0010	mg/L	0.100	0.00354	98	70-130			
Aluminum	0.768	0.0016	0.050	"	0.500	0.189	116	70-130			
Copper	0.107	0.000090	0.010	"	0.100	0.00665	100	70-130			
Lead	0.104	0.000020	0.0050	"	0.100	0.00126	103	70-130			
Zinc	0.184	0.00027	0.020	"	0.100	0.0828	101	70-130			
Matrix Spike (2400280-MS2)			**Source: 24A0559-05**		Prepared & Analyzed: 01/11/24						
Chromium	0.0994	0.00014	0.0010	mg/L	0.100	0.00197	97	70-130			
Aluminum	0.521	0.0016	0.050	"	0.500	ND	104	70-130			
Copper	0.0982	0.000090	0.010	"	0.100	ND	98	70-130			
Lead	0.0991	0.000020	0.0050	"	0.100	ND	99	70-130			
Zinc	0.0960	0.00027	0.020	"	0.100	ND	96	70-130			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400294 - EPA 7470A											
Blank (2400294-BLK1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	ND	0.15	0.20	µg/L							
LCS (2400294-BS1)					Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.46	0.15	0.20	µg/L	5.00		89	85-115			
Matrix Spike (2400294-MS1)			**Source: 24A0308-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.33	0.15	0.20	µg/L	5.00	ND	87	70-130			
Matrix Spike (2400294-MS2)			**Source: 24A0526-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.68	0.15	0.20	µg/L	5.00	ND	94	70-130			
Matrix Spike Dup (2400294-MSD1)			**Source: 24A0308-01**		Prepared: 01/11/24 Analyzed: 01/12/24						
Mercury	4.50	0.15	0.20	µg/L	5.00	ND	90	70-130	4	25	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400333 - EPA 3510B GCNV											
Blank (2400333-BLK1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.257*			"	*0.250*		*103*	*50-150*			
LCS (2400333-BS1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1260	2.58	0.052	0.50	µg/L	2.50		103	31-138			
Surrogate: Decachlorobiphenyl	*0.260*			"	*0.250*		*104*	*50-150*			
LCS Dup (2400333-BSD1)					Prepared: 01/12/24 Analyzed: 01/15/24						
Aroclor 1260	2.34	0.052	0.50	µg/L	2.50		94	31-138	10	30	
Surrogate: Decachlorobiphenyl	*0.241*			"	*0.250*		*97*	*50-150*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Blank (2400401-BLK1)					Prepared & Analyzed: 01/13/24						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Blank (2400401-BLK1)					Prepared & Analyzed: 01/13/24						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Methyl tert-butyl ether*	ND	0.069	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*9.61*			"	*10.0*		*96*	*65-135*			
Surrogate: Toluene-d8	*8.36*			"	*10.0*		*84*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*11.3*			"	*10.0*		*113*	*73-125*			
LCS (2400401-BS1)					Prepared & Analyzed: 01/13/24						
Benzene	21.6	0.096	0.30	µg/L	20.0		108	65-135			
Bromodichloromethane	17.6	0.058	0.50	"	20.0		88	65-135			
Bromoform	17.5	0.072	0.50	"	20.0		87	70-130			
Bromomethane	18.3	0.19	0.50	"	20.0		91	15-185			
Carbon tetrachloride	17.2	0.10	0.50	"	20.0		86	70-130			
Chlorobenzene	22.0	0.088	0.30	"	20.0		110	63-135			
Chloroethane	22.0	0.18	0.50	"	20.0		110	40-160			
Chloroform	18.6	0.079	0.50	"	20.0		93	70-135			
Chloromethane	19.3	0.19	0.50	"	20.0		96	1-472			
Dibromochloromethane	17.0	0.052	0.50	"	20.0		85	70-135			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0		96	65-135			
1,3-Dichlorobenzene	20.1	0.077	0.30	"	20.0		101	70-130			
1,4-Dichlorobenzene	19.2	0.26	0.30	"	20.0		96	65-135			
1,1-Dichloroethane	17.2	0.080	0.50	"	20.0		86	70-130			
1,2-Dichloroethane	16.6	0.060	0.50	"	20.0		83	50-150			
1,1-Dichloroethene	18.5	0.12	0.50	"	20.0		92	70-130			
trans-1,2-Dichloroethene	17.8	0.11	0.50	"	20.0		89	35-165			
1,2-Dichloropropane	22.8	0.066	0.50	"	20.0		114	5-210			
cis-1,3-Dichloropropene	16.6	0.058	0.50	"	20.0		83	25-175			
trans-1,3-Dichloropropene	14.5	0.12	0.50	"	20.0		73	50-150			
Ethylbenzene	21.2	0.098	0.30	"	20.0		106	60-140			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
LCS (2400401-BS1)					Prepared & Analyzed: 01/13/24						
Methylene chloride	21.8	0.076	0.50	µg/L	20.0		109	60-140			
1,1,2,2-Tetrachloroethane	16.2	0.049	0.50	"	20.0		81	60-140			
Tetrachloroethene	17.9	0.11	0.50	"	20.0		89	70-130			
Toluene	18.9	0.070	0.30	"	20.0		95	70-130			
1,1,1-Trichloroethane	16.2	0.060	0.50	"	20.0		81	70-130			
1,1,2-Trichloroethane	19.6	0.068	0.50	"	20.0		98	70-130			
Trichloroethene	16.6	0.082	0.50	"	20.0		83	65-135			
Trichlorofluoromethane	21.9	0.13	0.50	"	20.0		109	50-150			
Vinyl chloride	22.6	0.12	0.50	"	20.0		113	5-195			
Surrogate: 1,2-Dichloroethane-d4	*8.88*			*"*	*10.0*		*89*	*65-135*			
Surrogate: Toluene-d8	*10.9*			*"*	*10.0*		*109*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.97*			*"*	*10.0*		*90*	*73-125*			
LCS Dup (2400401-BSD1)					Prepared & Analyzed: 01/13/24						
Benzene	21.0	0.096	0.30	µg/L	20.0		105	65-135	2	30	
Bromodichloromethane	18.4	0.058	0.50	"	20.0		92	65-135	5	30	
Bromoform	17.0	0.072	0.50	"	20.0		85	70-130	3	30	
Bromomethane	20.0	0.19	0.50	"	20.0		100	15-185	9	30	
Carbon tetrachloride	16.6	0.10	0.50	"	20.0		83	70-130	3	30	
Chlorobenzene	21.9	0.088	0.30	"	20.0		110	63-135	0.5	30	
Chloroethane	22.0	0.18	0.50	"	20.0		110	40-160	0	30	
Chloroform	18.7	0.079	0.50	"	20.0		93	70-135	0.3	30	
Chloromethane	19.1	0.19	0.50	"	20.0		95	1-472	0.9	30	
Dibromochloromethane	17.8	0.052	0.50	"	20.0		89	70-135	4	30	
1,2-Dichlorobenzene	19.5	0.059	0.30	"	20.0		98	65-135	2	30	
1,3-Dichlorobenzene	19.8	0.077	0.30	"	20.0		99	70-130	1	30	
1,4-Dichlorobenzene	19.2	0.26	0.30	"	20.0		96	65-135	0.3	30	
1,1-Dichloroethane	20.1	0.080	0.50	"	20.0		100	70-130	16	30	
1,2-Dichloroethane	17.5	0.060	0.50	"	20.0		87	50-150	5	30	
1,1-Dichloroethene	17.8	0.12	0.50	"	20.0		89	70-130	3	30	
trans-1,2-Dichloroethene	17.7	0.11	0.50	"	20.0		88	35-165	0.6	30	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
LCS Dup (2400401-BSD1)					Prepared & Analyzed: 01/13/24						
1,2-Dichloropropane	22.4	0.066	0.50	µg/L	20.0		112	5-210	2	30	
cis-1,3-Dichloropropene	16.4	0.058	0.50	"	20.0		82	25-175	1	30	
trans-1,3-Dichloropropene	14.9	0.12	0.50	"	20.0		74	50-150	2	30	
Ethylbenzene	23.2	0.098	0.30	"	20.0		116	60-140	9	30	
Methylene chloride	21.3	0.076	0.50	"	20.0		107	60-140	2	30	
1,1,2,2-Tetrachloroethane	16.0	0.049	0.50	"	20.0		80	60-140	1	30	
Tetrachloroethene	18.0	0.11	0.50	"	20.0		90	70-130	0.6	30	
Toluene	19.2	0.070	0.30	"	20.0		96	70-130	1	30	
1,1,1-Trichloroethane	15.7	0.060	0.50	"	20.0		79	70-130	3	30	
1,1,2-Trichloroethane	20.7	0.068	0.50	"	20.0		104	70-130	5	30	
Trichloroethene	16.6	0.082	0.50	"	20.0		83	65-135	0.2	30	
Trichlorofluoromethane	16.1	0.13	0.50	"	20.0		81	50-150	30	30	
Vinyl chloride	20.3	0.12	0.50	"	20.0		102	5-195	11	30	
Surrogate: 1,2-Dichloroethane-d4	*9.24*			*"*	*10.0*		*92*	*65-135*			
Surrogate: Toluene-d8	*11.5*			*"*	*10.0*		*115*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.71*			*"*	*10.0*		*87*	*73-125*			
Matrix Spike (2400401-MS1)				**Source: 24A0540-01**	Prepared: 01/13/24	Analyzed: 01/15/24					
Benzene	18.6	0.096	0.30	µg/L	20.0	ND	93	37-151			
Bromodichloromethane	17.1	0.058	0.50	"	20.0	ND	85	35-155			
Bromoform	16.2	0.072	0.50	"	20.0	ND	81	45-169			
Bromomethane	15.6	0.19	0.50	"	20.0	ND	78	1-242			
Carbon tetrachloride	15.4	0.10	0.50	"	20.0	ND	77	70-140			
Chlorobenzene	25.1	0.088	0.30	"	20.0	ND	125	37-163			
Chloroethane	19.1	0.18	0.50	"	20.0	ND	95	14-230			
Chloroform	18.2	0.079	0.50	"	20.0	ND	91	51-138			
Chloromethane	18.6	0.19	0.50	"	20.0	ND	93	1-273			
Dibromochloromethane	17.2	0.052	0.50	"	20.0	ND	86	53-149			
1,2-Dichlorobenzene	16.3	0.059	0.30	"	20.0	ND	82	18-190			
1,3-Dichlorobenzene	16.5	0.077	0.30	"	20.0	ND	83	59-156			
1,4-Dichlorobenzene	16.0	0.26	0.30	"	20.0	ND	80	18-190			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Matrix Spike (2400401-MS1)			**Source: 24A0540-01**		Prepared: 01/13/24	Analyzed: 01/15/24					
1,1-Dichloroethane	21.5	0.080	0.50	µg/L	20.0	ND	108	59-155			
1,2-Dichloroethane	17.7	0.060	0.50	"	20.0	ND	89	49-155			
1,1-Dichloroethene	16.7	0.12	0.50	"	20.0	ND	83	1-234			
trans-1,2-Dichloroethene	18.5	0.11	0.50	"	20.0	ND	92	54-156			
1,2-Dichloropropane	21.2	0.066	0.50	"	20.0	ND	106	1-210			
cis-1,3-Dichloropropene	14.0	0.058	0.50	"	20.0	ND	70	1-227			
trans-1,3-Dichloropropene	13.1	0.12	0.50	"	20.0	ND	66	17-183			
Ethylbenzene	20.5	0.098	0.30	"	20.0	ND	103	37-162			
Methylene chloride	19.5	0.076	0.50	"	20.0	ND	98	1-221			
1,1,2,2-Tetrachloroethane	17.9	0.049	0.50	"	20.0	ND	90	46-148			
Tetrachloroethene	16.4	0.11	0.50	"	20.0	ND	82	64-148			
Toluene	18.8	0.070	0.30	"	20.0	ND	94	47-150			
1,1,1-Trichloroethane	16.5	0.060	0.50	"	20.0	ND	83	52-162			
1,1,2-Trichloroethane	19.2	0.068	0.50	"	20.0	ND	96	52-150			
Trichloroethene	15.4	0.082	0.50	"	20.0	ND	77	71-157			
Trichlorofluoromethane	15.2	0.13	0.50	"	20.0	ND	76	17-181			
Vinyl chloride	19.7	0.12	0.50	"	20.0	ND	99	10-251			
Surrogate: 1,2-Dichloroethane-d4	*10.4*			*"*	*10.0*		*104*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.93*			*"*	*10.0*		*99*	*73-125*			
Matrix Spike Dup (2400401-MSD1)			**Source: 24A0540-01**		Prepared: 01/13/24	Analyzed: 01/15/24					
Benzene	18.5	0.096	0.30	µg/L	20.0	ND	92	37-151	1	61	
Bromodichloromethane	17.1	0.058	0.50	"	20.0	ND	86	35-155	0.1	56	
Bromoform	16.2	0.072	0.50	"	20.0	ND	81	45-169	0.4	42	
Bromomethane	18.0	0.19	0.50	"	20.0	ND	90	1-242	14	61	
Carbon tetrachloride	15.2	0.10	0.50	"	20.0	ND	76	70-140	2	41	
Chlorobenzene	23.4	0.088	0.30	"	20.0	ND	117	37-163	7	53	
Chloroethane	20.0	0.18	0.50	"	20.0	ND	100	14-230	5	78	
Chloroform	17.8	0.079	0.50	"	20.0	ND	89	51-138	2	54	
Chloromethane	20.6	0.19	0.50	"	20.0	ND	103	1-273	10	60	

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400401 - EPA 3510B GCMS											
Matrix Spike Dup (2400401-MSD1)			**Source: 24A0540-01**	Prepared: 01/13/24 Analyzed: 01/15/24							
Dibromochloromethane	16.6	0.052	0.50	µg/L	20.0	ND	83	53-149	4	50	
1,2-Dichlorobenzene	15.9	0.059	0.30	"	20.0	ND	80	18-190	3	57	
1,3-Dichlorobenzene	15.8	0.077	0.30	"	20.0	ND	79	59-156	5	43	
1,4-Dichlorobenzene	15.2	0.26	0.30	"	20.0	ND	76	18-190	5	57	
1,1-Dichloroethane	21.9	0.080	0.50	"	20.0	ND	109	59-155	2	40	
1,2-Dichloroethane	17.3	0.060	0.50	"	20.0	ND	87	49-155	3	49	
1,1-Dichloroethene	16.8	0.12	0.50	"	20.0	ND	84	1-234	0.5	32	
trans-1,2-Dichloroethene	22.3	0.11	0.50	"	20.0	ND	111	54-156	19	45	
1,2-Dichloropropane	20.7	0.066	0.50	"	20.0	ND	104	1-210	2	55	
cis-1,3-Dichloropropene	13.8	0.058	0.50	"	20.0	ND	69	1-227	1	58	
trans-1,3-Dichloropropene	13.1	0.12	0.50	"	20.0	ND	66	17-183	0.08	86	
Ethylbenzene	18.4	0.098	0.30	"	20.0	ND	92	37-162	11	63	
Methylene chloride	35.0	0.076	0.50	"	20.0	ND	175	1-221	57	28	QM-7
1,1,2,2-Tetrachloroethane	18.5	0.049	0.50	"	20.0	ND	93	46-148	3	61	
Tetrachloroethene	15.7	0.11	0.50	"	20.0	ND	79	64-148	4	39	
Toluene	17.0	0.070	0.30	"	20.0	ND	85	47-150	10	41	
1,1,1-Trichloroethane	16.1	0.060	0.50	"	20.0	ND	81	52-162	3	36	
1,1,2-Trichloroethane	19.1	0.068	0.50	"	20.0	ND	95	52-150	0.7	46	
Trichloroethene	14.9	0.082	0.50	"	20.0	ND	75	71-157	3	48	
Trichlorofluoromethane	15.9	0.13	0.50	"	20.0	ND	80	17-181	4	84	
Vinyl chloride	22.3	0.12	0.50	"	20.0	ND	111	10-251	12	66	
Surrogate: 1,2-Dichloroethane-d4	*9.90*			*"*	*10.0*		*99*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.85*			*"*	*10.0*		*99*	*73-125*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24A0540
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400366 - EPA 5030 Water GC											
Blank (2400366-BLK1)					Prepared & Analyzed: 01/15/24						
JP-4	29.9		50	µg/L							
Gasoline	13.7	10	50	"							J
Surrogate: o-Chlorotoluene (Gas)	*16.2*			*"*	*20.0*		*81*	*65-135*			
LCS (2400366-BS1)					Prepared & Analyzed: 01/15/24						
Gasoline	545	10	50	µg/L	500		109	70-130			
Surrogate: o-Chlorotoluene (Gas)	*16.5*			*"*	*20.0*		*83*	*65-135*			
LCS Dup (2400366-BSD1)					Prepared & Analyzed: 01/15/24						
Gasoline	526	10	50	µg/L	500		105	70-130	4	30	
Surrogate: o-Chlorotoluene (Gas)	*15.9*			*"*	*20.0*		*80*	*65-135*			

01/17/24 15:25

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24A0540**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QS-BN	Base/Neutral surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two base/neutral surrogates.
QS-4	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QRL-2	Elevated reporting limits due to limited sample volume.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-1	The spike recovery was outside acceptance limits for the LCS or LCSD. The batch was accepted based on acceptable MS/MSD recoveries & RPD's.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

24A0540

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb **ERT/BB&E/NASA Ames** Bldg. T20G/Room 142. M/S T20G-4 Moffett Field, CA 94035-1000 (650) 604-5360 marcia.j.christlieb@nasa.gov	LAB:	CLS **3249 Fitzgerald Rd.** Rancho Cordova, CA 95742 (916)638-7301
PROJECT NAME:	QSE2-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #2		235 E. Main St, Suite 107 Northville, MI 48167

Field Conditions:

	pH	/ Temp (C or F)
SBE	8.19	/ 59.6
191	7.79	/ 60.7
RTJO	7.80	/ 61.0

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	ANALYSIS REQUESTED: 625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
1/9/2024	4:30 PM	SBE.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	4:30 PM	SBE.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	4:30 PM	SBE.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	4:30 PM	SBE.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	4:00 PM	191.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	4:00 PM	191.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	4:00 PM	191.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/9/2024	3:30 PM	RTJO.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/9/2024	3:30 PM	RTJO.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/9/2024	3:30 PM	RTJO.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	

Please send results to marcia.j.christlieb@nasa.gov Brian.l.kawashima@nasa.gov

Request Limited DQ

SAMPLER:	Brian Kawashima	DATE/TIME:	1/9/2024 1200H	RECEIVED BY:	
RELINQUISHED BY:		DATE/TIME:	1/10/24 1715H	RECEIVED BY:	
RELINQUISHED BY:		DATE/TIME:		RECEIVED BY:	

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

February 16, 2024

CLS Work Order #: 24B0080
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE2-2023 / 2024

Enclosed are the results of analyses for samples received by the laboratory on 02/01/24 16:00. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	**1.2**	0.41	4.0	"	"	"	"	"	"	J
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*40 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*89 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*39 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*96 %*		*35-114*	"	"	"	"	
Surrogate: Phenol-d6			*32 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*41 %*		*33-141*	"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
2-Nitrophenol	ND	0.48	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.81	10	"	"	"	"	"	"	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Dimethyl phthalate	ND	0.61	4.0	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	0.57	10	"	"	"	"	"	"	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	**1.3**	0.41	4.0	"	"	"	"	"	"	J
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	

Surrogate: 2,4,6-Tribromophenol	*31 %*	*10-123*	"	"	"	"
Surrogate: 2-Fluorobiphenyl	*88 %*	*43-116*	"	"	"	"
Surrogate: 2-Fluorophenol	*33 %*	*21-110*	"	"	"	"
Surrogate: Nitrobenzene-d5	*95 %*	*35-114*	"	"	"	"
Surrogate: Phenol-d6	*26 %*	*10-110*	"	"	"	"
Surrogate: Terphenyl-dl4	*55 %*	*33-141*	"	"	"	"

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,2,4-Trichlorobenzene	ND	0.55	5.0	µg/L	1	2400953	02/05/24	02/07/24	EPA 625.1	
1,2-Dichlorobenzene*	ND	0.50	10	"	"	"	"	"	"	
1,3-Dichlorobenzene*	ND	0.51	10	"	"	"	"	"	"	
1,4-Dichlorobenzene*	ND	0.48	10	"	"	"	"	"	"	
2,4,5-Trichlorophenol*	ND	0.58	10	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.60	8.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.50	8.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.56	8.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.47	25	"	"	"	"	"	"	
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"	"	"	"	"	"	
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.52	5.0	"	"	"	"	"	"	
2-Chlorophenol	ND	0.46	9.0	"	"	"	"	"	"	
2-Methylnaphthalene*	ND	0.52	10	"	"	"	"	"	"	
2-Methylphenol*	ND	0.41	10	"	"	"	"	"	"	
2-Nitroaniline*	ND	0.54	25	"	"	"	"	"	"	
2-Nitrophenol	ND	0.48	10	"	"	"	"	"	"	
3 & 4-Methylphenol*	ND	0.48	10	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.89	20	"	"	"	"	"	"	
3-Nitroaniline*	ND	0.68	25	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	0.79	25	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.62	5.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.45	9.0	"	"	"	"	"	"	
4-Chloroaniline*	ND	0.39	20	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.58	10	"	"	"	"	"	"	
4-Nitroaniline*	ND	0.81	25	"	"	"	"	"	"	
4-Nitrophenol	ND	0.73	7.0	"	"	"	"	"	"	
Acenaphthene	ND	0.51	5.0	"	"	"	"	"	"	
Acenaphthylene	ND	0.62	10	"	"	"	"	"	"	
Anthracene	ND	0.50	5.0	"	"	"	"	"	"	
Benzidine	ND	2.2	40	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Benzo (a) anthracene	ND	0.81	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Benzo (a) pyrene	ND	1.2	7.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	1.4	10	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1.1	10	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.96	7.0	"	"	"	"	"	"	
Benzoic acid*	ND	1.1	25	"	"	"	"	"	"	
Benzyl alcohol*	ND	0.42	20	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.51	10	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.49	10	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.52	10	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.69	7.0	"	"	"	"	"	"	
Chrysene	ND	0.60	7.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	1.4	7.0	"	"	"	"	"	"	
Dibenzofuran*	ND	0.54	10	"	"	"	"	"	"	
Diethyl phthalate	ND	0.59	5.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.61	4.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.61	7.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.98	7.0	"	"	"	"	"	"	
Fluoranthene	ND	0.61	6.0	"	"	"	"	"	"	
Fluorene	ND	0.60	5.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.74	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.55	2.7	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.78	10	"	"	"	"	"	"	
Hexachloroethane	ND	0.49	4.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"	"	"	"	"	"	
Isophorone	ND	0.52	6.0	"	"	"	"	"	"	
Naphthalene	ND	0.52	4.0	"	"	"	"	"	"	
Nitrobenzene (NB)	ND	0.42	5.0	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.64	10	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.51	10	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
N-Nitrosodiphenylamine	ND	0.57	10	µg/L	1	2400953	"	02/07/24	EPA 625.1	
Pentachlorophenol	ND	0.77	10	"	"	"	"	"	"	
Phenanthrene	ND	0.52	10	"	"	"	"	"	"	
Phenol	ND	0.41	4.0	"	"	"	"	"	"	
Pyrene	ND	0.61	5.0	"	"	"	"	"	"	
Pyridine *	ND	0.36	10	"	"	"	"	"	"	
Surrogate: 2,4,6-Tribromophenol			*44 %*		*10-123*	"	"	"	"	
Surrogate: 2-Fluorobiphenyl			*98 %*		*43-116*	"	"	"	"	
Surrogate: 2-Fluorophenol			*42 %*		*21-110*	"	"	"	"	
Surrogate: Nitrobenzene-d5			*107 %*		*35-114*	"	"	"	"	
Surrogate: Phenol-d6			*36 %*		*10-110*	"	"	"	"	
Surrogate: Terphenyl-dl4			*64 %*		*33-141*	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.069**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	**11**	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	
Nitrate/Nitrite as N	**0.55**	0.0048	0.20	mg/L	2	2401061	02/08/24	02/08/24	SM4500-NO3 E	
Total Organic Carbon	**3.6**	0.54	1.0	"	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.056**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**8.6**	3.1	3.1	"	"	2400982	02/06/24	02/07/24	SM2540D	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.15**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	**120**	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	**0.52**	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	J
Nitrate/Nitrite as N	**1.8**	0.012	0.50	mg/L	5	2401061	02/08/24	02/08/24	SM4500-NO3 E	
Total Organic Carbon	**15**	0.54	1.0	"	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.060**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**7.4**	3.4	3.4	"	"	2400982	02/06/24	02/07/24	SM2540D	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Ammonia as N	**0.029**	0.025	0.10	mg/L	1	2401004	02/06/24	02/06/24	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2400886	02/02/24	02/07/24	SM5210B	A-COM
Chemical Oxygen Demand	ND	6.6	7.0	"	"	2400939	02/05/24	02/05/24	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2400919	02/02/24	02/06/24	EPA 1664B	
Hexavalent Chromium	**0.32**	0.29	1.0	µg/L	"	2401169	02/12/24	02/12/24	EPA 218.6	J
Nitrate/Nitrite as N	**1.9**	0.012	0.50	mg/L	5	2401061	02/08/24	02/08/24	SM4500-NO3 E	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Total Organic Carbon	ND	0.54	1.0	mg/L	1	2401052	02/07/24	02/07/24	SM5310B	
Total Phosphorus as P	**0.054**	0.023	0.050	"	"	2400968	02/06/24	02/06/24	SM4500-P E	
Total Suspended Solids	**6.8**	3.5	3.5	"	"	2400982	02/06/24	02/07/24	SM2540D	

02/16/24 16:36

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water Sampled: 01/31/24 16:00 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*101 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water Sampled: 01/31/24 16:15 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*95 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water Sampled: 01/31/24 16:30 Received: 02/01/24 16:00										
Diesel	ND	0.0021	0.050	mg/L	1	2400948	02/05/24	02/05/24	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*116 %*	*65-135*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**	**Received: 02/01/24 16:00**								
Chromium	**0.00036**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.00062**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.00023**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.0050**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**	**Received: 02/01/24 16:00**								
Chromium	**0.0018**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.0086**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.00026**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.014**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**	**Received: 02/01/24 16:00**								
Chromium	**0.0014**	0.00014	0.0010	mg/L	1	2400937	02/05/24	02/05/24	EPA 200.8	
Copper	**0.0017**	0.000090	0.010	"	"	"	"	"	"	J
Lead	**0.000049**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	ND	0.15	0.20	µg/L	"	2400981	02/06/24	02/06/24	EPA 245.1	
Zinc	**0.0073**	0.00027	0.020	mg/L	"	2400937	02/05/24	02/05/24	EPA 200.8	J

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2401029	02/07/24	02/08/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*53 %*	*50-150*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2401029	02/07/24	02/08/24	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*66 %*	*50-150*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
trans-1,3-Dichloropropene	ND	0.12	0.50	µg/L	1	2400942	"	02/02/24	EPA 624.1	
Trichloroethene	ND	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*96 %*		*65-135*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*114 %*		*73-125*		"	"	"	"	
Surrogate: Toluene-d8			*93 %*		*72-125*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Chloromethane	ND	0.19	0.50	µg/L	1	2400942	"	02/02/24	EPA 624.1	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**1.1**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*108 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*110 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*90 %*		*72-125*		"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2400942	02/02/24	02/02/24	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
1,3-Dichlorobenzene	ND	0.077	0.30	µg/L	1	2400942	"	02/02/24	EPA 624.1	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**1.5**	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methyl tert-butyl ether*	ND	0.069	0.50	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**8.4**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*119 %*		*65-135*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*112 %*		*73-125*	"	"	"	"	
Surrogate: Toluene-d8			*90 %*		*72-125*	"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E2 2023/2024 (24B0080-01) Water	**Sampled: 01/31/24 16:00**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**22**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*86 %*	*65-135*		"	"	"	"	
191.E2 2023/2024 (24B0080-02) Water	**Sampled: 01/31/24 16:15**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**24**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*89 %*	*65-135*		"	"	"	"	
RTJO.E2 2023/2024 (24B0080-03) Water	**Sampled: 01/31/24 16:30**		**Received: 02/01/24 16:00**							
Gasoline	ND	10	50	µg/L	1	2400941	02/05/24	02/06/24	EPA 8015M	
JP-4	**23**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*77 %*	*65-135*		"	"	"	"	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	ND	0.51	5.0	µg/L							
Acenaphthylene	ND	0.62	10	"							
Anthracene	ND	0.50	5.0	"							
Benzidine	ND	2.2	40	"							
Benzo (a) anthracene	ND	0.81	10	"							
Benzo (b) fluoranthene	ND	1.4	10	"							
Benzo (k) fluoranthene	ND	0.96	7.0	"							
Benzo (g,h,i) perylene	ND	1.1	10	"							
Benzo (a) pyrene	ND	1.2	7.0	"							
Bis(2-chloroethoxy)methane	ND	0.51	10	"							
Bis(2-chloroethyl)ether	ND	0.49	10	"							
Bis(2-chloroisopropyl)ether	ND	0.52	10	"							
Bis(2-ethylhexyl)phthalate	ND	0.58	7.0	"							
4-Bromophenyl phenyl ether	ND	0.62	5.0	"							
Butyl benzyl phthalate	ND	0.69	7.0	"							
2-Chloronaphthalene	ND	0.52	5.0	"							
4-Chlorophenyl phenyl ether	ND	0.58	10	"							
Chrysene	ND	0.60	7.0	"							
Dibenz (a,h) anthracene	ND	1.4	7.0	"							
Di-n-butyl phthalate	ND	0.61	7.0	"							
3,3´-Dichlorobenzidine	ND	0.89	20	"							
Diethyl phthalate	ND	0.59	5.0	"							
Dimethyl phthalate	ND	0.61	4.0	"							
2,4-Dinitrotoluene (2,4-DNT)	ND	0.50	10	"							
2,6-Dinitrotoluene (2,6-DNT)	ND	0.56	5.0	"							
Di-n-octyl phthalate	ND	0.98	7.0	"							
Fluoranthene	ND	0.61	6.0	"							
Fluorene	ND	0.60	5.0	"							
Hexachlorobenzene	ND	0.74	5.0	"							
Hexachlorobutadiene	ND	0.55	2.7	"							
Hexachlorocyclopentadiene	ND	0.78	10	"							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Hexachloroethane	ND	0.49	4.0	µg/L							
Indeno (1,2,3-cd) pyrene	ND	1.3	10	"							
Isophorone	ND	0.52	6.0	"							
Naphthalene	ND	0.52	4.0	"							
Nitrobenzene (NB)	ND	0.42	5.0	"							
N-Nitrosodimethylamine	ND	0.64	10	"							
N-Nitrosodiphenylamine	ND	0.57	10	"							
N-Nitrosodi-n-propylamine	ND	0.51	10	"							
Phenanthrene	ND	0.52	10	"							
Pyrene	ND	0.61	5.0	"							
1,2,4-Trichlorobenzene	ND	0.55	5.0	"							
4-Chloro-3-methylphenol	ND	0.45	9.0	"							
2-Chlorophenol	ND	0.46	9.0	"							
2,4-Dichlorophenol	ND	0.50	8.0	"							
2,4-Dimethylphenol	ND	0.56	8.0	"							
4,6-Dinitro-2-methylphenol	ND	0.79	25	"							
2,4-Dinitrophenol	ND	0.47	25	"							
2-Nitrophenol	ND	0.48	10	"							
4-Nitrophenol	ND	0.73	7.0	"							
Pentachlorophenol	ND	0.77	10	"							
Phenol	ND	0.41	4.0	"							
2,4,6-Trichlorophenol	ND	0.60	8.0	"							
Benzyl alcohol*	ND	0.42	20	"							
4-Chloroaniline*	ND	0.39	20	"							
Dibenzofuran*	ND	0.54	10	"							
1,2-Dichlorobenzene*	ND	0.50	10	"							
1,3-Dichlorobenzene*	ND	0.51	10	"							
1,4-Dichlorobenzene*	ND	0.48	10	"							
2-Methylnaphthalene*	ND	0.52	10	"							
2-Nitroaniline*	ND	0.54	25	"							
3-Nitroaniline*	ND	0.68	25	"							

