

# **FACTORY STREET LEAD SITE TIME-CRITICAL REMOVAL ACTION REPORT**

**Factory Street Lead Site Removal Action  
Honolulu, Honolulu County, Hawaii**



**Prepared for:  
U.S. Environmental Protection Agency  
Region 9, Emergency Response Section**

**EPA Contract Number: 68HE0919D0002  
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## LIST OF ABBREVIATIONS AND ACRONYMS

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≤	less than or equal to
%	percent
μg/m <sup>3</sup>	microgram per cubic meter
μm	micrometer
bgs	below ground surface
ASTM	American Society for Testing and Materials
BMPs	best management practices
BWS	Board of Water Supply
CBR	California Bearing Ratio
CFR	Code of Federal Regulation
CIC	Community Involvement Coordinator
DCP	Dynamic Core Penetration
DMP	data management plan
DQO	data quality objective
DU	decision unit
EAL	Environmental Action Level
EHMP	Environmental Health Management Plan
EPA	U.S. Environmental Protection Agency
ERQASP	Emergency Response Quality Assurance Sampling Plan
ERRS	Emergency Rapid Response Services
ERS	Emergency Response Section
FOSC	Federal On-Scene Coordinator
ft	feet
HECO	Hawaiian Electric Company
HDOA	Hawaii Department of Agriculture
HDOH	Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response
HPUC	Hawaii Public Utilities Commission
ICP-MS	inductively coupled plasma-mass spectrometry
IDW	investigation-derived waste
kg	kilogram
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MCE	mixed cellulose ester

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## LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

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MDL	method detection limit
mg/L	milligrams per liter
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligram per cubic meter
MI	multi-incremental
MS/MSD	matrix spike/matrix spike duplicate
N/A	not applicable
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
pDR	personal DataRAM
PEL	permissible exposure limit
PID	photoionizing detector
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
REL	recommended exposure limit
RL	reporting limit
RPD	relative percent difference
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SRM	standard reference material
START	Superfund Technical Assessment and Response Team
TCLP	Toxicity Characteristic Leaching Procedure
TSI®	TSI Incorporated
TWA	time weighted average
UFCW	United Food & Commercial Workers
UTB	Untreated Base Course
VOCs	volatile organic compounds
WESTON®	Weston Solutions, Inc.
XRF	X-ray fluorescence

## EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 9 Federal On-Scene Coordinators (FOSCs) tasked Weston Solutions, Inc.'s (WESTON) Superfund Technical Assessment and Response Team (START) to support the time-critical removal action at the Factory Street Lead Removal Site located in Honolulu, Honolulu County, Hawaii (hereinafter referred to as the Site and/or the Project area). A Site location map is provided in Figure ES-1. WESTON START provided removal action support to EPA under EPA Region 9 START IV Contract number EP-S5-13-02, under Technical Direction Document number 0002/1302-T2-R9-19-04-0001 and under the EPA Region 9 START V Contract number 68HE0919D0002, under Subtask number 68HE0919F0082.00.

In 2017, the Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response (HEER) Office assessed contamination in Factory Street soils between North King Street and Waterhouse Street. The site assessment found lead concentrations in multi-incremental (MI) samples ranging from 7 to more than 24,000 milligrams per kilogram (mg/kg). Many of the results greatly exceed EPA's Regional Screening Level (RSL) and HDOH's Tier 1 Environmental Action Level (EAL) for lead. The highest lead concentrations were detected in shallow soils close to the intersection of Factory Street and North King Street; these findings are consistent with prior assessment work at the Site. The main areas of concern were the top 12 inches of soil below ground surface (bgs) in decision unit (DU)-3 through DU-6. Lead concentrations of MI soil samples for DU-3 through DU-6 from the HEER assessment are presented in Figure ES-2. The HDOH HEER Office contacted EPA in 2019 to request assistance addressing lead contamination on Factory Street.

After reviewing the various recent assessments, EPA determined that current lead concentrations were extremely elevated in the shallow surface soils of Factory Street and that a time-critical removal action was appropriate in DU-3 through DU-6. The last listed owner of Factory Street is Kalihi Taro and Land Company Limited, which was dissolved in 1926, leaving Factory Street abandoned. Factory Street has not been properly maintained, and EPA determined that if no action was taken the limited asphalt cover would continue to degrade, exposing more highly contaminated surface soil and further exacerbating human health exposure risk.

EPA's overall removal action objective for the Site was to significantly reduce or eliminate exposure to lead contamination that may pose an imminent and substantial endangerment to human health and/or the environment, and to restore the Site in accordance with City & County of Honolulu construction standards. In order to complete the removal objective, EPA needed to first complete various planning activities, such as conducting waste characterization sampling of the soil with elevated lead concentrations. Two soil borings were collected from the Site in DU-3 on August 15, 2019 during the planning phase. The top 12 inches of soil were collected, and hand delivered to Hawaii Analytical Laboratory for Toxicity Characteristic Leaching Procedure (TCLP) analysis for cadmium, chromium and mercury via EPA Method 1311m/7000Bm. These waste characterization results were combined with HDOH HEER TCLP results for lead collected July 26-July 28, 2017 in order to provide enough information to disposal facilities to allow for proper waste disposal.

On October 28, 2019, EPA and EPA's Emergency Rapid Response Services (ERRS) contractors mobilized to Factory Street to patch potholes, providing a temporary barrier between the source of contamination and community members until a more permanent action could be undertaken. Pothole patchwork was completed on October 30, 2019.

A START representative visited Halawa Valley Quarry in September 2019 and again in January 2020 to collect samples of base course materials to be used as backfill for the project. This sampling effort was to ensure that Site backfill materials would not expose community members to elevated levels of lead or other metals. Backfill materials were in-situ field screened using an Olympus Delta Professional X-Ray Fluorescence (XRF) spectrometer and sent under chain-of-custody control for laboratory definitive analysis for arsenic, barium, cadmium, chromium, lead, selenium, and silver via EPA Method 6010B. Results were less than HDOH Tier 1 EALs for unrestricted use based on a non-drinking water resource and within 150 meters of a surface water body, were consistent between visitations, and were within the normal background range for Hawaiian soils.

Between January 17 and March 9, 2020, the EPA Region 9 Emergency Response Program completed contaminated soil removal and Site restoration along Factory Street between the intersections of North King Street and Waterhouse Street, in DU-3 through DU-6, to a depth of at least 12 inches bgs. Soil was segregated into non-hazardous waste or hazardous waste based on lead TCLP results and origin. Excavated soil was placed directly into lined cubic yard boxes by the excavator operator, rather than being stockpiled on site, to be protective of human health in the densely populated neighborhood. Once full, cubic yard boxes were loaded and secured inside shipping containers. When shipping containers were full, they were sent off-site for disposal at appropriate facilities. Small sections of the street were excavated and backfilled each day to minimize impacts to the community on the busy street.

MI soil samples were collected from the limit of excavation prior to backfilling each excavated section, to determine concentrations of lead in soil left in place. Each MI soil sample consisted of 30 increments, and MI soil samples were specific to each DU. Five MI soil samples were collected (including one duplicate sample) and submitted to the laboratory under chain-of-custody control for analysis of arsenic, barium, cadmium, chromium, lead, selenium and silver via EPA Method 6010B. The duplicate sample was collected from DU-6, the DU with the highest lead in soil concentration. MI soil sample FS-S-5, collected from DU-5, had a soil lead concentration of 630 mg/kg; and MI soil samples FS-S-6 and FS-S-6-D, collected from DU-6, had soil lead concentrations of 16,000 mg/kg and 9,300 mg/kg, respectively. These samples exceeded the EPA RSL for residential soils. Soil lead concentrations left in place at the limits of excavation are illustrated in Figure ES-3.

Lead concentrations at the excavation limit in DU-5 and DU-6 were higher than anticipated. Past investigations excluded the shoulder areas of Factory Street to avoid disturbing underground utilities concentrated in this area. The expected source of contamination is thought to be discrete, with the highest lead concentrations likely located in the shoulders of Factory Street towards the North King Street intersection. This may have resulted in past studies significantly underestimating lead concentrations. EPA's removal action and excavation limit soil sampling

included the shoulder areas which likely explains why lead concentrations left in place in DU-5 and DU-6 were higher than expected.

Construction fencing was placed along the limit of excavation prior to backfilling, to demarcate the excavation limit and warn future excavation workers of the potential for lead-contaminated soil below the construction fencing. Base course materials obtained from Halawa Valley Quarry were then used to backfill the excavation. Upon completion of excavation and backfilling operations, base course was compacted, and compaction tested prior to resurfacing with asphalt treated base course and asphalt or concrete. The Project area was fully restored to City & County of Honolulu construction standards.

Throughout the removal action EPA ensured that workers and community members were protected from exposure to lead contamination. Construction best management practices were implemented to minimize exposure to particulate matter and run-off from precipitation events. Water was applied to newly excavated areas to keep them moist and prevent particulates from becoming airborne. The borders of recently backfilled excavations were covered with plastic sheeting to prevent materials from running off overnight during precipitation events, and bags of sand were used along the borders of known low points to protect adjacent properties from any run-off that may occur. Traffic control was provided for vehicles and pedestrians on both sides of the Project area to minimize disruptions to the surrounding community, to safely allow access to residential and commercial properties, and to be protective of site workers. Close coordination with utility companies occurred during the removal action to protect community members and site workers and to limit any interruption in services to community members.

During intrusive operations, perimeter air monitoring and air sampling was conducted using a series of four air monitoring/sampling stations positioned around the four sides of the area to be excavated. Perimeter air monitoring/sampling stations consisted of a TSI<sup>®</sup> Incorporated (TSI) Dusttrak aerosol monitor and a SKC AirChek<sup>®</sup> Touch sampling pump. A work zone air monitoring/sampling station was also deployed during intrusive operations, consisting of a Thermo Scientific<sup>™</sup> personal DataRAM 1000AN aerosol monitor and a SKC AirChek Touch sampling pump. The work zone monitoring/sampling station was located based on where the highest exposure risk was anticipated. DU-specific health-risk based particulate screening levels were established based on MI soil sampling results from the HDOH HEER Office 2017 Site Investigation.

Air samples collected during the first 7 days of intrusive operations were submitted to a contract laboratory for definitive analysis for lead via National Institute for Occupation Safety and Health (NIOSH) Method 7300. Laboratory definitive analyses were used to draw correlations between particulate air monitoring data and lead air sampling data, to verify that real time air monitoring was protective of community and worker health and safety. After analyzing data from the first 7 days of intrusive field operations, EPA determined that real-time air monitoring results were adequate to determine the effectiveness of Site engineering controls and ensure the protection of Site workers and community members from airborne contaminants. As an extra precaution, air samples collected from the work zone during excavation of DU-6, the DU with the highest concentration of lead in soil, were also submitted to the laboratory for definitive analysis via

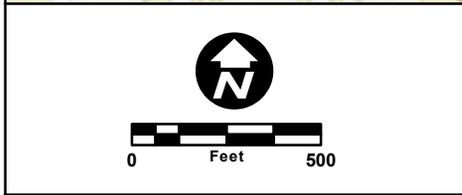
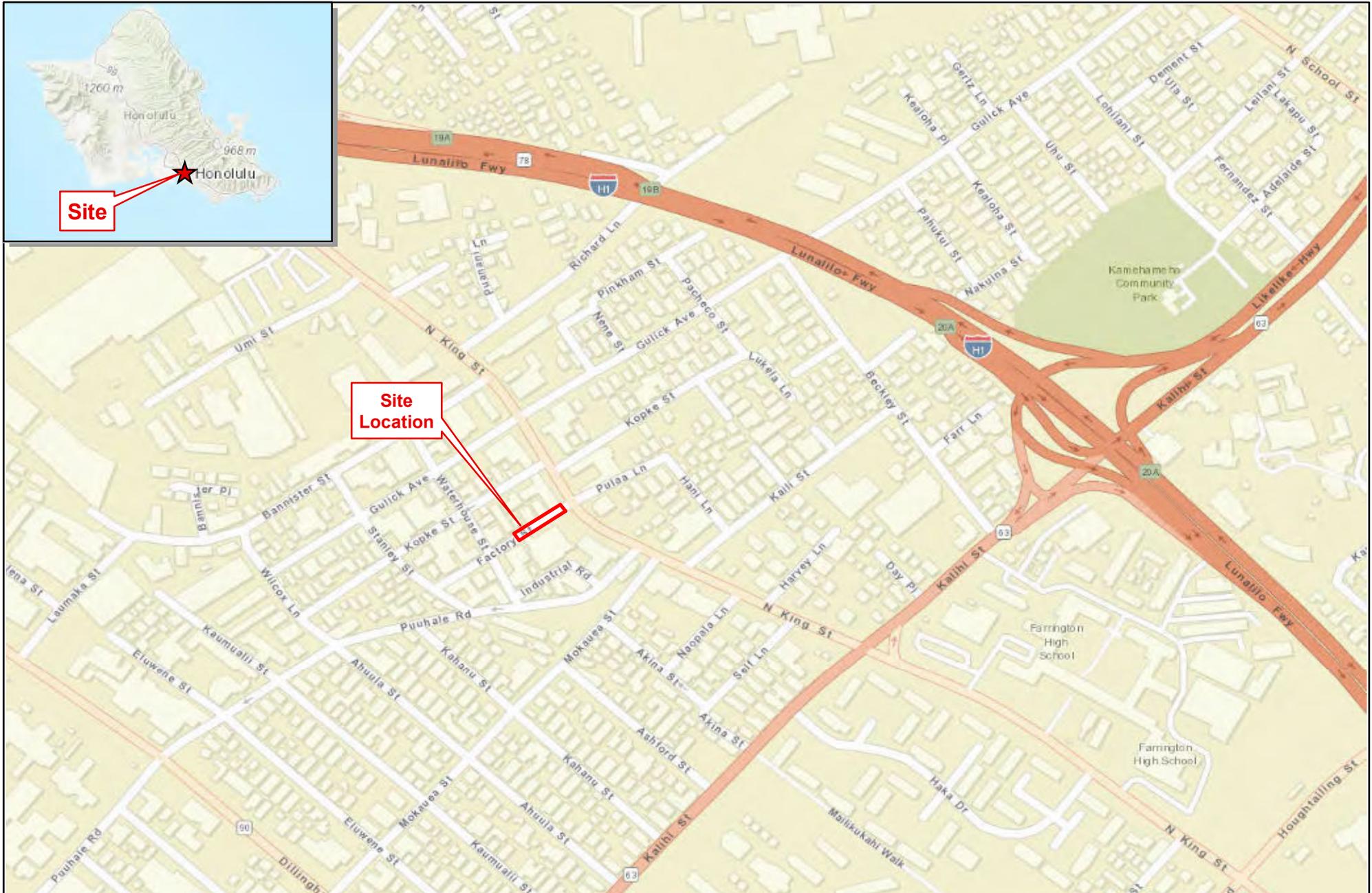
NIOSH Method 7300. No project related particulate screening level or lead action level exceedances occurred during intrusive operations.

DU specific particulate screening levels were back calculated using maximum MI lead concentrations from the HDOH HEER 2017 Site Investigation. Although these concentrations may be underestimated, a safety factor of 2 is built into the screening level essentially allowing for doubling of the concentrations while still being protective. The most conservative DU-specific screening level established for the Site based on a 10-hour TWA was 0.81 mg/m<sup>3</sup> for total airborne particulates in DU-6. The highest total particulate TWA observed during the removal action was 0.052 mg/m<sup>3</sup>, more than an order of magnitude below the most conservative DU-specific screening level established for the project.

Air samples were collected to support air monitoring data to ensure that construction best management practices were protective of workers and the community. A total of forty-four air samples were laboratory analyzed producing definitive results for lead in air, including thirty-two air samples collected in the most highly contaminated DU. The maximum concentration of lead in any air sample was 0.813 µg/m<sup>3</sup>, which is orders of magnitude lower than the OSHA PEL (based on a 10-hour TWA) of 40 µg/m<sup>3</sup>. Generally speaking, total particulate monitoring data and laboratory analyzed lead in air results were orders of magnitude lower than regulatory standards. Safety measures established for the project to protect both Site workers and the public were more than adequate.

Presently, no human-health exposure risk remains at the Site because lead-contaminated soil left in place is buried beneath at least 1 foot of restoration materials consisting of at least 6 inches of base course, 4 inches of asphalt treated base course and 2 inches of asphalt or 6 to 8 inches of base course and 4 to 6 inches of concrete. A risk to utility workers who may have to excavate to more than a foot bgs does still exist, however safety measures are in place for their protection. Construction fencing has been laid to demarcate the excavation limit and warn future utility workers that lead-contaminated soil may be found beneath the visual barrier. Furthermore, the HDOH HEER Office has developed an Environmental Health Management Plan (EHMP) for the area. This Time-Critical Removal Action Report will serve as a reference to inform an update to the EHMP.

Although the current risk of exposure has been mitigated, future maintenance of the Site is needed. If the street is left to fall into a state of disrepair, which could occur over a long period of time without maintenance, exposure of the community to lead-contaminated soil may occur in the future. EPA recommends the City & County of Honolulu and the State of Hawaii Department of Transportation work together to develop a plan to ensure that Factory Street is maintained to prevent future exposure risk to the community.



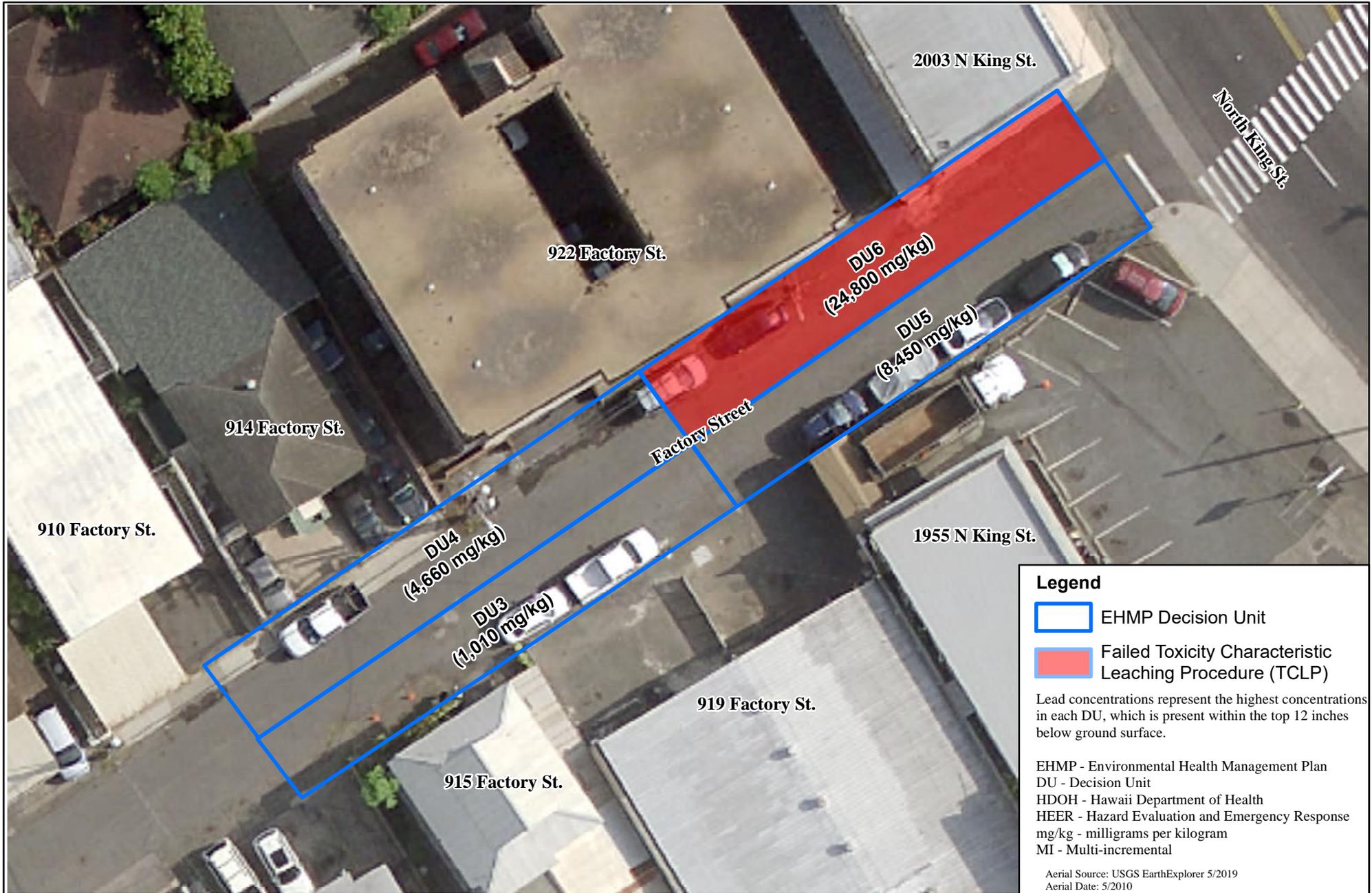
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 Emergency Response  
 Section



**FIGURE ES-1**  
**SITE LOCATION MAP**  
 Factory Street Site  
 Honolulu, Oahu, Hawaii



**Legend**

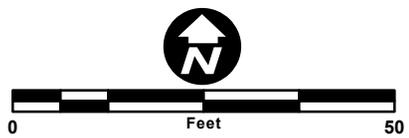
 EHMP Decision Unit

 Failed Toxicity Characteristic Leaching Procedure (TCLP)

Lead concentrations represent the highest concentrations in each DU, which is present within the top 12 inches below ground surface.

EHMP - Environmental Health Management Plan  
 DU - Decision Unit  
 HDOH - Hawaii Department of Health  
 HEER - Hazard Evaluation and Emergency Response  
 mg/kg - milligrams per kilogram  
 MI - Multi-incremental

Aerial Source: USGS EarthExplorer 5/2019  
 Aerial Date: 5/2010



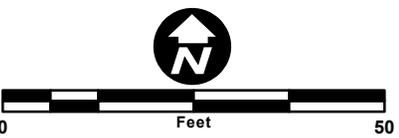
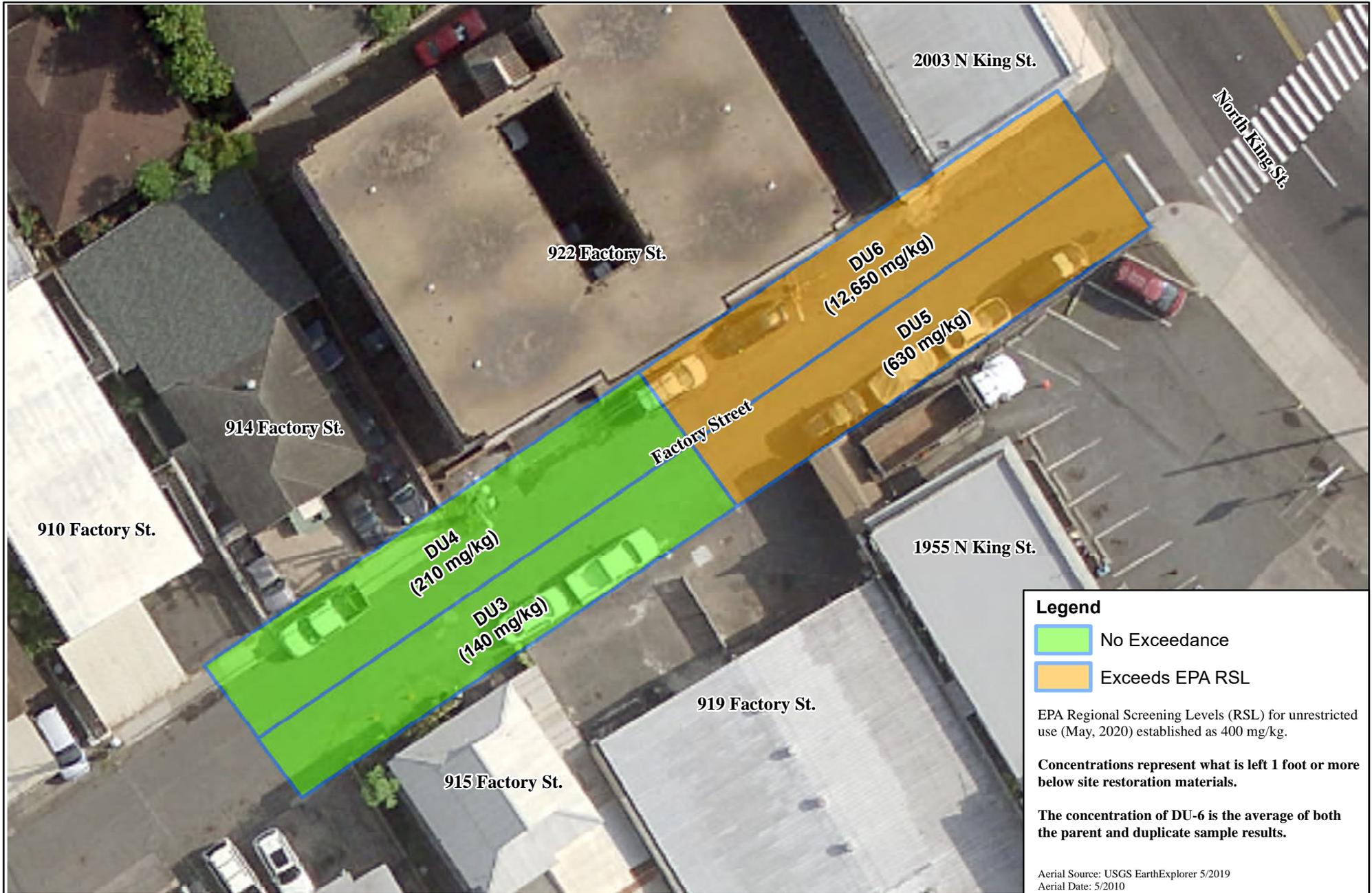
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**FIGURE ES-2**  
**2017 HDOH HEER MI SOIL**  
**LEAD CONCENTRATION MAP**  
**FACTORY STREET REMOVAL SITE**  
 HONOLULU, OAHU, HAWAII



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**FIGURE ES-3**  
**FINAL 2020 REMOVAL ACTION EXCAVATION**  
**LIMITS FOR LEAD IN THE SOIL**  
**FACTORY STREET REMOVAL SITE**  
 HONOLULU, OAHU, HAWAII

# 1. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 9 Federal On-Scene Coordinators (FOSCs) tasked Weston Solutions, Inc.'s (WESTON) Superfund Technical Assessment and Response Team (START) to the support removal action at the Factory Street Lead Removal Site located in Honolulu, Honolulu County, Hawaii (hereinafter referred to as the Site and/or Project area). WESTON START provided removal action support to EPA under EPA Region 9 START IV Contract number EP-S5-13-02, under Technical Direction Document number 0002/1302-T2-R9-19-04-0001 and under the EPA Region 9 START V Contract number 68HE0919D0002, under Subtask number 68HE0919F0082.00.

The Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response (HEER) Office conducted an extensive investigation on Factory Street between North King Street and Waterhouse Street in 2017. The decision units (DUs) found to have the highest lead concentrations, and therefore the DUs of most significant health risk, were DU-3 through DU-6, at depth profiles to 1 foot below ground surface. The HDOH HEER Office's 2017 Site Investigation, and other historical investigations and removal actions related to the Site, are presented in more detail in Section 2.4, Previous Investigations and Removal Actions.

The HDOH HEER Office contacted EPA in 2019 to request assistance addressing lead contamination on Factory Street. After reviewing the various recent assessments, EPA determined current lead concentrations were extremely elevated in the shallow surface soils of Factory Street, and that the Site warranted a time-critical removal action to protect human health and the environment. The highest lead levels were located adjacent to the 2003 North King Street parcel, with concentrations decreasing dramatically towards Waterhouse Street, suggesting that discrete sources of lead on Factory Street may have experienced some limited migration over time. It also appeared elevated lead levels were limited to Factory Street and shoulder areas and did not continue onto the private parcels immediately adjacent to the most elevated areas. Through consultation with the HDOH HEER Office, it was agreed that EPA would perform the removal action in DUs that exceed the EPA Regional Screening Levels (RSLs). EPA's overall removal action objective at the Site was to significantly reduce or eliminate exposure to lead contamination that may pose an imminent and substantial endangerment to human health and/or the environment, and to restore the Site in accordance with City & County of Honolulu construction standards.

Elevated lead levels may also exist in surface soils under the pavement on North King Street near the intersection with Factory Street. However, North King Street is a major thoroughfare that is administered by the City & County of Honolulu, and the pavement is maintained in excellent condition. One very small section of street within the King Street right of way at the corner of Factory Street was not maintained to the same standards as North King Street more generally. The City & County of Honolulu assessed this area in 2019 and did not find elevated lead under the pavement. As a result, there was no current human exposure to lead from surface soils on North King Street when EPA was conducting clean-up efforts on Factory Street.

Factory Street, in contrast, contained numerous potholes, crumbling asphalt, and exposed soil. EPA broadly mapped the condition of Factory Street in 2019 and generally found the areas of

highest lead contamination corresponded with the most degraded sections of the street. Because the abandoned street was not being maintained, if no action was taken, the limited asphalt cover would likely continue to degrade, exposing more highly contaminated surface soil. EPA was concerned about the state of disrepair of Factory Street and, out of an abundance of caution for public health, decided to temporarily patch potholes until a more permanent action could be undertaken. On October 28, 2019, EPA and Emergency Rapid Response Services (ERRS) contractors mobilized to Factory Street to patch potholes, providing a temporary barrier between the source of contamination and community members and effectively disrupting the exposure pathway. Pothole patchwork was completed on October 30, 2019.

Between January 17 and March 9, 2020, the EPA Region 9 Emergency Response Section (ERS) and START and ERRS contractors completed contaminated soil removal and Site restoration along Factory Street between the intersections of North King Street and Waterhouse Street, in DU-3 through DU-6. Excavated soil was removed from the Site and transported to its final disposal repository based on its hazardous or nonhazardous waste designation, and the Project area was backfilled and resurfaced. This report documents the 2019 waste characterization sampling, pothole patchwork and Site preparations, and the 2020 removal action, removal sampling and analysis, and construction at the Site. Technical support was performed by START in accordance with the Site-Specific Sampling and Analysis Plan (SAP), Data Management Plan (DMP), and Data Quality Objectives (DQOs), documented under the cover Sampling and Analysis Plan, Factory Street Lead Site Removal Action, Honolulu, Honolulu County, Hawaii, January 2020 (WESTON, 2020) and the Emergency Response and Time-Critical Quality Assurance Sampling Plan (ERQASP) for Soil Sampling dated September 9, 2019 (WESTON, 2019). Construction oversight was performed by a subcontractor under ERRS in accordance with the Site Construction Quality Assurance (QA)/Quality Control (QC) Plan, which is included in **Appendix A**.

## **2. SITE DESCRIPTION AND HISTORY**

### **2.1 SITE LOCATION**

The Site consists of a portion of Factory Street, between North King Street and Waterhouse Street, in the Kalihi subdivision of Honolulu, on the island of Oahu, Hawaii. A Site location map is provided as Figure 2-1. Historically, the Site has been associated with the address 2003 North King Street, Honolulu, HI, 96819, at the intersection of Factory Street and North King Street. The geographic coordinates of 2003 North King Street are latitude 21° 19' 56.8884" and longitude 157° 52' 43.4712". The Project area is approximately 32 ft by 200 ft, or 6,400 square ft (Figure 2-2). Elevation at the project Site ranges from approximately 40 to 49 ft above mean sea level. The nearest surface water body is the Kalihi Stream, which is located approximately 1,100 ft north-northwest of the project site.

### **2.2 POPULATION AND LAND-USE**

The general area is zoned as mixed industrial use, and includes an apartment complex, other residential housing, and small businesses. The street naming in the area (e.g., Factory Street and Industrial Road) indicates historical heavy industrial use. However, aerial imagery suggests the area has been primarily occupied by residential units and small businesses since at least 1952. The last listed owner of Factory Street (including neighboring lots) is the Kalihi Taro and Land Company, Limited. The Kalihi Taro and Land Company was dissolved in 1926. Neighboring lots were sold to private owners, but the street was not, leaving Factory Street ownerless and abandoned. Under Hawaii state law, the property does not automatically escheat to any state or local authority. No private or public entity has taken title to the street or taken action to condemn it or seize it; therefore, the only legal owner of the Site is a defunct corporation. EPA obtained a warrant for access from the U.S. District Court in Hawaii in order to conduct work associated with the removal action.

Factory Street is a busy side street in a dense, urban neighborhood and serves as a major corridor to North King Street, both for pedestrians and cars. The FOSC witnessed heavy foot and car traffic during various Site visits in April and May 2019 and during Site work in early 2020. Almost 2,000 residents live within a 0.1-mile radius of the Site (or within 0.04 square miles), which corresponds to a population density of almost 42,000 people per square mile. EPA identified schools and parks within a 0.5-mile radius of the Site, to understand the high pedestrian and vehicular traffic in the area. EPA found seven schools, including five elementary schools, in addition to the Kamehameha Community Park, Kalakaua District Park, and parts of Kalihi Stream.

The Site is surrounded by an underserved, overburdened community faced with many environmental justice issues. The mostly minority neighborhood is comprised of a population that is reported to be 87 percent (%) Asian, 4% Pacific Islander, and 3% White, with another 5% of people identifying as two or more races. Compared to the rest of Hawaii, this neighborhood is in the top 2% of most linguistically isolated communities and is in the top 3% for adults with less than a high school education.

## 2.3 SITE HISTORY

According to information obtained from previous assessments that have been completed at the Site (described as follows), the source of lead contamination appeared to be discrete, rather than associated with a more widespread urban source. The following commercial businesses, formerly located at the corners of the Factory Street and North King Street intersection, have been noted in prior investigations as potential sources of discrete lead contamination:

- Dental shop
- Sign painting shop
- Kalihi Fishing Supply
- Battery rebuilder

The dental shop, sign painting shop, and Kalihi Fishing Supply were identified by the HDOH HEER Office in the April 1996 *Site Inspection – Factory Street Lead Site* (HDOH, 1996) as having used or stored chemicals on-site. Other documents (including a 1993 Underground Storage Tank Closure report for Pacific Tire and a January 27, 1994, HDOH Fax Message from Michael Richardson to Leslie Au) indicated that the 1955 North King Street property was previously operated as a Shell Oil Company service station that conducted automobile fueling; repairs and maintenance; a tire retail and installation station; and a battery rebuilder.

## 2.4 PREVIOUS INVESTIGATIONS AND REMOVAL ACTIONS

In 1993, HDOH HEER conducted a lead study inside and outside of buildings on Factory Street. This was in response to reports of elevated blood lead levels in multiple children from a family living on Factory Street, with a maximum reported blood lead level of 33 micrograms per deciliter. Soil samples were collected in the Factory Street area, including four areas of exposed soil near an apartment complex on Factory Street. Lead concentrations from surface soils directly in front of the apartment complex ranged from 41,000 mg/kg to 342,000 mg/kg of lead. The family was relocated. HDOH HEER issued an Emergency Response Order to the owner of the apartment complex to stabilize and control the hazardous substance. The landowner submitted a work plan to remove 6 to 12 inches of soil from contaminated areas and to pave those areas with asphaltic concrete. The landowner did not submit documentation of the soil volume removed from the Site or post-removal confirmation sample results. HDOH HEER provided the landowner with a letter documenting that his interim response action was acceptable, and that no further action was required at the time.

The investigation included accounts from a witness who reportedly grew up in the area. The witness identified the Kalihi Pawn Shop (currently located at 2003 North King Street) as having once been the site of a fishing supply store. He reported that from approximately 1955 to 1966 the Kalihi Fishing Supply dumped lead ash from the manufacture of fishing weights on the ground at the Site. As a child, he would rummage through the ash to find big pieces of lead to make his own fishing weights. He believed that the lead was derived from discarded automobile batteries. The fishing supply store was located close to the area with highest levels of lead contamination, and HDOH and later EPA identified this as the most likely source of lead contamination.

HDOH HEER conducted additional downgradient sampling in 1993, and in 1994 submitted a Preliminary Assessment (HDOH, 1994) to EPA recommending further evaluation of the Site. EPA determined that further investigation was necessary to evaluate the Site, and, as a result, a Site Assessment was completed in 1995 (Ecology and Environment, 1995). The assessment showed continued lead contamination at the Site, with lead concentrations up to a maximum of 117,000 mg/kg. EPA found that the greatest levels of contamination at the Site were between the street and the buildings located at 2003 North King Street and 1955 North King Street. Although elevated levels of lead continued to exist on-site, all areas of high lead concentration were paved. Both the EPA Site Assessment in 1995 and the subsequent HDOH Site Inspection in 1996 recommended No Further Action because it was determined there were no current risks of exposure to residents.

In 2016, the HDOH HEER Office reopened the Site after a visit determined the Factory Street pavement was degrading, exposing surface soils that were likely contaminated with lead. In 2017, HEER assessed contamination in Factory Street soils between North King Street and Waterhouse Street. During the investigation, six horizontal DUs and six vertical DUs were evaluated. Vertical DUs were established at 0 to 0.5 feet (ft) below ground surface (bgs), 0.5 to 1 ft bgs, 1 to 2 ft bgs, 2 to 3 ft bgs, 3 to 4 ft bgs and 4 to 5 ft bgs. Multi-incremental (MI) soil samples were collected from 30 increments from their respective depth profile from soil borings advanced to a depth of 5 ft bgs. The investigation excluded the shoulder areas of Factory Street to avoid disturbing underground utilities concentrated in this area.

The site assessment found lead concentrations in MI samples ranging from 7 to more than 24,000 mg/kg. Many of the results greatly exceed EPA's RSL and HDOH's Tier 1 Environmental Action Level (EAL). The highest lead concentrations were detected in shallow soils close to the intersection of Factory Street and North King Street; these findings were consistent with prior assessment work at the Site. Lead concentrations of MI soil samples for DU-3 through DU-6 from the 2017 HEER assessment are presented in Figure 2-3. The figure depicts the highest lead concentrations in each DU, which is present within the top 12 inches bgs.

HEER analyzed all MI samples with lead laboratory results exceeding 100 milligrams per kilogram (mg/kg) for lead toxicity using the Toxicity Characteristic Leaching Procedure (TCLP). The results showed the surface soil (0 to 0.5 ft) in the DU adjacent to 2003 North King Street (DU-6) exceeded the lead TCLP limit of 5 milligrams per liter (mg/L), the regulatory level set out at 40 Code of Federal Regulation (CFR) §261.24. Soil from the top 6 inches of DU-6 needed to be disposed of as hazardous waste at an appropriate facility with Resource Conservation and Recovery Act (RCRA) Waste Code D008. Soil from all other DUs (i.e., DU-3, DU-4, DU-5, and the 0.5 to 1 ft bgs horizon of DU-6) did not exceed the lead TCLP limit and could be disposed of as non-hazardous waste.

In October 2017, in response to recent soil sampling on Factory Street, HEER conducted an emergency action to patch potholes in the shoulder areas of contaminated portions of the street. State On-Scene Coordinators from HDOH HEER assessed the Site to determine where potential exposure to lead-contaminated soils existed. A temporary patch was applied to these sections of the street to prevent exposure of residents to lead in surface soils. HEER considered this action temporary.

In 2017, HEER directed the owners of private parcels adjacent to the areas of highest lead contamination to conduct site assessments to determine whether lead contamination existed on their property. The owners responded by completing a joint assessment of the two parcels adjacent to Factory Street. The assessment followed the same MI sampling scheme as the HEER site assessment of Factory Street. Two samples exceeded the HDOH Tier 1 EAL. Both slightly elevated samples were collected deeper than 2 feet below the paved parking lot at 1955 North King Street. No further action was taken following this assessment because no current human exposure to contaminated soil existed on these parcels.

In 2017, the City & County of Honolulu Board of Water Supply (BWS) assessed soil lead concentrations in water meters and valve boxes in the larger Factory Street area. The purpose of this assessment was to evaluate potential worker safety hazards from lead exposure and to remove soil found to exceed the HDOH Construction/Trench Worker EAL of 800 mg/kg lead. BWS collected discrete soil samples from 99 water meters and valve boxes in an area centered on the intersection of Factory Street and North King Street. Of the samples taken, 19 had soil lead concentrations that equaled or exceeded the Construction/Trench Worker EAL (EA, 2018). Contaminated soil was removed from those water meters and valve boxes and replaced with clean material. The highest discrete lead concentration found during this assessment was 4,000 mg/kg. Highest lead concentrations were generally located on Factory Street and on North King Street near the intersection with Factory Street.

In 2019, EPA determined that the Site warranted a time-critical removal action to protect human health and the environment. EPA was concerned about the state of disrepair of Factory Street, and out of an abundance of caution for public health decided to temporarily patch potholes until a more permanent action could be undertaken. On October 28, 2019, EPA and ERRS contractors mobilized to Factory Street to patch potholes, providing a temporary barrier between the source of contamination and community members, effectively disrupting the exposure pathway. Pothole patchwork was completed on October 30, 2019.

### 3. FIELD ACTIVITIES

During planning and implementation of field work, EPA coordinated extensively with HDOH HEER, various Departments from the City & County of Honolulu, and with appropriate utilities such as the BWS. EPA and the ERRS and START contractors mobilized to the Site to conduct site setup, community outreach, and begin the time-critical removal action on January 17, 2020. Removal of lead-contaminated soil and the restoration of the Site were completed March 9, 2020. A photograph log detailing field activity is presented as **Appendix B**.

EPA excavated contaminated soil when the associated DU exceeded the EPA RSL of 400 mg/kg lead based on the 2017 HDOH HEER Site Investigation. Based on this criteria, EPA's removal action objective was to excavate contaminated soil from the top 12 inches of DU-3 through DU-6. Excavated soil was transported to appropriate disposal facilities based on the results of TCLP analysis, and in accordance with the off-site rule (40 CFR §300.440). EPA backfilled the street with appropriate base course material and paved excavated portions of Factory Street, consulting the City & County of Honolulu Department of Planning and Permitting structural design requirements for new asphalt concrete pavements. Excavation and restoration were extended a short distance onto neighboring parcels where a preferred paving end point (such as a residential building) was located, with permission from neighboring landowners.

This section summarizes community outreach, topographic and boundary survey, sampling and monitoring activities, excavation operations, and subsequent restoration completed at the Site during 2019-2020 field work.

#### 3.1 COMMUNITY OUTREACH

##### 3.1.1 Project Website and Outreach Documents

A project-specific website was established to share information with the community. Information was presented in English, Tagalog, and Ilocano. Tagalog and Ilocano are two Filipino dialects predominately spoken within the community surrounding Factory Street. Information on the website included, but was not limited to, a project profile; notices; images; contact information for the FOSC and Community Involvement Coordinator (CIC); and project related documents such as factsheets, informational flyers, street closure information, site vicinity maps, previous assessments, action memorandums, and information about the administrative record and Superfund Lead-Contaminated Residential Sites Handbook.

Project documents such as factsheets and informational postcards were mailed to residents and businesses located in the vicinity of the Site and were disseminated at Neighborhood Board Meetings ahead of Site work.

The project website is located at <https://response.epa.gov/FactoryStreet>.

### **3.1.2 Project Phone Line**

A project phone line was established to provide periodic updates on the removal action timeline and street closures. Information was presented in English, Tagalog, and Ilocano. A feature allowed callers to leave a message in their native language. Only a single message was received during the period where the project phone line was active. The message originated from a State regulator and was in English, resulting in no need for interpretation.

### **3.1.3 Site Outreach and Door to Door Activities**

Personnel from EPA, the HDOH HEER Office, and the language translation subcontractor were on-site to disseminate information to the community on January 17 and January 18, 2020, prior to the commencement of field activities. Project specific posters providing information in English, Tagalog, and Ilocano were developed and presented via establishment of an informational booth stationed near the Site. Project posters were placed on either side of the Project area for the duration of field work. In addition, personnel went door-to-door to engage residents who live directly adjacent to Factory Street ahead of and during excavation and restoration activities. Finally, EPA coordinated extensively with local officials and the media before and during Site work.

## **3.2 SITE LAY-DOWN YARDS**

Three separate lay-down yards were identified for the project. The primary staging area was located on the southeast corner of Factory Street and Waterhouse Street. A second lay-down yard located on the northwest corner of Factory Street and Waterhouse Street was used to stage equipment and materials. A section outside the fencing of this staging area was used to place a shipping container that was loaded with full cubic yard boxes containing hazardous waste soil. This shipping container was secured outside of operating hours. A third lay-down yard located on the corner of Kalihi Street and Auiki Street was used to stage shipping containers that were loaded with nonhazardous waste soil excavated from the Site. These shipping containers were also secured outside of operating hours. All three lay-down yards were inspected prior to mobilization and upon completion of Site work. No damage was observed at any of the lay-down yards and yards were determined to be left in good condition.

## **3.3 TOPOGRAPHIC AND BOUNDARY SURVEY**

R.M. Towill Corporation was subcontracted to provide a topographic and boundary survey for the Project area on Factory Street, which was conducted in June 2019.

The purpose of the boundary survey was to help understand property boundaries, which were not clearly defined near the Project area. A history of flooding and ponding on Factory Street combined with the absence of built drainage features prompted the topographic survey. EPA wanted to ensure that excavation within the Project area and subsequent repaving would not exacerbate flooding and ponding issues. Obtaining topographic features during the planning phase allowed project engineers to design Site resurfacing in a way that would preserve or improve water drainage for the community. Results of the survey supported the development of the paving plan for the Site.

The topographic and boundary survey can be found in **Appendix C**.

### **3.4 WASTE CHARACTERIZATION SAMPLING**

In order to arrange for proper disposal of lead-contaminated soil, EPA needed to complete waste characterization sampling at the Site. Representatives from EPA, START, and Hawaiian Engineering Group, Incorporated visited Factory Street on August 15, 2019 to collect two soil borings from DU-3 to support construction and design planning. Once project engineers had finished conducting bulk density testing, the top 12 inches of soil was collected, and hand delivered to Hawaii Analytical Laboratory for TCLP analysis for cadmium, chromium and mercury via EPA Method 1311m/7000Bm. These waste characterization results were combined with HDOH HEER TCLP results for lead collected July 26-July 28, 2017 in order to complete waste profiles and arrange for proper disposal of lead-contaminated soil and project debris. Results of waste characterization sampling are discussed in Section 4-1. Non-hazardous waste soil was shipped to Columbia Ridge Landfill, 18177 Cedar Springs Lane, Arlington, OR, 97812 and hazardous waste soil was shipped to Chemical Waste Management Incorporated, 17629 Cedar Springs Lane, Arlington, OR, 97812.

### **3.5 BASE COURSE SAMPLING**

On September 13, 2019, a START representative visited Halawa Valley Quarry to in-situ field analyze stockpiled backfill materials using a handheld Olympus Delta Professional x-ray fluorescence (XRF) spectrometer and collect samples for definitive laboratory analysis. The purpose of this sampling effort was to ensure that Site backfill materials would not expose community members to elevated levels of lead or other metals.

Each sample consisted of a five-point composite, weighing a total of 200 grams, collected from 25 cubic yards of base course material. Forty (40) grams of soil were collected using a designated Terra Core™ Sampler at each of the five increment locations within the 25 cubic yard bulk sample. The five increment locations were determined systematically in the field and were spaced approximately equally. Collected soil was transferred to a Ziploc® bag using the dedicated Terra Core™ Sampler and homogenized in the field. The sample was observed for non-parent material (i.e., debris) and field screened for metals using a handheld Olympus Delta Professional XRF instrument (EPA XRF unit number 550326) operated in accordance with the manufacturer's guidance. Before operation of the XRF each day, the unit was allowed the manufacturer recommended warm up time of 25 to 30 minutes. To determine whether the XRF instrument was within resolution and stability tolerances, an energy calibration check was run with a pure manganese element standard at the beginning of each day at the first XRF analysis, and at any time when the instrument detected the characteristic x-ray lines were shifting. To check the accuracy of the instrument and to assess the stability and consistency of analyses, a standard reference material (SRM) sample (National Institute of Standards and Technology 2702) was analyzed each day the XRF unit was utilized. The measured values for each SRM sample run during field XRF analysis for the project were within ±20% standard deviation of the true value and considered acceptable.

Details were recorded in a field logbook. The sample was then transferred to an 8-ounce sample jar, labelled, and placed on ice in a cooler until it could be shipped to Eurofins TestAmerica Laboratory located in Irvine, California, under chain-of-custody control. A total of six samples, including one duplicate sample, were collected and analyzed for arsenic, barium, cadmium, chromium, lead, selenium and silver using EPA Method 6010B and EPA Method 7471A for mercury. Additional volume was collected for one sample in sufficient quantities for the laboratory to conduct matrix spike/matrix spike duplicate (MS/MSD) analysis. The soil sampling and analysis QA/QC procedures are provided in the Site ERQASP (WESTON, 2019).

On January 17, 2020, a START representative visited Halawa Valley Quarry a second time to in-situ field assess stockpiled backfill materials using a handheld Olympus Delta Professional XRF spectrometer (EPA XRF unit number 550326) and to collect a sample for definitive laboratory analysis to ensure conditions were consistent with the previous visit. An identical screening and sampling approach was adopted where five, five-point composite samples were field screened with the XRF spectrometer and one five-point composite sample was collected and shipped to Eurofins TestAmerica Laboratories in Irvine California under chain-of-custody control for definitive analysis via EPA Method 6010B. Base course materials were determined to be appropriate for use on Site. Detailed results of in-situ field screening and laboratory definitive analysis are presented in Section 4.2.