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Blank (2400953-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
4-Nitroaniline*	ND	0.81	25	µg/L							
Benzoic acid*	ND	1.1	25	"							
3 & 4-Methylphenol*	ND	0.48	10	"							
2,4,5-Trichlorophenol*	ND	0.58	10	"							
Pyridine *	ND	0.36	10	"							
2-Methylphenol*	ND	0.41	10	"							
Surrogate: 2-Fluorophenol	*19.9*			"	*50.0*		*40*	*21-110*			
Surrogate: Phenol-d6	*28.0*			"	*50.0*		*56*	*10-110*			
Surrogate: Nitrobenzene-d5	*45.2*			"	*50.0*		*90*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*41.8*			"	*50.0*		*84*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*18.5*			"	*50.0*		*37*	*10-123*			
Surrogate: Terphenyl-dl4	*42.5*			"	*50.0*		*85*	*33-141*			
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	17.8	0.51	5.0	µg/L	20.0		89	70-130			
Acenaphthylene	17.5	0.62	10	"	20.0		88	60-130			
Anthracene	15.8	0.50	5.0	"	20.0		79	58-130			
Benzo (a) anthracene	14.6	0.81	10	"	20.0		73	42-133			
Benzo (b) fluoranthene	14.7	1.4	10	"	20.0		73	42-140			
Benzo (k) fluoranthene	16.1	0.96	7.0	"	20.0		81	25-146			
Benzo (g,h,i) perylene	14.9	1.1	10	"	20.0		74	13-195			
Benzo (a) pyrene	12.2	1.2	7.0	"	20.0		61	32-148			
Bis(2-chloroethoxy)methane	20.8	0.51	10	"	20.0		104	52-164			
Bis(2-chloroisopropyl)ether	21.3	0.52	10	"	20.0		106	63-139			
Bis(2-ethylhexyl)phthalate	16.2	0.58	7.0	"	20.0		81	43-137			
4-Bromophenyl phenyl ether	17.1	0.62	5.0	"	20.0		85	70-130			
Butyl benzyl phthalate	15.7	0.69	7.0	"	20.0		78	43-140			
2-Chloronaphthalene	17.9	0.52	5.0	"	20.0		89	70-130			
4-Chlorophenyl phenyl ether	18.7	0.58	10	"	20.0		93	57-145			
Chrysene	14.6	0.60	7.0	"	20.0		73	44-140			
Dibenz (a,h) anthracene	16.0	1.4	7.0	"	20.0		80	13-200			

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Di-n-butyl phthalate	17.4	0.61	7.0	µg/L	20.0		87	52-130			
3,3´-Dichlorobenzidine	12.1	0.89	20	"	20.0		61	47-130			J
Diethyl phthalate	17.7	0.59	5.0	"	20.0		89	47-130			
Dimethyl phthalate	16.8	0.61	4.0	"	20.0		84	50-130			
2,4-Dinitrotoluene (2,4-DNT)	16.6	0.50	10	"	20.0		83	53-130			
2,6-Dinitrotoluene (2,6-DNT)	16.6	0.56	5.0	"	20.0		83	68-137			
Di-n-octyl phthalate	13.5	0.98	7.0	"	20.0		67	21-132			
Fluoranthene	16.3	0.61	6.0	"	20.0		82	47-130			
Fluorene	18.2	0.60	5.0	"	20.0		91	70-130			
Hexachlorobenzene	17.1	0.74	5.0	"	20.0		86	38-142			
Hexachlorobutadiene	17.1	0.55	2.7	"	20.0		86	68-130			
Hexachloroethane	20.7	0.49	4.0	"	20.0		103	55-130			
Indeno (1,2,3-cd) pyrene	16.0	1.3	10	"	20.0		80	13-151			
Isophorone	12.2	0.52	6.0	"	20.0		61	52-180			
Naphthalene	18.5	0.52	4.0	"	20.0		92	70-130			
Nitrobenzene (NB)	20.2	0.42	5.0	"	20.0		101	54-158			
N-Nitrosodi-n-propylamine	21.0	0.51	10	"	20.0		105	59-170			
Phenanthrene	17.5	0.52	10	"	20.0		87	67-130			
Pyrene	16.6	0.61	5.0	"	20.0		83	70-130			
1,2,4-Trichlorobenzene	20.9	0.55	5.0	"	20.0		104	61-130			
4-Chloro-3-methylphenol	17.7	0.45	9.0	"	20.0		89	68-130			
2-Chlorophenol	17.7	0.46	9.0	"	20.0		89	55-130			
2,4-Dichlorophenol	21.6	0.50	8.0	"	20.0		108	64-130			
2,4-Dimethylphenol	21.5	0.56	8.0	"	20.0		107	58-130			
4,6-Dinitro-2-methylphenol	13.9	0.79	25	"	20.0		69	56-130			J
2,4-Dinitrophenol	13.3	0.47	25	"	20.0		67	39-173			J
2-Nitrophenol	19.6	0.48	10	"	20.0		98	61-163			
4-Nitrophenol	16.4	0.73	7.0	"	20.0		82	35-130			
Pentachlorophenol	14.6	0.77	10	"	20.0		73	42-152			
Phenol	16.7	0.41	4.0	"	20.0		84	48-130			
2,4,6-Trichlorophenol	16.5	0.60	8.0	"	20.0		82	69-130			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS (2400953-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Surrogate: 2-Fluorophenol	*32.6*			*µg/L*	*50.0*		*65*	*21-110*			
Surrogate: Phenol-d6	*28.9*			*"*	*50.0*		*58*	*10-110*			
Surrogate: Nitrobenzene-d5	*56.9*			*"*	*50.0*		*114*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*47.1*			*"*	*50.0*		*94*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*25.5*			*"*	*50.0*		*51*	*10-123*			
Surrogate: Terphenyl-dl4	*43.6*			*"*	*50.0*		*87*	*33-141*			
LCS Dup (2400953-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Acenaphthene	18.1	0.51	5.0	µg/L	20.0		91	70-130	2	30	
Acenaphthylene	18.1	0.62	10	"	20.0		90	60-130	3	30	
Anthracene	16.4	0.50	5.0	"	20.0		82	58-130	4	30	
Benzo (a) anthracene	16.6	0.81	10	"	20.0		83	42-133	13	30	
Benzo (b) fluoranthene	15.1	1.4	10	"	20.0		76	42-140	3	30	
Benzo (k) fluoranthene	16.8	0.96	7.0	"	20.0		84	25-146	4	30	
Benzo (g,h,i) perylene	16.7	1.1	10	"	20.0		83	13-195	12	30	
Benzo (a) pyrene	12.8	1.2	7.0	"	20.0		64	32-148	5	30	
Bis(2-chloroethoxy)methane	18.3	0.51	10	"	20.0		92	52-164	13	30	
Bis(2-chloroisopropyl)ether	18.5	0.52	10	"	20.0		93	63-139	14	30	
Bis(2-ethylhexyl)phthalate	17.0	0.58	7.0	"	20.0		85	43-137	5	30	
4-Bromophenyl phenyl ether	18.2	0.62	5.0	"	20.0		91	70-130	7	30	
Butyl benzyl phthalate	17.8	0.69	7.0	"	20.0		89	43-140	13	30	
2-Chloronaphthalene	18.1	0.52	5.0	"	20.0		91	70-130	1	30	
4-Chlorophenyl phenyl ether	18.5	0.58	10	"	20.0		93	57-145	0.9	30	
Chrysene	14.8	0.60	7.0	"	20.0		74	44-140	1	30	
Dibenz (a,h) anthracene	18.1	1.4	7.0	"	20.0		91	13-200	12	30	
Di-n-butyl phthalate	18.4	0.61	7.0	"	20.0		92	52-130	6	30	
3,3´-Dichlorobenzidine	9.64	0.89	20	"	20.0		48	47-130	23	30	J
Diethyl phthalate	18.8	0.59	5.0	"	20.0		94	47-130	6	30	
Dimethyl phthalate	17.5	0.61	4.0	"	20.0		88	50-130	4	30	
2,4-Dinitrotoluene (2,4-DNT)	17.4	0.50	10	"	20.0		87	53-130	5	30	
2,6-Dinitrotoluene (2,6-DNT)	17.4	0.56	5.0	"	20.0		87	68-137	5	30	
Di-n-octyl phthalate	14.1	0.98	7.0	"	20.0		70	21-132	4	30	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
LCS Dup (2400953-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Fluoranthene	17.8	0.61	6.0	µg/L	20.0		89	47-130	9	30	
Fluorene	19.0	0.60	5.0	"	20.0		95	70-130	4	30	
Hexachlorobenzene	17.9	0.74	5.0	"	20.0		90	38-142	4	30	
Hexachlorobutadiene	17.6	0.55	2.7	"	20.0		88	68-130	3	30	
Hexachloroethane	18.2	0.49	4.0	"	20.0		91	55-130	13	30	
Indeno (1,2,3-cd) pyrene	17.8	1.3	10	"	20.0		89	13-151	11	30	
Isophorone	10.6	0.52	6.0	"	20.0		53	52-180	14	30	
Naphthalene	18.8	0.52	4.0	"	20.0		94	70-130	2	30	
Nitrobenzene (NB)	17.9	0.42	5.0	"	20.0		89	54-158	12	30	
N-Nitrosodi-n-propylamine	18.7	0.51	10	"	20.0		93	59-170	12	30	
Phenanthrene	18.1	0.52	10	"	20.0		90	67-130	3	30	
Pyrene	18.3	0.61	5.0	"	20.0		92	70-130	10	30	
1,2,4-Trichlorobenzene	18.5	0.55	5.0	"	20.0		93	61-130	12	30	
4-Chloro-3-methylphenol	17.9	0.45	9.0	"	20.0		89	68-130	0.9	30	
2-Chlorophenol	19.0	0.46	9.0	"	20.0		95	55-130	7	30	
2,4-Dichlorophenol	19.2	0.50	8.0	"	20.0		96	64-130	12	30	
2,4-Dimethylphenol	18.7	0.56	8.0	"	20.0		93	58-130	14	30	
4,6-Dinitro-2-methylphenol	14.9	0.79	25	"	20.0		75	56-130	7	30	J
2,4-Dinitrophenol	13.8	0.47	25	"	20.0		69	39-173	3	30	J
2-Nitrophenol	17.3	0.48	10	"	20.0		87	61-163	12	30	
4-Nitrophenol	17.4	0.73	7.0	"	20.0		87	35-130	5	30	
Pentachlorophenol	15.2	0.77	10	"	20.0		76	42-152	4	30	
Phenol	18.2	0.41	4.0	"	20.0		91	48-130	8	30	
2,4,6-Trichlorophenol	16.9	0.60	8.0	"	20.0		84	69-130	2	30	
Surrogate: 2-Fluorophenol	*30.0*			"	*50.0*		*60*	*21-110*			
Surrogate: Phenol-d6	*32.6*			"	*50.0*		*65*	*10-110*			
Surrogate: Nitrobenzene-d5	*52.5*			"	*50.0*		*105*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*50.3*			"	*50.0*		*101*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*27.9*			"	*50.0*		*56*	*10-123*			
Surrogate: Terphenyl-dl4	*49.0*			"	*50.0*		*98*	*33-141*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike (2400953-MS1)				**Source: 24B0080-01**	Prepared: 02/05/24	Analyzed: 02/07/24					
Acenaphthene	16.4	0.51	5.0	µg/L	20.0	ND	82	47-145			
Acenaphthylene	16.7	0.62	10	"	20.0	ND	84	33-145			
Anthracene	14.3	0.50	5.0	"	20.0	ND	72	27-133			
Benzo (a) anthracene	12.6	0.81	10	"	20.0	ND	63	33-143			
Benzo (b) fluoranthene	11.8	1.4	10	"	20.0	ND	59	24-159			
Benzo (k) fluoranthene	12.9	0.96	7.0	"	20.0	ND	64	11-162			
Benzo (g,h,i) perylene	13.3	1.1	10	"	20.0	ND	67	1-219			
Benzo (a) pyrene	9.92	1.2	7.0	"	20.0	ND	50	17-163			
Bis(2-chloroethoxy)methane	17.1	0.51	10	"	20.0	ND	85	33-184			
Bis(2-chloroisopropyl)ether	17.3	0.52	10	"	20.0	ND	86	36-166			
Bis(2-ethylhexyl)phthalate	13.9	0.58	7.0	"	20.0	ND	69	8-158			
4-Bromophenyl phenyl ether	15.8	0.62	5.0	"	20.0	ND	79	53-127			
Butyl benzyl phthalate	14.1	0.69	7.0	"	20.0	ND	71	1-152			
2-Chloronaphthalene	16.6	0.52	5.0	"	20.0	ND	83	60-120			
4-Chlorophenyl phenyl ether	17.2	0.58	10	"	20.0	ND	86	25-158			
Chrysene	12.3	0.60	7.0	"	20.0	ND	62	17-168			
Dibenz (a,h) anthracene	15.2	1.4	7.0	"	20.0	ND	76	1-227			
Di-n-butyl phthalate	16.3	0.61	7.0	"	20.0	ND	81	1-120			
3,3´-Dichlorobenzidine	7.18	0.89	20	"	20.0	ND	36	1-262			J
Diethyl phthalate	13.3	0.59	5.0	"	20.0	ND	67	1-120			
Dimethyl phthalate	6.63	0.61	4.0	"	20.0	ND	33	1-120			
2,4-Dinitrotoluene (2,4-DNT)	16.1	0.50	10	"	20.0	ND	81	39-139			
2,6-Dinitrotoluene (2,6-DNT)	16.3	0.56	5.0	"	20.0	ND	81	50-158			
Di-n-octyl phthalate	11.7	0.98	7.0	"	20.0	ND	58	4-146			
Fluoranthene	14.1	0.61	6.0	"	20.0	ND	71	26-137			
Fluorene	17.5	0.60	5.0	"	20.0	ND	88	59-121			
Hexachlorobenzene	15.5	0.74	5.0	"	20.0	ND	77	1-152			
Hexachlorobutadiene	12.0	0.55	2.7	"	20.0	ND	60	24-120			
Hexachloroethane	13.6	0.49	4.0	"	20.0	ND	68	40-120			
Indeno (1,2,3-cd) pyrene	14.5	1.3	10	"	20.0	ND	72	1-171			
Isophorone	7.02	0.52	6.0	"	20.0	ND	35	21-196			

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike (2400953-MS1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
Naphthalene	16.5	0.52	4.0	µg/L	20.0	ND	82	21-133			
Nitrobenzene (NB)	16.7	0.42	5.0	"	20.0	ND	83	35-180			
N-Nitrosodi-n-propylamine	17.6	0.51	10	"	20.0	ND	88	1-230			
Phenanthrene	16.1	0.52	10	"	20.0	ND	80	54-120			
Pyrene	14.7	0.61	5.0	"	20.0	ND	74	52-120			
1,2,4-Trichlorobenzene	15.7	0.55	5.0	"	20.0	ND	78	44-142			
4-Chloro-3-methylphenol	16.4	0.45	9.0	"	20.0	ND	82	22-147			
2-Chlorophenol	16.0	0.46	9.0	"	20.0	ND	80	23-134			
2,4-Dichlorophenol	16.1	0.50	8.0	"	20.0	ND	81	39-135			
2,4-Dimethylphenol	14.2	0.56	8.0	"	20.0	ND	71	32-120			
4,6-Dinitro-2-methylphenol	10.9	0.79	25	"	20.0	ND	55	1-181			J
2,4-Dinitrophenol	10.2	0.47	25	"	20.0	ND	51	1-191			J
2-Nitrophenol	14.6	0.48	10	"	20.0	ND	73	29-182			
4-Nitrophenol	21.9	0.73	7.0	"	20.0	ND	110	1-132			
Pentachlorophenol	7.28	0.77	10	"	20.0	ND	36	14-176			J
Phenol	11.9	0.41	4.0	"	20.0	1.24	53	5-120			
2,4,6-Trichlorophenol	13.2	0.60	8.0	"	20.0	ND	66	37-144			
Surrogate: 2-Fluorophenol	*18.8*			"	*50.0*		*38*	*21-110*			
Surrogate: Phenol-d6	*16.7*			"	*50.0*		*33*	*10-110*			
Surrogate: Nitrobenzene-d5	*47.6*			"	*50.0*		*95*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*45.5*			"	*50.0*		*91*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*19.6*			"	*50.0*		*39*	*10-123*			
Surrogate: Terphenyl-dl4	*22.4*			"	*50.0*		*45*	*33-141*			
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
Acenaphthene	16.7	0.51	5.0	µg/L	20.0	ND	84	47-145	2	48	
Acenaphthylene	17.1	0.62	10	"	20.0	ND	86	33-145	2	74	
Anthracene	14.3	0.50	5.0	"	20.0	ND	72	27-133	0.1	66	
Benzo (a) anthracene	12.2	0.81	10	"	20.0	ND	61	33-143	3	53	
Benzo (b) fluoranthene	11.8	1.4	10	"	20.0	ND	59	24-159	0.2	71	
Benzo (k) fluoranthene	12.6	0.96	7.0	"	20.0	ND	63	11-162	2	63	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**	Prepared: 02/05/24 Analyzed: 02/07/24							
Benzo (g,h,i) perylene	13.3	1.1	10	µg/L	20.0	ND	66	1-219	0.2	97	
Benzo (a) pyrene	9.87	1.2	7.0	"	20.0	ND	49	17-163	0.5	72	
Bis(2-chloroethoxy)methane	17.5	0.51	10	"	20.0	ND	87	33-184	2	54	
Bis(2-chloroisopropyl)ether	17.9	0.52	10	"	20.0	ND	90	36-166	3	76	
Bis(2-ethylhexyl)phthalate	13.3	0.58	7.0	"	20.0	ND	66	8-158	5	82	
4-Bromophenyl phenyl ether	16.2	0.62	5.0	"	20.0	ND	81	53-127	3	43	
Butyl benzyl phthalate	13.5	0.69	7.0	"	20.0	ND	68	1-152	4	60	
2-Chloronaphthalene	17.0	0.52	5.0	"	20.0	ND	85	60-120	3	24	
4-Chlorophenyl phenyl ether	17.5	0.58	10	"	20.0	ND	87	25-158	2	61	
Chrysene	12.2	0.60	7.0	"	20.0	ND	61	17-168	1	87	
Dibenz (a,h) anthracene	15.2	1.4	7.0	"	20.0	ND	76	1-227	0.3	126	
Di-n-butyl phthalate	16.0	0.61	7.0	"	20.0	ND	80	1-120	2	47	
3,3´-Dichlorobenzidine	6.91	0.89	20	"	20.0	ND	35	1-262	4	108	J
Diethyl phthalate	13.4	0.59	5.0	"	20.0	ND	67	1-120	0.2	100	
Dimethyl phthalate	6.49	0.61	4.0	"	20.0	ND	32	1-120	2	183	
2,4-Dinitrotoluene (2,4-DNT)	16.3	0.50	10	"	20.0	ND	82	39-139	1	42	
2,6-Dinitrotoluene (2,6-DNT)	16.6	0.56	5.0	"	20.0	ND	83	50-158	2	48	
Di-n-octyl phthalate	11.2	0.98	7.0	"	20.0	ND	56	4-146	5	69	
Fluoranthene	14.1	0.61	6.0	"	20.0	ND	71	26-137	0.07	66	
Fluorene	17.8	0.60	5.0	"	20.0	ND	89	59-121	1	38	
Hexachlorobenzene	15.3	0.74	5.0	"	20.0	ND	76	1-152	1	55	
Hexachlorobutadiene	12.6	0.55	2.7	"	20.0	ND	63	24-120	5	62	
Hexachloroethane	14.3	0.49	4.0	"	20.0	ND	71	40-120	5	52	
Indeno (1,2,3-cd) pyrene	14.3	1.3	10	"	20.0	ND	72	1-171	1	99	
Isophorone	7.03	0.52	6.0	"	20.0	ND	35	21-196	0.1	93	
Naphthalene	17.0	0.52	4.0	"	20.0	ND	85	21-133	3	65	
Nitrobenzene (NB)	17.4	0.42	5.0	"	20.0	ND	87	35-180	4	62	
N-Nitrosodi-n-propylamine	18.0	0.51	10	"	20.0	ND	90	1-230	2	87	
Phenanthrene	16.1	0.52	10	"	20.0	ND	81	54-120	0.5	39	
Pyrene	14.6	0.61	5.0	"	20.0	ND	73	52-120	0.7	49	
1,2,4-Trichlorobenzene	16.4	0.55	5.0	"	20.0	ND	82	44-142	4	50	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Acid and Base/Neutral Extractables by EPA Method 625.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400953 - EPA 3510B GCMS											
Matrix Spike Dup (2400953-MSD1)			**Source: 24B0080-01**		Prepared: 02/05/24 Analyzed: 02/07/24						
4-Chloro-3-methylphenol	17.3	0.45	9.0	µg/L	20.0	ND	86	22-147	5	73	
2-Chlorophenol	17.5	0.46	9.0	"	20.0	ND	88	23-134	9	61	
2,4-Dichlorophenol	17.9	0.50	8.0	"	20.0	ND	89	39-135	10	50	
2,4-Dimethylphenol	14.2	0.56	8.0	"	20.0	ND	71	32-120	0.07	58	
4,6-Dinitro-2-methylphenol	12.7	0.79	25	"	20.0	ND	63	1-181	15	203	J
2,4-Dinitrophenol	10.4	0.47	25	"	20.0	ND	52	1-191	2	132	J
2-Nitrophenol	16.5	0.48	10	"	20.0	ND	82	29-182	12	55	
4-Nitrophenol	23.3	0.73	7.0	"	20.0	ND	116	1-132	6	131	
Pentachlorophenol	7.63	0.77	10	"	20.0	ND	38	14-176	5	86	J
Phenol	11.4	0.41	4.0	"	20.0	1.24	51	5-120	4	64	
2,4,6-Trichlorophenol	15.1	0.60	8.0	"	20.0	ND	76	37-144	13	58	
Surrogate: 2-Fluorophenol	*22.8*			"	*50.0*		*46*	*21-110*			
Surrogate: Phenol-d6	*18.8*			"	*50.0*		*38*	*10-110*			
Surrogate: Nitrobenzene-d5	*54.6*			"	*50.0*		*109*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*50.8*			"	*50.0*		*102*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*24.4*			"	*50.0*		*49*	*10-123*			
Surrogate: Terphenyl-dl4	*25.7*			"	*50.0*		*51*	*33-141*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400886 - General											
Blank (2400886-BLK1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2400886-BS1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	184	2.0	3.0	mg/L	167		110	83-138			A-COM
LCS Dup (2400886-BSD1)					Prepared: 02/02/24 Analyzed: 02/07/24						
Biochemical Oxygen Demand	184	2.0	3.0	mg/L	167		110	83-138	0	21	A-COM
Batch 2400919 - Solvent Extract											
Blank (2400919-BLK1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2400919-BS1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	39.6	0.66	1.0	mg/L	40.0		99	78-114			
LCS Dup (2400919-BSD1)					Prepared: 02/02/24 Analyzed: 02/06/24						
Hexane Extractable Material (HEM, Oil & Grease)	38.2	0.66	1.0	mg/L	40.0		96	78-114	4	18	
Batch 2400939 - General Preparation											
Blank (2400939-BLK1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2400939-BS1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	51.4	6.6	7.0	mg/L	50.0		103	80-120			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400939 - General Preparation											
LCS Dup (2400939-BSD1)					Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	47.1	6.6	7.0	mg/L	50.0		94	80-120	9	25	
Matrix Spike (2400939-MS1)			**Source: 24B0056-01**		Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	77.2	6.6	7.0	mg/L	50.0	8.45	137	75-125			QM-7
Matrix Spike Dup (2400939-MSD1)			**Source: 24B0056-01**		Prepared & Analyzed: 02/05/24						
Chemical Oxygen Demand	64.3	6.6	7.0	mg/L	50.0	8.45	112	75-125	18	30	
Batch 2400968 - General Preparation											
Blank (2400968-BLK1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2400968-BS1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.328	0.023	0.050	mg/L	0.300		109	80-120			
LCS Dup (2400968-BSD1)					Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.307	0.023	0.050	mg/L	0.300		102	80-120	7	25	
Matrix Spike (2400968-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.380	0.023	0.050	mg/L	0.300	0.0560	108	75-125			
Matrix Spike Dup (2400968-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/06/24						
Total Phosphorus as P	0.404	0.023	0.050	mg/L	0.300	0.0560	116	75-125	6	30	
Batch 2400982 - General Preparation											
Blank (2400982-BLK1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	ND	2.5	2.5	mg/L							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400982 - General Preparation											
LCS (2400982-BS1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	97.9	2.5	2.5	mg/L	100		98	80-120			
LCS Dup (2400982-BSD1)					Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	97.4	2.5	2.5	mg/L	100		97	80-120	0.5	200	
Duplicate (2400982-DUP1)			**Source: 24B0100-01**		Prepared: 02/06/24 Analyzed: 02/07/24						
Total Suspended Solids	51.8	5.6	5.6	mg/L		51.3			1	20	
Batch 2401004 - General Preparation											
Blank (2401004-BLK1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	ND	0.025	0.10	mg/L							
LCS (2401004-BS1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	0.456	0.025	0.10	mg/L	0.500		91	80-120			
LCS Dup (2401004-BSD1)					Prepared & Analyzed: 02/06/24						
Ammonia as N	0.458	0.025	0.10	mg/L	0.500		92	80-120	0.4	25	
Matrix Spike (2401004-MS1)			**Source: 24B0129-02**		Prepared & Analyzed: 02/06/24						
Ammonia as N	0.663	0.025	0.10	mg/L	0.500	0.156	101	75-125			
Matrix Spike Dup (2401004-MSD1)			**Source: 24B0129-02**		Prepared & Analyzed: 02/06/24						
Ammonia as N	0.604	0.025	0.10	mg/L	0.500	0.156	90	75-125	9	25	
Batch 2401052 - General Preparation											
Blank (2401052-BLK1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	ND	0.54	1.0	mg/L							

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401052 - General Preparation											
LCS (2401052-BS1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	8.79	0.54	1.0	mg/L	10.0		88	75-125			
LCS Dup (2401052-BSD1)					Prepared & Analyzed: 02/07/24						
Total Organic Carbon	9.40	0.54	1.0	mg/L	10.0		94	75-125	7	25	
Matrix Spike (2401052-MS1)			**Source: 24B0310-04**		Prepared & Analyzed: 02/07/24						
Total Organic Carbon	28.3	0.54	1.0	mg/L	10.0	22.9	54	75-125			QM-7
Matrix Spike Dup (2401052-MSD1)			**Source: 24B0310-04**		Prepared & Analyzed: 02/07/24						
Total Organic Carbon	28.8	0.54	1.0	mg/L	10.0	22.9	59	75-125	2	25	QM-7
Batch 2401061 - General Preparation											
Blank (2401061-BLK1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	ND	0.0024	0.10	mg/L							
LCS (2401061-BS1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	0.241	0.0024	0.10	mg/L	0.250		96	80-120			
LCS Dup (2401061-BSD1)					Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	0.236	0.0024	0.10	mg/L	0.250		94	80-120	2	20	
Matrix Spike (2401061-MS1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	2.30	0.012	0.50	mg/L	0.250	1.90	160	75-125			QM-7
Matrix Spike Dup (2401061-MSD1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/08/24						
Nitrate/Nitrite as N	2.34	0.012	0.50	mg/L	0.250	1.90	175	75-125	2	25	QM-7

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401169 - General Prep											
Blank (2401169-BLK1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2401169-BS1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.0	0.29	1.0	µg/L	10.0		100	80-120			
LCS Dup (2401169-BSD1)					Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	9.89	0.29	1.0	µg/L	10.0		99	80-120	1	20	
Matrix Spike (2401169-MS1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.2	0.29	1.0	µg/L	10.0	0.324	98	80-120			
Matrix Spike Dup (2401169-MSD1)			**Source: 24B0080-03**		Prepared & Analyzed: 02/12/24						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	0.324	101	80-120	3	20	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400948 - EPA 3510B GCNV											
Blank (2400948-BLK1)					Prepared & Analyzed: 02/05/24						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0198*			*"*	*0.0250*		*79*	*65-135*			
LCS (2400948-BS1)					Prepared & Analyzed: 02/05/24						
Diesel	1.90	0.0021	0.050	mg/L	2.50		76	65-135			
Surrogate: o-Terphenyl	*0.0227*			*"*	*0.0250*		*91*	*65-135*			
LCS Dup (2400948-BSD1)					Prepared & Analyzed: 02/05/24						
Diesel	2.44	0.0021	0.050	mg/L	2.50		98	65-135	25	30	
Surrogate: o-Terphenyl	*0.0236*			*"*	*0.0250*		*94*	*65-135*			
Matrix Spike (2400948-MS1)			**Source: 24A1466-01**		Prepared & Analyzed: 02/05/24						
Diesel	1.92	0.0021	0.050	mg/L	2.50	ND	77	46-137			
Surrogate: o-Terphenyl	*0.0231*			*"*	*0.0250*		*92*	*65-135*			
Matrix Spike Dup (2400948-MSD1)			**Source: 24A1466-01**		Prepared & Analyzed: 02/05/24						
Diesel	1.75	0.0021	0.050	mg/L	2.50	ND	70	46-137	9	30	
Surrogate: o-Terphenyl	*0.0187*			*"*	*0.0250*		*75*	*65-135*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400937 - EPA 200 Series											
Blank (2400937-BLK1)					Prepared & Analyzed: 02/05/24						
Chromium	0.000865	0.00014	0.0010	mg/L							
Aluminum	0.00266	0.0016	0.050	"							J
Copper	ND	0.000090	0.010	"							
Lead	ND	0.000020	0.0050	"							
Zinc	ND	0.00027	0.020	"							
LCS (2400937-BS1)					Prepared & Analyzed: 02/05/24						
Chromium	0.103	0.00014	0.0010	mg/L	0.100		103	85-115			
Aluminum	0.541	0.0016	0.050	"	0.500		108	85-115			
Copper	0.103	0.000090	0.010	"	0.100		103	85-115			
Lead	0.104	0.000020	0.0050	"	0.100		104	85-115			
Zinc	0.104	0.00027	0.020	"	0.100		104	85-115			
Matrix Spike (2400937-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/05/24						
Chromium	0.104	0.00014	0.0010	mg/L	0.100	0.000355	104	70-130			
Aluminum	0.534	0.0016	0.050	"	0.500	0.00661	105	70-130			
Copper	0.102	0.000090	0.010	"	0.100	0.000615	101	70-130			
Lead	0.105	0.000020	0.0050	"	0.100	0.000231	105	70-130			
Zinc	0.107	0.00027	0.020	"	0.100	0.00499	102	70-130			
Matrix Spike (2400937-MS2)			**Source: 24B0171-03**		Prepared & Analyzed: 02/05/24						
Chromium	0.107	0.00014	0.0010	mg/L	0.100	0.000566	107	70-130			
Aluminum	0.561	0.0016	0.050	"	0.500	0.00233	112	70-130			
Copper	0.109	0.000090	0.010	"	0.100	ND	109	70-130			
Lead	0.107	0.000020	0.0050	"	0.100	ND	107	70-130			
Zinc	0.128	0.00027	0.020	"	0.100	0.00218	125	70-130			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400981 - EPA 7470A											
Blank (2400981-BLK1)					Prepared & Analyzed: 02/06/24						
Mercury	ND	0.15	0.20	µg/L							
LCS (2400981-BS1)					Prepared & Analyzed: 02/06/24						
Mercury	4.11	0.15	0.20	µg/L	5.00		82	85-115			QM-1
Matrix Spike (2400981-MS1)			**Source: 24B0066-01**		Prepared & Analyzed: 02/06/24						
Mercury	3.59	0.15	0.20	µg/L	5.00	ND	72	70-130			
Matrix Spike Dup (2400981-MSD1)			**Source: 24B0066-01**		Prepared & Analyzed: 02/06/24						
Mercury	3.69	0.15	0.20	µg/L	5.00	ND	74	70-130	3	25	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2401029 - EPA 3510B GCNV											
Blank (2401029-BLK1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.258*			"	*0.250*		*103*	*50-150*			
LCS (2401029-BS1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1260	2.73	0.052	0.50	µg/L	2.50		109	31-138			
Surrogate: Decachlorobiphenyl	*0.253*			"	*0.250*		*101*	*50-150*			
LCS Dup (2401029-BSD1)					Prepared: 02/07/24 Analyzed: 02/08/24						
Aroclor 1260	2.66	0.052	0.50	µg/L	2.50		106	31-138	3	30	
Surrogate: Decachlorobiphenyl	*0.242*			"	*0.250*		*97*	*50-150*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Blank (2400942-BLK1)					Prepared & Analyzed: 02/02/24						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Blank (2400942-BLK1)					Prepared & Analyzed: 02/02/24						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Methyl tert-butyl ether*	ND	0.069	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*9.36*			"	*10.0*		*94*	*65-135*			
Surrogate: Toluene-d8	*8.31*			"	*10.0*		*83*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*11.7*			"	*10.0*		*117*	*73-125*			
LCS (2400942-BS1)					Prepared & Analyzed: 02/02/24						
Benzene	19.6	0.096	0.30	µg/L	20.0		98	65-135			
Bromodichloromethane	19.7	0.058	0.50	"	20.0		98	65-135			
Bromoform	19.2	0.072	0.50	"	20.0		96	70-130			
Bromomethane	21.4	0.19	0.50	"	20.0		107	15-185			
Carbon tetrachloride	19.4	0.10	0.50	"	20.0		97	70-130			
Chlorobenzene	19.2	0.088	0.30	"	20.0		96	63-135			
Chloroethane	20.4	0.18	0.50	"	20.0		102	40-160			
Chloroform	17.3	0.079	0.50	"	20.0		86	70-135			
Chloromethane	18.9	0.19	0.50	"	20.0		94	1-472			
Dibromochloromethane	20.4	0.052	0.50	"	20.0		102	70-135			
1,2-Dichlorobenzene	17.4	0.059	0.30	"	20.0		87	65-135			
1,3-Dichlorobenzene	17.8	0.077	0.30	"	20.0		89	70-130			
1,4-Dichlorobenzene	17.8	0.26	0.30	"	20.0		89	65-135			
1,1-Dichloroethane	20.1	0.080	0.50	"	20.0		100	70-130			
1,2-Dichloroethane	16.8	0.060	0.50	"	20.0		84	50-150			
1,1-Dichloroethene	16.5	0.12	0.50	"	20.0		82	70-130			
trans-1,2-Dichloroethene	20.7	0.11	0.50	"	20.0		103	35-165			
1,2-Dichloropropane	20.4	0.066	0.50	"	20.0		102	5-210			
cis-1,3-Dichloropropene	20.8	0.058	0.50	"	20.0		104	25-175			
trans-1,3-Dichloropropene	16.6	0.12	0.50	"	20.0		83	50-150			
Ethylbenzene	21.8	0.098	0.30	"	20.0		109	60-140			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
LCS (2400942-BS1)					Prepared & Analyzed: 02/02/24						
Methylene chloride	17.2	0.076	0.50	µg/L	20.0		86	60-140			
1,1,2,2-Tetrachloroethane	18.4	0.049	0.50	"	20.0		92	60-140			
Tetrachloroethene	20.1	0.11	0.50	"	20.0		101	70-130			
Toluene	21.1	0.070	0.30	"	20.0		106	70-130			
1,1,1-Trichloroethane	17.8	0.060	0.50	"	20.0		89	70-130			
1,1,2-Trichloroethane	18.5	0.068	0.50	"	20.0		93	70-130			
Trichloroethene	21.5	0.082	0.50	"	20.0		108	65-135			
Trichlorofluoromethane	20.4	0.13	0.50	"	20.0		102	50-150			
Vinyl chloride	21.3	0.12	0.50	"	20.0		106	5-195			
Surrogate: 1,2-Dichloroethane-d4	*11.1*			*"*	*10.0*		*111*	*65-135*			
Surrogate: Toluene-d8	*11.7*			*"*	*10.0*		*117*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.21*			*"*	*10.0*		*92*	*73-125*			
LCS Dup (2400942-BSD1)					Prepared & Analyzed: 02/02/24						
Benzene	20.1	0.096	0.30	µg/L	20.0		101	65-135	3	30	
Bromodichloromethane	20.1	0.058	0.50	"	20.0		101	65-135	2	30	
Bromoform	16.4	0.072	0.50	"	20.0		82	70-130	16	30	
Bromomethane	18.6	0.19	0.50	"	20.0		93	15-185	14	30	
Carbon tetrachloride	20.0	0.10	0.50	"	20.0		100	70-130	3	30	
Chlorobenzene	16.0	0.088	0.30	"	20.0		80	63-135	18	30	
Chloroethane	18.9	0.18	0.50	"	20.0		95	40-160	8	30	
Chloroform	17.4	0.079	0.50	"	20.0		87	70-135	0.7	30	
Chloromethane	16.2	0.19	0.50	"	20.0		81	1-472	15	30	
Dibromochloromethane	19.9	0.052	0.50	"	20.0		100	70-135	3	30	
1,2-Dichlorobenzene	17.2	0.059	0.30	"	20.0		86	65-135	1	30	
1,3-Dichlorobenzene	17.7	0.077	0.30	"	20.0		88	70-130	1	30	
1,4-Dichlorobenzene	17.5	0.26	0.30	"	20.0		87	65-135	2	30	
1,1-Dichloroethane	21.5	0.080	0.50	"	20.0		107	70-130	7	30	
1,2-Dichloroethane	17.3	0.060	0.50	"	20.0		86	50-150	3	30	
1,1-Dichloroethene	19.5	0.12	0.50	"	20.0		98	70-130	17	30	
trans-1,2-Dichloroethene	21.8	0.11	0.50	"	20.0		109	35-165	6	30	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
LCS Dup (2400942-BSD1)					Prepared & Analyzed: 02/02/24						
1,2-Dichloropropane	20.9	0.066	0.50	µg/L	20.0		104	5-210	2	30	
cis-1,3-Dichloropropene	20.0	0.058	0.50	"	20.0		100	25-175	4	30	
trans-1,3-Dichloropropene	15.4	0.12	0.50	"	20.0		77	50-150	7	30	
Ethylbenzene	21.5	0.098	0.30	"	20.0		108	60-140	1	30	
Methylene chloride	21.0	0.076	0.50	"	20.0		105	60-140	20	30	
1,1,2,2-Tetrachloroethane	16.8	0.049	0.50	"	20.0		84	60-140	9	30	
Tetrachloroethene	19.7	0.11	0.50	"	20.0		98	70-130	2	30	
Toluene	21.1	0.070	0.30	"	20.0		105	70-130	0.4	30	
1,1,1-Trichloroethane	18.9	0.060	0.50	"	20.0		94	70-130	6	30	
1,1,2-Trichloroethane	17.6	0.068	0.50	"	20.0		88	70-130	5	30	
Trichloroethene	21.3	0.082	0.50	"	20.0		106	65-135	1	30	
Trichlorofluoromethane	20.2	0.13	0.50	"	20.0		101	50-150	1	30	
Vinyl chloride	19.2	0.12	0.50	"	20.0		96	5-195	10	30	
Surrogate: 1,2-Dichloroethane-d4	*11.4*			*"*	*10.0*		*114*	*65-135*			
Surrogate: Toluene-d8	*11.3*			*"*	*10.0*		*113*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.78*			*"*	*10.0*		*88*	*73-125*			
Matrix Spike (2400942-MS1)				**Source: 24B0080-01**	Prepared & Analyzed: 02/02/24						
Benzene	19.2	0.096	0.30	µg/L	20.0	ND	96	37-151			
Bromodichloromethane	20.5	0.058	0.50	"	20.0	ND	103	35-155			
Bromoform	15.1	0.072	0.50	"	20.0	ND	76	45-169			
Bromomethane	22.6	0.19	0.50	"	20.0	ND	113	1-242			
Carbon tetrachloride	21.2	0.10	0.50	"	20.0	ND	106	70-140			
Chlorobenzene	15.9	0.088	0.30	"	20.0	ND	80	37-163			
Chloroethane	22.4	0.18	0.50	"	20.0	ND	112	14-230			
Chloroform	18.6	0.079	0.50	"	20.0	ND	93	51-138			
Chloromethane	25.4	0.19	0.50	"	20.0	ND	127	1-273			
Dibromochloromethane	21.3	0.052	0.50	"	20.0	ND	106	53-149			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0	ND	96	18-190			
1,3-Dichlorobenzene	19.4	0.077	0.30	"	20.0	ND	97	59-156			
1,4-Dichlorobenzene	19.0	0.26	0.30	"	20.0	ND	95	18-190			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Matrix Spike (2400942-MS1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
1,1-Dichloroethane	19.4	0.080	0.50	µg/L	20.0	ND	97	59-155			
1,2-Dichloroethane	21.5	0.060	0.50	"	20.0	ND	107	49-155			
1,1-Dichloroethene	12.1	0.12	0.50	"	20.0	ND	61	1-234			
trans-1,2-Dichloroethene	16.9	0.11	0.50	"	20.0	ND	85	54-156			
1,2-Dichloropropane	20.8	0.066	0.50	"	20.0	ND	104	1-210			
cis-1,3-Dichloropropene	21.4	0.058	0.50	"	20.0	ND	107	1-227			
trans-1,3-Dichloropropene	16.9	0.12	0.50	"	20.0	ND	84	17-183			
Ethylbenzene	21.4	0.098	0.30	"	20.0	ND	107	37-162			
Methylene chloride	21.4	0.076	0.50	"	20.0	ND	107	1-221			
1,1,2,2-Tetrachloroethane	21.7	0.049	0.50	"	20.0	ND	108	46-148			
Tetrachloroethene	19.2	0.11	0.50	"	20.0	ND	96	64-148			
Toluene	23.6	0.070	0.30	"	20.0	ND	118	47-150			
1,1,1-Trichloroethane	20.4	0.060	0.50	"	20.0	ND	102	52-162			
1,1,2-Trichloroethane	19.8	0.068	0.50	"	20.0	ND	99	52-150			
Trichloroethene	20.6	0.082	0.50	"	20.0	ND	103	71-157			
Trichlorofluoromethane	22.5	0.13	0.50	"	20.0	ND	112	17-181			
Vinyl chloride	29.4	0.12	0.50	"	20.0	ND	147	10-251			
Surrogate: 1,2-Dichloroethane-d4	*10.6*			*"*	*10.0*		*106*	*65-135*			
Surrogate: Toluene-d8	*11.5*			*"*	*10.0*		*115*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.40*			*"*	*10.0*		*94*	*73-125*			
Matrix Spike Dup (2400942-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
Benzene	18.0	0.096	0.30	µg/L	20.0	ND	90	37-151	6	61	
Bromodichloromethane	18.3	0.058	0.50	"	20.0	ND	92	35-155	11	56	
Bromoform	14.5	0.072	0.50	"	20.0	ND	73	45-169	4	42	
Bromomethane	23.9	0.19	0.50	"	20.0	ND	119	1-242	5	61	
Carbon tetrachloride	19.7	0.10	0.50	"	20.0	ND	99	70-140	7	41	
Chlorobenzene	14.9	0.088	0.30	"	20.0	ND	75	37-163	6	53	
Chloroethane	23.1	0.18	0.50	"	20.0	ND	115	14-230	3	78	
Chloroform	17.0	0.079	0.50	"	20.0	ND	85	51-138	9	54	
Chloromethane	25.0	0.19	0.50	"	20.0	ND	125	1-273	1	60	

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400942 - EPA 3510B GCMS											
Matrix Spike Dup (2400942-MSD1)			**Source: 24B0080-01**		Prepared & Analyzed: 02/02/24						
Dibromochloromethane	19.0	0.052	0.50	µg/L	20.0	ND	95	53-149	11	50	
1,2-Dichlorobenzene	19.1	0.059	0.30	"	20.0	ND	96	18-190	0.4	57	
1,3-Dichlorobenzene	19.3	0.077	0.30	"	20.0	ND	97	59-156	0.1	43	
1,4-Dichlorobenzene	18.8	0.26	0.30	"	20.0	ND	94	18-190	0.6	57	
1,1-Dichloroethane	18.3	0.080	0.50	"	20.0	ND	92	59-155	6	40	
1,2-Dichloroethane	19.0	0.060	0.50	"	20.0	ND	95	49-155	12	49	
1,1-Dichloroethene	20.8	0.12	0.50	"	20.0	ND	104	1-234	53	32	QR-1
trans-1,2-Dichloroethene	15.3	0.11	0.50	"	20.0	ND	77	54-156	10	45	
1,2-Dichloropropane	18.8	0.066	0.50	"	20.0	ND	94	1-210	10	55	
cis-1,3-Dichloropropene	18.4	0.058	0.50	"	20.0	ND	92	1-227	15	58	
trans-1,3-Dichloropropene	15.0	0.12	0.50	"	20.0	ND	75	17-183	12	86	
Ethylbenzene	19.9	0.098	0.30	"	20.0	ND	100	37-162	7	63	
Methylene chloride	34.7	0.076	0.50	"	20.0	ND	174	1-221	48	28	QR-1
1,1,2,2-Tetrachloroethane	20.9	0.049	0.50	"	20.0	ND	105	46-148	4	61	
Tetrachloroethene	17.0	0.11	0.50	"	20.0	ND	85	64-148	12	39	
Toluene	20.8	0.070	0.30	"	20.0	ND	104	47-150	13	41	
1,1,1-Trichloroethane	18.9	0.060	0.50	"	20.0	ND	94	52-162	8	36	
1,1,2-Trichloroethane	17.3	0.068	0.50	"	20.0	ND	87	52-150	13	46	
Trichloroethene	18.5	0.082	0.50	"	20.0	ND	92	71-157	11	48	
Trichlorofluoromethane	21.1	0.13	0.50	"	20.0	ND	106	17-181	6	84	
Vinyl chloride	33.6	0.12	0.50	"	20.0	ND	168	10-251	13	66	
Surrogate: 1,2-Dichloroethane-d4	*9.81*			*"*	*10.0*		*98*	*65-135*			
Surrogate: Toluene-d8	*11.2*			*"*	*10.0*		*112*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.06*			*"*	*10.0*		*91*	*73-125*			

02/16/24 16:36

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE2-2023 / 2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 24B0080
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2400941 - EPA 5030 Water GC											
Blank (2400941-BLK1)					Prepared: 02/05/24 Analyzed: 02/06/24						
JP-4	29.4		50	µg/L							
Gasoline	ND	10	50	"							
Surrogate: o-Chlorotoluene (Gas)	*16.6*			*"*	*20.0*		*83*	*65-135*			
LCS (2400941-BS1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Gasoline	483	10	50	µg/L	500		97	70-130			
Surrogate: o-Chlorotoluene (Gas)	*16.4*			*"*	*20.0*		*82*	*65-135*			
LCS Dup (2400941-BSD1)					Prepared: 02/05/24 Analyzed: 02/06/24						
Gasoline	539	10	50	µg/L	500		108	70-130	11	30	
Surrogate: o-Chlorotoluene (Gas)	*17.8*			*"*	*20.0*		*89*	*65-135*			

BB&E, Inc c/o NASA Ames	Project: QSE2-2023 / 2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 24B0080**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QR-1	The RPD value for the sample duplicate or MS/MSD was outside of the QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
QM-1	The spike recovery was outside acceptance limits for the LCS or LCSD. The batch was accepted based on acceptable MS/MSD recoveries & RPD's.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
A-COM	Seed factor below control limit of 0.30 at 0.28
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

24B0080

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb **ERT/BB&E/NASA Ames** Bldg. T20G/Room 142. M/S T20G-4 Moffett Field, CA 94035-1000 (650) 604-5360 marcia.j.christlieb@nasa.gov	LAB:	CLS **3249 Fitzgerald Rd.** Rancho Cordova, CA 95742 (916)638-7301
PROJECT NAME:	QSE2-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #2		235 E. Main St, Suite 107 Northville, MI 48167

Field Conditions:

	pH / Temp (C or F)
SBE	8.01 / 60.1
191	7.69 / 61
RTJO	7.67 / 61.2

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	ANALYSIS REQUESTED: 625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
1/31/2024	4:00 PM	SBE.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:00 PM	SBE.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:00 PM	SBE.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:00 PM	SBE.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:15 PM	191.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:15 PM	191.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:15 PM	191.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
1/31/2024	4:30 PM	RTJO.E2 2023/2024-2	Water	1 - Amber 250 mL	Cold		X							5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-3	Water	1 - Poly Liter	Cold			X						5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
1/31/2024	4:30 PM	RTJO.E2 2023/2024-7	Water	1 - Amber Liter	HCl							X		5 days	
1/31/2024	4:30 PM	RTJO.E2 2023/2024-8	Water	3 - Amber VOA	HCl								X	5 days	

SAMPLER: Brian Kawashima	DATE/TIME: 1/31/2024 2/1/24 1200	RECEIVED BY:	Please send results to marcia.j.christlieb@nasa.gov Brian.l.kawashima@nasa.gov Request Limited EDD
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	
RELINQUISHED BY:	DATE/TIME: 2/1/24 - 1600	RECEIVED AT LAB BY:	

2/1/24 1620 4.4 / 4.3

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

November 22, 2023

CLS Work Order #: 23K0465
COC #:

Marcia Christlieb
BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project Name: QSE1-2023/2024

Enclosed are the results of analyses for samples received by the laboratory on 11/08/23 17:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Ammonia as N	**0.060**	0.025	0.10	mg/L	1	2309548	11/10/23	11/10/23	SM4500-NH3F-2011	J
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2309504	11/09/23	11/14/23	SM5210B	HT-1
Chemical Oxygen Demand	**17**	6.6	7.0	"	"	2309562	11/13/23	11/13/23	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2309614	11/14/23	11/14/23	EPA 1664B	
Hexavalent Chromium	ND	0.29	1.0	µg/L	"	2309565	11/13/23	11/13/23	EPA 218.6	
Nitrate/Nitrite as N	**0.79**	0.0048	0.20	mg/L	2	2309584	11/13/23	11/13/23	SM4500-NO3 E	HT-NO3
Total Organic Carbon	**3.4**	0.54	1.0	"	1	2309561	11/13/23	11/13/23	SM5310B	
Total Phosphorus as P	ND	0.023	0.050	"	"	2309521	11/10/23	11/10/23	SM4500-P E	
Total Suspended Solids	**2.4**	2.2	2.2	"	"	2309543	11/10/23	11/14/23	SM2540D	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Ammonia as N	**0.27**	0.025	0.10	mg/L	1	2309548	11/10/23	11/10/23	SM4500-NH3F-2011	
Biochemical Oxygen Demand	ND	2.0	3.0	"	"	2309504	11/09/23	11/14/23	SM5210B	HT-1
Chemical Oxygen Demand	**21**	6.6	7.0	"	"	2309562	11/13/23	11/13/23	EPA 410.4	
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	"	"	2309614	11/14/23	11/14/23	EPA 1664B	
Hexavalent Chromium	**0.68**	0.29	1.0	µg/L	"	2309565	11/13/23	11/13/23	EPA 218.6	J
Nitrate/Nitrite as N	**1.4**	0.024	1.0	mg/L	10	2309584	11/13/23	11/13/23	SM4500-NO3 E	HT-NO3
Total Organic Carbon	ND	0.54	1.0	"	1	2309561	11/13/23	11/13/23	SM5310B	
Total Phosphorus as P	**0.035**	0.023	0.050	"	"	2309521	11/10/23	11/10/23	SM4500-P E	J
Total Suspended Solids	**3.3**	2.2	2.2	"	"	2309543	11/10/23	11/14/23	SM2540D	

11/22/23 14:01

BB&E, Inc c/o NASA Ames	Project: QSE1-2023/2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 23K0465**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2309503	11/09/23	11/09/23	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Diesel	ND	0.0021	0.050	mg/L	1	2309503	11/09/23	11/09/23	EPA 8015M	
JP-5/JP-8	ND	0.020	0.050	"	"	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	"	"	"	"	"	
Surrogate: o-Terphenyl			*102 %*	*65-135*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Chromium	**0.0056**			mg/L	1	2309471	11/09/23	11/17/23	EPA 200.8	
Copper	**0.0050**	0.000090	0.010	"	"	"	"	11/14/23	"	J
Lead	**0.00025**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	**0.18**	0.15	0.20	µg/L	"	2309476	11/09/23	11/10/23	EPA 245.1	J
Zinc	**0.013**	0.00027	0.020	mg/L	"	2309471	11/09/23	11/14/23	EPA 200.8	J
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Chromium	**0.00097**			mg/L	1	2309471	11/09/23	11/17/23	EPA 200.8	
Copper	**0.0034**	0.000090	0.010	"	"	"	"	11/14/23	"	J
Lead	**0.000050**	0.000020	0.0050	"	"	"	"	"	"	J
Mercury	**0.20**	0.15	0.20	µg/L	"	2309476	11/09/23	11/20/23	EPA 245.1	J
Zinc	**0.0067**	0.00027	0.020	mg/L	"	2309471	11/09/23	11/14/23	EPA 200.8	J

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2309572	11/13/23	11/13/23	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*54 %*	*50-150*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Aroclor 1016	ND	0.042	0.50	µg/L	1	2309572	11/13/23	11/13/23	EPA 8082	
Aroclor 1221	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1232	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1242	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1248	ND	0.050	0.50	"	"	"	"	"	"	
Aroclor 1254	ND	0.084	0.50	"	"	"	"	"	"	
Aroclor 1260	ND	0.052	0.50	"	"	"	"	"	"	
Aroclor 1268*	ND	0.084	0.50	"	"	"	"	"	"	
Surrogate: Decachlorobiphenyl			*82 %*	*50-150*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2309566	11/10/23	11/10/23	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.074	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Trichloroethene	ND	0.082	0.50	µg/L	1	2309566	"	11/10/23	EPA 624.1	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*114 %*		*65-135*		"	"	"	
Surrogate: 4-Bromofluorobenzene			*106 %*		*73-125*		"	"	"	
Surrogate: Toluene-d8			*93 %*		*72-125*		"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
1,1,1-Trichloroethane	ND	0.060	0.50	µg/L	1	2309566	11/10/23	11/10/23	EPA 624.1	
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.068	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.080	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.12	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.059	0.30	"	"	"	"	"	"	ELAP1
1,2-Dichloroethane	ND	0.060	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.066	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.077	0.30	"	"	"	"	"	"	ELAP1
1,4-Dichlorobenzene	ND	0.26	0.30	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.72	2.0	"	"	"	"	"	"	
Benzene	ND	0.096	0.30	"	"	"	"	"	"	
Bromodichloromethane	ND	0.058	0.50	"	"	"	"	"	"	
Bromoform	ND	0.072	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.19	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.10	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.088	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.18	0.50	"	"	"	"	"	"	
Chloroform	ND	0.079	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.19	0.50	"	"	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
cis-1,2-Dichloroethene	ND	0.074	0.50	µg/L	1	2309566	"	11/10/23	EPA 624.1	
cis-1,3-Dichloropropene	ND	0.058	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.052	0.50	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.098	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.076	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.11	0.50	"	"	"	"	"	"	
Toluene	ND	0.070	0.30	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.11	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	"	"	"	"	"	
Trichloroethene	**1.9**	0.082	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.13	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.12	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.26	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*119 %*		*65-135*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*97 %*		*73-125*	"	"	"	"	
Surrogate: Toluene-d8			*97 %*		*72-125*	"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SBE.E4 2022/2023 (23K0465-01) Water	**Sampled: 11/06/23 11:20**		**Received: 11/08/23 17:15**							
Gasoline	ND	10	50	µg/L	1	2309597	11/14/23	11/14/23	EPA 8015M	
JP-4	**3.3**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*94 %*	*65-135*		"	"	"	"	
191.E4 2022/2023 (23K0465-02) Water	**Sampled: 11/06/23 11:00**		**Received: 11/08/23 17:15**							
Gasoline	ND	10	50	µg/L	1	2309597	11/14/23	11/14/23	EPA 8015M	
JP-4	**5.2**		50	"	"	"	"	"	"	
Surrogate: o-Chlorotoluene (Gas)			*87 %*	*65-135*		"	"	"	"	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309504 - General											
Blank (2309504-BLK1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	ND	2.0	3.0	mg/L							
LCS (2309504-BS1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	190	2.0	3.0	mg/L	167		114	83-138			
LCS Dup (2309504-BSD1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Biochemical Oxygen Demand	189	2.0	3.0	mg/L	167		113	83-138	0.8	21	
Batch 2309521 - General Preparation											
Blank (2309521-BLK1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	ND	0.023	0.050	mg/L							
LCS (2309521-BS1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.331	0.023	0.050	mg/L	0.300		110	80-120			
LCS Dup (2309521-BSD1)					Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.349	0.023	0.050	mg/L	0.300		116	80-120	5	25	
Matrix Spike (2309521-MS1)			**Source: 23K0465-02**		Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.375	0.023	0.050	mg/L	0.300	0.0353	113	75-125			
Matrix Spike Dup (2309521-MSD1)			**Source: 23K0465-02**		Prepared & Analyzed: 11/10/23						
Total Phosphorus as P	0.375	0.023	0.050	mg/L	0.300	0.0353	113	75-125	0	30	
Batch 2309543 - General Preparation											
Blank (2309543-BLK1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	ND	2.0	2.0	mg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309543 - General Preparation											
LCS (2309543-BS1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	97.3	2.0	2.0	mg/L	100		97	80-120			
LCS Dup (2309543-BSD1)					Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	97.5	2.0	2.0	mg/L	100		98	80-120	0.2	200	
Duplicate (2309543-DUP1)			**Source: 23K0342-01**		Prepared: 11/10/23 Analyzed: 11/14/23						
Total Suspended Solids	242	33	33	mg/L		243			0.4	20	
Batch 2309548 - General Preparation											
Blank (2309548-BLK1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	ND	0.025	0.10	mg/L							
LCS (2309548-BS1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	0.497	0.025	0.10	mg/L	0.500		99	80-120			
LCS Dup (2309548-BSD1)					Prepared & Analyzed: 11/10/23						
Ammonia as N	0.520	0.025	0.10	mg/L	0.500		104	80-120	5	25	
Matrix Spike (2309548-MS1)			**Source: 23K0363-04**		Prepared & Analyzed: 11/10/23						
Ammonia as N	0.665	0.025	0.10	mg/L	0.500	0.195	94	75-125			
Matrix Spike Dup (2309548-MSD1)			**Source: 23K0363-04**		Prepared & Analyzed: 11/10/23						
Ammonia as N	0.661	0.025	0.10	mg/L	0.500	0.195	93	75-125	0.6	25	
Batch 2309561 - General Preparation											
Blank (2309561-BLK1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	ND	0.54	1.0	mg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309561 - General Preparation											
LCS (2309561-BS1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	11.2	0.54	1.0	mg/L	10.0		112	75-125			
LCS Dup (2309561-BSD1)					Prepared & Analyzed: 11/13/23						
Total Organic Carbon	11.2	0.54	1.0	mg/L	10.0		112	75-125	0.3	25	
Matrix Spike (2309561-MS1)			**Source: 23K0331-04**		Prepared & Analyzed: 11/13/23						
Total Organic Carbon	23.9	0.54	1.0	mg/L	10.0	11.0	130	75-125			QM-7
Matrix Spike Dup (2309561-MSD1)			**Source: 23K0331-04**		Prepared & Analyzed: 11/13/23						
Total Organic Carbon	23.6	0.54	1.0	mg/L	10.0	11.0	126	75-125	1	25	QM-7
Batch 2309562 - General Preparation											
Blank (2309562-BLK1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	ND	6.6	7.0	mg/L							
LCS (2309562-BS1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	57.8	6.6	7.0	mg/L	50.0		116	80-120			
LCS Dup (2309562-BSD1)					Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	57.8	6.6	7.0	mg/L	50.0		116	80-120	0	25	
Matrix Spike (2309562-MS1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	72.9	6.6	7.0	mg/L	50.0	17.0	112	75-125			
Matrix Spike Dup (2309562-MSD1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Chemical Oxygen Demand	68.6	6.6	7.0	mg/L	50.0	17.0	103	75-125	6	30	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309565 - General Prep											
Blank (2309565-BLK1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	ND	0.29	1.0	µg/L							
LCS (2309565-BS1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.1	0.29	1.0	µg/L	10.0		101	80-120			
LCS Dup (2309565-BSD1)					Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	9.94	0.29	1.0	µg/L	10.0		99	80-120	2	20	
Matrix Spike (2309565-MS1)			**Source: 23K0441-01**		Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	1.43	90	80-120			
Matrix Spike Dup (2309565-MSD1)			**Source: 23K0441-01**		Prepared & Analyzed: 11/13/23						
Hexavalent Chromium	10.4	0.29	1.0	µg/L	10.0	1.43	89	80-120	0.4	20	
Batch 2309584 - General Preparation											
Blank (2309584-BLK1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	ND	0.0024	0.10	mg/L							
LCS (2309584-BS1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	0.242	0.0024	0.10	mg/L	0.250		97	80-120			
LCS Dup (2309584-BSD1)					Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	0.251	0.0024	0.10	mg/L	0.250		100	80-120	4	20	
Matrix Spike (2309584-MS1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	1.15	0.0048	0.20	mg/L	0.250	0.789	144	75-125			QM-7

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309584 - General Preparation											
Matrix Spike Dup (2309584-MSD1)			**Source: 23K0465-01**		Prepared & Analyzed: 11/13/23						
Nitrate/Nitrite as N	1.10	0.0048	0.20	mg/L	0.250	0.789	124	75-125	4	25	
Batch 2309614 - Solvent Extract											
Blank (2309614-BLK1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	ND	0.66	1.0	mg/L							
LCS (2309614-BS1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	40.1	0.66	1.0	mg/L	40.0		100	78-114			
LCS Dup (2309614-BSD1)					Prepared & Analyzed: 11/14/23						
Hexane Extractable Material (HEM, Oil & Grease)	38.5	0.66	1.0	mg/L	40.0		96	78-114	4	18	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309503 - EPA 3510B GCNV											
Blank (2309503-BLK1)					Prepared & Analyzed: 11/09/23						
Diesel	ND	0.0021	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Surrogate: o-Terphenyl	*0.0325*			*"*	*0.0250*		*130*	*65-135*			
LCS (2309503-BS1)					Prepared & Analyzed: 11/09/23						
Diesel	2.06	0.0021	0.050	mg/L	2.50		83	65-135			
Surrogate: o-Terphenyl	*0.0184*			*"*	*0.0250*		*74*	*65-135*			
LCS Dup (2309503-BSD1)					Prepared & Analyzed: 11/09/23						
Diesel	1.92	0.0021	0.050	mg/L	2.50		77	65-135	7	30	
Surrogate: o-Terphenyl	*0.0252*			*"*	*0.0250*		*101*	*65-135*			
Matrix Spike (2309503-MS1)				**Source: 23K0421-01**	Prepared & Analyzed: 11/09/23						
Diesel	2.11	0.0021	0.050	mg/L	2.50	ND	84	46-137			
Surrogate: o-Terphenyl	*0.0243*			*"*	*0.0250*		*97*	*65-135*			
Matrix Spike Dup (2309503-MSD1)				**Source: 23K0421-01**	Prepared & Analyzed: 11/09/23						
Diesel	2.11	0.0021	0.050	mg/L	2.50	ND	84	46-137	0.004	30	
Surrogate: o-Terphenyl	*0.0227*			*"*	*0.0250*		*91*	*65-135*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309471 - EPA 200 Series											
Blank (2309471-BLK1)					Prepared: 11/09/23 Analyzed: 11/17/23						
Chromium	0.000725			mg/L							
Copper	0.0000900	0.000090	0.010	"							J
Lead	0.0000300	0.000020	0.0050	"							J
Zinc	0.000590	0.00027	0.020	"							J
LCS (2309471-BS1)					Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.111	0.00014	0.0010	mg/L	0.100		111	85-115			
Copper	0.0976	0.000090	0.010	"	0.100		98	85-115			
Lead	0.102	0.000020	0.0050	"	0.100		102	85-115			
Zinc	0.0934	0.00027	0.020	"	0.100		93	85-115			
Matrix Spike (2309471-MS1)			**Source: 23K0415-01**		Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.111	0.00014	0.0010	mg/L	0.100	0.0167	94	70-130			
Copper	0.104	0.000090	0.010	"	0.100	0.0147	89	70-130			
Lead	0.102	0.000020	0.0050	"	0.100	0.000230	102	70-130			
Zinc	0.591	0.00027	0.020	"	0.100	0.474	117	70-130			
Matrix Spike (2309471-MS2)			**Source: 23K0470-01**		Prepared: 11/09/23 Analyzed: 11/14/23						
Chromium	0.110	0.00014	0.0010	mg/L	0.100	0.0206	89	70-130			
Copper	0.0970	0.000090	0.010	"	0.100	0.00140	96	70-130			
Lead	0.103	0.000020	0.0050	"	0.100	0.0000300	103	70-130			
Zinc	0.181	0.00027	0.020	"	0.100	0.0973	84	70-130			
Batch 2309476 - EPA 7470A											
Blank (2309476-BLK1)					Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	ND	0.15	0.20	µg/L							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Metals by EPA 200 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309476 - EPA 7470A											
LCS (2309476-BS1)					Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.58	0.15	0.20	µg/L	5.00		92	85-115			
Matrix Spike (2309476-MS1)			**Source: 23K0419-02**		Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.57	0.15	0.20	µg/L	5.00	0.165	88	70-130			
Matrix Spike (2309476-MS2)			**Source: 23K0453-01**		Prepared: 11/09/23 Analyzed: 11/10/23						
Mercury	4.24	0.15	0.20	µg/L	5.00	0.151	82	70-130			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309572 - EPA 3510B GCNV											
Blank (2309572-BLK1)					Prepared & Analyzed: 11/13/23						
Aroclor 1016	ND	0.042	0.50	µg/L							
Aroclor 1221	ND	0.050	0.50	"							
Aroclor 1232	ND	0.050	0.50	"							
Aroclor 1242	ND	0.050	0.50	"							
Aroclor 1248	ND	0.050	0.50	"							
Aroclor 1254	ND	0.084	0.50	"							
Aroclor 1260	ND	0.052	0.50	"							
Aroclor 1268*	ND	0.084	0.50	"							
Surrogate: Decachlorobiphenyl	*0.236*			"	*0.250*		*94*	*50-150*			
LCS (2309572-BS1)					Prepared & Analyzed: 11/13/23						
Aroclor 1260	2.17	0.052	0.50	µg/L	2.50		87	31-138			
Surrogate: Decachlorobiphenyl	*0.253*			"	*0.250*		*101*	*50-150*			
LCS Dup (2309572-BSD1)					Prepared & Analyzed: 11/13/23						
Aroclor 1260	1.92	0.052	0.50	µg/L	2.50		77	31-138	12	30	
Surrogate: Decachlorobiphenyl	*0.251*			"	*0.250*		*100*	*50-150*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Blank (2309566-BLK1)					Prepared & Analyzed: 11/10/23						
Benzene	ND	0.096	0.30	µg/L							
Bromodichloromethane	ND	0.058	0.50	"							
Bromoform	ND	0.072	0.50	"							
Bromomethane	ND	0.19	0.50	"							
Carbon tetrachloride	ND	0.10	0.50	"							
Chlorobenzene	ND	0.088	0.30	"							
Chloroethane	ND	0.18	0.50	"							
2-Chloroethylvinyl ether	ND	0.72	2.0	"							
Chloroform	ND	0.079	0.50	"							
Chloromethane	ND	0.19	0.50	"							
Dibromochloromethane	ND	0.052	0.50	"							
1,2-Dichlorobenzene	ND	0.059	0.30	"							
1,3-Dichlorobenzene	ND	0.077	0.30	"							
1,4-Dichlorobenzene	ND	0.26	0.30	"							
1,1-Dichloroethane	ND	0.080	0.50	"							
1,2-Dichloroethane	ND	0.060	0.50	"							
1,1-Dichloroethene	ND	0.12	0.50	"							
cis-1,2-Dichloroethene	ND	0.074	0.50	"							
trans-1,2-Dichloroethene	ND	0.11	0.50	"							
1,2-Dichloropropane	ND	0.066	0.50	"							
cis-1,3-Dichloropropene	ND	0.058	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.098	0.30	"							
Methylene chloride	ND	0.076	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.049	0.50	"							
Tetrachloroethene	ND	0.11	0.50	"							
Toluene	ND	0.070	0.30	"							
1,1,1-Trichloroethane	ND	0.060	0.50	"							
1,1,2-Trichloroethane	ND	0.068	0.50	"							
Trichloroethene	ND	0.082	0.50	"							
Trichlorofluoromethane	ND	0.13	0.50	"							