### **3.6 EXCAVATION AND BACKFILLING OPERATIONS**

On January 20, 2020, EPA began excavation of lead-contaminated soil at the Site. Through consultation with the HDOH HEER Office, it was agreed that EPA would remove contaminated soil in DUs that exceeded the EPA RSL of 400 mg/kg lead based on the 2017 HEER Site Investigation. Based on this criteria, EPA's removal action objective was to excavate contaminated soil from at least the top 12 inches of DU-3 through DU-6.

Soil was excavated at the Site to a depth of at least 12 inches bgs using excavators and hand-digging methods, placed directly into lined cubic yard boxes, and segregated into non-hazardous waste soil and hazardous waste soil based on waste profiles. Each cubic yard box was given a unique identifier to assist with waste tracking. Once full, cubic yard boxes were marked appropriately and loaded into shipping containers using a forklift and pallet jack. Hazardous waste cubic yard boxes remained on-site, with full cubic yard boxes being loaded into a shipping container staged outside of the secondary lay-down yard. Non-hazardous waste cubic yard boxes were loaded and secured onto a flatbed truck where they were transported a short distance to a satellite lay-down yard. Cubic yard boxes containing non-hazardous waste soil were then transferred to staged shipping containers. All shipping containers were secured when not being loaded or tended. Once shipping containers were full, they were placarded appropriately, sealed, and could be scheduled for transport to the contiguous U.S. for final disposition at their respective waste disposal facilities based on their waste designation. Site surveillance was provided by contracted personnel during field operations, which provided an additional layer of security for hazardous waste soil secured in shipping containers that remained at the Site.

Only small portions of the Site were excavated each day so that excavated sections could be backfilled the same day, allowing EPA to provide local vehicle access to businesses and

residences and minimizing impacts to the community. This also ensured that no potentially lead-contaminated soil was accessible to community members outside of Site working hours, effectively preventing community exposure to possible lead contamination.

Upon completion of daily excavation in a specific portion of the Site, the stiffness of the native material at the excavation limit was tested. When native materials were determined to not be stiff enough to support project restoration based on the Site paving plan, ERRS crews continued to excavate up to an additional 6 inches and re-tested the native material for stiffness until it was determined the material was adequate. Alternatively, ERRS crews could install geotextile fabric ahead of backfilling operations to support Site restoration. Once excavation was completed to final depth, soil increments were collected from the bottom of the excavation for sampling and construction fencing was laid across the excavation to demarcate the excavation limit. The construction fencing serves as a visual barrier to warn future construction workers of the potential for lead-contaminated soil beyond the fencing.

The excavation was then backfilled with base course material and compacted. Construction best management practices (BMPs) were employed to limit any off-site migration in the event of precipitation events. At the end of the day after backfilling, plastic sheeting was laid covering the boundary of the newly excavated area and the area to be excavated the following day. Bags of sand were used to weigh down the plastic sheeting along its edges. In addition, bags of sand were used along the boundary of a residential property known to be adjacent to a Project area low point to prevent run-off from potentially exiting the Site and entering the property.

All areas of DU-3 through DU-6 were excavated to at least 12 inches bgs with one exception in DU-6. During excavation, ERRS crews encountered a small concrete slab beginning approximately 2-3 inches bgs and ending about 6 inches bgs in DU-6. The concrete slab was in front of the parking entrance for the businesses located at 2003 North King Street and is illustrated in Figure 3-1. The concrete slab was placed directly on top of an underground water line on Site. EPA determined that the concreted area may have been related to previous cleanup completed on the Site in 1993, overseen by HEER, or may have been related to construction of the driveway to the parking area. EPA decided not to excavate the concrete slab, as excavation would have likely damaged the underlying water line and potentially gas lines in the area. Additionally, the concrete area continued to a depth of 6 inches bgs, which encompassed the very elevated lead concentrations in DU-6. Construction fencing was placed on top of the concrete slab ahead of restoration activities, to provide a visual barrier of the extent of EPA's excavation on Site.

Upon completion of all Site excavation, the Project area was resurfaced using asphalt treated base course and asphalt or concrete. Pedestrian walkways were installed along the southern and northern boundaries of the Project area. The sidewalks were designed to be flush with the resurfaced roadway to maintain parking for residents who live near the Project area. Street reconstruction, including materials and compaction testing, is discussed in detail in Section 3.12.

### **3.7 EXCAVATION LIMIT SOIL SAMPLING**

EPA conducted soil sampling at the base of Site excavation to document concentrations of lead and other metals left on Site underneath Site reconstruction. The results of excavation limit soil sampling will inform an update to the HDOH HEER Environmental Health Management Plan (EHMP) and other associated environmental plans for the area. Together, the updated EHMP and construction fencing described in Section 3.6 provide information for construction and utility workers who may encounter lead-contaminated soil during future projects on Factory Street.

Soil was excavated to a depth of at least 1 ft bgs, as described in Section 3.6. Once soil excavation actions were completed for the day, START estimated what fraction of the individual DU had been excavated that day and collected the appropriate number of soil increments from the excavation floor. Increment sample locations were spaced equidistantly apart to provide a representative sample. A total of 30 increments were collected from each DU and composited to form a single MI sample for the DU. Each MI sample weighed 1 kilogram, with 35 grams of soil being collected from each increment location. A dedicated 5-gram soil sampler was used to collect soil increments to ensure equivalent amounts of soil were collected from each increment. Five MI soil samples (including four DUs and one duplicate sample) were collected from the Site. The duplicate sample was collected from DU-6, the DU with the highest lead concentration based on previous assessments. Soil increments were stored in a sample dedicated freezer upon collection to protect analytical integrity until they could be combined, homogenized and shipped to the laboratory under chain-of-custody control for lead and other metal analysis via EPA Method 6010B. Site documentation was performed in accordance with the SAP (WESTON, 2020). Laboratory analyzed excavation limit MI soil sample concentrations are presented and discussed in Section 4.3 Excavation Limit Soil Sampling Results.

In the process of collecting environmental samples at the Site, several different types of potentially contaminated investigation-derived wastes (IDW) were generated, including PPE and disposal sampling equipment. The EPA's National Contingency Plan requires that management of IDW generated at sites comply with all relevant or appropriate requirements to the extent practicable. This project followed the *Management of Investigation-Derived Wastes During Site Inspections, Office of Emergency and Remedial Response Directive 9345.3-02* (EPA, 1991), which provides guidance for management of IDW. Used PPE and disposable equipment are not considered hazardous and were either disposed of in non-hazardous waste boxes or were double-bagged and placed in a municipal refuse dumpster, including dedicated soil sampling equipment such as nitrile gloves, boot coverings, and soil samplers. Any used PPE and disposable equipment that could possibly be reused were rendered inoperable before disposal in the refuse dumpster.

### **3.8 AIR MONITORING AND SAMPLING**

EPA performed air monitoring and air sampling during Site excavation operations to ensure the health and safety of community members and Site workers. Air monitoring and air sampling efforts determined that engineering controls were effective in protecting workers and the community from particulates and from airborne lead during Site operations.

### 3.8.1 Background Air Monitoring

Prior to initiation of work at the Site and any dust-generating activity, air monitoring stations were established on Friday, January 17, 2020 to obtain background air data. Two TSI Dusttrak aerosol monitors and a Thermo Scientific personal DataRAM (pDR) 1000 aerosol monitor were deployed and run for a duration of approximately 3.5 hours. The SAP specified that two samples of a minimum of 200 liters of ambient air at a flow rate of 2 liters per minute be assessed. Based on a flow rate of 2 liters per minute, each TSI Dusttrak run evaluated more than 400 liters of ambient air. Background monitoring stations were set up at known work zones in DU-6 and represent the standard “background” work zone conditions for particulates. Background air monitoring results were used as a baseline to represent particulate concentrations that are typical for the area unrelated to the removal action at the Site. Total time-weighted averages (TWAs) for the TSI Dusttrak aerosol monitors were both 0.001 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) and maximum concentrations were recorded as 0.015  $\text{mg}/\text{m}^3$  and 0.018  $\text{mg}/\text{m}^3$ , respectively. The overall average background concentration for the Thermo Scientific pDR 1000 personal aerosol monitor was 0.015  $\text{mg}/\text{m}^3$  with a maximum concentration of 0.346  $\text{mg}/\text{m}^3$ .

### 3.8.2 Removal Action Air Monitoring and Sampling

During excavation work at the Site, co-located particulate monitoring and air sampling stations were arranged to determine airborne particulate and lead concentrations. Data collected from both air monitoring and sampling instruments were used to determine what concentration of airborne particulates and airborne lead in particulates may be migrating off-site; examine exposure of on-site personnel; support personal protective equipment (PPE) decisions; and determine the effectiveness of engineering controls. Overall, Site air monitoring and air sampling ensured the health and safety of the community and Site workers from potential airborne contaminants.

During each day of dust-generating excavation activities at the Site, airborne particulates were monitored, and air samples were collected at a minimum of four locations stationed around the perimeter of the work zone and at one station in the work zone. Co-located perimeter monitoring/sampling locations consisted of a TSI Dusttrak aerosol monitor and an SKC AirChek Touch sampling pump. For work zone air monitoring and sampling, a Thermo Scientific<sup>TM</sup> pDR 1000AN aerosol monitor and SKC AirChek Touch air sampling pump was used.

At the beginning of each day, four TSI Dusttrak aerosol monitors were positioned around the work zone where intrusive excavation activities would take place. Air intakes and sensor probes were established at a height typical of the breathing zone and instruments were zero air calibrated prior to beginning a run. Runs were started only after ensuring that data logging was enabled on the instrument. A Thermo Scientific<sup>TM</sup> pDR 1000AN aerosol monitor was also zero air calibrated at the beginning of each day prior to being deployed in the excavator cab or other work zone location. Generally, the excavator operator was determined to have the highest risk of exposure to airborne particulates. As a result, data collected from this instrument was assumed to be representative of work zone exposure rates.

SKC AirChek Touch air sampling pumps equipped with a 37-millimeter three-piece cassette mixed cellulose ester (MCE) 0.8 micrometer ( $\mu\text{m}$ ) filter were calibrated at the beginning of each day to a flow rate of 2 liters per minute using a calibrated flow meter prior to being deployed alongside air monitoring instruments. Final flow rates were calculated at the end of each day using the same calibrated flow meter. Initial and final flow rates were recorded in field logbooks and on field air monitoring/sampling data sheets. A minimum of five air samples were collected each day of intrusive excavation operations. More samples were collected on days where duplicate samples were being collected.

Air samples collected during the first 7 days of field work were shipped to the contract laboratory under chain-of-custody control for lead analysis via National Institute for Occupational Safety and Health (NIOSH) Method 7300. Samples collected were shipped the next day for overnight delivery to be analyzed within 24 hours of laboratory receipt. Definitive laboratory analyzed results were used to support air monitoring data and establish a correlation between air monitoring particulate results and air sampling lead results. After analyzing data from the first 7 days of intrusive field operations, EPA determined that real-time air monitoring results were adequate to determine the effectiveness of Site engineering controls and ensure the protection of Site workers and community members from airborne contaminants.

Generally, the remaining air samples collected during intrusive operations were archived and particulate monitoring served as the primary indication of the effectiveness of Site engineering controls in limiting lead in airborne particulates. As an additional precaution, all work zone air samples collected during intrusive excavation operations in DU-6, the DU with the highest concentrations of lead, were sent for laboratory definitive analysis under chain-of-custody control to examine potential exposure risk to Site workers. Finally, had air monitoring equipment detected levels of particulates indicative of a real-time monitoring exceedance, air samples would have been sent to the contract laboratory for lead analysis; however, this scenario never occurred. Site-specific airborne particulate and lead in air action levels established for the project were never exceeded. Particulate monitoring and air sampling results are discussed in detail in Section 4-4.

### **3.9 UNDERGROUND UTILITIES COORDINATION**

EPA coordinated with appropriate utility providers, including BWS, The Gas Company, the Hawaiian Electric Company, and the City & County of Honolulu Department of Environmental Services to collect as much information as possible about underground utilities prior to Site mobilization and the commencement of intrusive operations. In addition, advance notice was provided to Hawaii's Utility Notification Center, One Call, operated by the Hawaii Public Utilities Commission (HPUC). As recommended, the HPUC were contacted no less than 5 working days and no more than 28 calendar days prior to scheduled field work in order to identify and locate utilities on and near the Site. Upon mobilization, utility locates were photo-documented along with latitudinal and longitudinal coordinates by START in case utility markings faded. Finally, EPA obtained emergency contact information from each underground utility ahead of Site operations in case of any issues encountered on Site.

Underground utilities were encountered at very shallow depths on Site, including less than 6 inches bgs. Additionally, crews encountered a web of utilities that included abandoned lines, not all of which were included in utility locates. All lines were treated as live unless both ends of an abandoned line were clearly visible to Site crews. Extreme caution was taken by crews during excavation to prevent damage to underground utilities. Similar care was taken during restoration activities, as both concrete forms and compaction testing required driving metal stakes into the ground. Even though Site operations proceeded very slowly and carefully around underground utilities, some underground utility issues were encountered on Site as described below.

During excavation on February 4, 2020, a broken and buried 4-inch diameter sewer clean-out port was unexpectedly discovered in DU-6 in front of 922 Factory Street. The sewer clean-out was connected to a private sewer line originating at the 922 Factory Street apartment complex, adjacent to the Site. The broken section of the sewer clean-out port had surface oxidation indicating it was broken prior to EPA excavation. EPA's ERRS contractors excavated down to the intact portion of the clean-out, fitted it with a new coupling and polyvinyl chloride extension pipe, then poured a concrete collar around the area. This repair allowed the clean-out to be functional moving forward. A City & County of Honolulu Sewer Construction Inspector was on-site and determined this would be an appropriate fix. EPA believed the repair was necessary to ensure there were no Site impacts to the upgradient water system, including any debris that may have fallen into the clean-out when it was discovered during excavation operations. ERRS personnel determined that the sewer flow was beginning to back up at the site of the clean-out, cleared the sewer line of any soil that may have inadvertently fallen in during excavation operations, and restored flow. The location of the repaired clean-out port is depicted in Figure 3-2.

During excavation on February 6, 2020, a substantial void space was encountered at the base of Site excavation in DU-4, directly adjacent to the mailboxes at 922 Factory Street and immediately northeast of the sewer manhole. A MultiRae photoionizing detector (PID) was used to assess the void for volatile organic compounds (VOCs) and noxious gases. The instrument provided a VOC reading of 200 parts per billion which quickly faded to zero. Paint had just been used to mark the gas line and the reading was likely VOCs from the recently applied paint as no sustained reading was detected by the PID. The void space appeared to be undercutting several active and abandoned utility (gas and water) lines. EPA contacted appropriate underground utilities to assist with assessing the void space and determining the best course of action. It was determined that the void space was intermittent, but likely up to 10 feet long and 6 feet deep with various pockets and fingers.

The sewer line was observed through the manhole while the remaining portion of the void space was excavated. Flow remained constant with no sign of obstruction or disturbance to sewer functionality. A Roto-Rooter plumber was contracted to visit the Site and scope the upgradient sewer line to look for any signs that the private lines may be compromised and may be contributing to the void space. The plumber ran a camera through the upgradient, private sewer lines and found those lines to be intact and fully operational. A City & County of Honolulu Sewer Construction Inspector visited the Site to inspect the void space and assess next steps. It was determined that the sewer manhole was likely the cause of the void space, as the 1917 manhole was made from brick and mortar and the grout on the northeast side had completely

decayed. Soil may have eroded through spaces in the brick over time, entering the sewer system and being washed away. The Gas Company also visited the Site to evaluate the exposed gas line within the void space. It was determined that a 1-inch gas line resided inside a 1.25-inch pipe. The Gas Company representative stated that soil surrounding the gas line could be removed and that when backfilling a minimum of 6 inches and maximum of 2 feet of sand should be used to create a bed to protect the gas line.

To correct the void space, ERRS dug down to firm footing and backfilled with spoils and additional base course. ERRS bedded the water and gas lines with sand and used geotextile fabric to encase the northeast side of the sewer manhole, where the void was observed and excavated, to ensure that soil will no longer be able to flow into the sewer from the surrounding subsurface. Finally, ERRS completed backfill with base course material. The EPA FOSC informed the underground utilities and nearby property owner and manager about the void space and EPA's actions to address it. The FOSC also noted that additional void space may still be present on the northwest side of the manhole, as this area was not included in excavation work at the Site.

On February 8, 2020, a second buried 4-inch diameter sewer clean-out port was unexpectedly discovered beneath the street pavement in the northeast portion of DU-4 and inadvertently broken by the excavator operator. The sewer line became plugged between where the clean-out had been sheared and the main sewer line. As a result, approximately 5-10 gallons of greywater temporarily backed up into the excavation area. This greywater was contained in the immediate area of the clean-out and residents were instructed to minimize water use until the blockage was cleared. The broken clean-out port was snaked to clear the blockage and water was used to flush remaining debris and ensure flow was restored. A polyvinyl chloride extension was attached to the broken sewer clean-out port and a concrete collar was poured around the repaired clean-out port, resulting in a functional clean-out. The location of the repaired clean-out port is depicted in Figure 3-2.

On February 12, 2020, ERRS encountered a water line in DU-4 that was shallower than all other water laterals in the Project area to date. During excavation, a large rock clipped the water lateral in the middle of the street between 914 and 915 Factory Street, resulting in a water leak on-site. The FOSC contacted BWS, who immediately sent representatives to the Site. BWS was not able to shut off the water at a local supply valve, and informed EPA that the water repair would need to take place with water still flowing. ERRS borrowed a pipe crimping tool from BWS to crimp the water line and contracted with Diamond Head Plumbing to perform the emergency repair. ERRS uncrimped the line and BWS representatives confirmed that the repairs were adequate. EPA confirmed that normal water flow returned to 915 Factory Street, which was the only affected residence, and that there were no additional leaks on Site. The water leak did not affect previously backfilled areas and did not leave the excavation area. The excavation was left open, cordoned off with caution tape, and allowed to dry overnight and the following day. Once dry, a high tensile geotextile fabric was placed along the eastern half of the excavated area where flooding had occurred. A bed of sand was laid around the water line and the rest of the excavation was backfilled with base course and compacted.

At the end of the day on February 17, 2020 ERRS discovered a small wet spot in the previously excavated DU-5. It was not clear whether the wet spot was related to the nearby car washing operation or was coming from the excavation itself. On February 18, 2020, ERRS hand-excavated around the wet spot and found that a straight-joint in the water line was weeping. It was not clear whether this small leak was a result of the Project or had been there for some time. ERRS discovered a second small wet spot in the base course in DU-4 near the sewer manhole. ERRS hand-excavated and again discovered a small leak. The leak was a slow drip from a T-junction, and crews were again unable to determine whether the leak was a result of the Project or had been there for some time.

A representative from BWS arrived at the Site and turned off the water line running along the south side of the Project area. A plumber from Roto Rooter replaced an 11-inch section of copper pipe on the south side of DU-5 and installed a compression fitting to secure the new section of pipe and complete the repair. BWS restored water to the line and no further leak was observed. The excavated area around the repaired section of pipe was backfilled with sand and topped with base course. While BWS tried to shut down water leading to the leak in DU-4, the local valve was damaged and began to leak. BWS shut off the water upgradient to this line and repaired the valve during the night. The Roto Rooter plumber arrived on February 19, 2020 and repaired the leaking pipe in DU-4. A 13.25-inch long section of line with compression fitting was replaced. BWS restored water to the line to test the repair. No further leaks were observed.

All utility issues that were encountered during the excavation of lead-contaminated soil on Site were resolved and repairs were approved by their respective utilities. The approximate locations of underground utilities that were encountered during Site work are presented in Figure 3-2. Note that these are approximations only to provide context for this report and should not be relied upon for any future work on Factory Street.

### **3.10 OVERHEAD UTILITY POLE SHORING**

Two overhead utility poles (one in DU-4 and the other in DU-6) were located on the northern boundary of the Project area. Because the removal action involved excavating within 10 ft of utility poles, EPA consulted and coordinated with the Hawaiian Electric Company (HECO) to develop a plan to ensure overhead utilities would not be impacted during the project. Based on consultation between EPA and HECO, project engineers developed a pole shoring plan which is provided as **Appendix D**.

In order to shore each utility pole, ERRS first used a concrete cutter saw to cut two 4 ft by 4 ft squares in the street at an approximate angle of 45 degrees from the utility pole. The excavator was used to remove asphalt, road base and soil to an approximate depth of 20 inches. Excavated asphalt, road base and soil were immediately containerized into lined cubic yard boxes based on their designation as either hazardous waste soil or non-hazardous waste soil. Hand digging was used to remove the remaining soil and square off the edges of the shoring excavation. Concrete was then poured into the pole shoring excavation, smoothed, and allowed to dry, creating an anchor. Two prefabricated utility pole collars were fastened around the utility pole at a height of approximately 1 ft above ground level and 15 ft above ground level. One end of a pole brace was then fastened to the pole collar at 15 ft above ground level and the other end of the brace was

fastened to one of the hardened anchors using concrete screws. A second pole brace was attached at one end to the pole collar at 1 ft above ground level and the other end was attached to the same hardened anchor using concrete screws. This created a triangular shape between the utility pole and the two braces. This shoring technique was replicated on the other side of the utility pole using two additional pole braces and attaching them to the second shoring anchor. Refer to photos 40-53 of the Photograph Log presented in **Appendix B**.

Overhead utility poles were shored whenever excavation operations took place within 10 ft of the base of the utility pole. Once the excavation was backfilled and compacted with base course material to within 3 inches of the finished grade, the pole shoring was removed, in accordance with the pole shoring plan.

Utility poles were shored once more ahead of street reconstruction, as the Site paving plan required excavation to 6 inches below finished grade prior to resurfacing. Semi-circular concrete forms were constructed around the utility poles (**Appendix B Photo 186**) to a depth of 2 inches below finished grade. Concrete was poured and allowed to harden (**Appendix B Photos 194-195**), and overhead utility pole shoring was removed. The semi-circular concrete supports and pole shoring anchors were sub-grade and were paved over with asphalt. Approximate locations of these features are noted in the as-builts in the Final Construction Report provided in **Appendix E**. No impact to overhead utilities resulted from project related work.

### **3.11 SITE ACCESS AND TRAFFIC CONTROL**

EPA allowed for local vehicle and pedestrian access to Factory Street throughout the Project, in order to minimize impacts to the community during Site operations. GP Roadway Solutions was contracted to provide traffic control for the duration of the project. Pedestrian and vehicular traffic were permitted to traverse the Project area during the removal action in accordance with project signage. Project personnel periodically reconfigured pedestrian walkways and vehicular routes using traffic cones, fencing, and signage dependent upon where daily activities were being performed. Project personnel were vigilant in checking for pedestrians and vehicles and directing them appropriately to ensure the safety of both community members and Site workers. EPA also coordinated closely with refuse collection and mail distribution to ensure that these services continued for the community throughout Site work. Community members were cooperative and respectful of EPA instruction and no traffic incidents occurred at the Site.

### **3.12 STREET RECONSTRUCTION**

The topographic and boundary survey conducted by R.M. Towill Corporation and presented in **Appendix C** was provided to the subcontracted project engineers, Hawaii Engineering Group, Incorporated. Hawaii Engineering Group, Incorporated used the survey and additional information collected on Site to design the Factory Street Reconstruction Civil Improvement Plan. EPA and Hawaiian Engineering Group, Incorporated consulted closely with the City & County of Honolulu Department of Design and Construction during the design of this paving plan, to ensure Factory Street reconstruction would meet relevant standards and be unlikely to degrade unless maintenance did not occur over decades. The Factory Street Reconstruction Civil Improvement Plan is attached as **Appendix F**.

The paving plan was designed to closely resemble or improve pre-existing flow conditions. Material quality and compaction requirements followed the City & County of Honolulu, Standard Specifications for Public Works Construction, dated September 1986. QA/QC procedures for materials and compaction testing and inspection of the pavement construction followed the Site Construction QA/QC Plan provided as **Appendix A**. The Final Construction Report is provided in **Appendix E** and includes the Soil Investigation Report; the Compaction Testing Report; the Summary of Approved (Material) Submittals; the Approved Concrete Mix Design; the Approved Asphalt Concrete State Mix IV; the Approved Asphalt Treated Base Mix; the (Approved) Untreated Base Course Material; the Summary of Concrete Testing; the Concrete Cylinder Test Report; the Grading Certification Letter; and the final As Built Site Survey. While the Final Construction Report provides a more detailed description of construction approvals and oversight, this section provides an overview of reconstruction activities.