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Blank (2309566-BLK1)					Prepared & Analyzed: 11/10/23						
Vinyl chloride	ND	0.12	0.50	µg/L							
Xylenes (total)	ND	0.26	0.50	"							
Dichlorodifluoromethane (Freon 12)*	ND	0.23	0.50	"							
1,1,2-Trichloro-1,2,2-Trifluoroethane*	ND	0.11	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	*10.7*			"	*10.0*		*107*	*65-135*			
Surrogate: Toluene-d8	*8.94*			"	*10.0*		*89*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*9.27*			"	*10.0*		*93*	*73-125*			
LCS (2309566-BS1)					Prepared & Analyzed: 11/10/23						
Benzene	19.5	0.096	0.30	µg/L	20.0		98	65-135			
Bromodichloromethane	18.8	0.058	0.50	"	20.0		94	65-135			
Bromoform	21.6	0.072	0.50	"	20.0		108	70-130			
Bromomethane	19.6	0.19	0.50	"	20.0		98	15-185			
Carbon tetrachloride	19.1	0.10	0.50	"	20.0		95	70-130			
Chlorobenzene	16.4	0.088	0.30	"	20.0		82	63-135			
Chloroethane	21.8	0.18	0.50	"	20.0		109	40-160			
Chloroform	18.0	0.079	0.50	"	20.0		90	70-135			
Chloromethane	22.6	0.19	0.50	"	20.0		113	1-472			
Dibromochloromethane	19.3	0.052	0.50	"	20.0		96	70-135			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0		96	65-135			
1,3-Dichlorobenzene	20.5	0.077	0.30	"	20.0		103	70-130			
1,4-Dichlorobenzene	19.9	0.26	0.30	"	20.0		100	65-135			
1,1-Dichloroethane	21.2	0.080	0.50	"	20.0		106	70-130			
1,2-Dichloroethane	19.9	0.060	0.50	"	20.0		99	50-150			
1,1-Dichloroethene	21.3	0.12	0.50	"	20.0		106	70-130			
trans-1,2-Dichloroethene	19.8	0.11	0.50	"	20.0		99	35-165			
1,2-Dichloropropane	18.5	0.066	0.50	"	20.0		92	5-210			
cis-1,3-Dichloropropene	17.6	0.058	0.50	"	20.0		88	25-175			
trans-1,3-Dichloropropene	17.1	0.12	0.50	"	20.0		86	50-150			
Ethylbenzene	22.8	0.098	0.30	"	20.0		114	60-140			
Methylene chloride	22.3	0.076	0.50	"	20.0		112	60-140			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
LCS (2309566-BS1)					Prepared & Analyzed: 11/10/23						
1,1,2,2-Tetrachloroethane	18.8	0.049	0.50	µg/L	20.0		94	60-140			
Tetrachloroethene	20.3	0.11	0.50	"	20.0		101	70-130			
Toluene	20.3	0.070	0.30	"	20.0		102	70-130			
1,1,1-Trichloroethane	19.2	0.060	0.50	"	20.0		96	70-130			
1,1,2-Trichloroethane	20.0	0.068	0.50	"	20.0		100	70-130			
Trichloroethene	17.7	0.082	0.50	"	20.0		89	65-135			
Trichlorofluoromethane	24.2	0.13	0.50	"	20.0		121	50-150			
Vinyl chloride	20.2	0.12	0.50	"	20.0		101	5-195			
Surrogate: 1,2-Dichloroethane-d4	*8.48*			*"*	*10.0*		*85*	*65-135*			
Surrogate: Toluene-d8	*10.2*			*"*	*10.0*		*102*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.14*			*"*	*10.0*		*81*	*73-125*			
LCS Dup (2309566-BSD1)					Prepared & Analyzed: 11/10/23						
Benzene	19.9	0.096	0.30	µg/L	20.0		99	65-135	2	30	
Bromodichloromethane	19.3	0.058	0.50	"	20.0		96	65-135	2	30	
Bromoform	21.2	0.072	0.50	"	20.0		106	70-130	2	30	
Bromomethane	17.4	0.19	0.50	"	20.0		87	15-185	12	30	
Carbon tetrachloride	19.7	0.10	0.50	"	20.0		99	70-130	3	30	
Chlorobenzene	16.4	0.088	0.30	"	20.0		82	63-135	0.4	30	
Chloroethane	16.3	0.18	0.50	"	20.0		82	40-160	29	30	
Chloroform	18.6	0.079	0.50	"	20.0		93	70-135	4	30	
Chloromethane	20.7	0.19	0.50	"	20.0		103	1-472	9	30	
Dibromochloromethane	20.5	0.052	0.50	"	20.0		102	70-135	6	30	
1,2-Dichlorobenzene	19.4	0.059	0.30	"	20.0		97	65-135	1	30	
1,3-Dichlorobenzene	20.3	0.077	0.30	"	20.0		101	70-130	1	30	
1,4-Dichlorobenzene	19.9	0.26	0.30	"	20.0		100	65-135	0.2	30	
1,1-Dichloroethane	21.4	0.080	0.50	"	20.0		107	70-130	0.8	30	
1,2-Dichloroethane	20.2	0.060	0.50	"	20.0		101	50-150	2	30	
1,1-Dichloroethene	21.9	0.12	0.50	"	20.0		110	70-130	3	30	
trans-1,2-Dichloroethene	20.2	0.11	0.50	"	20.0		101	35-165	2	30	
1,2-Dichloropropane	18.5	0.066	0.50	"	20.0		93	5-210	0.2	30	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
LCS Dup (2309566-BSD1)					Prepared & Analyzed: 11/10/23						
cis-1,3-Dichloropropene	18.4	0.058	0.50	µg/L	20.0		92	25-175	4	30	
trans-1,3-Dichloropropene	17.6	0.12	0.50	"	20.0		88	50-150	3	30	
Ethylbenzene	22.3	0.098	0.30	"	20.0		112	60-140	2	30	
Methylene chloride	22.2	0.076	0.50	"	20.0		111	60-140	0.4	30	
1,1,2,2-Tetrachloroethane	19.5	0.049	0.50	"	20.0		98	60-140	4	30	
Tetrachloroethene	20.8	0.11	0.50	"	20.0		104	70-130	2	30	
Toluene	20.1	0.070	0.30	"	20.0		101	70-130	1	30	
1,1,1-Trichloroethane	19.8	0.060	0.50	"	20.0		99	70-130	3	30	
1,1,2-Trichloroethane	20.9	0.068	0.50	"	20.0		104	70-130	4	30	
Trichloroethene	18.1	0.082	0.50	"	20.0		91	65-135	2	30	
Trichlorofluoromethane	20.6	0.13	0.50	"	20.0		103	50-150	16	30	
Vinyl chloride	22.4	0.12	0.50	"	20.0		112	5-195	10	30	
Surrogate: 1,2-Dichloroethane-d4	*8.44*			*"*	*10.0*		*84*	*65-135*			
Surrogate: Toluene-d8	*10.4*			*"*	*10.0*		*104*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.56*			*"*	*10.0*		*86*	*73-125*			
Matrix Spike (2309566-MS1)				**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23						
Benzene	21.7	0.096	0.30	µg/L	20.0	ND	108	37-151			
Bromodichloromethane	21.0	0.058	0.50	"	20.0	ND	105	35-155			
Bromoform	18.1	0.072	0.50	"	20.0	ND	91	45-169			
Bromomethane	15.8	0.19	0.50	"	20.0	ND	79	1-242			
Carbon tetrachloride	20.8	0.10	0.50	"	20.0	ND	104	70-140			
Chlorobenzene	16.4	0.088	0.30	"	20.0	ND	82	37-163			
Chloroethane	15.1	0.18	0.50	"	20.0	ND	76	14-230			
Chloroform	34.7	0.079	0.50	"	20.0	15.8	94	51-138			
Chloromethane	18.0	0.19	0.50	"	20.0	ND	90	1-273			
Dibromochloromethane	21.6	0.052	0.50	"	20.0	ND	108	53-149			
1,2-Dichlorobenzene	19.2	0.059	0.30	"	20.0	ND	96	18-190			
1,3-Dichlorobenzene	19.8	0.077	0.30	"	20.0	ND	99	59-156			
1,4-Dichlorobenzene	19.4	0.26	0.30	"	20.0	ND	97	18-190			
1,1-Dichloroethane	26.2	0.080	0.50	"	20.0	ND	131	59-155			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Matrix Spike (2309566-MS1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
1,2-Dichloroethane	24.5	0.060	0.50	µg/L	20.0	ND	123	49-155			
1,1-Dichloroethene	25.7	0.12	0.50	"	20.0	ND	129	1-234			
trans-1,2-Dichloroethene	24.0	0.11	0.50	"	20.0	ND	120	54-156			
1,2-Dichloropropane	20.0	0.066	0.50	"	20.0	ND	100	1-210			
cis-1,3-Dichloropropene	14.3	0.058	0.50	"	20.0	ND	72	1-227			
trans-1,3-Dichloropropene	15.8	0.12	0.50	"	20.0	ND	79	17-183			
Ethylbenzene	22.6	0.098	0.30	"	20.0	ND	113	37-162			
Methylene chloride	27.3	0.076	0.50	"	20.0	ND	137	1-221			
1,1,2,2-Tetrachloroethane	20.1	0.049	0.50	"	20.0	ND	101	46-148			
Tetrachloroethene	22.6	0.11	0.50	"	20.0	ND	113	64-148			
Toluene	22.8	0.070	0.30	"	20.0	ND	114	47-150			
1,1,1-Trichloroethane	24.2	0.060	0.50	"	20.0	ND	121	52-162			
1,1,2-Trichloroethane	24.3	0.068	0.50	"	20.0	ND	122	52-150			
Trichloroethene	19.7	0.082	0.50	"	20.0	ND	99	71-157			
Trichlorofluoromethane	30.5	0.13	0.50	"	20.0	ND	152	17-181			
Vinyl chloride	21.2	0.12	0.50	"	20.0	ND	106	10-251			
Surrogate: 1,2-Dichloroethane-d4	*11.0*			*"*	*10.0*		*110*	*65-135*			
Surrogate: Toluene-d8	*11.1*			*"*	*10.0*		*111*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.36*			*"*	*10.0*		*84*	*73-125*			
Matrix Spike Dup (2309566-MSD1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
Benzene	26.4	0.096	0.30	µg/L	20.0	ND	132	37-151	20	61	
Bromodichloromethane	24.8	0.058	0.50	"	20.0	ND	124	35-155	17	56	
Bromoform	15.7	0.072	0.50	"	20.0	ND	79	45-169	14	42	
Bromomethane	19.6	0.19	0.50	"	20.0	ND	98	1-242	22	61	
Carbon tetrachloride	23.4	0.10	0.50	"	20.0	ND	117	70-140	12	41	
Chlorobenzene	15.9	0.088	0.30	"	20.0	ND	80	37-163	3	53	
Chloroethane	16.5	0.18	0.50	"	20.0	ND	83	14-230	9	78	
Chloroform	33.3	0.079	0.50	"	20.0	15.8	87	51-138	4	54	
Chloromethane	21.7	0.19	0.50	"	20.0	ND	109	1-273	19	60	
Dibromochloromethane	25.1	0.052	0.50	"	20.0	ND	126	53-149	15	50	

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

Purgeables by EPA Method 624.1 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309566 - EPA 3510B GCMS											
Matrix Spike Dup (2309566-MSD1)			**Source: 23K0534-06**	Prepared & Analyzed: 11/10/23							
1,2-Dichlorobenzene	25.9	0.059	0.30	µg/L	20.0	ND	130	18-190	30	57	
1,3-Dichlorobenzene	27.3	0.077	0.30	"	20.0	ND	137	59-156	32	43	
1,4-Dichlorobenzene	26.6	0.26	0.30	"	20.0	ND	133	18-190	31	57	
1,1-Dichloroethane	25.5	0.080	0.50	"	20.0	ND	127	59-155	3	40	
1,2-Dichloroethane	21.4	0.060	0.50	"	20.0	ND	107	49-155	14	49	
1,1-Dichloroethene	26.6	0.12	0.50	"	20.0	ND	133	1-234	3	32	
trans-1,2-Dichloroethene	23.8	0.11	0.50	"	20.0	ND	119	54-156	0.9	45	
1,2-Dichloropropane	23.5	0.066	0.50	"	20.0	ND	117	1-210	16	55	
cis-1,3-Dichloropropene	16.9	0.058	0.50	"	20.0	ND	84	1-227	17	58	
trans-1,3-Dichloropropene	18.1	0.12	0.50	"	20.0	ND	90	17-183	13	86	
Ethylbenzene	22.5	0.098	0.30	"	20.0	ND	112	37-162	0.5	63	
Methylene chloride	25.6	0.076	0.50	"	20.0	ND	128	1-221	6	28	
1,1,2,2-Tetrachloroethane	25.8	0.049	0.50	"	20.0	ND	129	46-148	25	61	
Tetrachloroethene	28.5	0.11	0.50	"	20.0	ND	142	64-148	23	39	
Toluene	27.1	0.070	0.30	"	20.0	ND	135	47-150	17	41	
1,1,1-Trichloroethane	23.9	0.060	0.50	"	20.0	ND	119	52-162	1	36	
1,1,2-Trichloroethane	26.4	0.068	0.50	"	20.0	ND	132	52-150	8	46	
Trichloroethene	24.0	0.082	0.50	"	20.0	ND	120	71-157	19	48	
Trichlorofluoromethane	31.8	0.13	0.50	"	20.0	ND	159	17-181	4	84	
Vinyl chloride	25.9	0.12	0.50	"	20.0	ND	129	10-251	20	66	
Surrogate: 1,2-Dichloroethane-d4	*11.3*			*"*	*10.0*		*113*	*65-135*			
Surrogate: Toluene-d8	*10.5*			*"*	*10.0*		*105*	*72-125*			
Surrogate: 4-Bromofluorobenzene	*8.22*			*"*	*10.0*		*82*	*73-125*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames
Bldg T20G-4, Room 134
Moffet Field, CA 94053-1000

Project: QSE1-2023/2024
Project Number: 2084001-CLIN 34
Project Manager: Marcia Christlieb

CLS Work Order #: 23K0465
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2309597 - EPA 5030 Water GC											
Blank (2309597-BLK1)					Prepared & Analyzed: 11/14/23						
JP-4	6.76		50	µg/L							
Gasoline	16.7	10	50	"							J
Surrogate: o-Chlorotoluene (Gas)	*16.9*			*"*	*20.0*		*84*	*65-135*			
LCS (2309597-BS1)					Prepared & Analyzed: 11/14/23						
Gasoline	540	10	50	µg/L	500		108	70-130			
Surrogate: o-Chlorotoluene (Gas)	*18.9*			*"*	*20.0*		*95*	*65-135*			
LCS Dup (2309597-BSD1)					Prepared & Analyzed: 11/14/23						
Gasoline	536	10	50	µg/L	500		107	70-130	0.8	30	
Surrogate: o-Chlorotoluene (Gas)	*16.2*			*"*	*20.0*		*81*	*65-135*			

11/22/23 14:01

BB&E, Inc c/o NASA Ames	Project: QSE1-2023/2024	
Bldg T20G-4, Room 134	Project Number: 2084001-CLIN 34	**CLS Work Order #: 23K0465**
Moffet Field, CA 94053-1000	Project Manager: Marcia Christlieb	COC #:

Notes and Definitions

QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
HT-NO3	The nitrite analysis was not performed. The nitrate plus nitrite result is reported as nitrate.
HT-1	The sample was received outside of the EPA recommended holding time.
ELAP1	The analysis is not ELAP-certified; the result is reported per the client's request.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
*	The laboratory does not hold CA-ELAP accreditation for this analyte or method. Accreditation may not be available from CA-ELAP for this analyte or method.

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

23K0465

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb	LAB:	CLS
	ERT/BB&E/NASA Ames		**3249 Fitzgerald Rd.**
	Bldg. T20G/Room 142. M/S T20G-4		Rancho Cordova, CA 95742
	Moffett Field, CA 94035-1000		(916)638-7301
	(650) 604-5360 marcia.j.christlieb@nasa.gov		
PROJECT NAME:	QSE1-2023/2024	INVOICE TO:	**BB&E, Inc.**
PROJECT NUMBER:	2084001-CLIN 34		**Accounts Payable**
JOB DESCRIPTION	Rain Event #1 2023		235 E. Main St, Suite 107
			Northville, MI 48167

Field Conditions:

	pH / Temp (C or F)
SBE	8.32 / 20.4
191	7.70 / 20.9
RTJO	

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	625,Motor Oil, PCBs	JP5,JP8, Diesel	TSS, BOD	TP, N+N (4500-NO3-E), COD, TOC, NH3 (4500-NH3 B+C)	Hg (245.1), Cu, Pb, Zn (200.8)	Cr	Oil&Grease	624, TPH-gas, JP4	TURN AROUND TIME	SPECIAL INSTRUCTIONS
11/6/2023	11:20 AM	SBE.E4 2022/2023-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
11/6/2023	11:20 AM	SBE.E4 2022/2023-2	Water	1 - Amber 250 mL	Cold		X							5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-3	Water	1 - Poly Liter	Cold			X						5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
11/6/2023	11:20 AM	SBE.E4 2022/2023-7	Water	1 - Amber Liter	HCl							X		5 days	
11/6/2023	11:20 AM	SBE.E4 2022/2023-8	Water	4 - Amber VOA	HCl								X	5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-1	Water	3 - Amber Liters	Cold	X								5 days	Analysis to include Aroclor 1268
11/6/2023	11:00 AM	191.E4 2022/2023-2	Water	1 - Amber 250 mL	Cold		X							5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-3	Water	1 - Poly Liter	Cold			X						5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-4	Water	1 - Poly 250 mL	H2SO4				X					5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-5	Water	1 - Poly 250 mL	HNO3					X				5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-6	Water	1 - Poly 250 mL	NH3/NH4						X			5 days	**Include Cr VI**
11/6/2023	11:00 AM	191.E4 2022/2023-7	Water	1 - Amber Liter	HCl							X		5 days	
11/6/2023	11:00 AM	191.E4 2022/2023-8	Water	4 - Amber VOA	HCl								X	5 days	

SAMPLER: Brian Kawashima

RELINQUISHED BY: DATE/TIME: 11/6/2023 12:00PM

RELINQUISHED BY: DATE/TIME: 11/8/23 - 1715

RECEIVED BY: 11/8/23 - 1300

RECEIVED BY:

RECEIVED AT LAB BY: 11/8/23

2-4/2-3

Please send results to
marcia.j.christlieb@nasa.gov
Brian.l.kawashima@nasa.gov
Request Level II EDD

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 2311616

Report Created for: CLS Labs

3249 Fitzgerald Road
Rancho Cordova, CA 95742

Project Contact: CLS Sub email
Project P.O.:
Project: 23K0465

Project Received: 11/09/2023

Analytical Report reviewed & approved for release on 11/16/2023 by:

Yen Cao
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: CLS Labs **WorkOrder:** 2311616

Project: 23K0465

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CCV	Continuing Calibration Verification.
CCV REC (%)	% recovery of Continuing Calibration Verification.
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LCS2	Second LCS for the batch. Spike level is lower than that for the first LCS; applicable to method 1633.
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit [1]
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit [2]
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SNR	Surrogate is diluted out of the calibration range
SPK Val	Spike Value

[1] MDL is the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, 40CFR, Part 136, Appendix B, EPA 821-R-16-006, December 2016. Values are based upon our default extraction volume/amount and are subject to change.

[2] RL is the lowest level that can be reliably determined within specified limits of precision and accuracy during routine laboratory operating conditions. (The RL cannot be lower than the lowest calibration standard used in the initial calibration of the instrument and must be greater [illegible] L.) Values are based upon our default extraction volume/amount and are subject to change.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: CLS Labs **WorkOrder:** 2311616

Project: 23K0465

SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TNTC	“Too Numerous to Count;” greater than 250 colonies observed on the plate.
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

Analytical Qualifiers

J	Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.
S	Surrogate recovery outside accepted recovery limits.
c1	Surrogate recovery outside of the control limits due to the dilution of the sample.
c2	Surrogate recovery outside of the control limits due to suspected matrix interference.

Quality Control Qualifiers

F2	LCS/LCSD recovery and/or RPD/RSD is out of acceptance criteria.
F5	LCS/LCSD recovery is outside of acceptance limits; however, the data is acceptable based upon the TNI allowable marginal exceedances.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed
Acenaphthene	ND	0.0029	0.0050	1	11/10/2023 17:58
Acenaphthylene	ND	0.0018	0.0050	1	11/10/2023 17:58
Anthracene	ND	0.0020	0.0050	1	11/10/2023 17:58
Benzidine	ND	2.7	5.0	1	11/10/2023 17:58
Benzo (a) anthracene	ND	0.020	0.050	1	11/10/2023 17:58
Benzo (a) pyrene	ND	0.0050	0.0050	1	11/10/2023 17:58
Benzo (b) fluoranthene	ND	0.0053	0.0099	1	11/10/2023 17:58
Benzo (g,h,i) perylene	ND	0.0039	0.0099	1	11/10/2023 17:58
Benzo (k) fluoranthene	ND	0.0050	0.0099	1	11/10/2023 17:58
Benzyl Alcohol	ND	1.9	5.0	1	11/10/2023 17:58
Bis (2-chloroethoxy) Methane	ND	0.51	0.99	1	11/10/2023 17:58
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	1	11/10/2023 17:58
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.0099	1	11/10/2023 17:58
Bis (2-ethylhexyl) Adipate	ND	0.78	0.99	1	11/10/2023 17:58
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	1	11/10/2023 17:58
4-Bromophenyl Phenyl Ether	ND	0.29	0.99	1	11/10/2023 17:58
Butylbenzyl Phthalate	ND	0.080	0.25	1	11/10/2023 17:58
4-Chloroaniline	ND	0.0020	0.0050	1	11/10/2023 17:58
4-Chloro-3-methylphenol	ND	0.58	0.99	1	11/10/2023 17:58
2-Chloronaphthalene	ND	0.56	0.99	1	11/10/2023 17:58
2-Chlorophenol	ND	0.036	0.050	1	11/10/2023 17:58
4-Chlorophenyl Phenyl Ether	ND	0.49	0.99	1	11/10/2023 17:58
Carbazole	ND	0.42	0.99	1	11/10/2023 17:58
Chrysene	ND	0.0027	0.0050	1	11/10/2023 17:58
Dibenzo (a,h) anthracene	ND	0.0052	0.0099	1	11/10/2023 17:58
n-Decane	ND	0.68	0.99	1	11/10/2023 17:58
Dibenzofuran	ND	0.0014	0.0050	1	11/10/2023 17:58
Di-n-butyl Phthalate	ND	0.077	0.25	1	11/10/2023 17:58
1,2-Dichlorobenzene	ND	0.53	0.99	1	11/10/2023 17:58
1,3-Dichlorobenzene	ND	0.58	0.99	1	11/10/2023 17:58
1,4-Dichlorobenzene	ND	0.44	0.99	1	11/10/2023 17:58
3,3-Dichlorobenzidine	ND	0.0061	0.0099	1	11/10/2023 17:58
2,4-Dichlorophenol	ND	0.0056	0.0099	1	11/10/2023 17:58
Diethyl Phthalate	ND	0.021	0.050	1	11/10/2023 17:58
2,4-Dimethylphenol	ND	0.53	0.99	1	11/10/2023 17:58
Dimethyl Phthalate	ND	0.0058	0.0099	1	11/10/2023 17:58
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	1	11/10/2023 17:58

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed
2,4-Dinitrophenol	ND	0.67	0.99	1	11/10/2023 17:58
2,4-Dinitrotoluene	ND	0.027	0.050	1	11/10/2023 17:58
2,6-Dinitrotoluene	ND	0.030	0.050	1	11/10/2023 17:58
Di-n-octyl Phthalate	ND	1.2	2.5	1	11/10/2023 17:58
1,2-Diphenylhydrazine	ND	0.42	0.99	1	11/10/2023 17:58
Fluoranthene	ND	0.0038	0.0099	1	11/10/2023 17:58
Fluorene	ND	0.0018	0.0099	1	11/10/2023 17:58
Hexachlorobenzene	ND	0.0017	0.0050	1	11/10/2023 17:58
Hexachlorobutadiene	ND	0.0011	0.0050	1	11/10/2023 17:58
Hexachlorocyclopentadiene	ND	2.3	5.0	1	11/10/2023 17:58
Hexachloroethane	ND	0.0034	0.0099	1	11/10/2023 17:58
Indeno (1,2,3-cd) pyrene	ND	0.0069	0.0099	1	11/10/2023 17:58
Isophorone	ND	0.45	0.99	1	11/10/2023 17:58
2-Methylnaphthalene	ND	0.0022	0.0050	1	11/10/2023 17:58
2-Methylphenol (o-Cresol)	ND	0.62	0.99	1	11/10/2023 17:58
3 & 4-Methylphenol (m,p-Cresol)	ND	0.69	0.99	1	11/10/2023 17:58
Naphthalene	ND	0.0062	0.0099	1	11/10/2023 17:58
2-Nitroaniline	ND	3.0	5.0	1	11/10/2023 17:58
3-Nitroaniline	ND	3.9	5.0	1	11/10/2023 17:58
4-Nitroaniline	ND	2.4	5.0	1	11/10/2023 17:58
Nitrobenzene	ND	0.60	0.99	1	11/10/2023 17:58
2-Nitrophenol	ND	3.0	5.0	1	11/10/2023 17:58
4-Nitrophenol	ND	3.6	5.0	1	11/10/2023 17:58
N-Nitrosodimethylamine	ND	3.6	5.0	1	11/10/2023 17:58
N-Nitrosodiphenylamine	ND	0.36	0.99	1	11/10/2023 17:58
N-Nitrosodi-n-propylamine	ND	0.59	0.99	1	11/10/2023 17:58
n-Octadecane	ND	0.54	0.99	1	11/10/2023 17:58
Pentachlorophenol	ND	0.16	0.25	1	11/10/2023 17:58
Phenanthrene	ND	0.0036	0.0050	1	11/10/2023 17:58
Phenol	**0.048**	0.019	0.040	1	11/10/2023 17:58
Pyrene	ND	0.0028	0.0050	1	11/10/2023 17:58
Pyridine	ND	0.88	0.99	1	11/10/2023 17:58
1,2,4-Trichlorobenzene	ND	0.52	0.99	1	11/10/2023 17:58
2,4,5-Trichlorophenol	ND	0.0063	0.0099	1	11/10/2023 17:58
2,4,6-Trichlorophenol	ND	0.0053	0.0099	1	11/10/2023 17:58

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SBE.E4 2022/2023	2311616-001A	Water	11/06/2023 11:20	GC48 11102325.D	282063

Analytes	Result	MDL	RL	DF	Date Analyzed

Surrogates	REC (%)	Qualifiers	Limits	
2-Fluorophenol	37		20-103	11/10/2023 17:58
Phenol-d5	29		20-120	11/10/2023 17:58
Nitrobenzene-d5	59	S	61-130	11/10/2023 17:58
2-Fluorobiphenyl	57	S	63-115	11/10/2023 17:58
2,4,6-Tribromophenol	72		48-149	11/10/2023 17:58
4-Terphenyl-d14	79		32-113	11/10/2023 17:58

Analyst(s): MV Analytical Comments: c2

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	2311616-002A	Water	11/06/2023 11:00	GC17 11102324.D	282074

Analytes	Result	MDL	RL	DF	Date Analyzed
Acenaphthene	ND	0.0060	0.010	2	11/10/2023 16:26
Acenaphthylene	ND	0.0037	0.010	2	11/10/2023 16:26
Anthracene	ND	0.0041	0.010	2	11/10/2023 16:26
Benzidine	ND	5.6	10	2	11/10/2023 16:26
Benzo (a) anthracene	ND	0.041	0.10	2	11/10/2023 16:26
Benzo (a) pyrene	ND	0.010	0.010	2	11/10/2023 16:26
Benzo (b) fluoranthene	ND	0.011	0.021	2	11/10/2023 16:26
Benzo (g,h,i) perylene	ND	0.0081	0.021	2	11/10/2023 16:26
Benzo (k) fluoranthene	ND	0.010	0.021	2	11/10/2023 16:26
Benzyl Alcohol	ND	3.9	10	2	11/10/2023 16:26
Bis (2-chloroethoxy) Methane	ND	1.1	2.1	2	11/10/2023 16:26
Bis (2-chloroethyl) Ether	ND	0.010	0.010	2	11/10/2023 16:26
Bis (2-chloroisopropyl) Ether	ND	0.010	0.021	2	11/10/2023 16:26
Bis (2-ethylhexyl) Adipate	ND	1.6	2.1	2	11/10/2023 16:26
Bis (2-ethylhexyl) Phthalate	ND	0.27	0.52	2	11/10/2023 16:26
4-Bromophenyl Phenyl Ether	ND	0.60	2.1	2	11/10/2023 16:26
Butylbenzyl Phthalate	ND	0.17	0.52	2	11/10/2023 16:26
4-Chloroaniline	ND	0.0041	0.010	2	11/10/2023 16:26
4-Chloro-3-methylphenol	ND	1.2	2.1	2	11/10/2023 16:26
2-Chloronaphthalene	ND	1.2	2.1	2	11/10/2023 16:26
2-Chlorophenol	ND	0.075	0.10	2	11/10/2023 16:26
4-Chlorophenyl Phenyl Ether	ND	1.0	2.1	2	11/10/2023 16:26
Carbazole	ND	0.87	2.1	2	11/10/2023 16:26
Chrysene	ND	0.0056	0.010	2	11/10/2023 16:26
Dibenzo (a,h) anthracene	ND	0.011	0.021	2	11/10/2023 16:26
n-Decane	ND	1.4	2.1	2	11/10/2023 16:26
Dibenzofuran	ND	0.0029	0.010	2	11/10/2023 16:26
Di-n-butyl Phthalate	ND	0.16	0.52	2	11/10/2023 16:26
1,2-Dichlorobenzene	ND	1.1	2.1	2	11/10/2023 16:26
1,3-Dichlorobenzene	ND	1.2	2.1	2	11/10/2023 16:26
1,4-Dichlorobenzene	ND	0.91	2.1	2	11/10/2023 16:26
3,3-Dichlorobenzidine	ND	0.013	0.021	2	11/10/2023 16:26
2,4-Dichlorophenol	ND	0.012	0.021	2	11/10/2023 16:26
Diethyl Phthalate	ND	0.043	0.10	2	11/10/2023 16:26
2,4-Dimethylphenol	ND	1.1	2.1	2	11/10/2023 16:26
Dimethyl Phthalate	ND	0.012	0.021	2	11/10/2023 16:26
4,6-Dinitro-2-methylphenol	ND	7.7	10	2	11/10/2023 16:26

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	2311616-002A	Water	11/06/2023 11:00	GC17 11102324.D	282074

Analytes	Result	MDL	RL	DF	Date Analyzed
2,4-Dinitrophenol	ND	1.4	2.1	2	11/10/2023 16:26
2,4-Dinitrotoluene	ND	0.056	0.10	2	11/10/2023 16:26
2,6-Dinitrotoluene	ND	0.062	0.10	2	11/10/2023 16:26
Di-n-octyl Phthalate	ND	2.5	5.2	2	11/10/2023 16:26
1,2-Diphenylhydrazine	ND	0.87	2.1	2	11/10/2023 16:26
Fluoranthene	ND	0.0079	0.021	2	11/10/2023 16:26
Fluorene	ND	0.0037	0.021	2	11/10/2023 16:26
Hexachlorobenzene	ND	0.0035	0.010	2	11/10/2023 16:26
Hexachlorobutadiene	ND	0.0023	0.010	2	11/10/2023 16:26
Hexachlorocyclopentadiene	ND	4.8	10	2	11/10/2023 16:26
Hexachloroethane	ND	0.0070	0.021	2	11/10/2023 16:26
Indeno (1,2,3-cd) pyrene	ND	0.014	0.021	2	11/10/2023 16:26
Isophorone	ND	0.93	2.1	2	11/10/2023 16:26
2-Methylnaphthalene	ND	0.0046	0.010	2	11/10/2023 16:26
2-Methylphenol (o-Cresol)	ND	1.3	2.1	2	11/10/2023 16:26
3 & 4-Methylphenol (m,p-Cresol)	ND	1.4	2.1	2	11/10/2023 16:26
Naphthalene	**0.034**	0.013	0.021	2	11/10/2023 16:26
2-Nitroaniline	ND	6.2	10	2	11/10/2023 16:26
3-Nitroaniline	ND	8.1	10	2	11/10/2023 16:26
4-Nitroaniline	ND	5.0	10	2	11/10/2023 16:26
Nitrobenzene	ND	1.3	2.1	2	11/10/2023 16:26
2-Nitrophenol	ND	6.2	10	2	11/10/2023 16:26
4-Nitrophenol	ND	7.5	10	2	11/10/2023 16:26
N-Nitrosodimethylamine	ND	7.5	10	2	11/10/2023 16:26
N-Nitrosodiphenylamine	ND	0.75	2.1	2	11/10/2023 16:26
N-Nitrosodi-n-propylamine	ND	1.2	2.1	2	11/10/2023 16:26
n-Octadecane	ND	1.1	2.1	2	11/10/2023 16:26
Pentachlorophenol	ND	0.33	0.52	2	11/10/2023 16:26
Phenanthrene	ND	0.0075	0.010	2	11/10/2023 16:26
Phenol	ND	0.039	0.083	2	11/10/2023 16:26
Pyrene	ND	0.0058	0.010	2	11/10/2023 16:26
Pyridine	ND	1.8	2.1	2	11/10/2023 16:26
1,2,4-Trichlorobenzene	ND	1.1	2.1	2	11/10/2023 16:26
2,4,5-Trichlorophenol	ND	0.013	0.021	2	11/10/2023 16:26
2,4,6-Trichlorophenol	ND	0.011	0.021	2	11/10/2023 16:26

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Received:	11/09/2023 12:20	**Extraction Method:**	E625.1
Date Prepared:	11/10/2023	**Analytical Method:**	E625.1
Project:	23K0465	**Unit:**	µg/L

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
191.E4 2022/2023	**2311616-002A**	**Water**	**11/06/2023 11:00**	**GC17 11102324.D**	**282074**

Analytes	Result	MDL	RL	DF	Date Analyzed
Surrogates	**REC (%)**	**Qualifiers**	**Limits**		
2-Fluorophenol	27		20-103		11/10/2023 16:26
Phenol-d5	20		20-120		11/10/2023 16:26
Nitrobenzene-d5	54	S	61-130		11/10/2023 16:26
2-Fluorobiphenyl	61	S	63-115		11/10/2023 16:26
2,4,6-Tribromophenol	54		48-149		11/10/2023 16:26
4-Terphenyl-d14	70		32-113		11/10/2023 16:26

Analyst(s): AK Analytical Comments: c1

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acenaphthene	ND	0.0029	0.0050	-	-	-
Acenaphthylene	ND	0.0018	0.0050	-	-	-
Anthracene	ND	0.0020	0.0050	-	-	-
Benzidine	ND	2.7	5.0	-	-	-
Benzo (a) anthracene	ND	0.020	0.050	-	-	-
Benzo (a) pyrene	ND	0.0050	0.0050	-	-	-
Benzo (b) fluoranthene	ND	0.0053	0.010	-	-	-
Benzo (g,h,i) perylene	ND	0.0039	0.010	-	-	-
Benzo (k) fluoranthene	ND	0.0050	0.010	-	-	-
Benzyl Alcohol	ND	1.9	5.0	-	-	-
Bis (2-chloroethoxy) Methane	ND	0.51	1.0	-	-	-
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	-	-	-
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.010	-	-	-
Bis (2-ethylhexyl) Adipate	ND	0.79	1.0	-	-	-
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	-	-	-
4-Bromophenyl Phenyl Ether	ND	0.29	1.0	-	-	-
Butylbenzyl Phthalate	ND	0.081	0.25	-	-	-
4-Chloroaniline	ND	0.0020	0.0050	-	-	-
4-Chloro-3-methylphenol	ND	0.59	1.0	-	-	-
2-Chloronaphthalene	ND	0.56	1.0	-	-	-
2-Chlorophenol	ND	0.036	0.050	-	-	-
4-Chlorophenyl Phenyl Ether	ND	0.49	1.0	-	-	-
Carbazole	ND	0.42	1.0	-	-	-
Chrysene	ND	0.0027	0.0050	-	-	-
Dibenzo (a,h) anthracene	ND	0.0052	0.010	-	-	-
n-Decane	ND	0.69	1.0	-	-	-
Dibenzofuran	ND	0.0014	0.0050	-	-	-
Di-n-butyl Phthalate	ND	0.078	0.25	-	-	-
1,2-Dichlorobenzene	ND	0.53	1.0	-	-	-
1,3-Dichlorobenzene	ND	0.59	1.0	-	-	-
1,4-Dichlorobenzene	ND	0.44	1.0	-	-	-
3,3-Dichlorobenzidine	ND	0.0062	0.010	-	-	-
2,4-Dichlorophenol	ND	0.0056	0.010	-	-	-
Diethyl Phthalate	ND	0.021	0.050	-	-	-
2,4-Dimethylphenol	ND	0.53	1.0	-	-	-
Dimethyl Phthalate	ND	0.0059	0.010	-	-	-
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	-	-	-
2,4-Dinitrophenol	ND	0.68	1.0	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
2,4-Dinitrotoluene	ND	0.027	0.050	-	-	-
2,6-Dinitrotoluene	ND	0.030	0.050	-	-	-
Di-n-octyl Phthalate	ND	1.2	2.5	-	-	-
1,2-Diphenylhydrazine	ND	0.42	1.0	-	-	-
Fluoranthene	ND	0.0038	0.010	-	-	-
Fluorene	ND	0.0018	0.010	-	-	-
Hexachlorobenzene	ND	0.0017	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0011	0.0050	-	-	-
Hexachlorocyclopentadiene	ND	2.3	5.0	-	-	-
Hexachloroethane	ND	0.0034	0.010	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0070	0.010	-	-	-
1-Methylnaphthalene	ND	0.0021	0.0050	-	-	-
Isophorone	ND	0.45	1.0	-	-	-
2-Methylnaphthalene	ND	0.0022	0.0050	-	-	-
2-Methylphenol (o-Cresol)	ND	0.63	1.0	-	-	-
3 & 4-Methylphenol (m,p-Cresol)	ND	0.70	1.0	-	-	-
Naphthalene	ND	0.0063	0.010	-	-	-
2-Nitroaniline	ND	3.0	5.0	-	-	-
3-Nitroaniline	ND	3.9	5.0	-	-	-
4-Nitroaniline	ND	2.4	5.0	-	-	-
Nitrobenzene	ND	0.61	1.0	-	-	-
2-Nitrophenol	ND	3.0	5.0	-	-	-
4-Nitrophenol	ND	3.6	5.0	-	-	-
N-Nitrosodimethylamine	ND	3.6	5.0	-	-	-
N-Nitrosodiphenylamine	ND	0.36	1.0	-	-	-
N-Nitrosodi-n-propylamine	ND	0.60	1.0	-	-	-
n-Octadecane	ND	0.54	1.0	-	-	-
Pentachlorophenol	ND	0.16	0.25	-	-	-
Phenanthrene	ND	0.0036	0.0050	-	-	-
Phenol	ND	0.019	0.040	-	-	-
Pyrene	ND	0.0028	0.0050	-	-	-
Pyridine	ND	0.89	1.0	-	-	-
1,2,4-Trichlorobenzene	ND	0.52	1.0	-	-	-
2,4,5-Trichlorophenol	ND	0.0064	0.010	-	-	-
2,4,6-Trichlorophenol	ND	0.0053	0.010	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery						
2-Fluorophenol	4.2			5	84	20-103
Phenol-d5	4.2			5	83	20-120
Nitrobenzene-d5	3.4			5	68	61-130
2-Fluorobiphenyl	4.5			5	91	63-115
2,4,6-Tribromophenol	3.3			5	65	48-149
4-Terphenyl-d14	4.4			5	89	32-113

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acenaphthene	0.21	0.21	0.25	84	83	60-132	1.72	25
Acenaphthylene	0.18	0.18	0.25	71	71	54-126	0.550	25
Anthracene	0.19	0.18	0.25	76	73	60-130	4.00	25
Benzidine	6.0	7.8	25	24	31	20-130	27.1,F2	25
Benzo (a) anthracene	0.22	0.22	0.25	87	89	60-130	1.63	25
Benzo (a) pyrene	0.21	0.22	0.25	86	87	60-130	1.72	25
Benzo (b) fluoranthene	0.20	0.21	0.25	81	84	60-130	2.69	25
Benzo (g,h,i) perylene	0.23	0.22	0.25	92	90	50-130	1.89	25
Benzo (k) fluoranthene	0.23	0.23	0.25	94	92	60-130	2.43	25
Benzyl Alcohol	20	20	25	81	79	60-130	3.18	25
Bis (2-chloroethoxy) Methane	4.4	4.2	5	89	84	65-130	5.84	25
Bis (2-chloroethyl) Ether	0.19	0.19	0.25	77	75	60-130	3.48	25
Bis (2-chloroisopropyl) Ether	0.20	0.20	0.25	81	79	63-139	2.83	25
Bis (2-ethylhexyl) Adipate	4.2	4.6	5	84	92	60-130	8.60	25
Bis (2-ethylhexyl) Phthalate	0.19	0.21	0.25	78	85	60-130	8.90	25
4-Bromophenyl Phenyl Ether	4.1	4.0	5	83	80	65-120	3.69	25
Butylbenzyl Phthalate	0.20	0.22	0.25	82	87	60-140	6.82	25
4-Chloroaniline	0.17	0.17	0.25	69	68	60-130	1.52	25
4-Chloro-3-methylphenol	4.2	4.1	5	84	83	65-130	1.58	25
2-Chloronaphthalene	4.2	4.1	5	85	82	65-120	2.53	25
2-Chlorophenol	0.18	0.18	0.25	71	71	60-130	0.344	25
4-Chlorophenyl Phenyl Ether	4.2	4.1	5	84	82	65-130	3.15	25
Carbazole	4.2	4.2	5	84	83	70-130	1.26	25
Chrysene	0.21	0.21	0.25	84	84	70-130	0.320	25
Dibenzo (a,h) anthracene	0.24	0.23	0.25	95	90	50-130	4.72	25
n-Decane	3.9	3.7	5	79	73	30-130	7.28	25
Dibenzofuran	0.21	0.21	0.25	85	83	65-130	2.49	25
Di-n-butyl Phthalate	0.20	0.21	0.25	80	83	60-130	4.13	25
1,2-Dichlorobenzene	4.4	4.2	5	88	84	60-130	4.73	25
1,3-Dichlorobenzene	4.1	3.9	5	81	78	60-130	3.71	25
1,4-Dichlorobenzene	4.2	4.0	5	84	81	60-130	3.82	25
3,3-Dichlorobenzidine	0.19	0.20	0.25	76	79	60-130	4.75	25
2,4-Dichlorophenol	0.21	0.20	0.25	85	80	53-122	5.82	25
Diethyl Phthalate	0.20	0.21	0.25	81	83	65-130	3.12	25
2,4-Dimethylphenol	4.5	4.1	5	90	81	60-130	9.74	25
Dimethyl Phthalate	0.20	0.20	0.25	78	79	60-130	1.27	25
4,6-Dinitro-2-methylphenol	16	17	25	64	70	60-130	8.93	25
2,4-Dinitrophenol	3.7	4.3	5	73	86	50-130	16.1	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,4-Dinitrotoluene	0.17	0.19	0.25	69,F5	75	70-130	8.20	25
2,6-Dinitrotoluene	0.16	0.16	0.25	63,F5	66,F5	68-137	4.58	25
Di-n-octyl Phthalate	4.0	4.1	5	79	83	70-130	4.55	25
1,2-Diphenylhydrazine	4.2	4.2	5	85	83	65-130	2.10	25
Fluoranthene	0.21	0.21	0.25	82	82	65-130	0.156	25
Fluorene	0.21	0.20	0.25	82	79	70-120	3.93	25
Hexachlorobenzene	0.21	0.20	0.25	83	79	60-130	4.99	25
Hexachlorobutadiene	0.20	0.18	0.25	79	73	68-130	7.94	25
Hexachlorocyclopentadiene	20	20	25	81	80	50-130	1.92	25
Hexachloroethane	0.19	0.19	0.25	77	74	55-120	3.95	25
Indeno (1,2,3-cd) pyrene	0.22	0.22	0.25	89	87	50-130	2.62	25
1-Methylnaphthalene	0.21	0.20	0.25	86	82	65-130	4.71	25
Isophorone	4.2	4.1	5	85	83	52-130	2.27	25
2-Methylnaphthalene	0.21	0.19	0.25	82	78	60-130	5.71	25
2-Methylphenol (o-Cresol)	4.4	4.2	5	89	83	60-130	6.15	25
3 & 4-Methylphenol (m,p-Cresol)	4.2	4.2	5	84	84	60-130	0.672	25
Naphthalene	0.21	0.20	0.25	85	79	70-130	6.89	25
2-Nitroaniline	20	21	25	81	84	65-130	3.72	25
3-Nitroaniline	22	23	25	88	92	70-140	5.29	25
4-Nitroaniline	21	22	25	86	88	70-130	2.17	25
Nitrobenzene	4.0	3.9	5	80	79	60-130	1.16	25
2-Nitrophenol	19	20	25	77	78	70-130	1.10	25
4-Nitrophenol	23	23	25	91	90	30-130	0.531	25
N-Nitrosodimethylamine	20	19	25	79	74	30-130	5.81	25
N-Nitrosodiphenylamine	4.1	4.1	5	83	81	65-130	2.17	25
N-Nitrosodi-n-propylamine	4.1	4.1	5	82	82	59-130	0.672	25
n-Octadecane	4.3	4.2	5	87	84	60-130	3.07	25
Pentachlorophenol	0.62	0.66	1.25	49,F5	53,F5	60-130	6.46	25
Phenanthrene	0.21	0.21	0.25	86	84	65-120	1.45	25
Phenol	0.75	0.73	1	75	73	48-120	2.45	25
Pyrene	0.21	0.21	0.25	82	84	70-120	1.50	25
Pyridine	2.9	2.9	5	57	57	30-130	0.157	25
1,2,4-Trichlorobenzene	4.5	4.1	5	89	83	57-130	7.35	25
2,4,5-Trichlorophenol	0.19	0.19	0.25	76	75	65-130	1.73	25
2,4,6-Trichlorophenol	0.18	0.18	0.25	70	72	69-130	2.10	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282063
Date Analyzed:	11/10/2023	**Extraction Method:**	E625.1
Instrument:	GC21	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282063

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
2-Fluorophenol	4.1	3.8	5	82	77	20-103	6.42	25
Phenol-d5	4.1	4.0	5	83	80	20-120	3.96	25
Nitrobenzene-d5	3.9	3.8	5	77	76	61-130	1.39	25
2-Fluorobiphenyl	4.2	3.9	5	83	79	63-115	5.22	25
2,4,6-Tribromophenol	4.5	4.2	5	89	84	48-149	5.27	25
4-Terphenyl-d14	4.4	4.4	5	89	87	32-113	1.19	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acenaphthene	ND	0.0029	0.0050	-	-	-
Acenaphthylene	ND	0.0018	0.0050	-	-	-
Acetochlor	ND	0.45	1.0	-	-	-
Anthracene	ND	0.0020	0.0050	-	-	-
Benzidine	ND	2.7	5.0	-	-	-
Benzo (a) anthracene	ND	0.020	0.050	-	-	-
Benzo (a) pyrene	ND	0.0050	0.0050	-	-	-
Benzo (b) fluoranthene	ND	0.0053	0.010	-	-	-
Benzo (g,h,i) perylene	ND	0.0039	0.010	-	-	-
Benzo (k) fluoranthene	ND	0.0050	0.010	-	-	-
Benzoic Acid	ND	1.6	5.0	-	-	-
Benzyl Alcohol	ND	1.9	5.0	-	-	-
1,1-Biphenyl	ND	0.019	0.050	-	-	-
Bis (2-chloroethoxy) Methane	ND	0.51	1.0	-	-	-
Bis (2-chloroethyl) Ether	ND	0.0050	0.0050	-	-	-
Bis (2-chloroisopropyl) Ether	ND	0.0049	0.010	-	-	-
Bis (2-ethylhexyl) Adipate	ND	0.79	1.0	-	-	-
Bis (2-ethylhexyl) Phthalate	ND	0.13	0.25	-	-	-
4-Bromophenyl Phenyl Ether	ND	0.29	1.0	-	-	-
Butylbenzyl Phthalate	ND	0.081	0.25	-	-	-
Carbazole	ND	0.42	1.0	-	-	-
4-Chloro-3-methylphenol	ND	0.59	1.0	-	-	-
4-Chloroaniline	ND	0.0020	0.0050	-	-	-
2-Chloronaphthalene	ND	0.56	1.0	-	-	-
2-Chlorophenol	ND	0.036	0.050	-	-	-
4-Chlorophenyl Phenyl Ether	ND	0.49	1.0	-	-	-
Chrysene	ND	0.0027	0.0050	-	-	-
Dibenzo (a,h) anthracene	ND	0.0052	0.010	-	-	-
Dibenzofuran	ND	0.0014	0.0050	-	-	-
Di-n-butyl Phthalate	ND	0.078	0.25	-	-	-
1,2-Dichlorobenzene	ND	0.53	1.0	-	-	-
1,3-Dichlorobenzene	ND	0.59	1.0	-	-	-
1,4-Dichlorobenzene	ND	0.44	1.0	-	-	-
3,3-Dichlorobenzidine	ND	0.0062	0.010	-	-	-
2,4-Dichlorophenol	ND	0.0056	0.010	-	-	-
Diethyl Phthalate	ND	0.021	0.050	-	-	-
2,4-Dimethylphenol	ND	0.53	1.0	-	-	-
Dimethyl Phthalate	ND	0.0059	0.010	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
4,6-Dinitro-2-methylphenol	ND	3.7	5.0	-	-	-
2,4-Dinitrophenol	ND	0.68	1.0	-	-	-
2,4-Dinitrotoluene	ND	0.027	0.050	-	-	-
2,6-Dichlorophenol	ND	0.034	0.050	-	-	-
2,6-Dinitrotoluene	ND	0.030	0.050	-	-	-
Di-n-octyl Phthalate	ND	1.2	2.5	-	-	-
1,2-Diphenylhydrazine	ND	0.42	1.0	-	-	-
Fluoranthene	ND	0.0038	0.010	-	-	-
Fluorene	ND	0.0018	0.010	-	-	-
Hexachlorobenzene	ND	0.0017	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0011	0.0050	-	-	-
Hexachlorocyclopentadiene	ND	2.3	5.0	-	-	-
Hexachloroethane	ND	0.0034	0.010	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0070	0.010	-	-	-
Isophorone	ND	0.45	1.0	-	-	-
1-Methylnaphthalene	ND	0.0021	0.0050	-	-	-
2-Methylnaphthalene	ND	0.0022	0.0050	-	-	-
2-Methylphenol (o-Cresol)	ND	0.63	1.0	-	-	-
3 & 4-Methylphenol (m,p-Cresol)	ND	0.70	1.0	-	-	-
Naphthalene	ND	0.0063	0.010	-	-	-
n-Decane	ND	0.69	1.0	-	-	-
2-Nitroaniline	ND	3.0	5.0	-	-	-
3-Nitroaniline	ND	3.9	5.0	-	-	-
4-Nitroaniline	ND	2.4	5.0	-	-	-
Nitrobenzene	ND	0.61	1.0	-	-	-
2-Nitrophenol	ND	3.0	5.0	-	-	-
4-Nitrophenol	ND	3.6	5.0	-	-	-
N-Nitrosodimethylamine	ND	3.6	5.0	-	-	-
N-Nitrosodi-n-propylamine	ND	0.60	1.0	-	-	-
N-Nitrosodiphenylamine	ND	0.36	1.0	-	-	-
n-Octadecane	ND	0.54	1.0	-	-	-
Pentachlorophenol	ND	0.16	0.25	-	-	-
Phenanthrene	ND	0.0036	0.0050	-	-	-
Phenol	ND	0.019	0.040	-	-	-
Pyrene	0.0036,J	0.0028	0.0050	-	-	-
Pyridine	ND	0.89	1.0	-	-	-
2,3,4,6-Tetrachlorophenol	ND	0.78	1.0	-	-	-
1,2,4-Trichlorobenzene	ND	0.52	1.0	-	-	-

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
2,4,5-Trichlorophenol	ND	0.0064	0.010	-	-	-
2,4,6-Trichlorophenol	ND	0.0053	0.010	-	-	-
Surrogate Recovery						
2-Fluorophenol	4.3			5	86	20-103
Phenol-d5	4.1			5	82	20-120
Nitrobenzene-d5	3.9			5	78	61-130
2-Fluorobiphenyl	4.0			5	80	63-115
2,4,6-Tribromophenol	3.4			5	68	48-149
4-Terphenyl-d14	4.3			5	86	32-113

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acenaphthene	0.19	0.19	0.25	75	76	60-132	1.54	25
Acenaphthylene	0.18	0.19	0.25	74	76	54-126	2.92	25
Anthracene	0.18	0.19	0.25	74	76	60-130	3.02	25
Benzidine	5.0	4.0	25	20	16,F5	20-130	22.6	25
Benzo (a) anthracene	0.21	0.22	0.25	84	87	60-130	3.86	25
Benzo (a) pyrene	0.20	0.21	0.25	79	84	60-130	6.18	25
Benzo (b) fluoranthene	0.21	0.21	0.25	83	85	60-130	1.87	25
Benzo (g,h,i) perylene	0.19	0.20	0.25	76	80	50-130	5.64	25
Benzo (k) fluoranthene	0.22	0.23	0.25	88	91	60-130	3.11	25
Benzyl Alcohol	18	18	25	72	73	60-130	0.177	25
Bis (2-chloroethoxy) Methane	3.8	3.9	5	76	78	65-130	2.08	25
Bis (2-chloroethyl) Ether	0.18	0.18	0.25	71	71	60-130	0.439	25
Bis (2-chloroisopropyl) Ether	0.17	0.19	0.25	66	76	63-139	13.9	25
Bis (2-ethylhexyl) Adipate	4.1	4.4	5	82	88	60-130	6.19	25
Bis (2-ethylhexyl) Phthalate	0.18	0.19	0.25	72	74	60-130	3.10	25
4-Bromophenyl Phenyl Ether	4.4	4.4	5	87	89	65-120	1.93	25
Butylbenzyl Phthalate	0.19	0.20	0.25	77	80	60-140	3.68	25
Carbazole	4.1	4.4	5	81	87	70-130	6.76	25
4-Chloro-3-methylphenol	4.2	4.3	5	84	86	65-130	2.58	25
4-Chloroaniline	0.18	0.19	0.25	73	77	60-130	5.74	25
2-Chloronaphthalene	3.9	4.0	5	79	80	65-120	2.02	25
2-Chlorophenol	0.18	0.18	0.25	71	74	60-130	3.81	25
4-Chlorophenyl Phenyl Ether	4.2	4.3	5	83	86	65-130	3.27	25
Chrysene	0.20	0.21	0.25	80	84	70-130	4.91	25
Dibenzo (a,h) anthracene	0.18	0.20	0.25	71	78	50-130	9.98	25
Dibenzofuran	0.19	0.20	0.25	77	79	65-130	2.79	25
Di-n-butyl Phthalate	0.19	0.20	0.25	75	80	60-130	5.58	25
1,2-Dichlorobenzene	4.2	4.1	5	84	83	60-130	1.23	25
1,3-Dichlorobenzene	3.8	3.9	5	76	78	60-130	1.95	25
1,4-Dichlorobenzene	3.9	3.9	5	77	78	60-130	1.45	25
3,3-Dichlorobenzidine	0.19	0.20	0.25	75	79	60-130	4.99	25
2,4-Dichlorophenol	0.22	0.23	0.25	86	93	53-122	7.47	25
Diethyl Phthalate	0.19	0.20	0.25	76	79	65-130	4.24	25
2,4-Dimethylphenol	3.9	3.7	5	78	74	60-130	5.21	25
Dimethyl Phthalate	0.19	0.20	0.25	76	79	60-130	4.79	25
4,6-Dinitro-2-methylphenol	20	21	25	79	84	60-130	5.83	25
2,4-Dinitrophenol	4.6	4.9	5	93	98	50-130	5.06	25
2,4-Dinitrotoluene	0.21	0.22	0.25	85	90	70-130	5.60	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"
1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,6-Dinitrotoluene	0.20	0.21	0.25	80	82	68-137	3.58	25
Di-n-octyl Phthalate	3.9	3.9	5	78	79	70-130	0.861	25
1,2-Diphenylhydrazine	3.6	3.7	5	72	75	65-130	3.35	25
Fluoranthene	0.20	0.22	0.25	81	87	65-130	7.37	25
Fluorene	0.19	0.20	0.25	77	80	70-120	4.02	25
Hexachlorobenzene	0.23	0.24	0.25	93	96	60-130	3.12	25
Hexachlorobutadiene	0.20	0.21	0.25	81	84	68-130	3.30	25
Hexachlorocyclopentadiene	19	20	25	75	78	50-130	3.54	25
Hexachloroethane	0.17	0.19	0.25	69	75	55-120	7.16	25
Indeno (1,2,3-cd) pyrene	0.18	0.21	0.25	72	83	50-130	13.8	25
Isophorone	3.6	3.8	5	72	77	52-130	5.92	25
1-Methylnaphthalene	0.19	0.20	0.25	77	80	65-130	4.28	25
2-Methylnaphthalene	0.20	0.21	0.25	81	84	60-130	3.86	25
2-Methylphenol (o-Cresol)	4.0	4.2	5	80	84	60-130	5.18	25
3 & 4-Methylphenol (m,p-Cresol)	4.1	4.0	5	82	80	60-130	2.77	25
Naphthalene	0.19	0.20	0.25	75	80	70-130	5.99	25
n-Decane	3.0	3.2	5	61	63	30-130	4.34	25
2-Nitroaniline	21	22	25	85	90	65-130	5.94	25
3-Nitroaniline	23	24	25	91	94	70-140	3.51	25
4-Nitroaniline	23	24	25	92	96	70-130	5.19	25
Nitrobenzene	3.8	4.4	5	76	89	60-130	15.2	25
2-Nitrophenol	23	25	25	91	99	70-130	8.46	25
4-Nitrophenol	22	25	25	88	98	30-130	11.2	25
N-Nitrosodimethylamine	17	17	25	68	70	30-130	2.07	25
N-Nitrosodi-n-propylamine	3.3	3.5	5	66	69	59-130	4.07	25
N-Nitrosodiphenylamine	3.9	4.0	5	78	81	65-130	3.08	25
n-Octadecane	3.4	3.6	5	67	71	60-130	5.69	25
Pentachlorophenol	0.82	0.83	1.25	65	66	60-130	0.862	25
Phenanthrene	0.20	0.21	0.25	82	85	65-120	4.46	25
Phenol	0.73	0.74	1	73	74	48-120	1.13	25
Pyrene	0.20	0.21	0.25	79	83	70-120	5.27	25
Pyridine	2.5	2.6	5	50	52	30-130	5.02	25
1,2,4-Trichlorobenzene	4.1	4.3	5	82	87	57-130	5.54	25
2,4,5-Trichlorophenol	0.21	0.22	0.25	84	89	65-130	5.69	25
2,4,6-Trichlorophenol	0.18	0.19	0.25	74	77	69-130	3.41	25

(Cont.)

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	CLS Labs	**WorkOrder:**	2311616
Date Prepared:	11/10/2023	**BatchID:**	282074
Date Analyzed:	11/14/2023	**Extraction Method:**	E625.1
Instrument:	GC17	**Analytical Method:**	E625.1
Matrix:	Water	**Unit:**	µg/L
Project:	23K0465	**Sample ID:**	MB/LCS/LCSD-282074

QC Summary Report for E625.1

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
2-Fluorophenol	3.9	4.3	5	78	87	20-103	10.0	25
Phenol-d5	4.0	4.4	5	80	88	20-120	9.59	25
Nitrobenzene-d5	3.8	4.6	5	77	92	61-130	17.7	25
2-Fluorobiphenyl	4.2	4.4	5	83	88	63-115	6.11	25
2,4,6-Tribromophenol	3.8	4.3	5	76	86	48-149	12.4	25
4-Terphenyl-d14	4.2	4.6	5	83	92	32-113	9.27	25

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 2311616 **ClientCode: CLSR** **QuoteID: 224283**

☐ WaterTrax ☐ CLIP ☐ EDF ☑ EQuIS ☑ Dry-Weight ☑ Email ☐ HardCopy ☐ ThirdParty ☑ J-flag
☑ Detection Summary ☐ Excel

Report to:
CLS Sub email
CLS Labs
3249 Fitzgerald Road
Rancho Cordova, CA 95742
(916) 638-7301 FAX: (916) 638-4510

Email: sub@californialab.com
cc/3rd Party:
PO:
Project: 23K0465

Bill to:
Accounts Payable
CLS Labs
3249 Fitzgerald Road
Rancho Cordova, CA 95742

Requested TAT: **5 days;**

Date Received: **11/09/2023**
Date Logged: **11/09/2023**

Lab ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
2311616-001	SBE.E4 2022/2023	Water	11/6/2023 11:20	☐	A	A										
2311616-002	191.E4 2022/2023	Water	11/6/2023 11:00	☐	A	A										

Test Legend:

1	625_SCSM_W	2	PRDisposal Fee	3		4	
5		6		7		8	
9		10		11		12	

Project Manager: Susan Thompson **Prepared by: Lilly Ortiz**

Comments: MAI OPB is ok for OPB per MS 5/7/2020.. Do not sent partials, even when TCDD is ordered per email 4/1/22.

NOTE: Soil samples are discarded 60 days after receipt unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

WORK ORDER SUMMARY

Client Name: CLS LABS
Client Contact: CLS Sub email
Contact's Email: sub@californialab.com

Project: 23K0465
Comments MAI OPB is ok for OPB per MS 5/7/2020.. Do not sent partials, even when TCDD is ordered per email 4/1/22.

Work Order: 2311616
QC Level: LEVEL 2
Date Logged: 11/9/2023

☐ WaterTrax ☐ CLIP ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☑ J-flag

LabID	ClientSampID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
001A	SBE.E4 2022/2023	Water	E625.1 (SVOCs)	2	1LA, Unpres	☐	☐	☐	11/6/2023 11:20	5 days	11/16/2023	Present	☐	☐
002A	191.E4 2022/2023	Water	E625.1 (SVOCs)	2	1LA, Unpres	☐	☐	☐	11/6/2023 11:00	5 days	11/16/2023	Present	☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Q: 224287

SUBCONTRACT ORDER

23K0465

23/16/10

SENDING LABORATORY:

CLS Labs
3249 Fitzgerald Rd.
Rancho Cordova, CA 95742
Phone: 916-638-7301
Fax: 916-638-4510
Project Manager: [redacted] client service
Project: Rain Event #1 2023

RECEIVING LABORATORY:

McCampbell Analytical Inc.
1534 Willow Pass Road
Pittsburg, CA 94565-1701
Phone :(925) 252-9262
Fax: (925) 252-9269

Analysis	TAT	Due	Expires	Laboratory ID	Sample Date	Received	Matrix
625.1 Semivolatiles (SUB)	5	11/16/23 12:00	11/13/23 11:20	23K0465-01	11/06/23 11:20	11/08/23 17:15	Water

Client sample ID: SBE.E4 2022/2023
Laboratory sample ID: 23K0465-01
Please use client sample ID on all reports
Sampler: [redacted]

Containers Supplied:
1L Amber- Unpres. (A) 1L Amber- Unpres. (B)

Analysis	TAT	Due	Expires	Laboratory ID	Sample Date	Received	Matrix
625.1 Semivolatiles (SUB)	5	11/16/23 12:00	11/13/23 11:00	23K0465-02	11/06/23 11:00	11/08/23 17:15	Water

Client sample ID: 191.E4 2022/2023
Laboratory sample ID: 23K0465-02
Please use client sample ID on all reports
Sampler: [redacted]

Containers Supplied:
1L Amber- Unpres. (A) 1L Amber- Unpres. (B)

Relinquished By	Date 11/9/23	Received By	Date 11/9/23-0700
Relinquished By	Date 11/9/23 1700	Received By	Date 1220 11/9/23
Shipped By	Airbill Number		

Page 1 of 1

Subcontract Sample Receipt Checklist

CLS Work Order Number: 23K0465

Chain of Custody (COC) Information

Carrier Name CLS				
Chain of custody present?	Yes	☒	☐	No
Chain of custody signed when relinquished and received?	Yes	☒	☐	No
Chain of custody agrees with sample labels?	Yes	☒	☐	No
			☐	Non-Compliant

Sample Receipt Information

Shipping container/cooler in good condition?	Yes	☒	☐	No	Not Present	☐
Samples in proper container/bottle?	Yes	☒	☐	Non-Compliant		
Sample containers intact?	Yes	☒	☐	No		
Sufficient sample volume for indicated test?	Yes	☒	☐	No		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☒	☐	No
Temperature upon receipt: _____ C				
Wet Ice present in Cooler?	Yes	☐	☐	No
Blue Ice present in Cooler?	Yes	☐	☐	No

Analytical Requirement Information

Are non-Standard of Modified methods requested?	Yes	☐	☐	No
Subcontract Lab CERTIFIED for the various methods requested?	Yes	☐	☐	No
Will Subcontract Lab be able to meet the turn-around time (TAT) requirements?	Yes	☐	☐	No

Subcontract Lab Information

Work Order Number assigned by Subcontract Lab _____

Date received at Subcontract Lab _____

If any items are check marked NO or are non-compliant, a phone call back to California Laboratory Services is required immediately. If all items are acceptable, a faxed copy of the signed sub chain of custody (COC) and the completed sample receipt check list is required within 24 hours of sample receipt.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Sample Receipt Checklist

Client Name:	CLS Labs	Date and Time Received:	11/9/2023 12:20
Project:	23K0465	Date Logged:	11/9/2023
		Received by:	Lilly Ortiz
WorkOrder №:	2311616 Matrix: Water	Logged by:	Lilly Ortiz
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐		
Sample IDs noted by Client on COC?	Yes	☑	No	☐		
Date and Time of collection noted by Client on COC?	Yes	☑	No	☐		
Sampler's name noted on COC?	Yes	☑	No	☐		
COC agrees with Quote?	Yes	☑	No	☐	NA	☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes	☐	No	☐	NA	☑
Custody seals intact on sample bottles?	Yes	☐	No	☐	NA	☑
Shipping container/cooler in good condition?	Yes	☑	No	☐		
Samples in proper containers/bottles?	Yes	☑	No	☐		
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes	☑	No	☐	NA	☐
Samples Received on Ice?	Yes	☑	No	☐		
(Ice Type: WET ICE)						
Sample/Temp Blank temperature	Temp: 0.9°C				NA	☐
ZHS conditional analyses: VOA meets zero headspace requirement (VOCs, TPHg/BTEX, RSK)?	Yes	☐	No	☐	NA	☑
Sample labels checked for correct preservation?	Yes	☑	No	☐		
pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO3: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA	☑
UCMR Samples:						
pH tested and acceptable upon receipt (200.7: ≤2; 533: 6 - 8; 537.1: 6 - 8)?	Yes	☐	No	☐	NA	☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L) [not applicable to 200.7]?	Yes	☐	No	☐	NA	☑

Comments:

NASA Ames Research Center
MS239-15
Moffett Field, California 94035

RE: QSE1-2024/2025

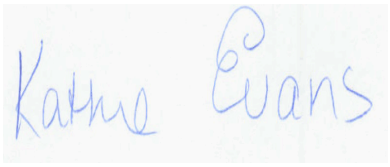
Work Order No.: 2411225 Rev. 1

Dear Brian Kawashima:

Torrent Laboratory, Inc. received 3 sample(s) on November 25, 2024 for the analyses presented in the following Report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these test results, please feel free to contact the Project Management Team at (408)263-5258; ext 204.