Prior to completing the Site paving plan, Project engineers needed to obtain information on the subsurface conditions of Factory Street from which to base recommendations for pavement design and reconstruction. On August 15, 2019, project engineers collected two soil borings from DU-3, as described in Section 3.4. Field Dynamic Core Penetration (DCP) testing was performed to determine the approximate in-situ California Bearing Ratio (CBR) of the underlying subgrade soil. The CBR value is a soil strength parameter used as a basis for pavement design. Test results indicated initial field CBR values ranged from approximately 5.9 to 77 percent. The variations of the test results were likely due to the presence of gravel and cobbles. The lowest CBR value of 5.9 was used as a conservative value for pavement design.

During excavation, DCP field tests were performed on exposed subgrade soil at the limit of excavation to determine the in-situ CBR strength. Project engineers also instructed ERRS on how to complete field stiffness tests by probing the soil, to ensure that every excavation section was tested appropriately. Where the CBR value was 5.9 or higher or the field stiffness test was determined to be adequate, base course could be placed on the subgrade soil without remedial work. When the CBR value was less than 5.9 or subgrade soil stiffness was not adequate, ERRS could continue to excavate and re-test the soil or could install geotextile fabric ahead of backfilling operations.

Prior to the initiation of excavation, project engineers reviewed and approved the untreated base course material for use on Site. Upon completion of excavation, field crews and project engineers focused on supporting paving operations that included the following tasks: mix design reviews and approvals for concrete, asphalt, and asphalt treated base course materials; surveying the limits of excavation for final project as-builts; final grading and compaction testing of base course; preparing for and placement of concrete; concrete materials testing; preparing for and placement of asphalt treated base course and asphalt; asphalt treated base course and asphalt compaction testing; and surveying the final pavement for Project as-builts.

Project engineers surveyed the bottom of the excavation for final Project as-builts and checked the grading and elevation of base course backfill material against project specifications. ERRS crews made grading adjustments as necessary and compacted base course material. Project engineers then conducted compaction testing on the base course material. Field density tests were performed using a nuclear gauge in accordance with the ASTM D6938-17a test procedure

(nuclear method; shallow depth). The acceptance criteria for base course compaction was a minimum of 95% of the maximum dry density for each test location. This specification was based on criteria similar to the State of Hawaii Standard Specifications for Road and Bridge Construction, dated 2005, and was developed in consultation with the City & County of Honolulu Department of Design and Construction. At each test location that did not meet the minimum required degree of compaction, the area was recompactd by ERRS crews until it was determined to be acceptable by additional re-tests or observations by the engineer.

Project pavers reset water meter boxes throughout the Project area and installed concrete forms on the North King Street side of the project (in DU-5 and DU-6). Paving operations began by pouring concrete for the curb and sidewalk on the North King Street side of the project. Project engineers visited the Site during the concrete pour in order to conduct concrete materials testing. Paving operations continued with pouring concrete for the curbs and sidewalks on the Waterhouse side of the project (in DU-3 and DU-4). Project engineers again poured cylinders for concrete materials testing. All concrete materials were determined to be adequate for Site restoration based on concrete materials testing. Concrete pours were phased to continue to allow local vehicle access to Factory Street. After the concrete was allowed to harden, utility pole shoring was removed, and final grading and compaction of base course in remaining areas was performed. Project engineers performed compaction testing and ERRS crews re-compactd as necessary, based on compaction testing results.

Project pavers then poured and compactd asphalt treated base course on the remaining areas of the Site. Project engineers tested compaction of the asphalt treated base course, and areas were re-compactd by the pavers as needed. Finally, project pavers poured and compactd asphalt on top of the asphalt treated base course. Project engineers tested compaction of the asphalt, and areas were re-compactd by the pavers as needed. The acceptance criteria for asphalt treated base course compaction was a relative specific gravity of not less than 95% of the specific gravity of the combined mixture without voids. The acceptance criteria for asphalt compaction was a relative specific gravity of not less than 91% of the specific gravity of the combined mixture without voids. These specifications were based on the City & County of Honolulu, Standard Specifications for Public Works Construction, dated September 1986. After project restoration was complete, project engineers surveyed the Site for the final as-builts. The newly paved street was closed to traffic until materials could cure.

Two low points were identified in the field within the Project area that required on-site alteration of the paving plan. The low points prevent flooding at adjacent properties from water sources that did not originate from the street itself and so needed to be maintained. The paving subcontractor consulted with EPA and ERRS crews to determine the best way to maximize drainage from these two properties while maintaining the overall Factory Street paving plan. During resurfacing, a precipitation event allowed field crews to verify that field adjustments were adequate to maintain or improve drainage for each of these properties. Pictures of these drainage features are provided in the Photograph Log located in **Appendix B**.

During project resurfacing efforts on Factory Street, the City & County of Honolulu resurfaced the deteriorating small section of street within the King Street right of way at the corner of Factory Street and tied this section into the resurfaced Project area.

### **3.13 EXCAVATION AND RECONSTRUCTION VOLUMES**

EPA generally removed contaminated soil to at least 1 ft bgs in DU-3 through DU-6. Contaminated soil was replaced with backfill material (base course) from the Halawa Valley Quarry. The backfill was capped with asphalt treated base course and asphalt or concrete to address human-health risks associated with lead exposure.

A total of 909,810 pounds of nonhazardous waste soil and project debris was removed from the Site, transported to and disposed of at Columbia Ridge Landfill located at 18177 Cedar Springs Lane, Arlington, OR, 97812. A total of 105,640 pounds of hazardous waste soil and project debris was removed from the Site, transported to and disposed of at Chemical Waste Management, Incorporated at 17829 Cedar Springs Lane, Arlington, OR, 97812, a waste facility with a RCRA Waste Code D008 designation. A total of 170 cubic yards of base course material (excluding concrete, asphalt, and asphalt treated base course) was used to prevent future exposure to lead contamination.

During the removal action, START documented field activities in field logbooks, a Microsoft Access Database, and Project Spreadsheets. A waste tracking summary including cubic yard box identification, soil volumes, DU origin, bill of lading/waste tracking numbers, waste manifest numbers, shipping container identification, seal numbers, final shipping container weights, and important dates are shown on Table 3-1 for hazardous waste soils and Table 3-2 for nonhazardous waste soils.

## 4. ANALYTICAL RESULTS AND DISCUSSION

START performed multi-media sampling and analysis to support EPA's decision-making process during Site work, as described in Section 3. The following sections summarize analytical results collected at the Site during the removal action.

### 4.1 WASTE CHARACTERIZATION RESULTS

TCLP analysis for cadmium, chromium, and mercury was performed on two waste characterization samples via EPA Method 1311m/7000Bm, collected from DU-3 on August 15, 2019. The two boring locations were selected based on the preference of Project engineers, as the borings were also used for the Field DCP testing described in Section 3.12. EPA determined, based on the 2017 HEER assessment, that metals other than lead in the Project area were generally uniformly distributed, and therefore DU-3 sample locations were appropriate for waste characterization of these three analytes. The XRF was used as a screening tool to ensure that the levels of background metals in the samples, including cadmium and chromium, were within expected ranges for the Site before the samples were sent for analysis. Sample locations can be found in **Appendix E** as DCP-1 and DCP-2.

Both samples were non-detect for all three metals at concentrations well below their respective RCRA hazardous waste threshold values. Waste characterization sampling results are presented in Table 4-1 and were combined with HEER TCLP results for lead collected July 26-July 28, 2017 to provide waste profiles for the proper disposal of waste from the Site. All HEER samples were below the RCRA hazardous waste threshold value for lead established as 5 mg/L except for the three samples collected from 0-0.5 ft bgs from DU-6. Based on lead TCLP results provided by the HDOH HEER Office, soil excavated from 0-0.5 ft bgs in DU-6 was treated as hazardous waste and the remaining soil on Site was treated as non-hazardous waste.

### 4.2 BASE COURSE MATERIAL RESULTS

Prior to Site mobilization, sources for appropriate backfill materials were identified. START visited the selected source of base course, the Halawa Valley Quarry, located in Aiea, Honolulu County, Hawaii, on September 19, 2019 and again on January 17, 2020. During these visits, START collected and field screened stockpiled base course materials for heavy metals using an Olympus XRF spectrometer and submitted samples for laboratory analysis. Sample collection is described in Section 3.5.

On September 19, 2019 a total of six 5-point composite samples including one duplicate sample were collected, field screened and submitted to Eurofins TestAmerica Laboratory for arsenic, barium, cadmium, chromium, lead, selenium and silver analysis via EPA Method 6010B and mercury analysis via EPA Method 7471A. On January 17, 2020, a total of five 5-point composite samples were collected and field screened, and one sample was submitted to Eurofins TestAmerica Laboratory for arsenic, barium, cadmium, chromium, lead, selenium and silver analysis via EPA Method 6010B. In total, eleven samples including one duplicate sample were in-situ field screened and seven samples including one duplicate sample were laboratory analyzed. Results were consistent between the two sampling events. In-situ field screened and

laboratory definitive results collected from stockpiled base course were typical of soil metal concentrations found in the Hawaiian Islands (AECOM, 2012).

A summary of base course material in-situ field screening and sampling results are presented in Table 4-2 and Table 4-3, respectively. Base course material results were compared to health-risk based HDOH Tier 1 EALs based on a non-drinking water resource and within 150 meters of a surface water body (HDOH, 2017) prior to use on Site. Both in-situ analysis using the Olympus Delta Professional XRF spectrometer and laboratory definitive results for arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver confirmed that backfill material met Site standards.

Three in-situ field screening results collected by the XRF spectrometer appear to be high for mercury. XRF spectrometer instruments are not a great indicator of mercury concentrations and as such these results were evaluated against laboratory definitive results for the samples. Laboratory definitive results were non-detect for all base course samples collected on September 19, 2019. EPA in consultation with HEER determined that the sample collected on January 17, 2020 did not need to be laboratory analyzed for mercury, as mercury was determined not to be a constituent of potential concern at the Halawa Valley Quarry.

### **4.3 EXCAVATION LIMIT SOIL SAMPLING RESULTS**

A total of five MI soil samples (including one duplicate sample) were collected from the limits of the excavation to determine the concentrations of arsenic, barium, cadmium, chromium, lead, selenium and silver left in place. Excavation limit soil sampling procedures were discussed in Section 3.7 and further detail can be found in the SAP (Weston, 2020). MI soil samples were submitted to TestAmerica Laboratories in Irvine, California, for analysis via EPA Method 6010B.

Lead concentrations in three MI soil samples (including one duplicate sample) exceeded the EPA RSL for residential use established as 400 mg/kg (EPA, 2020). Sample FS-S-5, collected from DU-5, had a lead concentration of 630 mg/kg. Sample FS-S-6, collected from DU-6, had a lead concentration of 16,000 mg/kg. Finally, sample FS-S-6-D, the duplicate sample consisting of 30 unique increments collected from DU-6, had a lead concentration of 9,300 mg/kg. Arsenic levels at the limits of excavation exceeded the EPA RSL for unrestricted use but were below HDOH Tier 1 EALs and Hawaiian Islands background concentrations based on a study conducted on behalf of the HDOH HEER Office (AECOM, 2012). No other exceedances were observed from analysis conducted. Lead exceedances of project screening levels are illustrated in Figure 4-1. A summary of laboratory definitive soil results can be found in Table 4-4.

Lead concentrations in soil left in place at excavation limits in DU-5 and DU-6 were higher than anticipated. Based on previous soil sampling conducted on behalf of the HDOH HEER Office, EPA expected to remove the high levels of lead contamination when the top 12 inches of soil were excavated. EPA consulted with HEER and determined the likely cause of the unanticipated results. The HEER assessment in 2017 did not include the shoulder areas due to concerns about impacting underground utilities during collection of soil borings. Based on historical assessments and the likely source of contamination, EPA expects the shoulder areas were likely the most

contaminated. By not sampling these areas, HEER results could have greatly underestimated the actual levels of lead contamination in the most contaminated DU's. When EPA excavated one foot of contaminated soil and then conducted soil sampling at the limit of Site excavation, sampling included these shoulder areas, which is why results may be higher than expected.

Even with higher than anticipated concentrations of lead in soil left in place at the excavation limit, and even if the concentrations of lead in excavated soils may have been higher than expected, EPA is confident that Site workers and the community were protected during the removal action. Air particulate monitoring and airborne lead sampling results (discussed in detail in Section 4.4) were orders of magnitude below the NIOSH recommended and Occupational Safety and Health Administration (OSHA) required levels. Soil was not stockpiled on Site and instead was immediately containerized in lined cubic yard boxes upon excavation. Furthermore, excavated areas were backfilled at the end of each day to prevent community access to lead-contaminated soil, and construction BMPs were implemented throughout the removal action. Some of the BMPs included: covering and weighing down the edges of the newly backfilled excavation to minimize run-off in the event of a large overnight precipitation event; utilizing sand-bags along the boundary of known Project area low-points to limit erosion from the Project area during precipitation events; and affixing dust screens to fencing of adjacent properties.

Restoration work at the Site is protective and currently prevents exposure to lead-contaminated soil. Any remaining contamination at the Site is buried beneath at least 1 foot of restoration materials consisting of at least 6 inches of base course, 4 inches of asphalt treated base course and 2 inches of asphalt or 6 to 8 inches of base course and 4 to 6 inches of concrete. Potential exposure for future utility or construction workers that will excavate to more than 1 ft bgs still exists, however safety measures are in place for their protection. Construction fencing was laid throughout the Site at the limit of excavation to serve as a visual cue or warning to future utility workers that lead-contaminated soil may be present beneath the fencing. The HDOH HEER Office has also developed an EHMP for the area to protect utility workers. This Time-Critical Removal Action Report will serve as a reference to inform an update to the EHMP and other related documents. While restoration work was thorough and the public are not presently being exposed to elevated concentrations of lead in soil, maintenance work should be conducted on the street to prevent it from falling into a state of disrepair. New potholes would need to be very large to expose residents to contaminated soil (over 1 foot deep through a well-constructed road), but it could be possible if the street is not maintained over a long period of time. EPA recommends the City & County of Honolulu and the State of Hawaii Department of Transportation work together to ensure that the street is maintained moving forward to prevent possible exposure in the future.

#### **4.4 PARTICULATE MONITORING AND AIR SAMPLING RESULTS**

START personnel conducted airborne particulate monitoring and air sampling during excavation in accordance with the SAP (WESTON, 2020) and the procedures discussed in Section 3.8. Particulate monitoring and air sampling were performed to ensure the health and safety of community members and Site workers during the excavation of lead-contaminated soil.

OSHA has established a permissible exposure limit (PEL) of 0.05 mg/m<sup>3</sup> for lead in air based on an 8-hour TWA. NIOSH established the same recommended exposure limit (REL) of 0.05 mg/m<sup>3</sup> based again on an 8-hour TWA (OSHA, 2017). EPA adjusted the PEL and REL based on 10-hour work periods on Site, resulting in an airborne lead action level of 0.04 mg/m<sup>3</sup>.

Since airborne lead levels can only be determined by laboratory analysis, EPA uses air monitoring as a real-time proxy to ensure that airborne lead is not impacting workers or the community. EPA used the maximum lead in soil concentrations from the 2017 HEER assessment, the 10-hour TWA for lead in air, and a safety factor of 2 to calculate Site-specific Particulate Screening Levels for Engineering Controls for each DU. These screening levels are presented in Table 4-5 and the calculation is described below:

Particulate screening levels were calculated using the following equation: (10<sup>6</sup> mg/kg \* Adjusted PEL for Lead based on a 10-hour TWA)/(DU Soil Lead Concentration \* Safety Factor).

Real time air monitoring also ensures that particulate concentrations are below relevant standards, as particulates themselves have the capability of impacting human health. The OSHA PEL for particulates is 15 mg/m<sup>3</sup> based on an 8-hour TWA, and the NIOSH REL is 10 mg/m<sup>3</sup> based on an 8-hour TWA. EPA used the NIOSH REL for the Site, being the more conservative value. When adjusted to a 10-hour TWA, the NIOSH REL is 8 mg/m<sup>3</sup>. In DU-3, the calculated Particulate Screening Level based on lead concentrations in soil is higher than the NIOSH REL for total particulates. In this case, the NIOSH REL for total particulates was used as the more conservative value.

<b>Table 4-5 Screening Levels for Particulate Monitoring</b>						
<b>Contaminant of Concern</b>	<b>OSHA PEL or NIOSH REL (mg/m<sup>3</sup>)</b>	<b>OSHA PEL or NIOSH REL (mg/m<sup>3</sup>) based on 10-hour TWA for Work Period</b>	<b>Maximum 2017 MI Laboratory Analyzed Soil Concentration Used for Screening Level Calculations (mg/kg)</b>	<b>Decision Unit</b>	<b>Particulate Screening Level for Engineering Controls based on 10-hour TWA (mg/m<sup>3</sup>)</b>	<b>Particulate Reporting Limit for Dusttrak Aerosol Monitor (mg/m<sup>3</sup>)</b>
Lead	0.05	0.04	1,010 Lead	3	19.8 <sup>a</sup>	0.02
			4,660 Lead	4	4.29	
			8,450 Lead	5	2.37	
			24,800 Lead	6	0.81	
Total Particulates/ Nuisance Dust	10	8	N/A	all	8	

Notes:

mg/kg = milligrams per kilogram

mg/m<sup>3</sup> = milligrams per cubic meter

MI = multi-incremental

NIOSH = National Institute for Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

PEL = permissible exposure limit

REL = recommended exposure limit

TWA = time weighted average

<sup>a</sup> = When the Particulate Screening Level for Engineering Controls based on a 10-hour TWA exceeded the NIOSH REL based on a 10-hour TWA for Total Particulates/Nuisance Dust the more conservative value was used as the Screening Level

Daily particulate monitoring consisted of positioning TSI Dusttrak aerosol monitors on each side of the work zone, effectively establishing a perimeter. In addition, a Thermo Scientific™ pDR 1000AN aerosol monitor was attached to the cab of the excavator to evaluate particulate exposure of the individual deemed to be most at risk, the excavator operator. The particulate monitors measured total particulate matter on a real-time basis and were set to alarm when particulate concentrations exceeded DU specific screening levels. This allowed work personnel to institute the established engineering controls, including work stoppage and water application for dust suppression. DU specific screening levels were based on 10-hr TWAs and as such setting real-time alarms at concentrations established to be protective for an entire day is very conservative, adding an extra layer of protection for Site workers and the community.

During the removal action, the 10-hour TWA for total particulate matter did not ever exceed DU specific screening levels. Air monitoring results are shown in Table 4-6 and 10-hour TWA results are presented in Figure 4-2. DU-6 had the lowest associated DU-specific particulate monitoring screening level, as it had the highest observed lead in soil concentration based on the 2017 HDOH HEER Site Assessment. The particulate screening level based on a 10-hour TWA for DU-6 was 0.81 mg/m<sup>3</sup>. The highest TWA value observed during the removal action was 0.052 mg/m<sup>3</sup>.

Daily air sampling was co-located with air monitoring locations. Air sampling was used to verify that community members and Site workers were not exposed to elevated levels of airborne lead during excavation work, and to confirm that air monitoring could be used as a real-time proxy to ensure Site engineering controls were protective. Initially all air samples were submitted to Eurofins TestAmerica, the certified contract laboratory, for lead analysis by NIOSH Method 7300, inductively coupled plasma-mass spectrometry (ICP-MS). These early samples were generally collected during excavation in the most contaminated areas. Sample results were compared to the 10-hour TWA OSHA PEL and NIOSH REL of 0.04 mg/m<sup>3</sup> or 40 µg/m<sup>3</sup>. The laboratory analyzed sample with the highest concentration of lead during the first 7 days of excavation had a value of 0.813 µg/m<sup>3</sup>, and samples were generally orders of magnitude below the regulatory standards. Because of this, and after analyzing data from the first 7 days of excavation, EPA determined that real-time air monitoring was an effective proxy to ensure airborne lead concentrations were well below established standards.

Generally, the remaining air samples collected during intrusive operation were archived and particulate monitoring served as the primary indication of the effectiveness of Site engineering controls in limiting airborne lead. As an additional precaution, all work zone air samples collected in DU-6, the DU with the highest concentrations of lead, were sent for laboratory

analysis. If any air monitoring data had exceeded DU specific particulate screening levels, air samples would have also been submitted for laboratory analysis. This scenario never occurred. A total of 147 air samples were collected, of which 43 were submitted for laboratory analysis.

Laboratory analyzed lead in air samples and air monitoring data collected during the removal action confirmed that excavation operations performed at the Site were protective of health for both Site workers and the community. Generally, particulate monitoring data and laboratory analyzed lead in air results were orders of magnitude lower than regulatory standards. A summary of air monitoring results is provided in Table 4-6 and air sampling results are provided in Table 4-7. A comparison of air sampling and monitoring results can be found in Table 4-8. Laboratory data packages and validation reports for air samples are provided in **Appendix G**.

## **4.5 FIELD SAMPLING AND ANALYTICAL QA/QC**

Analytical QA/QC was performed in accordance with the Site ERQASP (WESTON, 2019) and Site SAP (WESTON, 2020) to ensure that data collected during Site operations was of sufficient quality to meet Data Quality Objectives for the removal action.

For Accuracy, the laboratory control sample (LCS) and matrix spike/matrix spike duplicate (MS/MSD) recoveries were evaluated. For Precision, the relative percent difference (RPD) for LCS and laboratory control sample duplicate (LCSD) pairs, MS/MSD pairs, and field duplicate pairs were evaluated. Completeness is a measure of whether all samples that were intended to be collected were collected and laboratory analyzed. Completeness for the removal action is 100% as all intended samples were collected and analyzed by the laboratory as requested.

### **4.5.1 Blank Samples**

#### **4.5.1.1 Excavation Limit Soil Sampling**

Equipment rinsate blanks for excavation limit soil sampling were not collected. All sampling was conducted with clean, dedicated equipment, which does not require the collection of blanks. A method blank for Method 6010B (metals analysis) was performed where all analytes were non-detect.

#### **4.5.1.2 Base Course Sampling**

Equipment rinsate blanks for base course sampling were not collected. All sampling was conducted with clean, dedicated equipment, which does not require the collection of blanks. A method blank for Method 6010B (metals analysis) was analyzed for the September 13, 2019 base course sampling event and for the January 17, 2020 base course sampling event. A method blank for Method 7471A (mercury analysis) was conducted for the September 13, 2019 sampling event as that was the only event where mercury was requested to be analyzed. Method blank samples for base course sampling events were non-detect for all analytes.

#### **4.5.1.3 Waste Characterization Sampling**

Equipment rinsate blanks for waste characterization sampling were not collected. All sampling was conducted with clean, dedicated equipment, which does not require the collection of blanks. Leachate blanks (number of blanks unspecified) were analyzed with the samples and were deemed “acceptable” by the laboratory, presumably meaning they were free of target analyte contamination above laboratory reporting limits (RLs).

#### **4.5.1.4 Lead in Air Sampling**

NIOSH Method 7300 suggests submitting 2 to 10 air filter cassettes as field blanks for analysis per box or package. Two packages of air filter cassettes were used during the project. Four blank air filter cassettes were submitted to the contract laboratory for analysis as required by the NIOSH Method 7300 and EPA guidance. All field blanks were free of lead contamination above the RL.

Seven method blanks were analyzed with the sample sets, at the correct frequency. Lead was detected in four of the method blanks at levels greater than the RL of 0.0250 µg/sample. Occasionally laboratory prepared method blanks contain detections of target analytes from analytes in the media. The methods allow for subtraction due to this issue, and it is usually noted in the case narrative when this occurs. The detected amount (background) was subtracted from all associated sample results, including QC samples, as specified in the method; therefore, no qualification of data was needed. However, even if the background was not subtracted from associated sample results, all results would still be well below the NIOSH RELs, confirming that Site engineering controls were protective of community and worker safety.

#### **4.5.2 Duplicate Samples**

The recommended frequency for collection of duplicate samples is 1 for every 10 field samples.

##### **4.5.2.1 Excavation Limit Soil Sampling**

Since the removal action contained 4 DUs and one MI sample was to be collected per DU (i.e. 4 field samples) for excavation limit soil sampling, it was decided that the collection of one duplicate was appropriate. The sample set included one field duplicate pair: FS-S-6 and FS-S-6-D. Field duplicate data was used to calculate the relative percent difference (RPD) for evaluation of the variation between samples. The QC criteria as established in the Site SAP for field duplication are RPD less than or equal to ( $\leq$ ) 50% for concentrations greater than five times the RL, and the absolute difference between results less than the RL for sample concentrations less than five times the RL. The QC criteria were met for all analytes except for cadmium (60%) and lead (53%). The likely cause for variation in cadmium and lead in the duplicate is heterogeneity in the DU. This is not surprising given that lead contamination at the Site is thought to have been from a discrete source and the sample was collected from the DU with the highest levels of contamination. Additionally, cadmium results were at least an order of magnitude below HDOH Tier 1 EALs. The results for cadmium and lead were qualified as estimated in samples FS-S-6 and FS-S-6-D.