Kathie Evans
Project Manager

December 04, 2024
Date

Torrent LABORATORY, INC.

Date: 12/4/2024

Client: NASA Ames Research Center

Project: QSE1-2024/2025

Work Order: 2411225

CASE NARRATIVE

Unless otherwise indicated in the following narrative, no issues encountered with the receiving, preparation, analysis or reporting of the results associated with this work order.

Unless otherwise indicated in the following narrative, no results have been method and/or field blank corrected.

Reported results relate only to the items/samples tested by the laboratory.

This report shall not be reproduced, except in full, without the written approval of Torrent Laboratory, Inc.

BOD analysis was sub-contracted to Weck Analytical. Sub-contract data will follow under a separate cover

REVISIONS

Report revised to include sub-contracted BOD samples. Sub-contract data appears as an attachment to the Torrent generated report.

Rev. 1 (12/12/24)

Torrent LABORATORY, INC.

Sample Result Summary

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date Received: 11/25/24
Date Reported: 12/04/24

SBE.E1 2024/2025-1 2411225-001

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
TOC	A5310B	1	0.40	2.0	5.71	mg/L
Antimony	E200.8	1	0.00045	0.0010	0.00385	mg/L
Barium	E200.8	1	0.00080	0.0020	0.0474	mg/L
Copper	E200.8	1	0.00025	0.0010	0.0114	mg/L
Lead	E200.8	1	0.00032	0.0010	0.00211	mg/L
Molybdenum	E200.8	1	0.00041	0.0010	0.00206	mg/L
Nickel	E200.8	1	0.00049	0.0010	0.00132	mg/L
Vanadium	E200.8	1	0.00070	0.0020	0.00238	mg/L
Zinc	E200.8	1	0.0015	0.0025	0.0842	mg/L
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	0.443	mg/L
Chemical Oxygen Demand (COD)	H8000	1	3.4	10	45.7	mg/L
Total Suspended Solids	SM2540D	1	1.0	10	1.00	mg/L
TPH as Diesel	SW8015B	1	0.037	0.10	0.288	mg/L

RTJONES E1 2024/2025-1 2411225-002

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
TOC	A5310B	1	0.40	2.0	2.45	mg/L
Barium	E200.8	1	0.00080	0.0020	0.0952	mg/L
Chromium	E200.8	1	0.00042	0.0010	0.00150	mg/L
Copper	E200.8	1	0.00025	0.0010	0.00350	mg/L
Molybdenum	E200.8	1	0.00041	0.0010	0.00313	mg/L
Nickel	E200.8	1	0.00049	0.0010	0.00144	mg/L
Vanadium	E200.8	1	0.00070	0.0020	0.00508	mg/L
Zinc	E200.8	1	0.0015	0.0025	0.0338	mg/L
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	1.49	mg/L
Trichloroethylene	E624.1	1	0.15	0.50	2.1	ug/L
Total Suspended Solids	SM2540D	1	1.0	10	14.0	mg/L
Hexavalent Chromium	SW7199	1	0.16	0.50	0.531	ug/L
TPH as Diesel	SW8015B	1	0.037	0.10	0.103	mg/L

Torrent LABORATORY, INC.

Sample Result Summary

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date Received: 11/25/24
Date Reported: 12/04/24

191.E1 2024/2025-1

2411225-003

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Ammonia as N	A4500NH3D	1	0.030	0.10	0.446	mg/L
TOC	A5310B	1	0.40	2.0	4.06	mg/L
Arsenic	E200.8	1	0.00040	0.0010	0.00111	mg/L
Barium	E200.8	1	0.00080	0.0020	0.0592	mg/L
Copper	E200.8	1	0.00025	0.0010	0.00476	mg/L
Molybdenum	E200.8	1	0.00041	0.0010	0.00597	mg/L
Nickel	E200.8	1	0.00049	0.0010	0.00300	mg/L
Selenium	E200.8	1	0.00065	0.0020	0.00318	mg/L
Vanadium	E200.8	1	0.00070	0.0020	0.00327	mg/L
Zinc	E200.8	1	0.0015	0.0025	0.0202	mg/L
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	1.01	mg/L
Chemical Oxygen Demand (COD)	H8000	1	3.4	10	64.6	mg/L
Total Suspended Solids	SM2540D	1	1.0	10	5.00	mg/L
Hexavalent Chromium	SW7199	1	0.16	0.50	0.819	ug/L
TPH as Diesel	SW8015B	1	0.037	0.10	0.212	mg/L
TPH as Motor Oil	SW8015B	1	0.11	0.40	0.426	mg/L

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24 9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1016	SW8082A	1	0.70	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1221	SW8082A	1	5.6	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1232	SW8082A	1	1.2	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1242	SW8082A	1	3.8	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1248	SW8082A	1	5.5	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1254	SW8082A	1	0.20	10.0	ND		ug/L	11/26/24	11:31	AK	489124
Aroclor1260	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:31	AK	489124
			Acceptance Limits								
Tetrachloro-m-xylene (S)	SW8082A		44 - 124		**96.0**		%	11/26/24	11:31	AK	489124
Decachlorobiphenyl (S)	SW8082A		30 - 135		**114**		%	11/26/24	11:31	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24	9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1268	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:31	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
N-Nitrosdimethylamine	E625.1	1	2.35	20	ND		ug/L	11/27/24	19:35	MT	489206
Phenol	E625.1	1	1.46	20	ND		ug/L	11/27/24	19:35	MT	489206
Bis(2-chloroethyl) ether	E625.1	1	1.69	10	ND		ug/L	11/27/24	19:35	MT	489206
2-Chlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	19:35	MT	489206
1,3-Dichlorobenzene	E625.1	1	1.33	10	ND		ug/L	11/27/24	19:35	MT	489206
1,4-Dichlorobenzene	E625.1	1	1.58	10	ND		ug/L	11/27/24	19:35	MT	489206
1,2-Dichlorobenzene	E625.1	1	1.31	10	ND		ug/L	11/27/24	19:35	MT	489206
Bis(2-chloroisopropyl)ether	E625.1	1	1.49	10	ND		ug/L	11/27/24	19:35	MT	489206
N-nitroso-di-n-propylamine	E625.1	1	2.67	20	ND		ug/L	11/27/24	19:35	MT	489206
Hexachloroethane	E625.1	1	1.33	10	ND		ug/L	11/27/24	19:35	MT	489206
Nitrobenzene	E625.1	1	1.41	10	ND		ug/L	11/27/24	19:35	MT	489206
Isophorone	E625.1	1	1.49	10	ND		ug/L	11/27/24	19:35	MT	489206
2-Nitrophenol	E625.1	1	2.72	20	ND		ug/L	11/27/24	19:35	MT	489206
2,4-Dimethylphenol	E625.1	1	1.91	20	ND		ug/L	11/27/24	19:35	MT	489206
Bis(2-Chloroethoxy)methane	E625.1	1	1.38	10	ND		ug/L	11/27/24	19:35	MT	489206
2,4-Dichlorophenol	E625.1	1	2.13	20	ND		ug/L	11/27/24	19:35	MT	489206
1,2,4-Trichlorobenzene	E625.1	1	1.50	10	ND		ug/L	11/27/24	19:35	MT	489206
Naphthalene	E625.1	1	1.42	10	ND		ug/L	11/27/24	19:35	MT	489206
Hexachloro-1,3-butadiene	E625.1	1	1.51	10	ND		ug/L	11/27/24	19:35	MT	489206
4-Chloro-3-methylphenol	E625.1	1	1.47	20	ND		ug/L	11/27/24	19:35	MT	489206
2-Methylnaphthalene	E625.1	1	1.34	10	ND		ug/L	11/27/24	19:35	MT	489206
Hexachlorocyclopentadiene	E625.1	1	1.55	10	ND		ug/L	11/27/24	19:35	MT	489206
2,4,6-Trichlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	19:35	MT	489206
2-Chloronaphthalene	E625.1	1	1.43	10	ND		ug/L	11/27/24	19:35	MT	489206
Dimethyl phthalate	E625.1	1	1.24	10	ND		ug/L	11/27/24	19:35	MT	489206
Acenaphthylene	E625.1	1	1.48	10	ND		ug/L	11/27/24	19:35	MT	489206
2,6-Dinitrotoluene	E625.1	1	1.29	10	ND		ug/L	11/27/24	19:35	MT	489206
Acenaphthene	E625.1	1	1.40	10	ND		ug/L	11/27/24	19:35	MT	489206
2,4-Dinitrophenol	E625.1	1	5.68	40	ND		ug/L	11/27/24	19:35	MT	489206
4-Nitrophenol	E625.1	1	1.26	40	ND		ug/L	11/27/24	19:35	MT	489206
2,4-Dinitrotoluene	E625.1	1	1.04	10	ND		ug/L	11/27/24	19:35	MT	489206
Diethylphthalate	E625.1	1	0.760	10	ND		ug/L	11/27/24	19:35	MT	489206
Fluorene	E625.1	1	1.18	10	ND		ug/L	11/27/24	19:35	MT	489206
4-Chlorophenyl phenyl ether	E625.1	1	1.25	10	ND		ug/L	11/27/24	19:35	MT	489206
Diphenylamine	E625.1	1	0.974	10	ND		ug/L	11/27/24	19:35	MT	489206
Azobenzene	E625.1	1	1.46	10	ND		ug/L	11/27/24	19:35	MT	489206
4-Bromophenyl phenyl ether	E625.1	1	1.30	10	ND		ug/L	11/27/24	19:35	MT	489206
Hexachlorobenzene	E625.1	1	1.22	10	ND		ug/L	11/27/24	19:35	MT	489206
Pentachlorophenol	E625.1	1	1.53	20	ND		ug/L	11/27/24	19:35	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Phenanthrene	E625.1	1	0.911	10	ND		ug/L	11/27/24	19:35	MT	489206
Anthracene	E625.1	1	0.922	10	ND		ug/L	11/27/24	19:35	MT	489206
Di-n-butylphthalate	E625.1	1	0.639	10	ND		ug/L	11/27/24	19:35	MT	489206
Fluoranthene	E625.1	1	0.272	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzidine	E625.1	1	2.05	20	ND		ug/L	11/27/24	19:35	MT	489206
Pyrene	E625.1	1	0.585	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzyl butyl phthalate	E625.1	1	2.12	10	ND		ug/L	11/27/24	19:35	MT	489206
Benz[a]anthracene	E625.1	1	0.304	10	ND		ug/L	11/27/24	19:35	MT	489206
3,3-Dichlorobenzidine	E625.1	1	3.40	20	ND		ug/L	11/27/24	19:35	MT	489206
Chrysene	E625.1	1	0.322	10	ND		ug/L	11/27/24	19:35	MT	489206
Bis(2-Ethylhexyl)phthalate	E625.1	1	1.10	10	ND		ug/L	11/27/24	19:35	MT	489206
Di-n-octyl phthalate	E625.1	1	0.581	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzo[b]fluoranthene	E625.1	1	0.389	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzo[k]fluoranthene	E625.1	1	0.427	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzo[a]pyrene	E625.1	1	0.394	10	ND		ug/L	11/27/24	19:35	MT	489206
Indeno[1,2,3-cd]pyrene	E625.1	1	0.558	10	ND		ug/L	11/27/24	19:35	MT	489206
Dibenz[a,h]anthracene	E625.1	1	0.630	10	ND		ug/L	11/27/24	19:35	MT	489206
Benzo[g,h,i]perylene	E625.1	1	0.704	10	ND		ug/L	11/27/24	19:35	MT	489206
			Acceptance Limits								
2-Fluorophenol (S)	E625.1		17.9 - 100		**47.9**		%	11/27/24	19:35	MT	489206
Phenol-d6 (S)	E625.1		11.6 - 100		**32.6**		%	11/27/24	19:35	MT	489206
Nitrobenzene-d5 (S)	E625.1		31 - 116		**72.6**		%	11/27/24	19:35	MT	489206
2-Fluorobiphenyl (S)	E625.1		21.3 - 123		**75.9**		%	11/27/24	19:35	MT	489206
2,4,6-Tribromophenol (S)	E625.1		29.6 - 130		**90.2**		%	11/27/24	19:35	MT	489206
p-Terphenyl-d14 (S)	E625.1		38.6 - 129		**82.6**		%	11/27/24	19:35	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	3510_TPH	**Prep Batch Date/Time:**	11/26/24 6:50:00PM
Prep Batch ID:	1166095	**Prep Analyst:**	NDUM

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH as Diesel	SW8015B	1	0.037	0.10	**0.288**	x	mg/L	11/27/24	17:57	SN	489287
TPH as Motor Oil	SW8015B	1	0.11	0.40	ND		mg/L	11/27/24	17:57	SN	489287
TPH as JP-4	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	17:57	SN	489287
TPH as JP-5	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	17:57	SN	489287
TPH as JP-8	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	17:57	SN	489287
(S) Pentacosane	SW8015B		40 - 129		**96.3**		%	11/27/24	17:57	SN	489287

NOTE: x-not typical of Diesel ref. std: peaks within Diesel range quantified as diesel

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	300.0P	**Prep Batch Date/Time:**	11/25/24	6:00:00PM
Prep Batch ID:	1166181	**Prep Analyst:**	PHUFANO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	**0.443**		mg/L	11/25/24	22:59	PH	489236

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	TSS-P	**Prep Batch Date/Time:**	11/26/24 12:20:00PM
Prep Batch ID:	1166206	**Prep Analyst:**	ROME

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
Total Suspended Solids	SM2540D	1	1.0	10	**1.00**		mg/L	11/26/24	15:45	RE	489267

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001D
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	NH3-W-P	**Prep Batch Date/Time:**	12/3/24	12:00:00PM
Prep Batch ID:	1166227	**Prep Analyst:**	ROME	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Ammonia as N	A4500NH3D	1	0.030	0.10	ND		mg/L	12/03/24	12:00	RE	489280

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001E
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	1664P	**Prep Batch Date/Time:**	11/26/24	10:02:00AM
Prep Batch ID:	1166062	**Prep Analyst:**	MSAT	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOG	E1664B	1	1.1	4.00	ND		mg/L	11/26/24	13:00	MS	489119

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Dichlorodifluoromethane	E624.1	4.2	1.1	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Chloromethane	E624.1	4.2	0.70	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Vinyl Chloride	E624.1	4.2	0.87	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Bromomethane	E624.1	4.2	0.89	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Chloroethane	E624.1	4.2	0.48	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Trichlorofluoromethane	E624.1	4.2	0.78	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1-Dichloroethene	E624.1	4.2	0.60	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Freon 113	E624.1	4.2	1.4	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Methylene Chloride	E624.1	4.2	0.55	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
trans-1,2-Dichloroethene	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
MTBE	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
tert-Butanol	E624.1	4.2	12	21	ND		ug/L	11/25/24	16:59	JZ	489130
Diisopropyl ether (DIPE)	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1-Dichloroethane	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
ETBE	E624.1	4.2	0.27	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
cis-1,2-Dichloroethene	E624.1	4.2	0.63	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Bromochloromethane	E624.1	4.2	0.63	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Chloroform	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Carbon Tetrachloride	E624.1	4.2	0.66	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1,1-Trichloroethane	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1-Dichloropropene	E624.1	4.2	0.78	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Benzene	E624.1	4.2	0.27	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
TAME	E624.1	4.2	0.30	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,2-Dichloroethane	E624.1	4.2	0.46	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Trichloroethylene	E624.1	4.2	0.61	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,2-Dichloropropane	E624.1	4.2	0.37	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Bromodichloromethane	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
cis-1,3-Dichloropropene	E624.1	4.2	0.33	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Toluene	E624.1	4.2	0.60	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Tetrachloroethylene	E624.1	4.2	1.00	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
trans-1,3-Dichloropropene	E624.1	4.2	0.91	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1,2-Trichloroethane	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Dibromochloromethane	E624.1	4.2	0.76	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Chlorobenzene	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Ethyl Benzene	E624.1	4.2	0.82	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
m,p-Xylene	E624.1	4.2	1.7	4.2	ND		ug/L	11/25/24	16:59	JZ	489130
o-Xylene	E624.1	4.2	0.65	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
Bromoform	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,1,2,2-Tetrachloroethane	E624.1	4.2	0.33	2.1	ND		ug/L	11/25/24	16:59	JZ	489130

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
1,3-Dichlorobenzene	E624.1	4.2	0.70	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,4-Dichlorobenzene	E624.1	4.2	0.74	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
1,2-Dichlorobenzene	E624.1	4.2	0.67	2.1	ND		ug/L	11/25/24	16:59	JZ	489130
(S) Dibromofluoromethane	E624.1		61.2 - 131		**118**		%	11/25/24	16:59	JZ	489130
(S) Toluene-d8	E624.1		75.1 - 127		**106**		%	11/25/24	16:59	JZ	489130
(S) 4-Bromofluorobenzene	E624.1		64.1 - 120		**102**		%	11/25/24	16:59	JZ	489130

NOTE: Reporting limits were raised due to sample matrix (foaming during purging).

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	5030GRO	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166071	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH Gasoline	SW8260TPH	4.2	120	210	ND		ug/L	11/25/24	16:59	JZ	489130
(S) 4-Bromofluorobenzene	SW8260TPH		41.5 - 125		**104**		%	11/25/24	16:59	JZ	489130

NOTE: Reporting limits were raised due to sample matrix (foaming during purging).

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001G
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	TOC-W-P	**Prep Batch Date/Time:**	12/3/24 12:00:00PM
Prep Batch ID:	1166220	**Prep Analyst:**	ERAGUDO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOC	A5310B	1	0.40	2.0	**5.71**		mg/L	12/03/24	16:01	ERR	489275

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001H
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	COD-P	**Prep Batch Date/Time:**	11/26/24	11:30:00AM
Prep Batch ID:	1166078	**Prep Analyst:**	BJAY	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Chemical Oxygen Demand (COD)	H8000	1	3.4	10	**45.7**		mg/L	11/26/24	14:00	BJAY	489142

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	245.1P	**Prep Batch Date/Time:**	11/26/24	7:30:00PM
Prep Batch ID:	1166106	**Prep Analyst:**	ATRUONG	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Mercury	E245.1	1	0.00010	0.00020	ND		mg/L	11/27/24	10:24	BJAY	489168

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	200.8P	**Prep Batch Date/Time:**	11/26/24 5:30:00PM
Prep Batch ID:	1166102	**Prep Analyst:**	ATRUONG

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Antimony	E200.8	1	0.00045	0.0010	**0.00385**		mg/L	11/27/24	15:36	ERR	489194
Arsenic	E200.8	1	0.00040	0.0010	ND		mg/L	11/27/24	15:36	ERR	489194
Barium	E200.8	1	0.00080	0.0020	**0.0474**		mg/L	11/27/24	15:36	ERR	489194
Beryllium	E200.8	1	0.00056	0.0020	ND		mg/L	11/27/24	15:36	ERR	489194
Cadmium	E200.8	1	0.00025	0.0010	ND		mg/L	11/27/24	15:36	ERR	489194
Chromium	E200.8	1	0.00042	0.0010	ND		mg/L	11/27/24	15:36	ERR	489194
Cobalt	E200.8	1	0.00027	0.0010	ND		mg/L	11/27/24	15:36	ERR	489194
Copper	E200.8	1	0.00025	0.0010	**0.0114**		mg/L	11/27/24	15:36	ERR	489194
Lead	E200.8	1	0.00032	0.0010	**0.00211**		mg/L	11/27/24	15:36	ERR	489194
Molybdenum	E200.8	1	0.00041	0.0010	**0.00206**		mg/L	11/27/24	15:36	ERR	489194
Nickel	E200.8	1	0.00049	0.0010	**0.00132**		mg/L	11/27/24	15:36	ERR	489194
Selenium	E200.8	1	0.00065	0.0020	ND		mg/L	11/27/24	15:36	ERR	489194
Silver	E200.8	1	0.00021	0.00050	ND		mg/L	11/27/24	15:36	ERR	489194
Thallium	E200.8	1	0.0013	0.0020	ND		mg/L	11/27/24	15:36	ERR	489194
Vanadium	E200.8	1	0.00070	0.0020	**0.00238**		mg/L	11/27/24	15:36	ERR	489194
Zinc	E200.8	1	0.0015	0.0025	**0.0842**		mg/L	11/27/24	15:36	ERR	489194

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	SBE.E1 2024/2025-1	**Lab Sample ID:**	2411225-001J
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:00		
SDG:			

Prep Method:	7199/218.6-WP	**Prep Batch Date/Time:**	12/25/24 5:30:00PM
Prep Batch ID:	1166182	**Prep Analyst:**	PHUFANO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Hexavalent Chromium	SW7199	1	0.16	0.50	ND		ug/L	11/25/24	20:39	PH	489237

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24 9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1016	SW8082A	1	0.70	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1221	SW8082A	1	5.6	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1232	SW8082A	1	1.2	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1242	SW8082A	1	3.8	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1248	SW8082A	1	5.5	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1254	SW8082A	1	0.20	10.0	ND		ug/L	11/26/24	11:44	AK	489124
Aroclor1260	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:44	AK	489124
			Acceptance Limits								
Tetrachloro-m-xylene (S)	SW8082A		44 - 124		**98.0**		%	11/26/24	11:44	AK	489124
Decachlorobiphenyl (S)	SW8082A		30 - 135		**116**		%	11/26/24	11:44	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24	9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1268	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:44	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
N-Nitrosdimethylamine	E625.1	1	2.35	20	ND		ug/L	11/27/24	20:04	MT	489206
Phenol	E625.1	1	1.46	20	ND		ug/L	11/27/24	20:04	MT	489206
Bis(2-chloroethyl) ether	E625.1	1	1.69	10	ND		ug/L	11/27/24	20:04	MT	489206
2-Chlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	20:04	MT	489206
1,3-Dichlorobenzene	E625.1	1	1.33	10	ND		ug/L	11/27/24	20:04	MT	489206
1,4-Dichlorobenzene	E625.1	1	1.58	10	ND		ug/L	11/27/24	20:04	MT	489206
1,2-Dichlorobenzene	E625.1	1	1.31	10	ND		ug/L	11/27/24	20:04	MT	489206
Bis(2-chloroisopropyl)ether	E625.1	1	1.49	10	ND		ug/L	11/27/24	20:04	MT	489206
N-nitroso-di-n-propylamine	E625.1	1	2.67	20	ND		ug/L	11/27/24	20:04	MT	489206
Hexachloroethane	E625.1	1	1.33	10	ND		ug/L	11/27/24	20:04	MT	489206
Nitrobenzene	E625.1	1	1.41	10	ND		ug/L	11/27/24	20:04	MT	489206
Isophorone	E625.1	1	1.49	10	ND		ug/L	11/27/24	20:04	MT	489206
2-Nitrophenol	E625.1	1	2.72	20	ND		ug/L	11/27/24	20:04	MT	489206
2,4-Dimethylphenol	E625.1	1	1.91	20	ND		ug/L	11/27/24	20:04	MT	489206
Bis(2-Chloroethoxy)methane	E625.1	1	1.38	10	ND		ug/L	11/27/24	20:04	MT	489206
2,4-Dichlorophenol	E625.1	1	2.13	20	ND		ug/L	11/27/24	20:04	MT	489206
1,2,4-Trichlorobenzene	E625.1	1	1.50	10	ND		ug/L	11/27/24	20:04	MT	489206
Naphthalene	E625.1	1	1.42	10	ND		ug/L	11/27/24	20:04	MT	489206
Hexachloro-1,3-butadiene	E625.1	1	1.51	10	ND		ug/L	11/27/24	20:04	MT	489206
4-Chloro-3-methylphenol	E625.1	1	1.47	20	ND		ug/L	11/27/24	20:04	MT	489206
2-Methylnaphthalene	E625.1	1	1.34	10	ND		ug/L	11/27/24	20:04	MT	489206
Hexachlorocyclopentadiene	E625.1	1	1.55	10	ND		ug/L	11/27/24	20:04	MT	489206
2,4,6-Trichlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	20:04	MT	489206
2-Chloronaphthalene	E625.1	1	1.43	10	ND		ug/L	11/27/24	20:04	MT	489206
Dimethyl phthalate	E625.1	1	1.24	10	ND		ug/L	11/27/24	20:04	MT	489206
Acenaphthylene	E625.1	1	1.48	10	ND		ug/L	11/27/24	20:04	MT	489206
2,6-Dinitrotoluene	E625.1	1	1.29	10	ND		ug/L	11/27/24	20:04	MT	489206
Acenaphthene	E625.1	1	1.40	10	ND		ug/L	11/27/24	20:04	MT	489206
2,4-Dinitrophenol	E625.1	1	5.68	40	ND		ug/L	11/27/24	20:04	MT	489206
4-Nitrophenol	E625.1	1	1.26	40	ND		ug/L	11/27/24	20:04	MT	489206
2,4-Dinitrotoluene	E625.1	1	1.04	10	ND		ug/L	11/27/24	20:04	MT	489206
Diethylphthalate	E625.1	1	0.760	10	ND		ug/L	11/27/24	20:04	MT	489206
Fluorene	E625.1	1	1.18	10	ND		ug/L	11/27/24	20:04	MT	489206
4-Chlorophenyl phenyl ether	E625.1	1	1.25	10	ND		ug/L	11/27/24	20:04	MT	489206
Diphenylamine	E625.1	1	0.974	10	ND		ug/L	11/27/24	20:04	MT	489206
Azobenzene	E625.1	1	1.46	10	ND		ug/L	11/27/24	20:04	MT	489206
4-Bromophenyl phenyl ether	E625.1	1	1.30	10	ND		ug/L	11/27/24	20:04	MT	489206
Hexachlorobenzene	E625.1	1	1.22	10	ND		ug/L	11/27/24	20:04	MT	489206
Pentachlorophenol	E625.1	1	1.53	20	ND		ug/L	11/27/24	20:04	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Phenanthrene	E625.1	1	0.911	10	ND		ug/L	11/27/24	20:04	MT	489206
Anthracene	E625.1	1	0.922	10	ND		ug/L	11/27/24	20:04	MT	489206
Di-n-butylphthalate	E625.1	1	0.639	10	ND		ug/L	11/27/24	20:04	MT	489206
Fluoranthene	E625.1	1	0.272	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzidine	E625.1	1	2.05	20	ND		ug/L	11/27/24	20:04	MT	489206
Pyrene	E625.1	1	0.585	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzyl butyl phthalate	E625.1	1	2.12	10	ND		ug/L	11/27/24	20:04	MT	489206
Benz[a]anthracene	E625.1	1	0.304	10	ND		ug/L	11/27/24	20:04	MT	489206
3,3-Dichlorobenzidine	E625.1	1	3.40	20	ND		ug/L	11/27/24	20:04	MT	489206
Chrysene	E625.1	1	0.322	10	ND		ug/L	11/27/24	20:04	MT	489206
Bis(2-Ethylhexyl)phthalate	E625.1	1	1.10	10	ND		ug/L	11/27/24	20:04	MT	489206
Di-n-octyl phthalate	E625.1	1	0.581	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzo[b]fluoranthene	E625.1	1	0.389	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzo[k]fluoranthene	E625.1	1	0.427	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzo[a]pyrene	E625.1	1	0.394	10	ND		ug/L	11/27/24	20:04	MT	489206
Indeno[1,2,3-cd]pyrene	E625.1	1	0.558	10	ND		ug/L	11/27/24	20:04	MT	489206
Dibenz[a,h]anthracene	E625.1	1	0.630	10	ND		ug/L	11/27/24	20:04	MT	489206
Benzo[g,h,i]perylene	E625.1	1	0.704	10	ND		ug/L	11/27/24	20:04	MT	489206
			Acceptance Limits								
2-Fluorophenol (S)	E625.1		17.9 - 100		**49.4**		%	11/27/24	20:04	MT	489206
Phenol-d6 (S)	E625.1		11.6 - 100		**33.7**		%	11/27/24	20:04	MT	489206
Nitrobenzene-d5 (S)	E625.1		31 - 116		**72.6**		%	11/27/24	20:04	MT	489206
2-Fluorobiphenyl (S)	E625.1		21.3 - 123		**74.8**		%	11/27/24	20:04	MT	489206
2,4,6-Tribromophenol (S)	E625.1		29.6 - 130		**83.9**		%	11/27/24	20:04	MT	489206
p-Terphenyl-d14 (S)	E625.1		38.6 - 129		**84.0**		%	11/27/24	20:04	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	3510_TPH	**Prep Batch Date/Time:**	11/26/24 6:50:00PM
Prep Batch ID:	1166095	**Prep Analyst:**	NDUM

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH as Diesel	SW8015B	1	0.037	0.10	**0.103**	x	mg/L	11/27/24	18:20	SN	489287
TPH as Motor Oil	SW8015B	1	0.11	0.40	ND		mg/L	11/27/24	18:20	SN	489287
TPH as JP-4	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:20	SN	489287
TPH as JP-5	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:20	SN	489287
TPH as JP-8	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:20	SN	489287
(S) Pentacosane	SW8015B		40 - 129		**101**		%	11/27/24	18:20	SN	489287

NOTE: x-not typical of Diesel ref. std: peaks within Diesel range quantified as diesel

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	300.0P	**Prep Batch Date/Time:**	11/25/24 6:00:00PM
Prep Batch ID:	1166181	**Prep Analyst:**	PHUFANO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	**1.49**		mg/L	11/26/24	0:09	PH	489236

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	TSS-P	**Prep Batch Date/Time:**	11/26/24 12:20:00PM
Prep Batch ID:	1166206	**Prep Analyst:**	ROME

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Total Suspended Solids	SM2540D	1	1.0	10	**14.0**		mg/L	11/26/24	15:45	RE	489267

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002D
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	NH3-W-P	**Prep Batch Date/Time:**	12/3/24 12:00:00PM
Prep Batch ID:	1166227	**Prep Analyst:**	ROME

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Ammonia as N	A4500NH3D	1	0.030	0.10	ND		mg/L	12/03/24	12:00	RE	489280

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002E
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	1664P	**Prep Batch Date/Time:**	11/26/24 10:02:00AM
Prep Batch ID:	1166062	**Prep Analyst:**	MSAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOG	E1664B	1	1.1	4.00	ND		mg/L	11/26/24	13:00	MS	489119

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Dichlorodifluoromethane	E624.1	1	0.26	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Chloromethane	E624.1	1	0.17	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Vinyl Chloride	E624.1	1	0.21	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Bromomethane	E624.1	1	0.21	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Chloroethane	E624.1	1	0.11	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Trichlorofluoromethane	E624.1	1	0.19	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1-Dichloroethene	E624.1	1	0.14	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Freon 113	E624.1	1	0.34	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Methylene Chloride	E624.1	1	0.13	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
trans-1,2-Dichloroethene	E624.1	1	0.16	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
MTBE	E624.1	1	0.077	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
tert-Butanol	E624.1	1	2.9	5.0	ND		ug/L	11/25/24	17:29	JZ	489130
Diisopropyl ether (DIPE)	E624.1	1	0.12	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1-Dichloroethane	E624.1	1	0.12	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
ETBE	E624.1	1	0.064	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
cis-1,2-Dichloroethene	E624.1	1	0.15	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Bromochloromethane	E624.1	1	0.15	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Chloroform	E624.1	1	0.12	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Carbon Tetrachloride	E624.1	1	0.16	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1,1-Trichloroethane	E624.1	1	0.16	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1-Dichloropropene	E624.1	1	0.19	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Benzene	E624.1	1	0.065	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
TAME	E624.1	1	0.072	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,2-Dichloroethane	E624.1	1	0.11	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Trichloroethylene	E624.1	1	0.15	0.50	**2.1**		ug/L	11/25/24	17:29	JZ	489130
1,2-Dichloropropane	E624.1	1	0.089	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Bromodichloromethane	E624.1	1	0.076	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
cis-1,3-Dichloropropene	E624.1	1	0.078	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Toluene	E624.1	1	0.14	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Tetrachloroethylene	E624.1	1	0.24	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
trans-1,3-Dichloropropene	E624.1	1	0.22	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1,2-Trichloroethane	E624.1	1	0.076	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Dibromochloromethane	E624.1	1	0.18	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Chlorobenzene	E624.1	1	0.16	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Ethyl Benzene	E624.1	1	0.20	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
m,p-Xylene	E624.1	1	0.39	1.0	ND		ug/L	11/25/24	17:29	JZ	489130
o-Xylene	E624.1	1	0.15	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
Bromoform	E624.1	1	0.076	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,1,2,2-Tetrachloroethane	E624.1	1	0.079	0.50	ND		ug/L	11/25/24	17:29	JZ	489130

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
1,3-Dichlorobenzene	E624.1	1	0.17	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,4-Dichlorobenzene	E624.1	1	0.18	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
1,2-Dichlorobenzene	E624.1	1	0.16	0.50	ND		ug/L	11/25/24	17:29	JZ	489130
(S) Dibromofluoromethane	E624.1		61.2 - 131		**118**		%	11/25/24	17:29	JZ	489130
(S) Toluene-d8	E624.1		75.1 - 127		**105**		%	11/25/24	17:29	JZ	489130
(S) 4-Bromofluorobenzene	E624.1		64.1 - 120		**102**		%	11/25/24	17:29	JZ	489130

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	5030GRO	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166071	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH Gasoline	SW8260TPH	1	29	50	ND		ug/L	11/25/24	17:29	JZ	489130
(S) 4-Bromofluorobenzene	SW8260TPH		41.5 - 125		**101**		%	11/25/24	17:29	JZ	489130

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002G
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	TOC-W-P	**Prep Batch Date/Time:**	12/3/24 12:00:00PM
Prep Batch ID:	1166220	**Prep Analyst:**	ERAGUDO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOC	A5310B	1	0.40	2.0	**2.45**		mg/L	12/03/24	16:34	ERR	489275

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002H
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	COD-P	**Prep Batch Date/Time:**	11/26/24 11:30:00AM
Prep Batch ID:	1166078	**Prep Analyst:**	BJAY

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Chemical Oxygen Demand (COD)	H8000	1	3.4	10	ND		mg/L	11/26/24	14:00	BJAY	489142

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	245.1P	**Prep Batch Date/Time:**	11/26/24 7:30:00PM
Prep Batch ID:	1166106	**Prep Analyst:**	ATRUONG

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Mercury	E245.1	1	0.00010	0.00020	ND		mg/L	11/27/24	10:26	BJAY	489168

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	200.8P	**Prep Batch Date/Time:**	11/26/24 5:30:00PM
Prep Batch ID:	1166102	**Prep Analyst:**	ATRUONG

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Antimony	E200.8	1	0.00045	0.0010	ND		mg/L	11/27/24	15:50	ERR	489194
Arsenic	E200.8	1	0.00040	0.0010	ND		mg/L	11/27/24	15:50	ERR	489194
Barium	E200.8	1	0.00080	0.0020	**0.0952**		mg/L	11/27/24	15:50	ERR	489194
Beryllium	E200.8	1	0.00056	0.0020	ND		mg/L	11/27/24	15:50	ERR	489194
Cadmium	E200.8	1	0.00025	0.0010	ND		mg/L	11/27/24	15:50	ERR	489194
Chromium	E200.8	1	0.00042	0.0010	**0.00150**		mg/L	11/27/24	15:50	ERR	489194
Cobalt	E200.8	1	0.00027	0.0010	ND		mg/L	11/27/24	15:50	ERR	489194
Copper	E200.8	1	0.00025	0.0010	**0.00350**		mg/L	11/27/24	15:50	ERR	489194
Lead	E200.8	1	0.00032	0.0010	ND		mg/L	11/27/24	15:50	ERR	489194
Molybdenum	E200.8	1	0.00041	0.0010	**0.00313**		mg/L	11/27/24	15:50	ERR	489194
Nickel	E200.8	1	0.00049	0.0010	**0.00144**		mg/L	11/27/24	15:50	ERR	489194
Selenium	E200.8	1	0.00065	0.0020	ND		mg/L	11/27/24	15:50	ERR	489194
Silver	E200.8	1	0.00021	0.00050	ND		mg/L	11/27/24	15:50	ERR	489194
Thallium	E200.8	1	0.0013	0.0020	ND		mg/L	11/27/24	15:50	ERR	489194
Vanadium	E200.8	1	0.00070	0.0020	**0.00508**		mg/L	11/27/24	15:50	ERR	489194
Zinc	E200.8	1	0.0015	0.0025	**0.0338**		mg/L	11/27/24	15:50	ERR	489194

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	RTJONES E1 2024/2025-1	**Lab Sample ID:**	2411225-002J
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 11:00		
SDG:			

Prep Method:	7199/218.6-WP	**Prep Batch Date/Time:**	12/25/24 5:30:00PM
Prep Batch ID:	1166182	**Prep Analyst:**	PHUFANO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Hexavalent Chromium	SW7199	1	0.16	0.50	**0.531**		ug/L	11/25/24	21:43	PH	489237

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24 9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1016	SW8082A	1	0.70	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1221	SW8082A	1	5.6	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1232	SW8082A	1	1.2	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1242	SW8082A	1	3.8	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1248	SW8082A	1	5.5	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1254	SW8082A	1	0.20	10.0	ND		ug/L	11/26/24	11:56	AK	489124
Aroclor1260	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:56	AK	489124
			Acceptance Limits								
Tetrachloro-m-xylene (S)	SW8082A		44 - 124		**96.0**		%	11/26/24	11:56	AK	489124
Decachlorobiphenyl (S)	SW8082A		30 - 135		**110**		%	11/26/24	11:56	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	3511-PCB	**Prep Batch Date/Time:**	11/26/24	9:56:00AM
Prep Batch ID:	1166061	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Aroclor1268	SW8082A	1	0.50	10.0	ND		ug/L	11/26/24	11:56	AK	489124

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
N-Nitrosdimethylamine	E625.1	1	2.35	20	ND		ug/L	11/27/24	20:32	MT	489206
Phenol	E625.1	1	1.46	20	ND		ug/L	11/27/24	20:32	MT	489206
Bis(2-chloroethyl) ether	E625.1	1	1.69	10	ND		ug/L	11/27/24	20:32	MT	489206
2-Chlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	20:32	MT	489206
1,3-Dichlorobenzene	E625.1	1	1.33	10	ND		ug/L	11/27/24	20:32	MT	489206
1,4-Dichlorobenzene	E625.1	1	1.58	10	ND		ug/L	11/27/24	20:32	MT	489206
1,2-Dichlorobenzene	E625.1	1	1.31	10	ND		ug/L	11/27/24	20:32	MT	489206
Bis(2-chloroisopropyl)ether	E625.1	1	1.49	10	ND		ug/L	11/27/24	20:32	MT	489206
N-nitroso-di-n-propylamine	E625.1	1	2.67	20	ND		ug/L	11/27/24	20:32	MT	489206
Hexachloroethane	E625.1	1	1.33	10	ND		ug/L	11/27/24	20:32	MT	489206
Nitrobenzene	E625.1	1	1.41	10	ND		ug/L	11/27/24	20:32	MT	489206
Isophorone	E625.1	1	1.49	10	ND		ug/L	11/27/24	20:32	MT	489206
2-Nitrophenol	E625.1	1	2.72	20	ND		ug/L	11/27/24	20:32	MT	489206
2,4-Dimethylphenol	E625.1	1	1.91	20	ND		ug/L	11/27/24	20:32	MT	489206
Bis(2-Chloroethoxy)methane	E625.1	1	1.38	10	ND		ug/L	11/27/24	20:32	MT	489206
2,4-Dichlorophenol	E625.1	1	2.13	20	ND		ug/L	11/27/24	20:32	MT	489206
1,2,4-Trichlorobenzene	E625.1	1	1.50	10	ND		ug/L	11/27/24	20:32	MT	489206
Naphthalene	E625.1	1	1.42	10	ND		ug/L	11/27/24	20:32	MT	489206
Hexachloro-1,3-butadiene	E625.1	1	1.51	10	ND		ug/L	11/27/24	20:32	MT	489206
4-Chloro-3-methylphenol	E625.1	1	1.47	20	ND		ug/L	11/27/24	20:32	MT	489206
2-Methylnaphthalene	E625.1	1	1.34	10	ND		ug/L	11/27/24	20:32	MT	489206
Hexachlorocyclopentadiene	E625.1	1	1.55	10	ND		ug/L	11/27/24	20:32	MT	489206
2,4,6-Trichlorophenol	E625.1	1	2.50	20	ND		ug/L	11/27/24	20:32	MT	489206
2-Chloronaphthalene	E625.1	1	1.43	10	ND		ug/L	11/27/24	20:32	MT	489206
Dimethyl phthalate	E625.1	1	1.24	10	ND		ug/L	11/27/24	20:32	MT	489206
Acenaphthylene	E625.1	1	1.48	10	ND		ug/L	11/27/24	20:32	MT	489206
2,6-Dinitrotoluene	E625.1	1	1.29	10	ND		ug/L	11/27/24	20:32	MT	489206
Acenaphthene	E625.1	1	1.40	10	ND		ug/L	11/27/24	20:32	MT	489206
2,4-Dinitrophenol	E625.1	1	5.68	40	ND		ug/L	11/27/24	20:32	MT	489206
4-Nitrophenol	E625.1	1	1.26	40	ND		ug/L	11/27/24	20:32	MT	489206
2,4-Dinitrotoluene	E625.1	1	1.04	10	ND		ug/L	11/27/24	20:32	MT	489206
Diethylphthalate	E625.1	1	0.760	10	ND		ug/L	11/27/24	20:32	MT	489206
Fluorene	E625.1	1	1.18	10	ND		ug/L	11/27/24	20:32	MT	489206
4-Chlorophenyl phenyl ether	E625.1	1	1.25	10	ND		ug/L	11/27/24	20:32	MT	489206
Diphenylamine	E625.1	1	0.974	10	ND		ug/L	11/27/24	20:32	MT	489206
Azobenzene	E625.1	1	1.46	10	ND		ug/L	11/27/24	20:32	MT	489206
4-Bromophenyl phenyl ether	E625.1	1	1.30	10	ND		ug/L	11/27/24	20:32	MT	489206
Hexachlorobenzene	E625.1	1	1.22	10	ND		ug/L	11/27/24	20:32	MT	489206
Pentachlorophenol	E625.1	1	1.53	20	ND		ug/L	11/27/24	20:32	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	625-P	**Prep Batch Date/Time:**	11/26/24 1:08:00PM
Prep Batch ID:	1166074	**Prep Analyst:**	SSUTRA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Phenanthrene	E625.1	1	0.911	10	ND		ug/L	11/27/24	20:32	MT	489206
Anthracene	E625.1	1	0.922	10	ND		ug/L	11/27/24	20:32	MT	489206
Di-n-butylphthalate	E625.1	1	0.639	10	ND		ug/L	11/27/24	20:32	MT	489206
Fluoranthene	E625.1	1	0.272	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzidine	E625.1	1	2.05	20	ND		ug/L	11/27/24	20:32	MT	489206
Pyrene	E625.1	1	0.585	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzyl butyl phthalate	E625.1	1	2.12	10	ND		ug/L	11/27/24	20:32	MT	489206
Benz[a]anthracene	E625.1	1	0.304	10	ND		ug/L	11/27/24	20:32	MT	489206
3,3-Dichlorobenzidine	E625.1	1	3.40	20	ND		ug/L	11/27/24	20:32	MT	489206
Chrysene	E625.1	1	0.322	10	ND		ug/L	11/27/24	20:32	MT	489206
Bis(2-Ethylhexyl)phthalate	E625.1	1	1.10	10	ND		ug/L	11/27/24	20:32	MT	489206
Di-n-octyl phthalate	E625.1	1	0.581	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzo[b]fluoranthene	E625.1	1	0.389	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzo[k]fluoranthene	E625.1	1	0.427	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzo[a]pyrene	E625.1	1	0.394	10	ND		ug/L	11/27/24	20:32	MT	489206
Indeno[1,2,3-cd]pyrene	E625.1	1	0.558	10	ND		ug/L	11/27/24	20:32	MT	489206
Dibenz[a,h]anthracene	E625.1	1	0.630	10	ND		ug/L	11/27/24	20:32	MT	489206
Benzo[g,h,i]perylene	E625.1	1	0.704	10	ND		ug/L	11/27/24	20:32	MT	489206
			Acceptance Limits								
2-Fluorophenol (S)	E625.1		17.9 - 100		**41.8**		%	11/27/24	20:32	MT	489206
Phenol-d6 (S)	E625.1		11.6 - 100		**32.0**		%	11/27/24	20:32	MT	489206
Nitrobenzene-d5 (S)	E625.1		31 - 116		**79.1**		%	11/27/24	20:32	MT	489206
2-Fluorobiphenyl (S)	E625.1		21.3 - 123		**78.0**		%	11/27/24	20:32	MT	489206
2,4,6-Tribromophenol (S)	E625.1		29.6 - 130		**73.2**		%	11/27/24	20:32	MT	489206
p-Terphenyl-d14 (S)	E625.1		38.6 - 129		**82.4**		%	11/27/24	20:32	MT	489206

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003B
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	3510_TPH	**Prep Batch Date/Time:**	11/26/24 6:50:00PM
Prep Batch ID:	1166095	**Prep Analyst:**	NDUM

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH as Diesel	SW8015B	1	0.037	0.10	**0.212**	x	mg/L	11/27/24	18:42	SN	489287
TPH as Motor Oil	SW8015B	1	0.11	0.40	**0.426**		mg/L	11/27/24	18:42	SN	489287
TPH as JP-4	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:42	SN	489287
TPH as JP-5	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:42	SN	489287
TPH as JP-8	SW8015B	1	0.037	0.10	ND		mg/L	11/27/24	18:42	SN	489287
(S) Pentacosane	SW8015B		40 - 129		**99.7**		%	11/27/24	18:42	SN	489287

NOTE: x-not typical of Diesel ref. std: peaks within Diesel range quantified as diesel

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	300.0P	**Prep Batch Date/Time:**	11/25/24 6:00:00PM
Prep Batch ID:	1166181	**Prep Analyst:**	PHUFANO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
NItrate and Nitrite as N	E300.0	1	0.0070	0.10	**1.01**		mg/L	11/26/24	0:33	PH	489236

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003C
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	TSS-P	**Prep Batch Date/Time:**	11/26/24 12:20:00PM
Prep Batch ID:	1166206	**Prep Analyst:**	ROME

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
Total Suspended Solids	SM2540D	1	1.0	10	**5.00**	J	mg/L	11/26/24	15:45	RE	489267

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003D
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	NH3-W-P	**Prep Batch Date/Time:**	12/3/24 12:00:00PM
Prep Batch ID:	1166227	**Prep Analyst:**	ROME

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Ammonia as N	A4500NH3D	1	0.030	0.10	**0.446**		mg/L	12/03/24	12:00	RE	489280

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003E
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	1664P	**Prep Batch Date/Time:**	11/26/24	10:02:00AM
Prep Batch ID:	1166062	**Prep Analyst:**	MSAT	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOG	E1664B	1	1.1	4.00	ND		mg/L	11/26/24	13:00	MS	489119

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Dichlorodifluoromethane	E624.1	4.2	1.1	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Chloromethane	E624.1	4.2	0.70	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Vinyl Chloride	E624.1	4.2	0.87	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Bromomethane	E624.1	4.2	0.89	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Chloroethane	E624.1	4.2	0.48	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Trichlorofluoromethane	E624.1	4.2	0.78	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1-Dichloroethene	E624.1	4.2	0.60	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Freon 113	E624.1	4.2	1.4	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Methylene Chloride	E624.1	4.2	0.55	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
trans-1,2-Dichloroethene	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
MTBE	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
tert-Butanol	E624.1	4.2	12	21	ND		ug/L	11/25/24	18:00	JZ	489130
Diisopropyl ether (DIPE)	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1-Dichloroethane	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
ETBE	E624.1	4.2	0.27	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
cis-1,2-Dichloroethene	E624.1	4.2	0.63	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Bromochloromethane	E624.1	4.2	0.63	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Chloroform	E624.1	4.2	0.51	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Carbon Tetrachloride	E624.1	4.2	0.66	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1,1-Trichloroethane	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1-Dichloropropene	E624.1	4.2	0.78	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Benzene	E624.1	4.2	0.27	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
TAME	E624.1	4.2	0.30	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,2-Dichloroethane	E624.1	4.2	0.46	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Trichloroethylene	E624.1	4.2	0.61	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,2-Dichloropropane	E624.1	4.2	0.37	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Bromodichloromethane	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
cis-1,3-Dichloropropene	E624.1	4.2	0.33	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Toluene	E624.1	4.2	0.60	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Tetrachloroethylene	E624.1	4.2	1.00	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
trans-1,3-Dichloropropene	E624.1	4.2	0.91	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1,2-Trichloroethane	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Dibromochloromethane	E624.1	4.2	0.76	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Chlorobenzene	E624.1	4.2	0.68	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Ethyl Benzene	E624.1	4.2	0.82	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
m,p-Xylene	E624.1	4.2	1.7	4.2	ND		ug/L	11/25/24	18:00	JZ	489130
o-Xylene	E624.1	4.2	0.65	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
Bromoform	E624.1	4.2	0.32	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,1,2,2-Tetrachloroethane	E624.1	4.2	0.33	2.1	ND		ug/L	11/25/24	18:00	JZ	489130

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	624-P	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166070	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
1,3-Dichlorobenzene	E624.1	4.2	0.70	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,4-Dichlorobenzene	E624.1	4.2	0.74	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
1,2-Dichlorobenzene	E624.1	4.2	0.67	2.1	ND		ug/L	11/25/24	18:00	JZ	489130
(S) Dibromofluoromethane	E624.1		61.2 - 131		**124**		%	11/25/24	18:00	JZ	489130
(S) Toluene-d8	E624.1		75.1 - 127		**105**		%	11/25/24	18:00	JZ	489130
(S) 4-Bromofluorobenzene	E624.1		64.1 - 120		**98.5**		%	11/25/24	18:00	JZ	489130

NOTE: Reporting limits were raised due to sample matrix (foaming during purging).

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003F
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	5030GRO	**Prep Batch Date/Time:**	11/25/24 11:53:00AM
Prep Batch ID:	1166071	**Prep Analyst:**	JZHAO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TPH Gasoline	SW8260TPH	4.2	120	210	ND		ug/L	11/25/24	18:00	JZ	489130
(S) 4-Bromofluorobenzene	SW8260TPH		41.5 - 125		**99.1**		%	11/25/24	18:00	JZ	489130

NOTE: Reporting limits were raised due to sample matrix (foaming during purging).

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003G
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	TOC-W-P	**Prep Batch Date/Time:**	12/3/24 12:00:00PM
Prep Batch ID:	1166220	**Prep Analyst:**	ERAGUDO

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
TOC	A5310B	1	0.40	2.0	**4.06**		mg/L	12/03/24	16:51	ERR	489275

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003H
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	COD-P	**Prep Batch Date/Time:**	11/26/24	11:30:00AM
Prep Batch ID:	1166078	**Prep Analyst:**	BJAY	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Chemical Oxygen Demand (COD)	H8000	1	3.4	10	**64.6**		mg/L	11/26/24	14:00	BJAY	489142

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	245.1P	**Prep Batch Date/Time:**	11/26/24 7:30:00PM
Prep Batch ID:	1166106	**Prep Analyst:**	ATRUONG

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Mercury	E245.1	1	0.00010	0.00020	ND		mg/L	11/27/24	10:33	BJAY	489168

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003I
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	200.8P	**Prep Batch Date/Time:**	11/26/24 5:30:00PM
Prep Batch ID:	1166102	**Prep Analyst:**	ATRUONG

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Antimony	E200.8	1	0.00045	0.0010	ND		mg/L	11/27/24	15:55	ERR	489194
Arsenic	E200.8	1	0.00040	0.0010	**0.00111**		mg/L	11/27/24	15:55	ERR	489194
Barium	E200.8	1	0.00080	0.0020	**0.0592**		mg/L	11/27/24	15:55	ERR	489194
Beryllium	E200.8	1	0.00056	0.0020	ND		mg/L	11/27/24	15:55	ERR	489194
Cadmium	E200.8	1	0.00025	0.0010	ND		mg/L	11/27/24	15:55	ERR	489194
Chromium	E200.8	1	0.00042	0.0010	ND		mg/L	11/27/24	15:55	ERR	489194
Cobalt	E200.8	1	0.00027	0.0010	ND		mg/L	11/27/24	15:55	ERR	489194
Copper	E200.8	1	0.00025	0.0010	**0.00476**		mg/L	11/27/24	15:55	ERR	489194
Lead	E200.8	1	0.00032	0.0010	ND		mg/L	11/27/24	15:55	ERR	489194
Molybdenum	E200.8	1	0.00041	0.0010	**0.00597**		mg/L	11/27/24	15:55	ERR	489194
Nickel	E200.8	1	0.00049	0.0010	**0.00300**		mg/L	11/27/24	15:55	ERR	489194
Selenium	E200.8	1	0.00065	0.0020	**0.00318**		mg/L	11/27/24	15:55	ERR	489194
Silver	E200.8	1	0.00021	0.00050	ND		mg/L	11/27/24	15:55	ERR	489194
Thallium	E200.8	1	0.0013	0.0020	ND		mg/L	11/27/24	15:55	ERR	489194
Vanadium	E200.8	1	0.00070	0.0020	**0.00327**		mg/L	11/27/24	15:55	ERR	489194
Zinc	E200.8	1	0.0015	0.0025	**0.0202**		mg/L	11/27/24	15:55	ERR	489194

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Brian Kawashima
NASA Ames Research Center

Date/Time Received: 11/25/24, 1:21 pm
Date Reported: 12/04/24

Client Sample ID:	191.E1 2024/2025-1	**Lab Sample ID:**	2411225-003J
Project Name/Location:	QSE1-2024/2025	**Sample Matrix:**	Water
Project Number:	2084001-CLIN62		
Date/Time Sampled:	11/25/24 / 10:30		
SDG:			

Prep Method:	7199/218.6-WP	**Prep Batch Date/Time:**	12/25/24	5:30:00PM
Prep Batch ID:	1166182	**Prep Analyst:**	PHUFANO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Hexavalent Chromium	SW7199	1	0.16	0.50	**0.819**		ug/L	11/25/24	22:05	PH	489237

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	3511-PCB	**Prep Date:**	11/26/24	**Prep Batch:**	1166061
Matrix:	Water	**Analytical Method:**	SW8082A	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489124
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Aroclor1016	0.70	10	ND	
Aroclor1221	5.6	10	ND	
Aroclor1232	1.2	10	ND	
Aroclor1242	3.8	10	ND	
Aroclor1248	5.5	10	ND	
Aroclor1254	0.20	10	ND	
Aroclor1260	0.50	10	ND	
Tetrachloro-m-xylene (S)			118	
Decachlorobiphenyl (S)			102	

Work Order:	2411225	**Prep Method:**	1664P	**Prep Date:**	11/26/24	**Prep Batch:**	1166062
Matrix:	Water	**Analytical Method:**	E1664B	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489119
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
TOG	1.1	4.00	ND	

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	624-P	**Prep Date:**	11/25/24	**Prep Batch:**	1166070
Matrix:	Water	**Analytical Method:**	E624.1	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489130
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Dichlorodifluoromethane	0.26	0.50	ND	
Chloromethane	0.17	0.50	ND	
Vinyl Chloride	0.21	0.50	ND	
Bromomethane	0.21	0.50	ND	
Chloroethane	0.11	0.50	ND	
Trichlorofluoromethane	0.19	0.50	ND	
1,1-Dichloroethene	0.14	0.50	ND	
Freon 113	0.34	0.50	ND	
Methylene Chloride	0.13	0.50	ND	
trans-1,2-Dichloroethene	0.16	0.50	ND	
MTBE	0.077	0.50	ND	
tert-Butanol	7.4	10	ND	
Diisopropyl ether (DIPE)	0.12	0.50	ND	
1,1-Dichloroethane	0.12	0.50	ND	
ETBE	0.064	0.50	ND	
cis-1,2-Dichloroethene	0.15	0.50	ND	
Bromochloromethane	0.15	0.50	ND	
Chloroform	0.12	0.50	ND	
Carbon Tetrachloride	0.16	0.50	ND	
1,1,1-Trichloroethane	0.16	0.50	ND	
1,1-Dichloropropene	0.19	0.50	ND	
Benzene	0.065	0.50	ND	
TAME	0.072	0.50	ND	
1,2-Dichloroethane	0.11	0.50	ND	
Trichloroethylene	0.15	0.50	ND	
1,2-Dichloropropane	0.089	0.50	ND	
Bromodichloromethane	0.076	0.50	ND	
cis-1,3-Dichloropropene	0.078	0.50	ND	
Toluene	0.14	0.50	ND	
Tetrachloroethylene	0.24	0.50	ND	
trans-1,3-Dichloropropene	0.22	0.50	ND	
1,1,2-Trichloroethane	0.076	0.50	ND	
Dibromochloromethane	0.18	0.50	ND	
Chlorobenzene	0.16	0.50	ND	
Ethyl Benzene	0.20	0.50	ND	
m,p-Xylene	0.39	1.0	ND	
o-Xylene	0.15	0.50	ND	
Bromoform	0.076	0.50	ND	
1,1,2,2-Tetrachloroethane	0.079	0.50	ND	
1,3-Dichlorobenzene	0.17	0.50	ND	
1,4-Dichlorobenzene	0.18	0.50	ND	
1,2-Dichlorobenzene	0.16	0.50	ND	
(S) Dibromofluoromethane			123	
(S) Toluene-d8			108	
(S) 4-Bromofluorobenzene			98.7	

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	5030GRO	**Prep Date:**	11/25/24	**Prep Batch:**	1166071
Matrix:	Water	**Analytical Method:**	SW8260TPH	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489130
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier	
TPH Gasoline	29	50	ND		
(S) 4-Bromofluorobenzene			86.4		

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	625-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166074
Matrix:	Water	**Analytical Method:**	E625.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489206
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
N-Nitrosdimethylamine	2.35	20	ND	
Phenol	1.46	20	ND	
Bis(2-chloroethyl) ether	1.69	10	ND	
2-Chlorophenol	2.50	20	ND	
1,3-Dichlorobenzene	1.33	10	ND	
1,4-Dichlorobenzene	1.58	10	ND	
1,2-Dichlorobenzene	1.31	10	ND	
Bis(2-chloroisopropyl)ether	1.49	10	ND	
N-nitroso-di-n-propylamine	2.67	20	ND	
Hexachloroethane	1.33	10	ND	
Nitrobenzene	1.41	10	ND	
Isophorone	1.49	10	ND	
2-Nitrophenol	2.72	20	ND	
2,4-Dimethylphenol	1.91	20	ND	
Bis(2-Chloroethoxy)methane	1.38	10	ND	
2,4-Dichlorophenol	2.13	20	ND	
1,2,4-Trichlorobenzene	1.50	10	ND	
Naphthalene	1.42	10	ND	
Hexachloro-1,3-butadiene	1.51	10	ND	
4-Chloro-3-methylphenol	1.47	20	ND	
2-Methylnaphthalene	1.34	10	ND	
Hexachlorocyclopentadiene	1.55	10	ND	
2,4,6-Trichlorophenol	2.50	20	ND	
2-Chloronaphthalene	1.43	10	ND	
Dimethyl phthalate	1.24	10	ND	
Acenaphthylene	1.48	10	ND	
2,6-Dinitrotoluene	1.29	10	ND	
Acenaphthene	1.40	10	ND	
2,4-Dinitrophenol	5.68	40	ND	
4-Nitrophenol	1.26	40	ND	
2,4-Dinitrotoluene	1.04	10	ND	
Diethylphthalate	0.760	10	ND	
Fluorene	1.18	10	ND	
4-Chlorophenyl phenyl ether	1.25	10	ND	
Diphenylamine	0.974	10	ND	
Azobenzene	1.46	10	ND	
4-Bromophenyl phenyl ether	1.30	10	ND	
Hexachlorobenzene	1.22	10	ND	
Pentachlorophenol	1.53	20	ND	
Phenanthrene	0.911	10	ND	
Anthracene	0.922	10	ND	
Di-n-butylphthalate	0.639	10	ND	
Fluoranthene	0.272	10	ND	
Benzidine	2.05	20	ND	
Pyrene	0.585	10	ND	

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	625-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166074
Matrix:	Water	**Analytical Method:**	E625.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489206
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Benzyl butyl phthalate	2.12	10	ND	
Benz[a]anthracene	0.304	10	ND	
3,3-Dichlorobenzidine	3.40	20	ND	
Chrysene	0.322	10	ND	
Bis(2-Ethylhexyl)phthalate	1.10	10	ND	
Di-n-octyl phthalate	0.581	10	ND	
Benzo[b]fluoranthene	0.389	10	ND	
Benzo[k]fluoranthene	0.427	10	ND	
Benzo[a]pyrene	0.394	10	ND	
Indeno[1,2,3-cd]pyrene	0.558	10	ND	
Dibenz[a,h]anthracene	0.630	10	ND	
Benzo[g,h,i]perylene	0.704	10	ND	
2-Fluorophenol (S)			57.6	
Phenol-d6 (S)			36.6	
Nitrobenzene-d5 (S)			78.3	
2-Fluorobiphenyl (S)			77.2	
2,4,6-Tribromophenol (S)			91.8	
p-Terphenyl-d14 (S)			81.3	

Work Order:	2411225	**Prep Method:**	COD-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166078
Matrix:	Water	**Analytical Method:**	H8000	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489142
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Chemical Oxygen Demand (COD)	3.4	10	ND	

Work Order:	2411225	**Prep Method:**	3510_TPH	**Prep Date:**	11/26/24	**Prep Batch:**	1166095
Matrix:	Water	**Analytical Method:**	SW8015B	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489219
Units:	mg/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
TPH as Diesel	0.037	0.10	ND	
TPH as Motor Oil	0.11	0.40	ND	
Pentacosane (S)			96.5	

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	200.8P	**Prep Date:**	11/26/24	**Prep Batch:**	1166102
Matrix:	Water	**Analytical Method:**	E200.8	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489194
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Antimony	0.45	1.0	ND	
Arsenic	0.40	1.0	ND	
Barium	0.80	2.0	ND	
Beryllium	0.56	2.0	ND	
Cadmium	0.25	1.0	ND	
Chromium	0.42	1.0	ND	
Cobalt	0.27	1.0	ND	
Copper	0.25	1.0	0.25	
Lead	0.32	1.0	ND	
Molybdenum	0.41	1.0	ND	
Nickel	0.49	1.0	ND	
Selenium	0.65	2.0	ND	
Silver	0.21	0.50	ND	
Thallium	1.5	2.0	ND	
Vanadium	0.70	2.0	ND	
Zinc	1.5	5.0	ND	
Aluminum	3.9	20	ND	

Work Order:	2411225	**Prep Method:**	245.1P	**Prep Date:**	11/26/24	**Prep Batch:**	1166106
Matrix:	Water	**Analytical Method:**	E245.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489168
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Mercury	0.00010	0.00020	ND	

Work Order:	2411225	**Prep Method:**	300.0P	**Prep Date:**	11/25/24	**Prep Batch:**	1166181
Matrix:	Water	**Analytical Method:**	E300.0	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489236
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Nitrate	0.0070	0.10	ND	
Nitrite	0.0090	0.10	ND	

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2411225	**Prep Method:**	7199/218.6-WP	**Prep Date:**	12/25/24	**Prep Batch:**	1166182
Matrix:	Water	**Analytical Method:**	SW7199	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489237
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Hexavalent Chromium	0.00016	0.00050	ND	

Work Order:	2411225	**Prep Method:**	TSS-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166206
Matrix:	Water	**Analytical Method:**	A2540D	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489267
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Total Suspended Solids	0.10	1.0	ND	