#### **4.5.2.2 Base Course Sampling**

On September 19, 2019 one field duplicate pair: FS-BC-02 and FS-BC-03 was collected, field screened and submitted to Eurofins TestAmerica Laboratory for arsenic, barium, cadmium, chromium, lead, selenium and silver analysis via EPA Method 6010B and mercury analysis via EPA Method 7471A. Field duplicate data was used to calculate RPD for evaluation of the variation between samples. The QC criteria established in the Site SAP for field duplication are RPD less than or equal to ( $\leq$ ) 50% for concentrations greater than five times the RL, and the absolute difference between results less than the RL for sample concentrations less than five times the RL. QC criteria was met for all analytes.

#### **4.5.2.3 Waste Characterization Sampling**

The entire volume of soil within the top foot of soil boring FS-DU.03.01 was collected and constituted waste characterization sample FS-DU.03.01. Similarly, the top foot of soil from soil boring FS-DU.03.02 was collected constituting waste characterization sample FS-DU.03.02. As a result, the sample set did not include any duplicate pairs.

#### **4.5.2.4 Lead in Air Sampling**

Duplicate analysis of air samples was selected in the field at random and were analyzed at a rate of 1 for every 10 field samples. The sample set included four field duplicate pairs: FS-A-0122-NW and FS-A-0122-NW-D; FS-A-0122-SE and FS-A-0122-SE-D; FS-A-0123-SE and FS-A-0123-SE-D; and FS-A-0127-SE and FS-A-0127-SE-D. The QC criteria for field duplication are  $RPD \leq 50\%$  for concentrations greater than five times the RL, and the absolute difference between results less than the RL for sample concentrations less than five times the RL. The field duplication QC criteria were met for all analyses.

### **4.5.3 Laboratory Control Samples**

#### **4.5.3.1 Excavation Limit Soil Sampling**

An LCS was analyzed for excavation limit soil samples to verify the accuracy of laboratory instruments. Known spikes were added and compared with analyte recoveries. All analytes were within the laboratory provided percent recovery limits of 80-120% and ranged from 92 to 99 percent recoveries.

#### **4.5.3.2 Base Course Sampling**

An LCS for metals in soil was analyzed for the September 13, 2019 base course sampling event and for the January 17, 2020 base course sampling event. An LCS for mercury was analyzed for the September 13, 2019 sampling event as that was the only event where mercury was requested to be analyzed. Known spikes were added and compared with analyte recoveries to validate the accuracy of laboratory instruments performing the analyses. All analytes were within the laboratory provided percent recovery limits of 80-120% and ranged between 87 to 111 percent recoveries.

### **4.5.3.3 Waste Characterization Sampling**

One LCS recovery was reported for each of the target analytes, and each recovery was within QC limits established by the laboratory. Percent recoveries ranged from 99.3 to 104.9.

### **4.5.3.4 Lead in Air Samples**

Seven LCS/Laboratory Control Sample Duplicates (LCSD) pairs were analyzed with the sample sets for air, at the correct frequency, and recoveries and RPDs were within QC limits of 80-120% and  $\leq 20\%$  established by the laboratory.

## **4.5.4 Matrix Spike and Matrix Spike Duplicate Results**

### **4.5.4.1 Excavation Limit MI Soil Samples**

FS-S-6 was used for MS/MSD analysis. Analysis included EPA Method 6010B for arsenic, barium, cadmium, chromium, lead, selenium and silver. Recoveries were within QC limits of 75-125% and RPD were within the QC limits of  $\leq 20\%$ , with the following exceptions: in sample FS-S-6, recovery of arsenic (64% and 65%) and selenium (61% and 70%). The results for arsenic and selenium in sample FS-S-6, were qualified as estimated. The MS/MSD recoveries and/or RPDs for barium, chromium, and lead were also outside QC limits, but the concentrations of the analytes in the un-spiked sample were greater than four times the amount of the spiked concentrations, so no action was required.

Concentrations of selenium were non-detect in all excavation limit soil samples and as a result no possibility of exposure risk to selenium exists at the Site. Arsenic samples were broadly consistent between samples and are below the background concentrations provided by HDOH (AECOM, 2012) and the HDOH Tier 1 EAL (HDOH, 2017). Barium concentrations were also broadly consistent between samples and well below the HDOH Tier 1 EAL and EPA RSL. There is no EPA RSL for chromium, but results were broadly consistent between samples and well below the HDOH Tier 1 EAL.

### **4.5.4.2 Base Course Sampling**

The following samples were used for MS/MSD analyses: FS-BC-01 for the September 13, 2019 base course sampling event, and HVQ.0117.01 for the January 17, 2020 base course sampling event. FS-BC-01 analyses included EPA method 6010B for arsenic, barium, cadmium, chromium, lead, selenium and silver and EPA Method 7471A for Mercury. Sample HVQ.0117.01 analysis included EPA Method 6010B for arsenic, barium, cadmium, chromium, lead, selenium and silver. Recoveries were within laboratory provided QC limits of 75-125% for arsenic, barium, cadmium, chromium, lead, selenium and silver and 80-120% for mercury. RPD were within the QC limits of  $\leq 20\%$ , with the following exceptions: in sample FS-BC-01, recovery of barium (126%; only MSD) and chromium (42% and 67%). The results for barium and chromium in sample FS-BC-01 were qualified as estimated.

When evaluating sample HVQ.0117.01 it appears that arsenic (79%; only MS), barium (79%; only MSD) and selenium (78%; only MS) recoveries are outside laboratory provided QC limits

presented as 80-120%. However, QC limits established for the project for MS/MSD recovery for metals other than mercury are 75-125% as presented in the Site SAP. Because the recoveries for arsenic, barium and selenium were within the limits of 75-125%, the data was not qualified. RPDs for all analytes were within the QC limits of  $\leq 20\%$ .

Base course sample results for all analytes were all well below HDOH Tier 1 EALs for unrestricted use. Even with data qualifiers, EPA is confident that base course materials met Site objectives and would not expose community members to metals above health-based thresholds.

#### **4.5.4.3 Waste Characterization Sampling**

The sample(s) utilized for MS/MSD analyses were not identified by the laboratory. Upon follow-up, the laboratory informed EPA that the MS/MSD analyses were run on other project samples belonging to a batch of 20 samples, as requested per the laboratory's American Industrial Hygiene Association accreditation. Recoveries were within QC limits of 75-125% for cadmium and chromium, and outside QC limits for of 80-120% for mercury (19.6 and 21.5%). RPD were within the QC limit of  $\leq 20\%$  for all three analytes. No data were qualified due to low mercury recoveries because the source of the MS/MSD samples was unknown. Waste characterization results were non-detect for all analytes.

#### **4.5.4.4 Lead in Air Sampling**

MS/MSD analysis was not required as it is not possible to spike air samples.

#### **4.5.4.5 Summary**

Analytical QA/QC performed at the Site confirmed that the quality of data collected was sufficient to support the conclusions discussed in this Report. All data were qualified in accordance with the Site SAP or more stringent laboratory QC requirements, and the implications of qualifications were described above.

## 5. CONCLUSION

EPA determined that a time-critical removal action was appropriate for the Site due to very high concentrations of lead-contaminated soil in the top 12 inches of the heavily degraded, abandoned street. Factory Street is a busy street in a dense, urban area and is surrounded by an underserved, overburdened community facing many environmental justice issues. EPA's removal action objective was to significantly reduce or eliminate exposure to lead contamination that may pose an imminent and substantial endangerment to human health and/or the environment by removing lead-contaminated soil in the top 12 inches of the Site and restoring the Site using the City & County of Honolulu construction standards.

EPA and its ERRS contractors first completed emergency patchwork in October 2019 to provide a temporary barrier between the source of contamination and community members. Then, between January 17, 2020 and March 9, 2020, EPA, ERRS, and START personnel completed soil removal and restoration actions within the Project area. The top 12 inches contained the highest concentrations of lead impacted soil and were removed from the Site. Restoration of the Site included either at least 6 inches of base course material, 4 inches of asphalt treated base course, and 2 inches of asphalt or 6 to 8 inches of base course material and 4 to 6 inches of concrete.

A total of 909,810 pounds of non-hazardous waste soil and project debris and 105,640 pounds of hazardous waste soil were removed and disposed of at appropriate facilities. A total of 170 cubic yards of base course material (excluding concrete, asphalt, and asphalt treated base course) was used to prevent future exposure to lead contamination. Base course was documented to have metal concentrations less than the health-risk based HDOH Tier 1 EALs prior to use. Base course materials used to backfill excavations were compacted and compaction tested prior to resurfacing with asphalt treated base course and asphalt or concrete. Site restoration activities were conducted in accordance with City & County of Honolulu specifications to ensure the quality and integrity of the new roadway.

MI soil samples collected from the limit of excavation revealed that soil left in place in DU-5 and DU-6 exceeded the EPA lead RSL for residential soil of 400 mg/kg. Concentrations of lead in soil left in place in these DU's were higher than anticipated. The Factory Street shoulder areas were not sampled during previous investigations to prevent impacting underground utilities during the collection of soil borings. Based on historical assessments and the likely source of contamination, EPA expects the shoulder areas were likely the most contaminated. By not sampling these areas, HEER results could have greatly underestimated the actual levels of lead contamination in the most contaminated DU's. When EPA excavated one foot of contaminated soil and then conducted soil sampling at the limit of Site excavation, sampling included these shoulder areas, which is why the results may be higher than expected.

Even with higher than anticipated concentrations of lead in soil left in place at the excavation limit, and even if the concentrations of lead in excavated soils may have been higher than expected, EPA is confident that Site workers and the community were protected during the removal action. Air particulate monitoring and airborne lead sampling results never exceeded regulatory standards and were generally orders of magnitude below the NIOSH recommend and

OSHA required levels. Soil was not stockpiled on Site and instead was immediately containerized in lined cubic yard boxes upon excavation. Furthermore, excavated areas were backfilled at the end of each day to prevent community access to lead-contaminated soil, and construction BMPs were implemented throughout the removal action.

Restoration work at the Site is protective and currently prevents exposure to lead-contaminated soil. Any remaining contamination at the Site is buried beneath at least 1 foot of restoration materials consisting of at least 6 inches of base course, 4 inches of asphalt treated base course and 2 inches of asphalt or 6 to 8 inches of base course and 4 to 6 inches of concrete. Potential exposure for future utility or construction workers that will excavate to more than 1 ft bgs still exists, however safety measures are in place for their protection. Construction fencing was laid throughout the Site at the limit of excavation to serve as a visual cue or warning to future utility workers that lead-contaminated soil may be present beneath the fencing. HEER has also developed an EHMP for the area to protect utility workers. This Time-Critical Removal Action Report will serve as a reference to inform an update to the EHMP and other related documents.

While restoration work was thorough and the public are not presently being exposed to elevated concentrations of lead in soil, maintenance work should be conducted on the street to prevent it from falling into a state of disrepair. New potholes would need to be very large to expose residents to contaminated soil (over 1 foot deep through a well-constructed road), but it could be possible if the street is not maintained over a long period of time. EPA recommends the City & County of Honolulu and the State of Hawaii Department of Transportation work together to ensure that the street is maintained moving forward to prevent possible exposure in the future.

EPA coordinated with overhead and underground utilities to ensure community and worker health and safety throughout the removal action. Overhead utilities were secured using pole braces and shoring anchors and were not impacted during the Project. Extreme caution was taken around underground utilities, and EPA coordinated closely with underground utility purveyors to resolve all underground utility issues and to ensure the safety of the community throughout.

EPA involved the community at every step to minimize impact to their daily lives and ensure their health and safety. EPA worked on small sections of the street at a time to maintain local access and worked to provide alternative parking for residents. Project personnel directed vehicle and pedestrian traffic and ensured refuse collection and mail distribution continued uninterrupted. EPA used a variety of information channels, including information booths and posters, a Project hotline and website, door-to-door outreach, and mailed factsheets and postcards to provide relevant information to community members. The FOOSC's worked closely with community leaders and relayed information in English, Ilocano, and Tagalog. EPA also worked with a community radio station and several media outlets to increase public awareness about the Project.

The Site Construction QA/QC Plan is presented as **Appendix A**. Photographic documentation for the Site is provided as **Appendix B**. Topographic and Boundary Survey information is provided as **Appendix C**. The Pole Shoring Plan is presented in **Appendix D**. The Final Construction Report is provided in **Appendix E** and the Factory Street Reconstruction Civil

Improvement Plan is presented in **Appendix F**. Finally, Laboratory Data Packages and Data Validation Reports are presented in **Appendix G**.

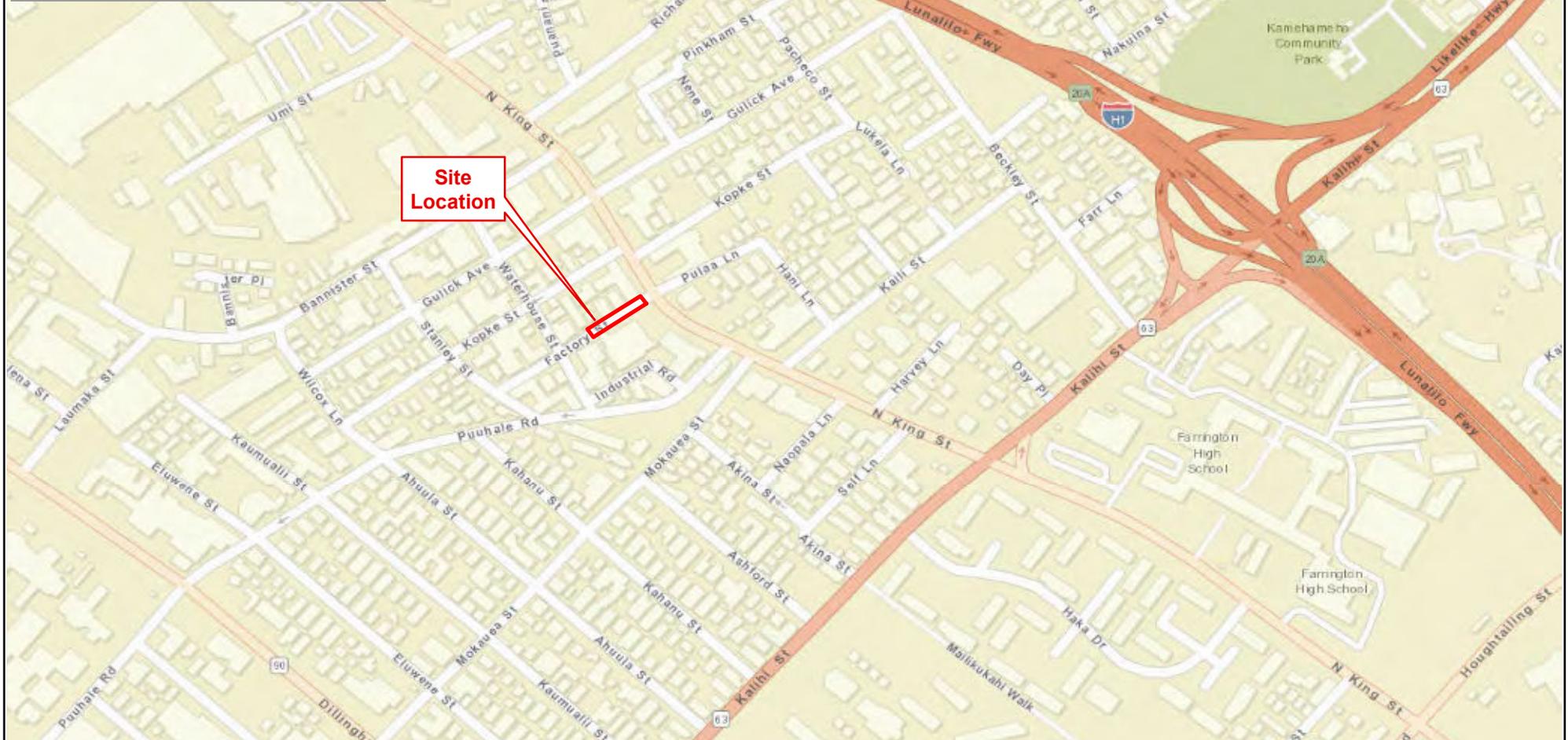
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## FIGURES

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**FIGURE 2-1**  
**SITE LOCATION MAP**  
 Factory Street Site  
 Honolulu, Oahu, Hawaii



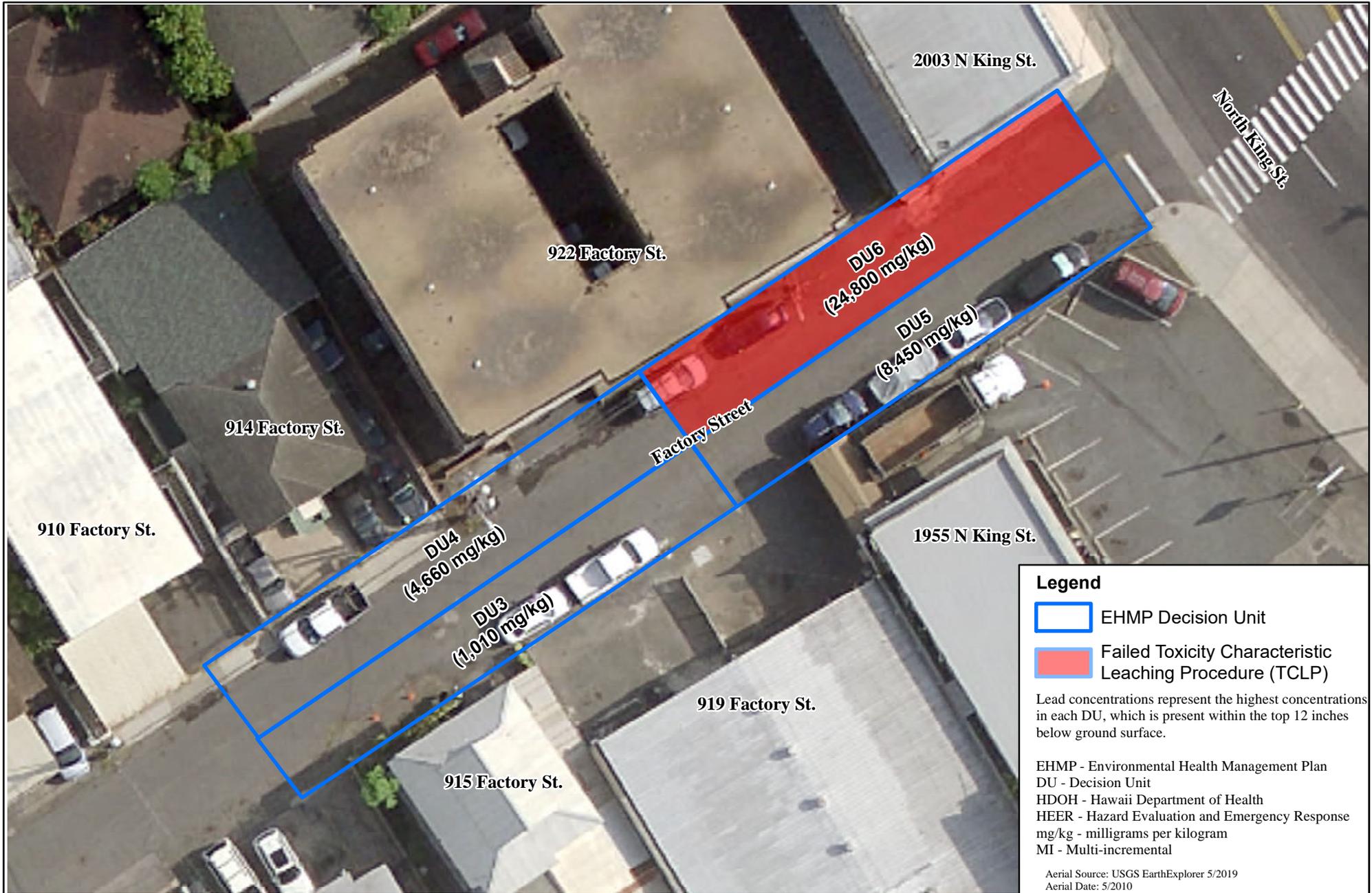
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**FIGURE 2-2**  
**PROJECT AREA MAP**  
 Factory Street Site  
 Honolulu, Oahu, Hawaii



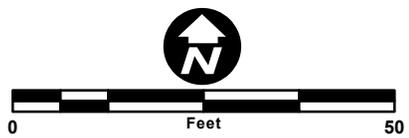
**Legend**

- EHMP Decision Unit
- Failed Toxicity Characteristic Leaching Procedure (TCLP)

Lead concentrations represent the highest concentrations in each DU, which is present within the top 12 inches below ground surface.

EHMP - Environmental Health Management Plan  
 DU - Decision Unit  
 HDOH - Hawaii Department of Health  
 HEER - Hazard Evaluation and Emergency Response  
 mg/kg - milligrams per kilogram  
 MI - Multi-incremental

Aerial Source: USGS EarthExplorer 5/2019  
 Aerial Date: 5/2010



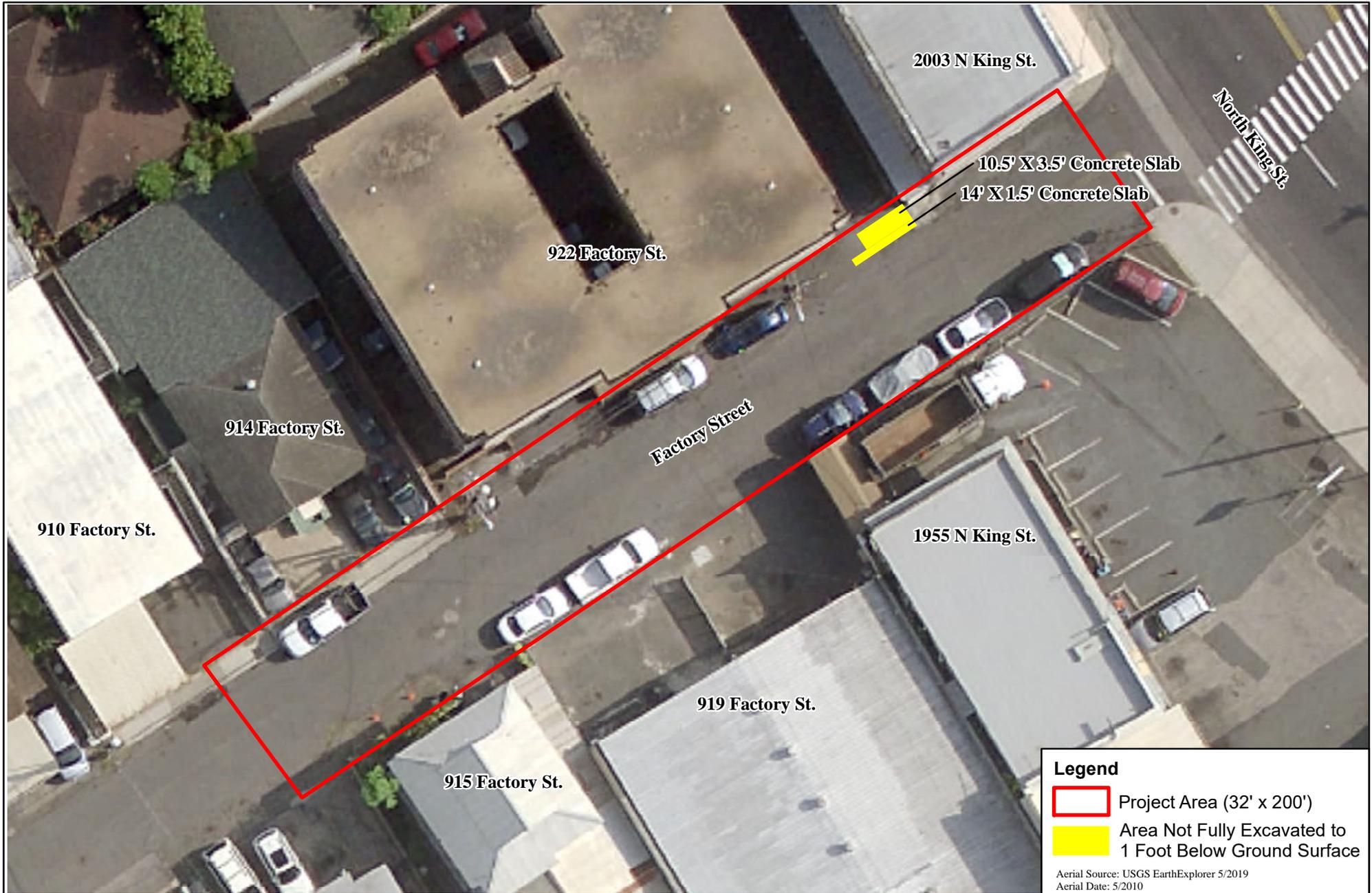
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**FIGURE 2-3**  
**2017 HDOH HEER MI SOIL**  
**LEAD CONCENTRATION MAP**  
**FACTORY STREET REMOVAL SITE**  
**HONOLULU, OAHU, HAWAII**



**Legend**

- Project Area (32' x 200')
- Area Not Fully Excavated to 1 Foot Below Ground Surface

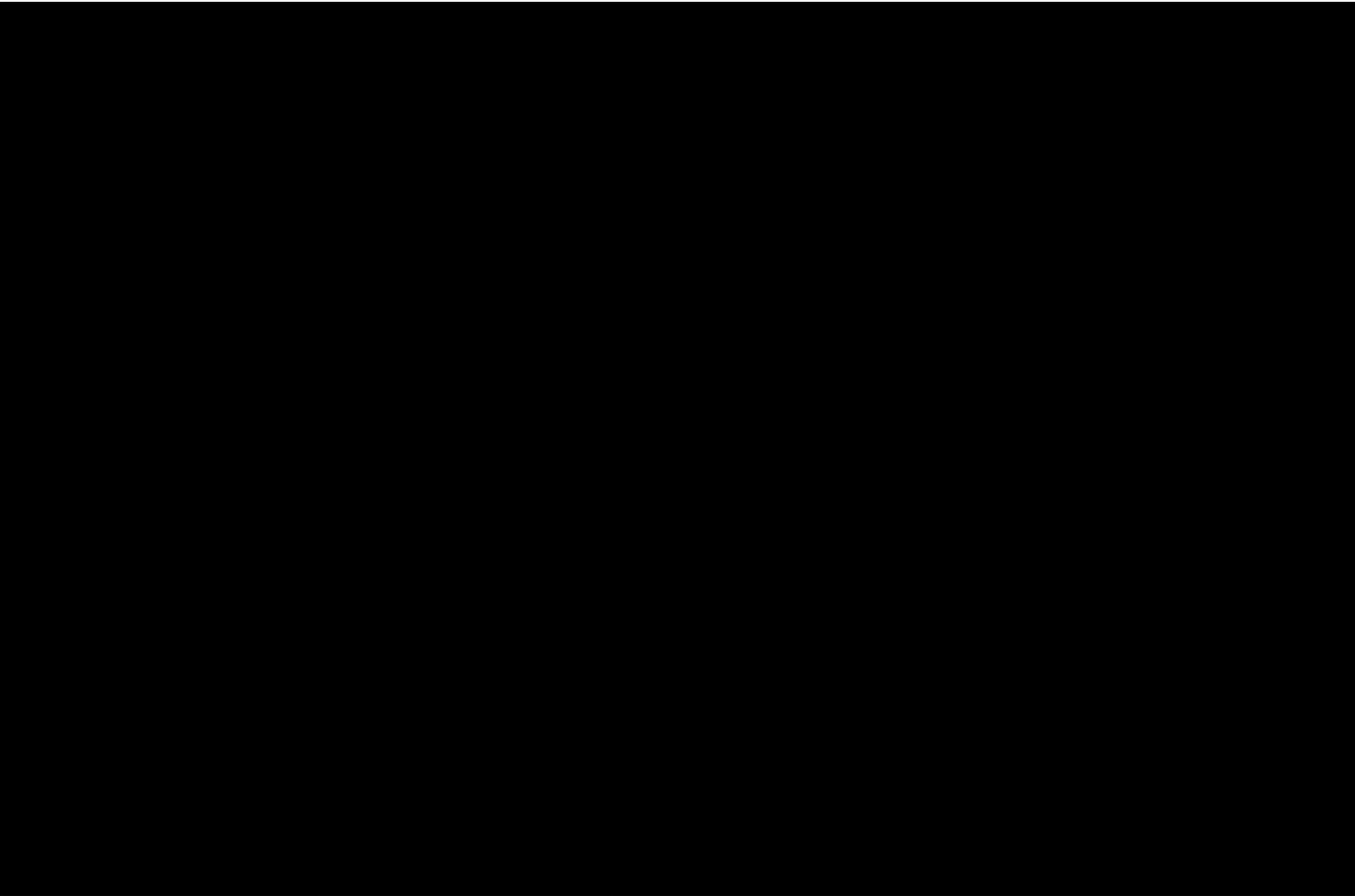
Aerial Source: USGS EarthExplorer 5/2019  
Aerial Date: 5/2010

0 Feet 50

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**FIGURE 3-1**  
**PROJECT AREAS NOT FULLY EXCAVATED**  
**TO ONE FOOT BELOW GROUND SURFACE**  
 Factory Street Site  
 Honolulu, Oahu, Hawaii



0 Feet 50

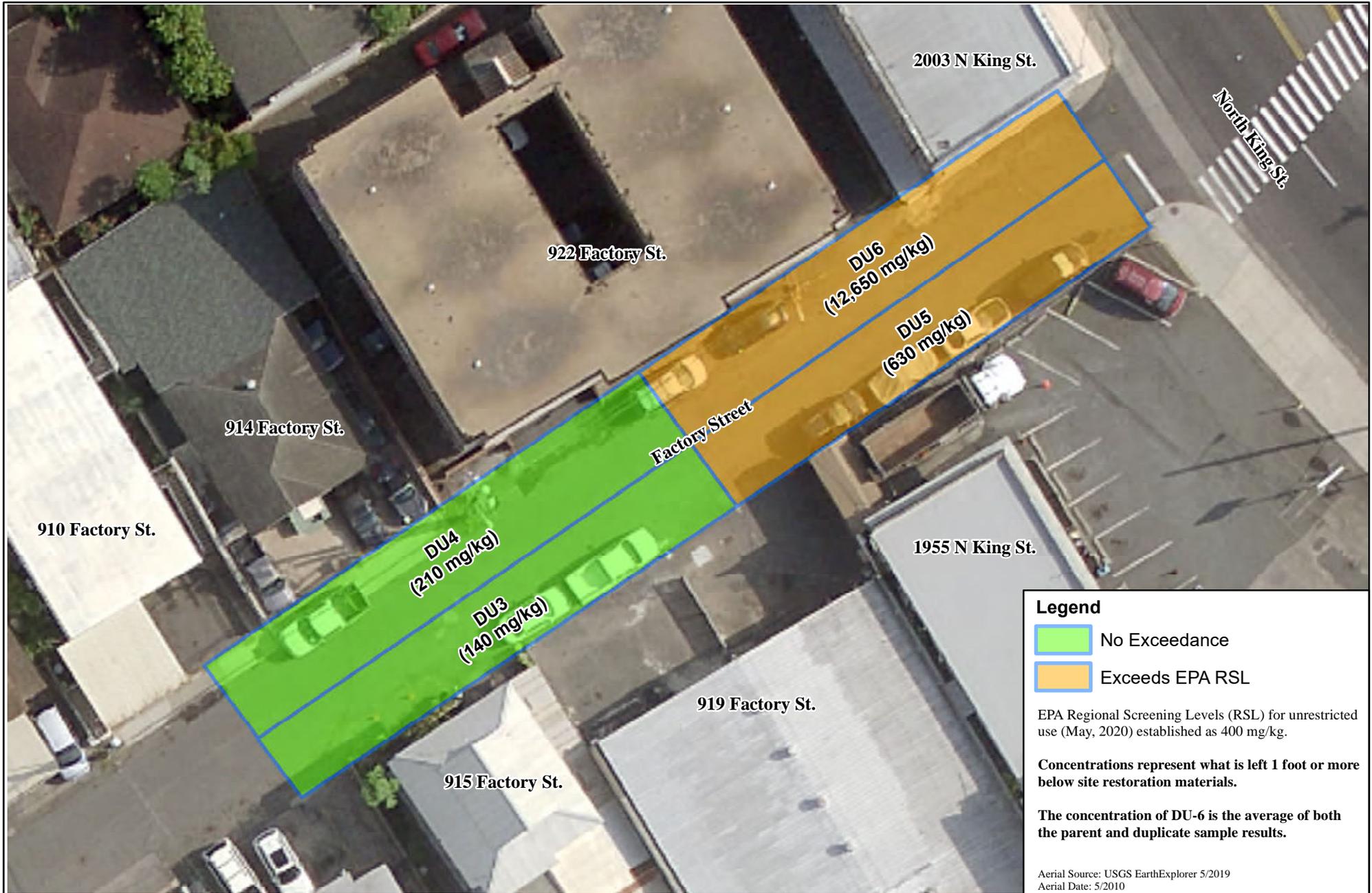
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**FIGURE 3-2**  
**APPROXIMATE SITE UTILITY MAP**  
Factory Street Site  
Honolulu, Oahu, Hawaii



**Legend**

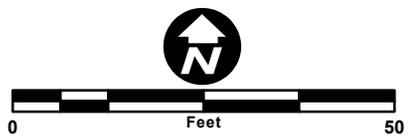
- No Exceedance
- Exceeds EPA RSL

EPA Regional Screening Levels (RSL) for unrestricted use (May, 2020) established as 400 mg/kg.

Concentrations represent what is left 1 foot or more below site restoration materials.

The concentration of DU-6 is the average of both the parent and duplicate sample results.

Aerial Source: USGS EarthExplorer 5/2019  
Aerial Date: 5/2010



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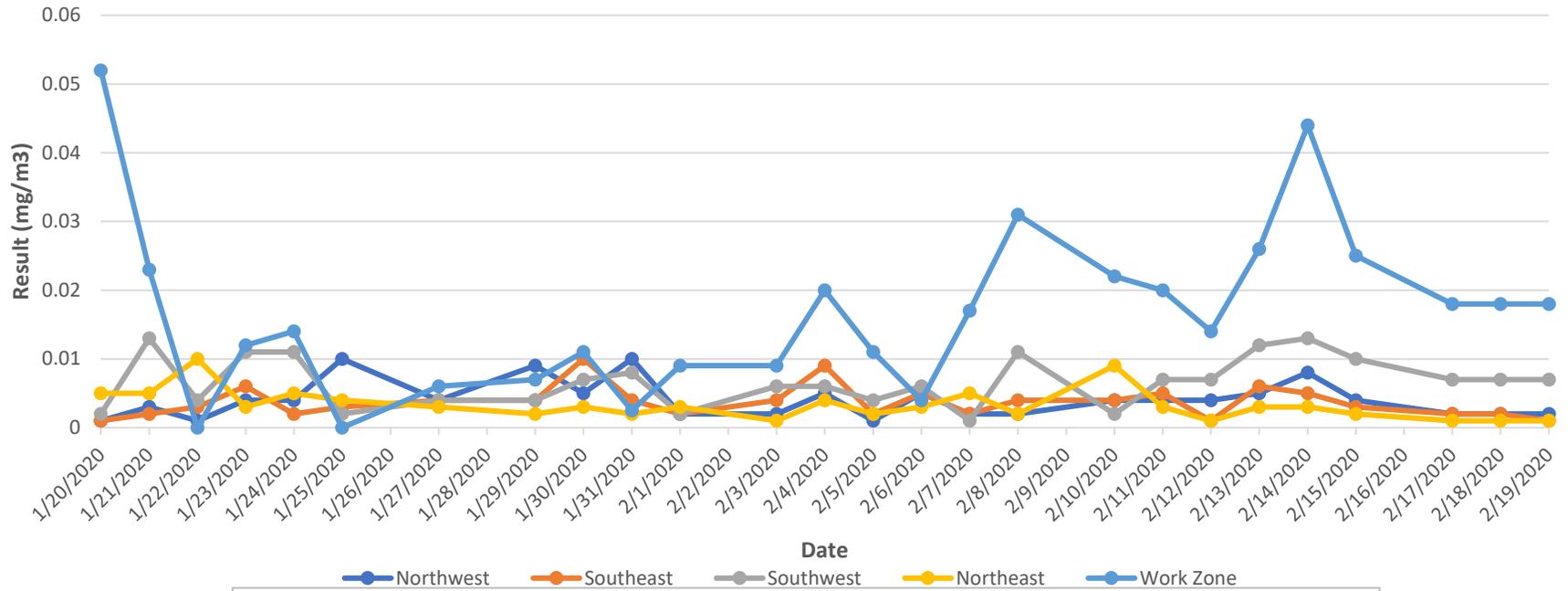


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**FIGURE 4-1**  
**FINAL 2020 REMOVAL ACTION EXCAVATION**  
**LIMITS FOR LEAD IN THE SOIL**  
**FACTORY STREET REMOVAL SITE**  
 HONOLULU, OAHU, HAWAII

**Figure 4-2**  
**10-Hour Time Weighted Average Air Monitoring Results**



**10 hour time weighted average screening levels (mg/m3): DU-3=8; DU-4=4.29; DU-5=2.37; DU-6=0.81**

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## TABLES

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**Table 3-1: Factory Street Hazardous Waste Soil Tracker**

Package Identification	Package Volume (cubic yard)	Origin (Decision Unit Identification)	Excavation Start Date	Excavation End Date	Manifest Number	Shipping Container Identification	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
H-001	1	DU-6	1/21/2020	1/21/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-002	1	DU-6	1/21/2020	1/23/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-003	1	DU-6	1/23/2020	1/23/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-004	1	DU-6	1/23/2020	1/23/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-005	1	DU-6	1/23/2020	1/23/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-006	1	DU-6	1/24/2020	1/24/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-007	1	DU-6	1/24/2020	1/24/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-008	1	DU-6	1/24/2020	1/24/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-009	1	DU-6	1/24/2020	1/24/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-010	1	DU-6	1/24/2020	1/24/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-011	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-012	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-013	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-014	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-015	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-016	1	DU-6	1/25/2020	1/25/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-017	1	DU-6	1/27/2020	1/29/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-018	1	DU-6	1/29/2020	1/29/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-019	1	DU-6	1/29/2020	1/29/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-020	1	DU-6	1/29/2020	1/29/2020	013229451FLE	NSIU 4050190	018952	2/3/2020	3/3/2020	54,760
H-021	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-022	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-023	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-024	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-025	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-026	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-027	1	DU-6	2/3/2020	2/3/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-028	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-029	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-030	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-031	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-032	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-033	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-034	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-035	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-036	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-037	1	DU-6	2/4/2020	2/4/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-038	1	DU-6	2/5/2020	2/5/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880

**Table 3-1: Factory Street Hazardous Waste Soil Tracker**

Package Identification	Package Volume (cubic yard)	Origin (Decision Unit Identification)	Excavation Start Date	Excavation End Date	Manifest Number	Shipping Container Identification	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
H-039	1	DU-6	2/5/2020	2/5/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
H-040	1	DU-6	2/5/2020	2/5/2020	013229452FLE	NSIU 4049380	018929	2/6/2020	3/11/2020	50,880
<b>Total Weight in Pounds = 105,640</b>										

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-001	1	DU-6	1/21/2020	1/21/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-002	1	DU-6	1/21/2020	1/21/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-003	1	DU-4	1/22/2020	1/22/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-004	1	DU-4	1/22/2020	1/22/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-005	1	DU-4	1/22/2020	1/22/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-006	1	DU-4	1/22/2020	1/22/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-007	1	DU-4	1/22/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-008	1	DU-4	1/22/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-009	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-010	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-011	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-012	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-013	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-014	1	DU-6	1/23/2020	1/23/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-015	1	DU-6	1/23/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-016	1	DU-6	1/24/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-017	1	DU-6	1/24/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-018	1	DU-6	1/24/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-019	1	DU-6	1/24/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-020	1	DU-6	1/24/2020	1/24/2020	FS-N20-01	MATU 2575988	HNL 0010382	1/27/2020	2/25/2020	51080
N-021	1	DU-6	1/24/2020	1/24/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-022	1	DU-6	1/24/2020	1/24/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-023	1	DU-6	1/24/2020	1/24/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-024	1	DU-6	1/24/2020	1/24/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-025	1	DU-6	1/24/2020	1/24/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-026	1	DU-6	1/24/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-027	1	DU-6	1/25/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-028	1	DU-6	1/25/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-029	1	DU-6	1/25/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-030	1	DU-6	1/25/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-031	1	DU-6	1/25/2020	1/25/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-032	1	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-033	1	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-034	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-035	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-036	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-037	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-038	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-039	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-040	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-041	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-042	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-043	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-044	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-045	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-046	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-047	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-02	MATU 2616691	0063265	1/28/2020	2/25/2020	53160
N-048	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-049	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-050	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-051	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-052	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-053	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-054	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-055	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-056	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-057	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-058	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-059	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-060	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-061	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-062	0.67	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-063	0.33	DU-5	1/27/2020	1/27/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-064	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-065	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-066	1	DU-6	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-067	1	DU-6	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-068	1	DU-6	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-069	1	DU-6	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-070	1	DU-6	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-071	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-072	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-073	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-074	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-075	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-076	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-077	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-078	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-079	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-080	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-03	MATU 2522313	018956	1/30/2020	2/25/2020	51880
N-081	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-082	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-083	1	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-084	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-085	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-086	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-087	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-088	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-089	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-090	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-091	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-092	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-093	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-094	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-095	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-096	0.67	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-097	0.33	DU-5	1/29/2020	1/29/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-098	1	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-099	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-100	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-101	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-102	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-103	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-104	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-105	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-106	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-107	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-108	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-109	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-110	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-111	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-112	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-113	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-114	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-115	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-116	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-117	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-118	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-04	MATU 2540873	018934	1/30/2020	2/25/2020	52160
N-119	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-120	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-121	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-122	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-123	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-124	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-125	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-126	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-127	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-128	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-129	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-130	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-131	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-132	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-133	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-134	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-135	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-136	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-137	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-138	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-139	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-140	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-141	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-142	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-143	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-144	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-145	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-146	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-147	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-148	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-149	0.67	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-150	0.33	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-151	1	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-152	1	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-153	1	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-154	1	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-166	1	DU-5	1/30/2020	1/30/2020	FS-N20-05	MATU 2611051	018904	1/31/2020	2/26/2020	49880
N-155	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-156	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-157	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-158	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-159	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-160	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-161	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-162	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-163	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-164	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-165	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-167	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-168	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-169	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-170	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-171	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-172	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-173	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-174	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-175	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-176	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-177	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-178	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-179	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-180	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-181	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-182	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-183	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-184	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-185	1	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-186	0.67	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-187	0.33	DU-5	1/31/2020	1/31/2020	FS-N20-06	MATU2588326	018988	2/4/2020	2/25/2020	49380
N-188	1	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-189	1	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-190	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-191	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-192	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-193	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-194	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-195	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-196	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-197	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-198	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-199	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-200	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-201	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-202	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-203	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-204	0.67	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-205	0.33	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-206	1	DU-5	2/1/2020	2/1/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-207	1	DU-6	2/3/2020	2/3/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-208	1	DU-6	2/3/2020	2/3/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-209	1	DU-6	2/3/2020	2/3/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-210	1	DU-6	2/3/2020	2/3/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-211	1	DU-6	2/3/2020	2/3/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-212	1	DU-6	2/4/2020	2/4/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-213	1	DU-6	2/4/2020	2/4/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-214	1	DU-6	2/4/2020	2/4/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-215	1	DU-6	2/4/2020	2/4/2020	FS-N20-07	MATU2597539	018977	2/5/2020	2/25/2020	49060
N-216	1	DU-6	2/4/2020	2/4/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-217	1	DU-6	2/4/2020	2/4/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-218	1	DU-6	2/4/2020	2/4/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-219	1	DU-6	2/4/2020	2/4/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-220	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-221	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-222	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-223	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-224	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-225	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-226	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-227	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-228	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-229	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-230	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-231	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-232	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-233	1	DU-6	2/5/2020	2/5/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-234	1	DU-4	2/6/2020	2/6/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-235	1	DU-4	2/6/2020	2/6/2020	FS-N20-08	MATU2583319	018998	2/6/2020	2/28/2020	50920
N-236	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-237	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-238	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-239	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-240	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-241	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-242	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-243	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-244	1	DU-4	2/6/2020	2/6/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-245	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-246	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-247	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-248	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-249	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-250	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-251	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-252	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-253	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-254	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-255	1	DU-4	2/7/2020	2/7/2020	FS-N20-09	MATU2649606	018932	2/10/2020	3/16/2020	49880
N-256	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-257	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-258	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-259	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-260	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-261	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-262	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-263	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-264	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-265	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-266	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-267	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-268	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-269	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-270	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-271	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-272	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-273	1	DU-4	2/8/2020	2/8/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-274	1	DU-4	2/10/2020	2/10/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-275	1	DU-4	2/10/2020	2/10/2020	FS-N20-10	MATU2581506	018942	2/10/2020	3/4/2020	51300
N-276	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-277	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-278	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-279	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-280	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-281	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-282	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-283	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-284	1	DU-4	2/10/2020	2/10/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-285	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-286	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-287	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-288	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-289	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-290	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-291	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-292	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-293	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-294	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-295	1	DU-4	2/11/2020	2/11/2020	FS-N20-11	MATU2536364	018960	2/12/2020	3/4/2020	48380
N-296	1	DU-4	2/11/2020	2/11/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-297	1	DU-4	2/11/2020	2/11/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-298	1	DU-4	2/11/2020	2/11/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-299	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-300	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-301	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-302	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-303	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-304	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-305	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-306	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-307	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-308	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-309	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-310	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-311	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-312	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-313	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-314	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-315	1	DU-3	2/12/2020	2/12/2020	FS-N20-12	MATU2600859	018914	2/13/2020	3/4/2020	50110
N-316	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-317	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-318	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-319	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-320	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-321	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-322	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-323	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-324	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-325	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-326	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-327	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-328	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-329	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-330	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-331	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-332	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-333	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-334	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-335	1	DU-3	2/13/2020	2/14/2020	FS-N20-13	MATU2594890	018989	2/14/2020	3/4/2020	51900
N-336	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-337	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-338	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-339	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-340	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-341	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-342	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-343	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-344	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-345	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-346	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-347	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-348	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-349	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-350	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-351	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-352	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-353	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-354	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-355	1	DU-3	2/14/2020	2/15/2020	FS-N20-14	MATU2650037	018991	2/17/2020	3/16/2020	50520
N-356	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-357	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-358	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-359	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-360	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-361	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-362	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-363	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-364	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-365	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-366	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-367	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-368	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-369	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-370	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-371	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-372	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-373	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-374	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-375	1	DU-3	2/17/2020	2/17/2020	FS-N20-15	MATU2549633	018947	2/17/2020	3/9/2020	51260
N-376	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-377	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-378	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-379	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-380	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-381	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-382	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-383	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-384	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-385	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-386	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-387	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-388	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-389	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-390	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-391	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-392	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-393	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-394	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-395	1	DU-3	2/17/2020	2/17/2020	FS-N20-16	MATU2617255	018957	2/18/2020	3/16/2020	47080
N-396	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-397	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-398	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-399	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-400	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-401	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-402	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-403	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-404	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-405	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-406	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-407	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-408	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-409	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-410	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-411	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-412	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-413	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-414	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-415	1	DU-3	2/18/2020	2/18/2020	FS-N20-17	MATU2635834	018949	2/19/2020	3/9/2020	49400
N-416	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460

**Table 3-2: Factory Street Non-Hazardous Soil Waste Tracker**

Package Identification	Package Volume (cubic yard)	Origin Decision Unit ID	Excavation Start Date	Excavation End Date	Bill of Lading/Waste Tracking #	Shipping Container ID	Shipping Container Seal #	Off Island Date	Facility Date Received	Final Shipping Container Weight (pounds)
N-417	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-418	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-419	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-420	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-421	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-422	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-423	1	DU-3	2/18/2020	2/18/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-424	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-425	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-426	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-427	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-428	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-429	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-430	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-431	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-432	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-433	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-434	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
N-435	1	DU-3	2/19/2020	2/19/2020	FS-N20-18	MATU2619685	018933	3/4/2020	3/26/2020	52460
<b>Final Weight in pounds = 909,810</b>										

**Table 4-1: Factory Street Removal Action Laboratory Analyzed Waste Characterization Results**

Sample Identification		FS-DU.03.01		FS-DU.03.02	
Sample Location		Factory Street Decision Unit Three Discrete		Factory Street Decision Unit Three Discrete	
Sample Date		08/15/2019		08/15/2019	
Analyte	RCRA Hazardous Waste Threshold Value (mg/L)	Metals - TCLP (mg/L)			
Cadmium	1.0	ND<0.05	U	ND<0.05	U
Chromium	5.0	ND<0.4	U	ND<0.4	U
Mercury	0.2	ND<0.02	U	ND<0.02	U
Notes:					
Metals TCLP by EPA Method 1311m/7000Bm					
<b><u>Bold, Underlined and Highlighted</u></b> = Analytical result exceeds screening levels					
mg/L = milligrams per liter					
ND = non-detect					
RCRA = Resource Conservation and Recovery Act					
TCLP = Toxicity Characteristic Leaching Procedure					
U = sample results reported by laboratory are below reporting limits					

**Table 4-2: Halawa Valley Quarry, Aiea, Honolulu County, Hawaii - Olympus Delta Professional X-Ray Fluorescence Spectrometer Base Course Results**

Sample ID	FS-BC-01	FS-BC-02	FS-BC-03	FS-BC-04	FS-BC-05	FS-BC-06	HVQ-1	HVQ-2	HVQ-3	HVQ-4	HVQ-5	
Sample Date	09/13/2019	09/13/2019	09/13/2019	09/13/2019	09/13/2019	9/13/2019	1/17/2020	1/17/2020	1/17/2020	1/17/2020	1/17/2020	
Analyte	HDOH Tier 1 EAL (mg/kg)	Metals - Soil (mg/kg)										
Arsenic*	24	ND	ND	3.8 +/- 1.2	3.8 +/- 1.2	4.4 +/- 1.3	4.4 +/-1.4	ND	6 +/- 1.2	5.1 +/- 1.6	ND	ND
Barium	1000	84 +/- 16	77 +/- 17	53 +/- 14	88 +/- 14	65 +/- 16	98 +/- 16	84 +/- 16	69 +/- 14	ND	79 +/- 15	56 +/- 14
Cadmium	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	1100	185 +/- 19	139 +/- 18	220 +/- 17	152 +/- 15	187 +/- 18	147 +/- 18	126 +/- 18	80 +/- 15	ND	139 +/- 16	161 +/- 17
Lead	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	78	ND	ND	ND	2 +/- 0.5	ND	ND	ND	1.8 +/- 0.5	ND	ND	ND
Mercury	4.7	ND	ND	4.4 +/- 1.4	6.3 +/- 1.4	ND	ND	ND	4.4 +/- 1.4	ND	ND	ND

Notes:  
 In-situ screening via handheld Olympus Delta Professional XRF spectrometer  
 ND = not detected above the reporting limit (<RL)  
 mg/Kg = milligrams per kilogram  
 HDOH EAL = Hawaii Department of Health Environmental Action Level  
 HDOH Tier I EALs based on non-drinking water resource and within 150 meters of a surface water body  
 \*=The average background concentration of arsenic is 11.92 mg/kg was provided by the Hawaii Department of Health (HDOH 2012).