Work Order:	2411225	**Prep Method:**	TOC-W-P	**Prep Date:**	12/03/24	**Prep Batch:**	1166220
Matrix:	Water	**Analytical Method:**	A5310B	**Analyzed Date:**	12/3/2024	**Analytical Batch:**	489275
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
TOC	0.40	2.0	ND	

Work Order:	2411225	**Prep Method:**	NH3-W-P	**Prep Date:**	12/03/24	**Prep Batch:**	1166227
Matrix:	Water	**Analytical Method:**	A4500NH3D	**Analyzed Date:**	12/3/2024	**Analytical Batch:**	489280
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Ammonia as N	0.030	0.10	ND	

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	3511-PCB	**Prep Date:**	11/26/24	**Prep Batch:**	1166061
Matrix:	Water	**Analytical Method:**	SW8082A	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489124
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Aroclor1016	0.70	10.0	ND	30	106	110	3.40	25 - 145	30	
Aroclor1260	0.50	10.0	ND	30	91.3	96.3	5.33	30 - 145	30	
Tetrachloro-m-xylene (S)				50	124	122		44 - 124		
Decachlorobiphenyl (S)				50	110	106		30 - 135		

Work Order:	2411225	**Prep Method:**	1664P	**Prep Date:**	11/26/24	**Prep Batch:**	1166062
Matrix:	Water	**Analytical Method:**	E1664B	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489119
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
TOG	1.1	4.00	ND	40	84.8	81.3	4.22	60 - 140	20	

Work Order:	2411225	**Prep Method:**	624-P	**Prep Date:**	11/25/24	**Prep Batch:**	1166070
Matrix:	Water	**Analytical Method:**	E624.1	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489130
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
1,1-Dichloroethene	0.14	0.50	ND	17.9	96.4	96.7	0.580	61.4 - 129	30	
Benzene	0.16	0.50	ND	17.9	99.2	101	2.23	66.9 - 140	30	
Trichloroethylene	0.15	0.50	ND	17.9	98.1	102	3.92	69.3 - 144	30	
Toluene	0.14	0.50	ND	17.9	105	109	3.14	76.6 - 123	30	
Chlorobenzene	0.16	0.50	ND	17.9	97.2	102	4.49	73.9 - 137	30	
(S) Dibromofluoromethane				17.9	92.7	96.9		61.2 - 131		
(S) Toluene-d8				17.9	98.9	102		75.1 - 127		
(S) 4-Bromofluorobenzene				17.9	89.7	94.6		64.1 - 120		

Work Order:	2411225	**Prep Method:**	5030GRO	**Prep Date:**	11/25/24	**Prep Batch:**	1166071
Matrix:	Water	**Analytical Method:**	SW8260TPH	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489130
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
TPH Gasoline	29	50	ND	238	107	116	7.88	52.4 - 127	30	
(S) 4-Bromofluorobenzene				11.9	100	101		41.5 - 125		

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	625-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166074
Matrix:	Water	**Analytical Method:**	E625.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489206
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
N-Nitrosdimethylamine	2.35	20.0	ND	30	45.8	45.3	0.733	14 - 198	30	
Phenol	1.46	20.0	ND	30	32.6	32.1	1.75	17 - 120	30	
Bis(2-chloroethyl) ether	1.69	10.0	ND	10	70.6	70.6	0.000	43 - 126	30	
2-Chlorophenol	2.50	20.0	ND	30	78.1	78.4	0.426	36 - 120	30	
1,3-Dichlorobenzene	1.33	10.0	ND	10	69.8	69.3	0.719	60 - 140	30	
1,4-Dichlorobenzene	1.58	10.0	ND	10	82.7	80.0	3.32	60 - 140	30	
1,2-Dichlorobenzene	1.31	10.0	ND	10	73.2	72.4	1.10	60 - 140	30	
Bis(2-chloroisopropyl)ether	1.49	10.0	ND	10	83.9	82.9	1.20	63 - 139	30	
N-nitroso-di-n-propylamine	2.67	20.0	ND	10	79.8	81.1	1.62	14 - 198	30	
Hexachloroethane	1.33	10.0	ND	10	74.4	72.5	2.59	55 - 120	30	
Nitrobenzene	1.41	10.0	ND	10	75.8	73.7	2.81	54 - 158	30	
Isophorone	1.49	10.0	ND	10	77.3	77.3	0.000	47 - 180	30	
2-Nitrophenol	2.72	20.0	ND	30	70.2	71.5	2.35	45 - 167	30	
2,4-Dimethylphenol	1.91	20.0	ND	30	73.5	73.2	0.909	42 - 120	30	
Bis(2-Chloroethoxy)methane	1.38	10.0	ND	10	82.0	79.3	3.35	49 - 165	30	
2,4-Dichlorophenol	2.13	20.0	ND	30	75.2	77.4	2.62	53 - 122	30	
1,2,4-Trichlorobenzene	1.50	10.0	ND	10	74.2	72.7	2.04	57 - 130	30	
Naphthalene	1.42	10.0	ND	10	74.0	75.0	1.34	36 - 120	30	
Hexachloro-1,3-butadiene	1.51	10.0	ND	10	72.5	72.1	0.553	38 - 120	30	
4-Chloro-3-methylphenol	1.47	20.0	ND	30	75.8	79.7	5.15	41 - 128	30	
2-Methylnaphthalene	1.34	10.0	ND	10	78.2	78.0	0.256	60 - 140	30	
Hexachlorocyclopentadiene	1.55	10.0	ND	10	71.2	68.4	4.01	60 - 140	30	
2,4,6-Trichlorophenol	2.50	20.0	ND	30	80.8	76.6	5.08	60 - 140	30	
2-Chloronaphthalene	1.43	10.0	ND	10	78.4	73.1	7.00	65 - 120	30	
Dimethyl phthalate	1.24	10.0	ND	10	81.3	75.5	7.40	50 - 130	30	
Acenaphthylene	1.48	10.0	ND	10	75.1	72.4	3.66	54 - 126	30	
2,6-Dinitrotoluene	1.29	10.0	ND	10	81.4	78.7	3.37	68 - 137	30	
Acenaphthene	1.40	10.0	ND	10	81.3	73.3	10.3	60 - 132	30	
2,4-Dinitrophenol	5.68	40.0	ND	30	68.3	77.1	11.9	39 - 173	30	
4-Nitrophenol	1.26	40.0	ND	30	35.5	35.8	0.930	13 - 129	30	
2,4-Dinitrotoluene	1.04	10.0	ND	10	79.5	85.5	7.27	60 - 140	30	
Diethylphthalate	0.760	10.0	ND	10	86.3	83.6	3.18	47 - 130	30	
Fluorene	1.18	10.0	ND	10	86.0	81.9	4.88	70 - 120	30	
4-Chlorophenyl phenyl ether	1.25	10.0	ND	10	88.3	83.9	5.11	38 - 145	30	
Diphenylamine	0.974	10.0	ND	10	84.4	83.8	0.713	60 - 140	30	
Azobenzene	1.46	10.0	ND	10	85.0	85.3	0.352	60 - 140	30	
4-Bromophenyl phenyl ether	1.30	10.0	ND	10	86.2	85.2	1.17	65 - 120	30	
Hexachlorobenzene	1.22	10.0	ND	10	76.9	77.0	0.130	8 - 142	30	
Pentachlorophenol	1.53	20.0	ND	30	66.2	70.1	5.38	38 - 152	30	
Phenanthrene	0.911	10.0	ND	10	81.6	81.4	0.245	65 - 120	30	
Anthracene	0.922	10.0	ND	10	84.6	83.6	1.19	43 - 120	30	
Di-n-butylphthalate	0.639	10.0	ND	10	79.6	82.0	2.97	8 - 120	30	
Fluoranthene	0.272	10.0	ND	10	82.4	85.5	3.69	43 - 121	30	
Benzidine	18.0	20.0	ND	10	29.4	23.3	23.2	10 - 140	30	
Pyrene	0.585	10.0	ND	10	78.7	76.1	3.36	70 - 120	30	
Benzyl butyl phthalate	2.12	10.0	ND	10	75.4	74.8	0.799	43 - 140	30	

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	625-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166074
Matrix:	Water	**Analytical Method:**	E625.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489206
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Benz[a]anthracene	0.304	10.0	ND	10	80.0	75.1	6.32	42 - 133	30	
3,3-Dichlorobenzidine	3.40	20.0	ND	10	69.3	76.5	9.88	8 - 213	30	
Chrysene	0.322	10.0	ND	10	82.5	78.5	4.97	44 - 140	30	
Bis(2-Ethylhexyl)phthalate	1.10	10.0	ND	10	83.4	80.7	3.29	29 - 137	30	
Di-n-octyl phthalate	0.581	10.0	ND	10	78.8	76.9	2.44	19 - 132	30	
Benzo[b]fluoranthene	0.389	10.0	ND	10	78.6	78.4	0.255	42 - 140	30	
Benzo[k]fluoranthene	0.427	10.0	ND	10	77.4	78.7	1.67	25 - 146	30	
Benzo[a]pyrene	0.394	10.0	ND	10	78.8	79.5	0.884	32 - 148	30	
Indeno[1,2,3-cd]pyrene	0.558	10.0	ND	10	85.6	80.8	5.77	13 - 151	30	
Dibenz[a,h]anthracene	0.630	10.0	ND	10	81.9	76.5	6.82	13 - 200	30	
Benzo[g,h,i]perylene	0.704	10.0	ND	10	80.9	78.3	3.27	13 - 195	30	
2-Fluorophenol (S)				10000	56.6	55.1		17.9 - 100		
Phenol-d6 (S)				10000	39.1	37.6		11.6 - 100		
Nitrobenzene-d5 (S)				6000	79.2	76.5		31 - 116		
2-Fluorobiphenyl (S)				6000	85.8	80.3		21.3 - 123		
2,4,6-Tribromophenol (S)				10000	96.3	95.1		29.6 - 130		
p-Terphenyl-d14 (S)				6000	80.7	77.0		38.6 - 129		

Work Order:	2411225	**Prep Method:**	COD-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166078
Matrix:	Water	**Analytical Method:**	H8000	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489142
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Chemical Oxygen Demand (C(	3.4	10	ND	100	103	101	1.96	80 - 120	20	

Work Order:	2411225	**Prep Method:**	3510_TPH	**Prep Date:**	11/26/24	**Prep Batch:**	1166095
Matrix:	Water	**Analytical Method:**	SW8015B	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489219
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
TPH as Diesel	0.037	0.10	ND	1.0	83.3	86.4	3.65	52 - 115	30	
Pentacosane (S)				200	102	104		59 - 129		

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	200.8P	**Prep Date:**	11/26/24	**Prep Batch:**	1166102
Matrix:	Water	**Analytical Method:**	E200.8	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489194
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Antimony	0.019	0.50	ND	50	98.8	100	1.61	85 - 115	20	
Arsenic	0.19	0.50	ND	50	97.0	97.5	0.617	85 - 115	20	
Barium	0.066	0.50	ND	50	97.9	98.7	0.813	85 - 115	20	
Beryllium	0.018	0.50	ND	50	108	114	5.04	85 - 115	20	
Cadmium	0.033	0.50	ND	50	102	104	2.33	85 - 115	20	
Chromium	0.044	0.50	ND	50	105	105	0.382	85 - 115	20	
Cobalt	0.026	0.50	ND	50	106	105	1.33	85 - 115	20	
Copper	0.25	1.0	0.25	50	98.1	98.8	0.813	85 - 115	20	
Lead	0.031	0.50	ND	50	107	110	2.03	85 - 115	20	
Molybdenum	0.018	0.50	ND	50	100	102	1.39	85 - 115	20	
Nickel	0.30	1.0	ND	50	96.2	97.0	0.828	85 - 115	20	
Selenium	0.034	0.50	ND	50	97.2	98.6	1.43	85 - 115	20	
Silver	0.012	0.50	ND	50	100	101	0.993	85 - 115	20	
Thallium	0.0040	0.50	ND	50	105	105	0.190	85 - 115	20	
Vanadium	0.020	0.50	ND	50	105	104	0.765	85 - 115	20	
Zinc	0.59	2.0	ND	50	100	102	1.39	85 - 115	20	
Aluminum	1.0	20	ND	50	115	115	0.000	85 - 115	20	

Work Order:	2411225	**Prep Method:**	245.1P	**Prep Date:**	11/26/24	**Prep Batch:**	1166106
Matrix:	Water	**Analytical Method:**	E245.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489168
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Mercury	0.00013	0.00020	ND	0.015	100	98.5	1.34	85 - 115	20	

Work Order:	2411225	**Prep Method:**	300.0P	**Prep Date:**	11/25/24	**Prep Batch:**	1166181
Matrix:	Water	**Analytical Method:**	E300.0	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489236
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Nitrate	0.0070	0.10	ND	2.5	99.6	99.7	0.000	80 - 120	20	
Nitrite	0.0090	0.10	ND	2.5	107	108	0.000	80 - 120	20	

Work Order:	2411225	**Prep Method:**	7199/218.6-WP	**Prep Date:**	12/25/24	**Prep Batch:**	1166182
Matrix:	Water	**Analytical Method:**	SW7199	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489237
Units:	ug/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Hexavalent Chromium	0.083	0.50	ND	30	100	98.8	1.61	90 - 110	20	

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	TOC-W-P	**Prep Date:**	12/03/24	**Prep Batch:**	1166220
Matrix:	Water	**Analytical Method:**	A5310B	**Analyzed Date:**	12/3/2024	**Analytical Batch:**	489275
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
TOC	0.40	2.0	ND	10	100	100	0.000	80 - 120	20	

Work Order:	2411225	**Prep Method:**	NH3-W-P	**Prep Date:**	12/03/24	**Prep Batch:**	1166227
Matrix:	Water	**Analytical Method:**	A4500NH3D	**Analyzed Date:**	12/3/2024	**Analytical Batch:**	489280
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Ammonia as N	0.030	0.10	ND	5	90.6	92.4	1.97	80 - 120	20	

Torrent LABORATORY, INC.

MS/MSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	COD-P	**Prep Date:**	11/26/24	**Prep Batch:**	1166078
Matrix:	**Water**	**Analytical Method:**	H8000	**Analyzed Date:**	11/26/2024	**Analytical Batch:**	489142
Spiked Sample:	2411225-002H						
Units:	mg/L						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Chemical Oxygen Demand (COD)	3.4	10	ND	100	110	101	7.14	75 - 125	20	

Work Order:	2411225	**Prep Method:**	200.8P	**Prep Date:**	11/26/24	**Prep Batch:**	1166102
Matrix:	**Water**	**Analytical Method:**	E200.8	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489194
Spiked Sample:	2411225-001I						
Units:	mg/L						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Antimony	0.000019	0.00050	0.00385	0.05	96.3	98.5	2.09	75 - 125	20	
Arsenic	0.00019	0.00050	0.000956	0.05	101	99.6	1.37	75 - 125	20	
Barium	0.000066	0.00050	0.0474	0.05	93.0	98.2	2.73	75 - 125	20	
Beryllium	0.000018	0.00050	ND	0.05	107	110	2.77	75 - 125	20	
Cadmium	0.000033	0.00050	ND	0.05	102	102	0.392	75 - 125	20	
Chromium	0.000044	0.00050	0.000710	0.05	103	104	1.52	75 - 125	20	
Cobalt	0.000026	0.00050	ND	0.05	101	102	1.77	75 - 125	20	
Copper	0.00025	0.0010	0.0114	0.05	95.5	95.9	0.338	75 - 125	20	
Lead	0.000031	0.00050	0.00211	0.05	102	104	1.68	75 - 125	20	
Molybdenum	0.000018	0.00050	0.00206	0.05	106	106	0.181	75 - 125	20	
Nickel	0.00030	0.0010	0.00132	0.05	94.8	93.9	0.825	75 - 125	20	
Selenium	0.000034	0.00050	0.00152	0.05	97.0	97.4	0.399	75 - 125	20	
Silver	0.000012	0.00050	ND	0.05	99.8	98.5	1.41	75 - 125	20	
Thallium	0.000004(	0.00050	ND	0.05	102	105	3.08	75 - 125	20	
Vanadium	0.000020	0.00050	0.00238	0.05	105	106	1.09	75 - 125	20	
Zinc	0.00059	0.0020	0.0842	0.05	89.3	91.2	0.772	75 - 125	20	

Work Order:	2411225	**Prep Method:**	245.1P	**Prep Date:**	11/26/24	**Prep Batch:**	1166106
Matrix:	**Water**	**Analytical Method:**	E245.1	**Analyzed Date:**	11/27/2024	**Analytical Batch:**	489168
Spiked Sample:	2411225-002I						
Units:	mg/L						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Mercury	0.000130	0.000200	ND	0.015	97.3	97.3	0.000	70 - 130	20	

Torrent LABORATORY, INC.

MS/MSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2411225	**Prep Method:**	300.0P	**Prep Date:**	11/25/24	**Prep Batch:**	1166181
Matrix:	**Water**	**Analytical Method:**	E300.0	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489236
Spiked Sample:	2411225-001C						
Units:	mg/L						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
NItrate and Nitrite as N	0.0070	0.10	0.443	5.0	95.3	95.6	0.263	75 - 125	20	

Work Order:	2411225	**Prep Method:**	7199/218.6-WP	**Prep Date:**	12/25/24	**Prep Batch:**	1166182
Matrix:	**Water**	**Analytical Method:**	SW7199	**Analyzed Date:**	11/25/2024	**Analytical Batch:**	489237
Spiked Sample:	2411225-001J						
Units:	ug/L						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Hexavalent Chromium	0.083	0.50	ND	30	100	100	0.000	85 - 115	20	

Torrent LABORATORY, INC.

Duplicate QC Summary Report

Work Order:	2411225	**Prep Method:**	TOC-W-P	**Prep Date:**	12/3/2024	**Prep Batch:**	1166220
Matrix:		**Analytical Method:**	A5310B	**Analyzed Date:**	12/03/24	**Analytical Batch:**	489275
Units:						**Lab Sample ID:**	2411225-001G-DUP-1166220

Parameters	MDL	PQL	Sample Result	Duplicate Result	% RPD
TOC	0.40	2.0	5.71	5.85	2.42

Work Order:	2411225	**Prep Method:**	NH3-W-P	**Prep Date:**	12/3/2024	**Prep Batch:**	1166227
Matrix:		**Analytical Method:**	A4500NH3D	**Analyzed Date:**	12/03/24	**Analytical Batch:**	489280
Units:						**Lab Sample ID:**	2411225-003D-DUP-1166227

Parameters	MDL	PQL	Sample Result	Duplicate Result	% RPD
Ammonia as N	0.030	0.10	0.446	0.460	3.09

Laboratory Qualifiers and Definitions

DEFINITIONS:

Accuracy/Bias (% Recovery) - The closeness of agreement between an observed value and an accepted reference value.
Blank (Method/Preparation Blank) -MB/PB - An analyte-free matrix to which all reagents are added in the same volumes/proportions as used in sample processing. The method blank is used to document contamination resulting from the analytical process.
Duplicate - a field sample and/or laboratory QC sample prepared in duplicate following all of the same processes and procedures used on the original sample (sample duplicate, LCSD, MSD)
Laboratory Control Sample (LCS ad LCSD) - A known matrix spiked with compounds representative of the target analyte(s). This is used to document laboratory performance.
Matrix - the component or substrate that contains the analyte of interest (e.g., - groundwater, sediment, soil, waste water, etc)
Matrix Spike (MS/MSD) - Client sample spiked with identical concentrations of target analyte (s). The spiking occurs prior to the sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix.
Method Detection Limit (MDL) - the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero
Practical Quantitation Limit/Reporting Limit/Limit of Quantitation (PQL/RL/LOQ) - a laboratory determined value at 2 to 5 times above the MDL that can be reproduced in a manner that results in a 99% confidence level that the result is both accurate and precise. PQLs/RLs/LODs reflect all preparation factors and/or dilution factors that have been applied to the sample during the preparation and/or analytical processes.
Precision (%RPD) - The agreement among a set of replicate/duplicate measurements without regard to known value of the replicates
Surrogate (S) or (Surr) - An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are used in most organic analysis to demonstrate matrix compatibility with the chosen method of analysis
Tentatively Identified Compound (TIC) - A compound not contained within the analytical calibration standards but present in the GCMS library of defined compounds. When the library is searched for an unknown compound, it can frequently give a tentative identification to the compound based on retention time and primary and secondary ion match. TICs are reported as estimates and are candidates for further investigation.
Units: the unit of measure used to express the reported result - **mg/L** and ***mg/Kg*** (equivalent to PPM - parts per million in **liquid** and ***solid***), **ug/L** and ***ug/Kg*** (equivalent to PPB - parts per billion in **liquid** and ***solid***), **ug/m3**, ***mg/m3***, **ppbv** and ***ppmv*** (all units of measure for reporting concentrations in air), **%** (equivalent to 10000 ppm or 1,000,000 ppb), **ug/Wipe** (concentration found on the surface of a single Wipe usually taken over a 100cm2 surface)

LABORATORY QUALIFIERS

B - Indicates when the analyte is found in the associated method or preparation blank
D - Surrogate is not recoverable due to the necessary dilution of the sample
E - Indicates the reportable value is outside of the calibration range of the instrument but within the linear range of the instrument (unless otherwise noted) Values reported with an E qualifier should be considered as estimated.
H- Indicates that the recommended holding time for the analyte or compound has been exceeded
J- Indicates a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather the quantitative
NA - Not Analyzed
N/A - Not Applicable
ND - Not Detected at a concentration greater than the PQL/RL or, if reported to the MDL, at greater than the MDL.
NR - Not recoverable - a matrix spike concentration is not recoverable due to a concentration within the original sample that is greater than four times the spike concentration added
R- The % RPD between a duplicate set of samples is outside of the absolute values established by laboratory control charts
S- Spike recovery is outside of established method and/or laboratory control limits. Further explanation of the use of this qualifier should be included within a case narrative
X -Used to indicate that a value based on pattern identification is within the pattern range but not typical of the pattern found in standards. Further explanation may or may not be provided within the sample footnote and/or the case narrative.

Sample Receipt Checklist

Client Name: NASA Ames Research Center

Project Name: QSE1-2024/2025

Work Order No.: 2411225

Date and Time Received: 11/25/2024 1:21:00PM

Received By: CM

Physically Logged By: Lorna Imbat

Checklist Completed By: Lorna Imbat

Carrier Name: Client Drop Off

Chain of Custody (COC) Information

Chain of custody present?	Yes
Chain of custody signed when relinquished and received?	Yes
Chain of custody agrees with sample labels?	Yes
Custody seals intact on sample bottles?	Not Present

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Not Present
Shipping Container/Cooler In Good Condition?	Yes
Samples in proper container/bottle?	Yes
Samples containers intact?	Yes
Sufficient sample volume for indicated test?	Yes

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes		
Container/Temp Blank temperature in compliance?	No	Temperature:	15.0 °C
Water-VOA vials have zero headspace?	Yes		
Water-pH acceptable upon receipt?	Yes		

pH Checked by: Lorna Imbat

pH Adjusted by: N/A

Comments:

Torrent LABORATORY, INC.

Login Summary Report

Client ID: TL5529 NASA Ames Research Center
Project Name: QSE1-2024/2025
Project # : 2084001-CLIN62
Report Due Date: 12/4/2024
Comments:
Work Order # : ***2411225***

QC Level: II
TAT Requested: 5+ day:5
Date Received: 11/25/2024
Time Received: 1:21 pm

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
2411225-001A	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			SUB_Misc	Yes
2411225-001B	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			PCBs_W_8082/3511 TEPH_W_8015B SVOC_W_625 PCBs_W_8082AExt	
Sample Note:	PCBs include Aroclor 1268 TPH for Diesel, JP4, JP5, JP8, MO							
2411225-001C	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			NO2NO3_W_300.0 TSS_2540D	
2411225-001D	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			Ammonia as N_W	
2411225-001E	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			TOG_W_1664B	
2411225-001F	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			VOC_624.1 VOC_W_GRO	
2411225-001G	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			TOC_5310B	
2411225-001H	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			COD_W_H8000	
2411225-001I	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			Hg_245.1 Met_W_200.8CAM17	
2411225-001J	SBE.E1 2024/2025-1	11/25/24 10:00	Water	01/09/25			Cr6_W_7199	
2411225-002A	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25			SUB_Misc	Yes
2411225-002B	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25			PCBs_W_8082/3511 TEPH_W_8015B SVOC_W_625 PCBs_W_8082AExt	
2411225-002C	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25			NO2NO3_W_300.0 TSS_2540D	

Login Summary Report

Client ID: TL5529 NASA Ames Research Center
Project Name: QSE1-2024/2025
Project # : 2084001-CLIN62
Report Due Date: 12/4/2024
QC Level: II
TAT Requested: 5+ day:5
Date Received: 11/25/2024
Time Received: 1:21 pm
Comments:
Work Order # : ***2411225***

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
2411225-002D	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							Ammonia as N_W	
2411225-002E	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							TOG_W_1664B	
2411225-002F	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							VOC_624.1 VOC_W_GRO	
2411225-002G	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							TOC_5310B	
2411225-002H	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							COD_W_H8000	
2411225-002I	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							Hg_245.1 Met_W_200.8CAM17	
2411225-002J	RTJONES E1 2024/2025-1	11/25/24 11:00	Water	01/09/25				
							Cr6_W_7199	
2411225-003A	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							SUB_Misc	Yes
2411225-003B	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							PCBs_W_8082/3511 TEPH_W_8015B SVOC_W_625 PCBs_W_8082AExt	
2411225-003C	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							NO2NO3_W_300.0 TSS_2540D	
2411225-003D	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							Ammonia as N_W	
2411225-003E	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							TOG_W_1664B	
2411225-003F	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							VOC_624.1 VOC_W_GRO	
2411225-003G	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				
							TOC_5310B	
2411225-003H	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25				

Login Summary Report

Client ID: TL5529 NASA Ames Research Center
Project Name: QSE1-2024/2025
Project # : 2084001-CLIN62
Report Due Date: 12/4/2024

QC Level: II
TAT Requested: 5+ day:5
Date Received: 11/25/2024
Time Received: 1:21 pm

Comments:

Work Order # : ***2411225***

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
2411225-003I	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25			COD_W_H8000 Hg_245.1 Met_W_200.8CAM17	
2411225-003J	191.E1 2024/2025-1	11/25/24 10:30	Water	01/09/25			Cr6_W_7199	

Torrent LABORATORY, INC.

2411225

REPORT TO: Marcia Christlieb, Brian Kawashir

ERT/BB&E/NASA Ames
Bldg. T20G/Room 142. M/S T20G-4
Moffett Field, CA 94035-1000
(650) 604-5360
marcia.j.christlieb@nasa.gov;
Brian.L.Kawashima@nasa.gov

PROJECT NAME: QSE1-2024/2025
PROJECT NUMBER: 2084001-CLIN 62
JOB DESCRIPTION Rain Event #1

LAB: **Torrent Labs**
483 Sinclair Frontage Road
Milpitas, CA 95035
408.63.5258

INVOICE TO: **BB&E, Inc.**
Accounts Payable
235 E. Main St, Suite 107
Northville, MI 48167

ERT CHAIN OF CUSTODY

LAB ID #:

Field Conditions:
pH / Temp (C or F)
SBE /
191 /
RTJO /

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	625,Diesel, JP4, JP5, JP8 Motor Oil, PCBs	TSS, N&N	BOD	NH3 (4500-NH3 B+C)	245.1, 200.8	Oil & Grease	624, TPH-gas	TOC	COD	TURN AROUND TIME	SPECIAL INSTRUCTIONS
11/25/2024	10:00 AM	SBE.E1 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268 -001A
11/25/2024	10:00 AM	SBE.E1 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
11/25/2024	10:00 AM	SBE.E1 2024/2025- 6	Water	2 - Amber Liter	HCl						X				5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
11/25/2024	10:00 AM	SBE.E1 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268 -002A
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 6	Water	2 - Amber Liter	HCl						X				5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
11/25/2024	11:00 AM	RTJONES.E1 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 1	Water	4 - Amber Liters	Cold	X									5 days	Analysis to include Aroclor 1268 -003A
11/25/2024	10:30 AM	191.E1 2024/2025- 2	Water	1 - Poly Liter	Cold		X								5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 3	Water	1 - Poly Liter	Cold			X							5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 4	Water	1 - Poly 250 mL	H2SO4				X						5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 5	Water	1 - Poly 250 mL	HNO3					X					5 days	**Include Cr VI**
11/25/2024	10:30 AM	191.E1 2024/2025- 6	Water	2 - Amber Liter	HCl						X				5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 7	Water	4 - 40 ml VOA	HCl							X			5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 8	Water	2 - 40 ml VOA	HCl								X		5 days	
11/25/2024	10:30 AM	191.E1 2024/2025- 9	Water	2 - 40 ml VOA	H2SO4									X	5 days	

SAMPLER: Brian Kawashima
DATE/TIME: 11/25/2024
RECEIVED BY:

RELINQUISHED BY:
DATE/TIME: 11/25/2024
RECEIVED BY: 11/25/24

RELINQUISHED BY:
DATE/TIME: 11/25/2024 1321
RECEIVED AT LAB BY: Claudia Moreno

Please send results to
marcia.j.christlieb@nasa.gov
Brian.l.kawashima@nasa.gov
Request Linko EDD

Page 1 of 1

D/O

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders: 4K26057

Project: 2411225

Attn: Kathie Evans

Client: Torrent Laboratory
483 Sinclair Frontage Road
Milipitas, CA 95035

Report Date: 12/10/2024
Received Date: 11/26/2024
Turnaround Time: Normal
Phones: (408) 263-5258
Fax: (408) 263-8293
P.O. #: 2411225
Billing Code:

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047

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. The report may include analytes that are not currently accreditable by some state agencies or accrediting bodies. This analytical report must be reproduced in its entirety.

Dear Kathie Evans,

Enclosed are the results of analyses for samples received 11/26/24 with the Chain-of-Custody document. The samples were received in good condition, at 2.6 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Kenneth C. Oda For Rahul R. Nair
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139
www.wecklabs.com

Torrent Laboratory
483 Sinclair Frontage Road
Milipitas, CA 95035

Project Number: 2411225

Project Manager: Kathie Evans

Reported:
12/10/2024 17:42

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
2411225-001A	Client	4K26057-01	Water	11/25/24 10:00	
2411225-002A	Client	4K26057-02	Water	11/25/24 10:00	
2411225-003A	Client	4K26057-03	Water	11/25/24 10:30	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139
www.wecklabs.com

Torrent Laboratory
483 Sinclair Frontage Road
Milipitas, CA 95035

Project Number: 2411225

Project Manager: Kathie Evans

Reported:
12/10/2024 17:42

Sample Results

Sample: 2411225-001A — Sampled: 11/25/24 10:00 by Client

4K26057-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: SM 5210B		**Instr:** PH13				
Batch ID: W4K2093	**Preparation:** _NONE (WETCHEM)	**Prepared:** 11/26/24 09:33				**Analyst:** jls
Biochemical Oxygen Demand	**2.4**	2.0	mg/l	1	12/01/24	

Sample Results

Sample: 2411225-002A — Sampled: 11/25/24 10:00 by Client

4K26057-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: SM 5210B		**Instr:** PH13				
Batch ID: W4K2093	**Preparation:** _NONE (WETCHEM)	**Prepared:** 11/26/24 09:33				**Analyst:** jls
Biochemical Oxygen Demand	ND	2.0	mg/l	1	12/01/24	

Sample Results

Sample: 2411225-003A — Sampled: 11/25/24 10:30 by Client

4K26057-03 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: SM 5210B		**Instr:** PH13				
Batch ID: W4K2093	**Preparation:** _NONE (WETCHEM)	**Prepared:** 11/26/24 09:33				**Analyst:** jls
Biochemical Oxygen Demand	ND	2.0	mg/l	1	12/01/24	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139
www.wecklabs.com

Torrent Laboratory
483 Sinclair Frontage Road
Milipitas, CA 95035

Project Number: 2411225

Project Manager: Kathie Evans

Reported:
12/10/2024 17:42

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W4K2093 - SM 5210B										
Blank (W4K2093-BLK1)			**Prepared: 11/26/24**	**Analyzed: 12/01/24**						
Biochemical Oxygen Demand	ND	2.0	mg/l							
Blank (W4K2093-BLK2)			**Prepared: 11/26/24**	**Analyzed: 12/01/24**						
Biochemical Oxygen Demand	ND	2.0	mg/l							
Blank (W4K2093-BLK3)			**Prepared: 11/26/24**	**Analyzed: 12/01/24**						
Biochemical Oxygen Demand	ND	2.0	mg/l							
LCS (W4K2093-BS1)			**Prepared: 11/26/24**	**Analyzed: 12/01/24**						
Biochemical Oxygen Demand	180	2.0	mg/l	198		91	85-115			
Duplicate (W4K2093-DUP1)	**Source: 4K25097-02**		**Prepared: 11/26/24**	**Analyzed: 12/01/24**						
Biochemical Oxygen Demand	2.62	2.0	mg/l		2.69			3	20	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139
www.wecklabs.com

Torrent Laboratory
483 Sinclair Frontage Road
Milipitas, CA 95035

Project Number: 2411225

Project Manager: Kathie Evans

Reported:
12/10/2024 17:42

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	Method Reporting Limit (MRL) is 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.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139
www.wecklabs.com