**Table 4-3: Factory Street Removal Action Laboratory Analyzed Base Course Results**

Sample ID	FS-BC-01	FS-BC-02	FS-BC-03	FS-BC-04	FS-BC-05	FS-BC-06	HVQ.0117.01	
Sample Location	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	Halawa Valley Quarry 5-pt composite	
Sample Date	09/13/2019	09/13/2019	09/13/2019	09/13/2019	09/13/2019	09/13/2019	01/17/2020	
Analyte	HDOH Tier 1 EAL for unrestricted use (mg/kg)	Metals - Soil (mg/kg)						
Arsenic	24	ND<1.5 U	ND<1.3 U					
Barium	1000	13 J	14	13	13	14	29	16
Cadmium	14	ND<0.25 U	ND<0.26 U	ND<0.25 U	ND<0.25 U	ND<0.25 U	ND<0.25 U	ND<0.03 U
Chromium	1100	33 J	35	26	27	30	72	19
Lead	200	ND<1.0 U	1.6					
Selenium	78	ND<1.7 U	ND<1.4 U					
Silver	78	ND<0.9 U	ND<0.91 U	ND<0.9 U	ND<0.9 U	ND<0.89 U	ND<0.89 U	ND<0.09 U
Mercury	4.7	ND<0.012 U	NA					

Notes:  
 Metals by EPA Method 6010B/7471A  
**Bold, Underlined and Highlighted** = Analytical result exceeds screening levels  
 mg/kg = milligrams per kilogram  
 EAL = Environmental Action Level  
 HDOH = Hawaii Department of Health  
 NA = not analyzed  
 J = Indicates result is less than the Laboratory Reporting Limit (RL) but greater than or equal to the Laboratory Method Detection Limit, and the concentration is an approximate value; or values are qualified as estimated due to concentrations being outside of QC limits when concentrations were detected above laboratory RLs  
 U = Sample results reported by the laboratory as non-detect  
 HDOH Tier 1 EAL for unrestricted use for non-drinking water resource within 150 meters of surface water body (Fall 2017)

**Table 4-4: Factory Street Removal Action Laboratory Analyzed Excavation Limit Soil Results**

Sample ID		FS-S-3	FS-S-4	FS-S-5	FS-S-6	FS-S-6-D
Sample Location		Factory Street Decision Unit Three 30-pt composite	Factory Street Decision Unit Four 30-pt composite	Factory Street Decision Unit Five 30-pt composite	Factory Street Decision Unit Six 30-pt composite	Factory Street Decision Unit Six Duplicate 30-pt composite
Sample Date		02/19/2020	02/13/2020	02/01/2020	02/05/2020	2/5/2020
Analyte	EPA RSL for unrestricted use (mg/kg)					
Arsenic*	0.68	7.3	6.8	6.7	7.0 J	7.0
Barium	15,000	370	370	370	390	410
Cadmium	71	0.4	0.52	0.56	1.4 J	2.6 J
Chromium	--	160	140	140	140	130
Lead	400	140	210	<b>630</b>	<b>16,000</b> J	<b>9,300</b> J
Selenium	390	ND<1.4 U	ND<1.4 U	ND<1.4 U	ND<14 UJ	ND<1.4 U
Silver	390	ND<0.089 U	ND<0.089 U	0.15 J	0.76	0.72

Notes:

Metals by EPA Method 6010B

**Bold, Underlined and Highlighted** = Analytical result exceeds screening levels

mg/kg = milligrams per kilogram

EPA = Environmental Protection Agency

RSL = Regional Screening Level

ND = non-detect

J = Indicates result is less than the Laboratory Reporting Limit (RL) but greater than or equal to the Laboratory Method Detection Limit, and the concentration is an approximate value; or values are qualified as estimated due to concentrations being outside of QC limits when concentrations were detected above laboratory RLs

U = Sample results reported by the laboratory as non-detect

RSL = United States Environmental Protection Agency (EPA). Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSL). May 2020.

\*=The average background concentration of arsenic is 11.92 mg/kg was provided by the Hawaii Department of Health (HDOH 2012).

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
pDR 1000	3857	FS-A-0117-02 STATION	1/17/2020	North King Street side of 922 Factory Street building	10:53	Passive	14:26	3 Hr. 33 Min	N/A	N/A	0.015	--	0.346	13:21	Collecting background data
pDR 1000	3859	FS-A-0117-01 STATION	1/17/2020	Waterhouse Street side of 922 Factory Street building	10:57	Passive	14:34	3 Hr. 37 Min	N/A	N/A	0.014	--	0.162	13:00	Collecting background data
Dusttrak	8533171403	DT-A-0117-01 STATION	1/17/2020	Waterhouse Street side of 922 Factory Street building	10:53	2 L/min	14:27	3 Hr. 34 Min	428	liters	0.001	--	0.015	14:26	Collecting background data
Dusttrak	8533171402	DT-A-0117-02 STATION	1/17/2020	North King Street side of 922 Factory Street building	11:01	2 L/min	14:37	3 Hr. 36 Min	432	liters	0.001	--	0.018	14:24	Collecting background data
Dusttrak	8533171402	DT-A-0120-NW	1/20/2020	North Side Factory Street - Waterhouse Street End	14:27	2 L/min	17:01	2 Hr. 34 Min	308	liters	0.001	4.29	0.025	15:27	
Dusttrak	8533171403	DT-A-0120-SE	1/20/2020	South Side Factory Street - King Street End	14:35	2 L/min	17:19	2 Hr. 44 Min	328	liters	0.001	4.29	0.014	16:07	
Dusttrak	8533171401	DT-A-0120-SW	1/20/2020	South Side Factory Street - Waterhouse Street End	14:31	2 L/min	17:03	2 Hr. 32 Min	304	liters	0.002	4.29	0.042	15:25	
Dusttrak	8533164204	DT-A-0120-NE	1/20/2020	North Side Factory Street - King Street End	14:31	2 L/min	17:08	2 Hr. 37 Min	314	liters	0.005	4.29	4.050	?	Could not locate the time of maximum concentration. Looks like spiked a couple times at the beginning and then sorted itself out.
pDR 1000	3859	FS-A-0120-WZ	1/20/2020	Work Zone	14:55	Passive	16:53	1 Hr. 58 Min	N/A	N/A	0.052	4.29	4.006	15:07	Maximum STEL Concentration 0.163 mg/m3 @ 15:14
Dusttrak	8533171402	DT-A-0121-SE	1/21/2020	South Side Factory Street - King Street End	8:02	2 L/min	16:54	8 Hr. 50 Min	1060	liters	0.002	0.81	0.013	12:57	

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	8533171401	DT-A-0121-NW	1/21/2020	North Side Factory Street - Waterhouse Street End	7:50	2 L/min	16:36	8 Hr. 45 Min	1050	liters	0.003	0.81	0.041	16:25	
Dusttrak	8533171403	DT-A-0121-NE	1/21/2020	North Side Factory Street - King Street End	8:05	2 L/min	16:58	8 Hr. 49 Min	1058	liters	0.005	0.81	0.023	13:00	
Dusttrak	8533164204	DT-A-0121-SW	1/21/2020	South Side Factory Street - Waterhouse Street End	7:57	2 L/min	16:41	8 Hr. 45 Min	1050	liters	0.013	0.81	16.800	16:01	False Positive - N.E. fiddling with Dusttrak. Dusttrak is drifting.
pDR 1000	3859	FS-A-0121-WZ-1	1/21/2020	Work Zone - Dayne	10:51	N/A	11:43	51 Minutes	N/A	N/A	0.000	0.81	0.242	11:18	Maximum STEL Concentration 0.000 mg/m3 @10:52
pDR 1000	3859	FS-A-0121-WZ-2	1/21/2020	Work Zone - Tad	13:30	N/A	16:49	3 Hr 27 Min	N/A	N/A	0.023	0.81	2.619	16:12	Maximum STEL Concentration 0.102 mg/m3 @ 16:22
Dusttrak	8533164204	DT-A-0122-NE	1/22/2020	North Side Factory Street - King Street End	8:04	2 L/min	16:56	8 Hr 51 Min	1062	liters	0.010	0.81	0.071	13:38	
Dusttrak	8533171401	DT-A-0122-SW	1/22/2020	South Side Factory Street - Waterhouse Street End	7:56	2 L/min	16:41	8 Hr 46 Min	1052	liters	0.004	0.81	0.055	8:54	
Dusttrak	8533171402	DT-A-0122-NW	1/22/2020	North Side Factory Street - Waterhouse Street End	7:58	2 L/min	16:35	8 Hr 34 Min	1028	liters	0.001	0.81	0.024	10:53	
Dusttrak	8533171403	DT-A-0122-SE	1/22/2020	South Side Factory Street - King Street End	8:08	2 L/min	16:50	8 Hr 42 Min	1044	liters	0.003	0.81	0.017	14:54	
pDR 1000	2835	FS-A-0122-WZ	1/22/2020	Work Zone - Mike on Excavator	8:15	N/A	15:00	6 Hr 45 Min	N/A	N/A	0.000	0.81	0.588	10:35	Maximum STEL Concentration 0.012 mg/m3 Time observed 11:15
pDR 1000	3859	FS-A-0122-NE	1/22/2020	North Side Factory Street - King Street End	8:04	N/A	16:56	8 Hr 24 Min	N/A	N/A	0.000	0.81	1.807	8:40	Maximum STEL Concentration 0.03 mg/m3 @ 8:49

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	8533164204	DT-A-0123-SW	1/23/2020	South Side Factory Street - Waterhouse Street End	8:10	2 L/min	16:45	8 Hr 13 Min	986	Liters	0.011	0.81	0.083	8:24	
Dusttrak	8533171401	DT-A-0123-NW	1/23/2020	North Side Factory Street - Waterhouse Street End	8:05	2 L/min	16:12	8 Hr 13 min	986	Liters	0.004	0.81	0.076	16:02	
Dusttrak	8533171402	DT-A-0123-NE	1/23/2020	North Side Factory Street - King Street End	7:54	2 L/min	16:25	8 Hr 20 Min	1000	liters	0.003	0.81	0.189	10:07	
Dusttrak	8533171403	DT-A-0123-SE	1/23/2020	South Side Factory Street - King Street End	8:07	2 L/min	16:19	8 Hr 12 Min	984	liters	0.006	0.81	0.089	12:50	
pDR 1000	2835	FS-A-0123-WZ	1/23/2020	Excavator Cab-Operator Dayne	10:03	Passive	16:36	6 Hr 33 Min	N/A	N/A	0.012	0.81	3.691	16:03	Maximum STEL Concentration 0.063 mg/m3 @ 11:07 - Exceedance was when Dayne kicked pDR accidentally - False Positive
Dusttrak	4204	DT-A-0124-SW	1/24/2020	South Side Factory Street - Waterhouse Street End	7:45	2 L/min	16:04	8 Hr 19 Min	998	liters	0.011	0.81	0.048	14:33	
Dusttrak	1403	DT-A-0124-NW	1/24/2020	North Side Factory Street - Waterhouse Street End	7:45	2 L/min	16:08	8 Hr 20 Min	1000	liters	0.004	0.81	0.025	11:11	
Dusttrak	1401	DT-A-0124-NE	1/24/2020	North Side Factory Street - King Street End	7:52	2 L/min	16:11	8 Hr 19 Min	998	liters	0.005	0.81	0.035	9:56	
Dusttrak	1402	DT-A-0124-SE	1/24/2020	South Side Factory Street - King Street End	7:51	2 L/min	16:09	8 Hr 20 Min	1000	liters	0.002	0.81	0.012	14:33	
pDR 1000	3857	FS-A-0124-WZ	1/24/2020	Excavator Cab-Operator Dayne	7:49	Passive	16:15	8 Hr 26 Min	Passive	N/A	0.014	0.81	0.962	8:38	Maximum STEL Concentration 0.060 mg/m3 @ 8:25

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1402	DT-A-0125-SW	1/25/2020	South Side Factory Street - Waterhouse Street End	7:43	2 L/min	15:35	7 Hr 51 Min	942	Liters	0.002	0.81	0.017	11:16	
Dusttrak	4204	DT-A-0125-NW	1/25/2020	North Side Factory Street - Waterhouse Street End	7:41	2 L/min	15:37	7 Hr 56 Min	952	Liters	0.010	0.81	0.069	15:33	
Dusttrak	1401	DT-A-0125-NE	1/25/2020	North Side Factory Street - King Street End	7:47	2 L/min	15:43	7 Hr 54 Min	948	Liters	0.004	0.81	0.062	15:13	
Dusttrak	1403	DT-A-0125-SE	1/25/2020	South Side Factory Street - King Street End	7:47	2 L/min	15:41	7 Hr 53 Min	946	Liters	0.003	0.81	0.035	15:12	
pDR 1000	3859	FS-A-0125-WZ	1/25/2020	Excavator Cab-Operator Dayne	7:45	Passive	15:46	8 Hr 1 Min	Passive	N/A	0.000	0.81	1.134	15:33	Maximum STEL Concentration 0.014 mg/m3 @ 15:47
Dusttrak	1402	DT-A-0127-SW	1/27/2020	South Side Factory Street - Waterhouse Street End	7:48	2 L/min	16:30	3 Hr 53 Min	466	Liters	0.004	2.37	0.037	11:32	Instrument powered off - Flow Error Message
Dusttrak	1401	DT-A-0127-NW	1/27/2020	North Side Factory Street - Waterhouse Street End	7:45	2 L/min	16:40	8 Hr 48 Min	1056	Liters	0.004	2.37	0.020	16:07	
Dusttrak	1403	DT-A-0127-NE	1/27/2020	North Side Factory Street - King Street End	7:47	2 L/min	16:30	8 Hr 42 Min	1044	Liters	0.003	2.37	0.026	10:13	
Dusttrak	4204	DT-A-0127-SE	1/27/2020	South Side Factory Street - King Street End	7:44	2 L/min	16:35	8 Hr 50 min	1060	Liters	0.004	2.37	0.032	8:25	
pDR 1000	2835	FS-A-0127-WZ	1/27/2020	Excavator Cab-Operator Dayne	7:37	Passive	16:43	9 Hr 6 Min	N/A	N/A	0.006	2.37	1.643	16:43	Maximum Concentration detected at end of day. False Positive - Set off by cab door. Maximum STEL Concentration 0.040 mg/m3 @ 9:53

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1401	DT-A-0129-SW	1/29/2020	South Side Factory Street - Waterhouse Street End	7:47	2 L/min	16:37	8 Hr 45 Min	1050	Liters	0.004	2.37	0.024	14:21	
Dusttrak	4204	DT-A-0129-NW	1/29/2020	North Side Factory Street - Waterhouse Street End	7:46	2 L/min	16:32	8 Hr 45 Min	1050	Liters	0.009	2.37	0.058	8:05	
Dusttrak	1402	DT-A-0129-NE	1/29/2020	North Side Factory Street - King Street End	7:51	2 L/min	16:30	8 Hr 51 Min	1062	Liters	0.002	2.37	0.017	7:55	
Dusttrak	1403	DT-A-0129-SE	1/29/2020	South Side Factory Street - King Street End	7:46	2 L/min	16:35	8 Hr 49 Min	1058	Liters	0.004	2.37	0.081	15:54	
pDR 1000	2835	FS-A-0129-WZ	1/29/2020	Excavator Cab-Operator Dayne	7:41	Passive	16:23	8 Hr 42 Min	N/A	N/A	0.007	2.37	1.232	8:49	Maximum STEL Concentration 0.063 mg/m3 @ 13:18
Dusttrak	1402	DT-A-0130-SW	1/30/2020	South Side Factory Street - Waterhouse Street End	7:38	2 L/min	17:06	9 hr 29 Min	1138	Liters	0.007	2.37	0.038	8:44	
Dusttrak	1403	DT-A-0130-NW	1/30/2020	North Side Factory Street - Waterhouse Street End	7:40	2 L/min	17:10	9 Hr 30 Min	1140	Liters	0.005	2.37	0.030	11:07	
Dusttrak	1401	DT-A-0130-NE	1/30/2020	North Side Factory Street - King Street End	7:42	2 L/min	17:04	9 Hr 15 Min	1110	Liters	0.003	2.37	0.043	11:37	
Dusttrak	4204	DT-A-0130-SE	1/30/2020	South Side Factory Street - King Street End	7:41	2 L/min	17:02	9 Hr 20 Min	1120	Liters	0.010	2.37	0.049	11:36	
pDR 1000	3859	FS-A-0130-WZ	1/30/2020	Field Technician	7:38	Passive	16:22	8 Hr 44 Min	N/A	N/A	0.011	2.37	1.177	11:18	Maximum STEL Concentration 0.023 mg/m3 @ 11:25
Dusttrak	1403	DT-A-0131-SW	1/31/2020	South Side Factory Street - Waterhouse Street End	7:38	2 L/min	16:25	8 Hr 48 Min	1056	Liters	0.008	2.37	0.085	11:38	

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	4204	DT-A-0131-NW	1/31/2020	North Side Factory Street - Waterhouse Street End	7:36	2 L/min	16:28	8 Hr 52 Min	1064	Liters	0.010	2.37	0.056	8:05	
Dusttrak	1402	DT-A-0131-NE	1/31/2020	North Side Factory Street - King Street End	7:44	2 L/min	16:27	8 Hr 49 Min	1058	Liters	0.002	2.37	0.025	7:47	
Dusttrak	1401	DT-A-0131-SE	1/31/2020	South Side Factory Street - King Street End	7:45	2 L/min	16:27	8 Hr 50 Min	1060	Liters	0.004	2.37	0.020	7:46	
pDR 1000	3857	FS-A-0131-WZ	1/31/2020	Excavator Cab-Operator Dayne	7:37	Passive	16:24	8 Hr 47 Min	N/A	N/A	0.002	2.37	1.194	11:29	Maximum STEL Concentration 0.055 mg/m3 @ 8:49
Dusttrak	1402	DT-A-0201-SW	2/1/2020	South Side Factory Street - Waterhouse Street End	7:31	2 L/min	11:46	4 Hr 14 Min	508	Liters	0.002	2.37	0.071	7:35	
Dusttrak	1403	DT-A-0201-NW	2/1/2020	North Side Factory Street - Waterhouse Street End	7:28	2 L/min	11:45	4 Hr 17 Min	514	Liters	0.002	2.37	0.027	11:38	
Dusttrak	1401	DT-A-0201-NE	2/1/2020	North Side Factory Street - King Street End	7:34	2 L/min	11:47	4 Hr 13 Min	506	Liters	0.003	2.37	0.013	11:42	
Dusttrak	4204	DT-A-0201-SE	2/1/2020	South Side Factory Street - King Street End	7:35	2 L/min	11:40	4 Hr 6 Min	492	Liters	0.005	2.37	0.239	10:50	
pDR 1000	3857	FS-A-0201-WZ	2/1/2020	Excavator Cab-Operator Dayne	7:27	Passive	11:44	4 Hr 17 Min	N/A	N/A	0.009	2.37	1.809	11:09	Maximum STEL Concentration 0.038 mg/m3 @ 11:11
Dusttrak	1401	DT-A-0203-SW	2/3/2020	South Side Factory Street - Waterhouse Street End	10:33	2 L/min	16:44	6 Hr 10 Min	740	liters	0.006	0.81	0.042	10:49	
Dusttrak	1403	DT-A-0203-NW	2/3/2020	North Side Factory Street - Waterhouse Street End	10:32	2 L/min	16:41	6 Hr 9 Min	738	liters	0.002	0.81	0.058	16:19	

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1402	DT-A-0203-NE	2/3/2020	North Side Factory Street - King Street End	10:37	2 L/min	16:39	6 Hr 2 min	724	liters	0.001	0.81	0.011	11:23	
Dusttrak	4204	DT-A-0203-SE	2/3/2020	South Side Factory Street - King Street End	10:40	2 L/min	16:37	5 Hr 57 Min	714	liters	0.004	0.81	0.016	15:32	
pDR 1000	3857	FS-A-0203-WZ	2/3/2020	Excavator Cab-Operator Dayne	10:25	Passive	14:57	4 Hr 32 Min	N/A	N/A	0.009	0.81	0.722	13:26	Maximum STEL Concentration 0.026 mg/m3 @ 12:30
pDR 1000	2835	FS-A-0203-WZ-2	2/3/2020	Window ledge 922 Factory Street	11:33	Passive	16:05	4 Hr 32 Min	N/A	N/A	0.009	0.81	0.722	14:34	Maximum STEL Concentration 0.026 mg/m3 @ 13:38
Dusttrak	4204	DT-A-0204-SE	2/4/2020	South Side Factory Street - King Street End	7:35	2 L/min	17:16	9 Hr 42 Min	1164	liters	0.009	0.81	0.045	15:09	
Dusttrak	1401	DT-A-0204-NE	2/4/2020	North Side Factory Street - King Street End	7:36	2 L/min	17:17	9 Hr 41 Min	1162	liters	0.004	0.81	0.045	13:07	
Dusttrak	1403	DT-A-0204-NW	2/4/2020	North Side Factory Street - Waterhouse Street End	7:37	2 L/min	17:23	9 Hr 46 Min	1172	liters	0.005	0.81	0.022	7:53	
Dusttrak	1402	DT-A-0204-SW	2/4/2020	South Side Factory Street - Waterhouse Street End	7:38	2 L/min	17:21	9 Hr 42 Min	1164	liters	0.006	0.81	0.046	8:08	
pDR 1000	3857	FS-A-0204-WZ	2/4/2020	Excavator Cab-Operator Dayne	8:47	Passive	17:10	8 Hr 22 Min	N/A	N/A	0.020	0.81	1.113	11:40	Maximum STEL Concentration 0.076 mg/m3 @ 16:37
pDR 1000	2835	FS-A-0204-WZ-2	2/4/2020	Window ledge 922 Factory Street	7:48	Passive	17:09	9 Hr 21 Min	N/A	N/A	0.012	0.81	0.795	11:35	Maximum STEL Concentration 0.055 mg/m3 @ 9:02
Dusttrak	1401	DT-A-0205-SE-1	2/5/2020	South Side Factory Street - King Street End	8:17	2 L/min	10:13	1 Hr 56 Min	232	liters	0.001	0.81	0.021	8:33	
		DT-A-0205-SE-2			10:55	2 L/min	16:03	5 Hr 4 Min	608	liters	0.002	0.81	0.024	15:55	

Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1402	DT-A-0205-NW-1	2/5/2020	North Side Factory Street - Waterhouse Street End	8:20	2 L/min	10:13	1 Hr 53 Min	226	liters	0.001	0.81	0.009	8:23	
		DT-A-0205-NW-2			10:57	2 L/min	16:06	5 Hr 6 Min	612	liters	0.001	0.81	0.011	12:37	
Dusttrak	1403	DT-A-0205-NE-1	2/5/2020	North Side Factory Street - King Street End	8:23	2 L/min	10:12	1 Hr 49 Min	218	liters	0.001	0.81	0.013	9:11	
		DT-A-0205-NE-2			11:00	2 L/min	16:07	5 Hr 7 Min	614	liters	0.002	0.81	0.058	15:28	
Dusttrak	4204	DT-A-0205-SW-1	2/5/2020	South Side Factory Street - Waterhouse Street End	8:29	2 L/min	10:14	1 Hr 45 Min	210	liters	0.002	0.81	0.025	9:10	
		DT-A-0205-SW-2			10:52	2 L/min	15:57	4 Hr 58 Min	596	liters	0.004	0.81	0.021	15:49	
pDR 1000	3859	FS-A-0205-WZ	2/5/2020	Excavator Cab-Operator Dayne	8:08	Passive	15:30	7 Hr 24 Min	N/A	N/A	0.011	0.81	4.477	11:29	Maximum Concentration during sweeping of manhole cover. Maximum STEL Concentration 0.061 mg/m3 @ 11:43
Dusttrak	1401	DT-A-0206-SE	2/6/2020	South Side Factory Street - King Street End	7:48	2 L/min	16:20	8 hr 32 Min	1024	liters	0.005	4.29	0.040	13:08	
Dusttrak	1403	DT-A-0206-NW	2/6/2020	North Side Factory Street - Waterhouse Street End	7:49	2 L/min	16:22	8 hr 33 Min	1026	liters	0.005	4.29	0.070	13:07	
Dusttrak	1402	DT-A-0206-NE	2/6/2020	North Side Factory Street - King Street End	7:51	2 L/min	16:25	8 Hr 34 min	1028	liters	0.003	4.29	0.036	15:30	
Dusttrak	4204	DT-A-0206-SW	2/6/2020	Southwest	7:46	2 L/min	16:19	8 Hr 33 min	1026	liters	0.006	4.29	0.033	13:06	
pDR 1000	3859	FS-A-0206-WZ	2/6/2020	Excavator Cab-Operator Dayne	7:37	Passive	15:51	8 hr 14 min	N/A	N/A	0.004	4.29	0.833	11:17	Maximum STEL Concentration 0.042 mg/m3 @ 11:08

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1401	DT-A-0207-SE	2/7/2020	South Side Factory Street - King Street End	10:46	2 L/min	17:03	6 Hr 17 min	734	liters	0.002	4.29	0.026	16:45	
Dusttrak	1403	DT-A-0207-NW	2/7/2020	North Side Factory Street - Waterhouse Street End	10:49	2 L/min	16:49	6 hr 0 min	720	liters	0.002	4.29	0.034	13:50	
Dusttrak	1402	DT-A-0207-SW	2/7/2020	South Side Factory Street - Waterhouse Street End	10:45	2 L/min	16:57	6 hr 12 Min	724	liters	0.001	4.29	0.008	16:06	
Dusttrak	4204	DT-A-0207-NE	2/7/2020	North Side Factory Street - King Street End	10:47	2 L/min	17:07	6 hr 20 Min	760	liters	0.005	4.29	0.035	16:31	
pDR 1000	3859	FS-A-0207-WZ	2/7/2020	Excavator Cab-Operator Dayne	11:59	N/A	16:27	4 Hr 28 min	N/A	liters	0.017	4.29	1.019	13:44	Maximum STEL Concentration 0.050 mg/m3 @ 13:47
Dusttrak	1403	DT-A-0208-SE	2/8/2020	South Side Factory Street - King Street End	7:53	2 L/min	15:26	7 Hr 31 min	902	liters	0.004	4.29	0.028	12:29	
Dusttrak	1401	DT-A-0208-NW	2/8/2020	North Side Factory Street - Waterhouse Street End	7:55	2 L/min	15:13	7 Hr 18 min	876	liters	0.002	4.29	0.032	12:32	
Dusttrak	4204	DT-A-0208-SW	2/8/2020	South Side Factory Street - Waterhouse Street End	8:02	2 L/min	15:26	7 Hr 24 Min	888	liters	0.011	4.29	0.082	14:47	
Dusttrak	1402	DT-A-0208-NE	2/8/2020	North Side Factory Street - King Street End	8:05	2 L/min	15:25	7 Hr 20 Min	880	liters	0.002	4.29	0.010	8:13	
pDR 1000	3859	FS-A-0208-WZ	2/8/2020	Excavator Cab-Operator Dayne	7:40	N/A	14:56	7 Hr 16 Min	N/A	N/A	0.031	4.29	0.608	12:45	During application of quikrete to broken sewer cleanout port visible dust was generated. Maximum STEL Concentration 0.061 mg/m3 @ 12:49

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1403	DT-A-0210-SE	2/10/2020	South Side Factory Street - King Street End	8:04	2 L/min	17:04	8 Hr 59 min	1078	liters	0.004	4.29	0.023	10:58	
Dusttrak	1401	DT-A-0210-NW	2/10/2020	North Side Factory Street - Waterhouse Street End	8:10	2 L/min	16:54	8 Hr 46 min	1052	liters	0.004	4.29	0.015	15:06	
Dusttrak	4204	DT-A-0210-NE	2/10/2020	North Side Factory Street - King Street End	8:02	2 L/min	16:58	8 Hr 53 Min	1066	liters	0.009	4.29	0.034	16:54	
Dusttrak	1402	DT-A-0210-SW	2/10/2020	South Side Factory Street - Waterhouse Street End	8:05	2 L/min	16:47	7 Hr 51 Min	942	liters	0.002	4.29	0.016	15:01	
pDR 1000	3859	FS-A-0210-WZ	2/10/2020	Excavator Cab-Operator Dayne	7:47	N/A	16:21	7 Hr 26 Min	N/A	N/A	0.022	4.29	0.796	10:56	Maximum STEL Concentration 0.050 mg/m3 @ 11:11
Dusttrak	1403	DT-A-0211-SE	2/11/2020	South Side Factory Street - King Street End	7:29	2 L/min	17:04	8 Hr 34 min	1028	liters	0.005	4.29	0.095	8:50	
Dusttrak	1401	DT-A-0211-NW	2/11/2020	North Side Factory Street - Waterhouse Street End	7:26	2 L/min	16:54	8 Hr 30 min	1020	liters	0.004	4.29	0.034	10:13	
Dusttrak	4204	DT-A-0211-SW	2/11/2020	South Side Factory Street - Waterhouse Street End	7:28	2 L/min	16:58	8 Hr 32 Min	1024	liters	0.007	4.29	0.036	14:21	
Dusttrak	1402	DT-A-0211-NE	2/11/2020	North Side Factory Street - King Street End	7:30	2 L/min	16:47	8 Hr 35 Min	1030	liters	0.003	4.29	0.021	9:27	
pDR 1000	2835	FS-A-0211-WZ	2/11/2020	Excavator Cab-Operator Dayne	7:49	N/A	13:29	5 Hr 40 min	N/A	N/A	0.020	4.29	2.930	8:15	Maximum STEL Concentration 0.092 mg/m3 @ 13:35
Dusttrak	1403	DT-A-0212-SE	2/12/2020	South Side Factory Street - King Street End	7:18	2 L/min	17:13	9 Hr 55 min	1190	liters	0.001	4.29	0.010	13:22	

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	1401	DT-A-0212-NW	2/12/2020	North Side Factory Street - Waterhouse Street End	7:13	2 L/min	17:23	10 Hr 10 min	1220	liters	0.004	4.29	0.034	10:00	Maximum Concentration observed during concrete jackhammering.
Dusttrak	4204	DT-A-0212-SW	2/12/2020	South Side Factory Street - Waterhouse Street End	7:17	2 L/min	17:06	9 Hr 49 Min	1178	liters	0.007	4.29	0.033	13:03	
Dusttrak	1402	DT-A-0212-NE	2/12/2020	North Side Factory Street - King Street End	7:21	2 L/min	17:18	9 Hr 57 Min	1194	liters	0.001	4.29	0.025	8:56	Maximum Concentration observed during concrete jackhammering.
pDR 1000	3857	FS-A-0212-WZ	2/12/2020	Excavator Cab-Operator Dayne	8:26	N/A	12:44	4 Hr 18 Min	N/A	N/A	0.014	4.29	1.315	9:48	Maximum Concentration observed during concrete jackhammering; Maximum STEL Concentration 0.070 mg/m3 @ 12:44
Dusttrak	1403	DT-A-0213-SE	2/13/2020	South Side Factory Street - King Street End	7:36	2 L/min	17:02	9 Hr 25 min	1190	liters	0.006	4.29	0.086	7:43	
Dusttrak	1401	DT-A-0213-NW	2/13/2020	North Side Factory Street - Waterhouse Street End	7:33	2 L/min	17:03	9 Hr 30 min	1220	liters	0.005	4.29	0.082	8:55	
Dusttrak	4204	DT-A-0213-SW	2/13/2020	South Side Factory Street - Waterhouse Street End	7:34	2 L/min	16:54	9 Hr 20 Min	1178	liters	0.012	4.29	0.152	8:46	
Dusttrak	1402	DT-A-0213-NE	2/13/2020	North Side Factory Street - King Street End	7:38	2 L/min	16:56	9 Hr 18 Min	1194	liters	0.003	4.29	0.062	8:48	
pDR 1000	3859	FS-A-0213-WZ	2/13/2020	Excavator Cab-Operator Dayne	7:35	N/A	15:42	8 Hr 7 Min	N/A	N/A	0.026	4.29	0.959	8:33	Maximum STEL Concentration 0.059 mg/m3 @ 8:42
Dusttrak	1401	DT-A-0214-NW	2/14/2020	North Side Factory Street - Waterhouse Street End	7:31	2 L/min	16:24	9 Hr 24 min	1128	liters	0.008	8	0.206	12:00	

Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
Dusttrak	4204	DT-A-0214-SW	2/14/2020	South Side Factory Street - Waterhouse Street End	7:29	2 L/min	16:46	9 Hr 23 Min	1126	liters	0.013	8	0.224	8:54	
Dusttrak	1402	DT-A-0214-NE	2/14/2020	North Side Factory Street - King Street End	7:34	2 L/min	16:49	9 Hr 15 Min	1110	liters	0.003	8	0.021	10:58	
Dusttrak	1403	DT-A-0214-SE	2/14/2020	South Side Factory Street - King Street End	7:33	2 L/min	16:47	9 Hr 14 min	1108	liters	0.005	8	0.017	9:32	
pDR 1000	3859	FS-A-0214-WZ-1	2/14/2020	Excavator Cab-Operator Dayne	7:52	N/A	16:51	8 Hr 59 Min	N/A	N/A	0.044	8	0.815	N/A	Maximum STEL Concentration 0.056 mg/m3 @ 14:37
pDR 1000	2835	FS-A-0214-WZ-2	2/14/2020	Fenceline at 915 Factory St	13:41	N/A	16:45	3 Hr 4 Min	N/A	N/A	0.042	8	1.571	N/A	To be protective of the children playing at 915 Factory St, an additional pDR was placed on the fenceline of the property during excavation upwind of property at DU-3; Maximum STEL Concentration 0.083 mg/m3 @ 14:02
Dusttrak	1401	DT-A-0215-NW	2/15/2020	North Side Factory Street - Waterhouse Street End	7:36	2 L/min	15:45	8 Hr 9 min	978	liters	0.004	8	0.033	15:19	
Dusttrak	4204	DT-A-0215-SW	2/15/2020	South Side Factory Street - Waterhouse Street End	7:15	2 L/min	15:32	8 Hr 17 Min	994	liters	0.010	8	0.044	13:37	
Dusttrak	1402	DT-A-0215-NE	2/15/2020	North Side Factory Street - King Street End	7:20	2 L/min	15:33	8 Hr 13 Min	986	liters	0.002	8	0.041	8:30	
Dusttrak	1403	DT-A-0215-SE	2/15/2020	South Side Factory Street - King Street End	7:21	2 L/min	15:31	8 Hr 10 min	980	liters	0.003	8	0.026	11:26	

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
pDR 1000	3859	FS-A-0215-WZ-1	2/15/2020	Excavator Cab-Operator Dayne	7:52	N/A	16:51	8 Hr 59 Min	N/A	N/A	0.025	8	1.112	8:16	Maximum STEL Concentration 0.052 mg/m3 @ 12:27
pDR 1000	2835	FS-A-0215-WZ-2	2/15/2020	Fenceline at 915 Factory St	7:30	N/A	15:13	7 Hr 43 Min	N/A	N/A	0.022	8	0.655	12:26	Normal excavation activities at DU-3; To be protective of the children playing at 915 Factory St, an additional pDR was placed on the fenceline of the property during excavation upwind of property at DU-3; Maximum STEL Concentration 0.057 mg/m3 @ 11:39
Dusttrak	1401	DT-A-0217-NW	2/17/2020	North Side Factory Street - Waterhouse Street End	7:23	2 L/min	16:35	9 Hr 12 min	1104	liters	0.002	8	0.020	13:45	
Dusttrak	1402	DT-A-0217-NE	2/17/2020	North Side Factory Street - King Street End	7:20	2 L/min	16:27	9 Hr 7 Min	1094	liters	0.001	8	0.016	16:15	
Dusttrak	1403	DT-A-0217-SE	2/17/2020	South Side Factory Street - King Street End	7:21	2 L/min	16:26	9 Hr 5 min	1090	liters	0.002	8	0.013	10:16	
Dusttrak	4204	DT-A-0217-SW	2/17/2020	South Side Factory Street - Waterhouse Street End	7:22	2 L/min	16:34	9 Hr 13 Min	1106	liters	0.007	8	0.030	13:14	
pDR 1000	3859	FS-A-0217-WZ-1	2/17/2020	Excavator Cab-Operator Dayne	7:45	N/A	15:50	8 Hr 5 Min	N/A	N/A	0.018	8	0.620	8:28	Maximum STEL Concentration 0.044 mg/m3 @ 10:00

Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
pDR 1000	2835	FS-A-0217-WZ-2	2/17/2020	Fenceline at 915 Factory St	7:49	N/A	16:37	8 Hr 48 Min	N/A	N/A	0.014	8	1.787	15:33	Sweeping area around boxes at DU-3; To be protective of the children playing at 915 Factory St, an additional pDR was placed on the fenceline of the property during excavation upwind of property at DU-3
Dustrak	1401	DT-A-0218-NW	2/18/2020	North Side Factory Street - Waterhouse Street End	7:33	2 L/min	16:23	8 Hr 50 min	1060	liters	0.002	8	0.020	15:25	
Dustrak	1402	DT-A-0218-NE	2/18/2020	North Side Factory Street - King Street End	7:20	2 L/min	16:29	9 Hr 9 Min	1098	liters	0.001	8	0.016	15:20	
Dustrak	1403	DT-A-0218-SE	2/18/2020	South Side Factory Street - King Street End	7:30	2 L/min	16:24	8 Hr 54 min	1068	liters	0.002	8	0.013	15:22	
Dustrak	4204	DT-A-0218-SW	2/18/2020	South Side Factory Street - Waterhouse Street End	7:35	2 L/min	16:27	8 Hr 52 Min	1064	liters	0.007	8	0.030	13:09	
pDR 1000	2835	FS-A-0218-WZ-1	2/18/2020	Excavator Cab-Operator Dayne	7:49	N/A	16:24	8 Hr 35 Min	N/A	N/A	0.018	8	0.723	16:11	Maximum STEL Concentration 0.098 mg/m3 @ 16:11

Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
pDR 1000	3859	FS-A-0218-WZ-2	2/18/2020	Fenceline at 915 Factory St	8:09	N/A	16:37	8 Hr 28 Min	N/A	N/A	0.010	8	0.622	15:21	Normal excavation activities at DU-3; To be protective of the children playing at 915 Factory St, an additional pDR was placed on the fenceline of the property during excavation upwind of property at DU-3; Maximum STEL Concentration 0.037 mg/m3 @ 15:27
Dusttrak	1401	DT-A-0219-NW	2/19/2020	North Side Factory Street - Waterhouse Street End	7:49	2 L/min	14:50	5 Hr 51 min	702	liters	0.002	8	0.022	14:48	
Dusttrak	1402	DT-A-0219-NE	2/19/2020	North Side Factory Street - King Street End	7:51	2 L/min	14:56	7 Hr 1 Min	842	liters	0.001	8	0.005	14:55	
Dusttrak	1403	DT-A-0219-SE	2/19/2020	South Side Factory Street - King Street End	7:40	2 L/min	14:53	7 Hr 9 min	858	liters	0.001	8	0.009	14:40	
Dusttrak	4204	DT-A-0219-SW	2/19/2020	South Side Factory Street - Waterhouse Street End	7:48	2 L/min	14:51	6 Hr 59 Min	838	liters	0.007	8	0.029	14:43	
pDR 1000	2835	FS-A-0219-WZ-1	2/19/2020	Excavator Cab-Operator Dayne	7:17	N/A	15:04	7 Hr 47 Min	N/A	N/A	0.018	8	0.723	15:41	Maximum STEL Maximum 0.098 mg/m3 @ 15:41

**Table 4-6: Factory Street Removal Action Air Monitoring Total Particulate Data**

Instrument Make/Model	Serial Number	File name	Date	Location/Orientation	Start Time	Flow Rate	End Time	Total Run Time (min)	Total Volume (L)	Volume Unit	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Time Maximum Concentration Observed	Comments
pDR 1000	3859	FS-A-0219-WZ-2	2/19/2020	Fenceline at 915 Factory St	8:38	N/A	11:11	2 Hr 33 Min	N/A	N/A	0.011	8	0.357	9:42	To be protective of the children playing at 915 Factory St, an additional pDR was placed on the fenceline of the property during excavation upwind of property at DU-3; Maximum STEL Concentration 0.020 mg/m3 @ 9:48

**Notes:**  
 hr = hour  
 L = liters  
 mg/m3 = milligrams per meter cubed  
 min = minute  
 STEL = short term exposure limit measured over a 15 minute time period  
 TWA = time weighted average  
 Total Particulates measures mass concentration of all sizes of particulate matter suspended in air. Data was also collected on PM1, PM2.5, PM4, and PM10 particle sizes.

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18913	FS-A-0120-NE	Saw cutting centerline and pole shorings	<0.025	<0.0808	U	40	1/20/2020	North Side Factory Street - King Street End	14:40	1.9808	17:13	1.9754	309.38	L	2 Hr 34 Min	
SKC AirChek Touch	18789	FS-A-0120-SE	Saw cutting centerline and pole shorings	<0.025	<0.0767	U	40	1/20/2020	South Side Factory Street - King Street End	14:45	1.9495	17:18	1.9233	325.8	L	2 Hr 43 Min	
SKC AirChek Touch	18405	FS-A-0120-SW	Saw cutting centerline and pole shorings	0.0399	0.129		40	1/20/2020	South Side Factory Street - Waterhouse Street End	14:35	1.933	17:05	1.9071	308.99	L	2 Hr 34 Min	
SKC AirChek Touch	18170	FS-A-0120-NW	Saw cutting centerline and pole shorings	<0.025	<0.0864	U	40	1/20/2020	North Side Factory Street - Waterhouse Street End	14:30	2.0086	16:54	1.9631	289.45	L	2 Hr 24 Min	
SKC AirChek Touch	18876	FS-A-0120-WZ	Saw cutting centerline and pole shorings	0.0636	0.364		40	1/20/2020	Work Zone - Street Cutting. Affixed to Dayne	15:00	2.0031	16:49	1.9538	174.81	L	1 Hr 28 Min	
SKC AirChek Touch	18913	FS-A-0121-SW	Pole shoring excavation DU-6	0.0325	0.031		40	1/21/2020	South Side Factory Street - Waterhouse Street End	7:57	1.9595	16:41	1.961	1046.23	L	8 Hr 43 Min	
SKC AirChek Touch	18789	FS-A-0121-NW	Pole shoring excavation DU-6	0.0362	0.0347		40	1/21/2020	North Side Factory Street - Waterhouse Street End	7:50	1.9382	16:36	1.9025	1043.67	L	8 Hr 41 Min	
SKC AirChek Touch	18405	FS-A-0121-WZ	Pole shoring excavation DU-6	0.303	0.605		40	1/21/2020	Work Zone - Affixed to Dayne and Tad	Start - 10:51; End 11:43; Start 13:30; End 16:49	1.9236	16:49	1.9008	500.25	L	4 Hr 9 Min	
SKC AirChek Touch	18170	FS-A-0121-SE	Pole shoring excavation DU-6	0.354	0.333		40	1/21/2020	South Side Factory Street - King Street End	8:02	2.0002	1654	1.9573	1062.1	L	8 Hr 51 Min	
SKC AirChek Touch	18876	FS-A-0121-NE	Pole shoring excavation DU-6	0.0576	0.0543		40	1/21/2020	North Side Factory Street - King Street End	8:05	1.9733	16:58	1.9437	1061.65	L	8 Hr 50 Min	
Field Blank		FS-A-0121-FB1		<0.025		U	40	1/21/2020									
Field Blank		FS-A-0121-FB2		<0.025		U	40	1/21/2020									
SKC AirChek Touch	18405	FS-A-0122-WZ	Pole shoring excavation DU-4	0.0543	0.0669		40	1/22/2020	Work Zone - Affixed to Mark's Excavator	8:15	1.9505	15:00	1.8586	811.49	L	6 Hr 45 Min	
SKC AirChek Touch	18170	FS-A-0122-SE	Pole shoring excavation DU-4	0.481	0.462		40	1/22/2020	South Side Factory Street - King Street End	8:08	2.0199	16:54	1.9441	1041.63	L	8 Hr 40 Min	
SKC AirChek Touch	18876	FS-A-0122-SW	Pole shoring excavation DU-4	0.0436	0.0415		40	1/22/2020	South Side Factory Street - Waterhouse Street End	7:56	2.0016	16:41	1.9559	1051.28	L	8 Hr 45 Min	
SKC AirChek Touch	18913	FS-A-0122-NW	Pole shoring excavation DU-4	0.0637	0.0618		40	1/22/2020	North Side Factory Street - Waterhouse Street End	7:58	2.026	16:50	1.9677	1030.73	L	8 Hr 35 Min	
SKC AirChek Touch	18789	FS-A-0122-NE	Pole shoring excavation DU-4	0.0449	0.0421		40	1/22/2020	North Side Factory Street - King Street End	8:04	1.9628	16:56	1.9065	1064.38	L	8 Hr 52 Min	
SKC AirChek Touch	18803	FS-A-0122-NW-D	Pole shoring excavation DU-4	0.0616	0.0649		40	1/22/2020	North Side Factory Street - Waterhouse Street End	8:40	1.9694	16:35	1.892	948.73	L	7 Hr 54 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18860	FS-A-0122-SE-D	Pole shoring excavation DU-4	0.507	0.518		40	1/22/2020	South Side Factory Street - King Street End	8:41	1.978	16:50	1.9074	978.43	L	8 Hr 9 Min	
SKC AirChek Touch	18803	FS-A-0123-SE	Pole shoring excavation DU-4; DU-6	0.392	0.397	J	40	1/23/2020	South Side Factory Street - King Street End	8:07	1.9706	16:19	1.9065	987.77	L	8 Hr 13 Min	
SKC AirChek Touch	18290	FS-A-0123-SW	Pole shoring excavation DU-4; DU-6	0.21	0.212		40	1/23/2020	South Side Factory Street - Waterhouse Street End	8:10	2.0326	16:09	1.8691	989.01	L	7 hr 59 Min	
SKC AirChek Touch	18770	FS-A-0123-NW	Pole shoring excavation DU-4; DU-6	0.257	0.26		40	1/23/2020	North Side Factory Street - Waterhouse Street End	8:05	1.9540	16:12	1.8332	987.05	L	8 Hr 13 Min	
SKC AirChek Touch	18913	FS-A-0123-NE	Pole shoring excavation DU-4; DU-6	0.812	0.799		40	1/23/2020	North Side Factory Street - King Street End	7:54	2.0410	16:22	1.8977	1015.96	L	8 Hr 27 Min	
SKC AirChek Touch	18875	FS-A-0123-SE-D	Pole shoring excavation DU-4; DU-6	0.274	0.261	J	40	1/23/2020	South Side Factory Street - King Street End (Duplicate)	8:07	1.9824	16:19	1.8363	1051.28	L	8 Hr 45 Min	
SKC AirChek Touch	18170	FS-A-0123-WZ	Pole shoring excavation DU-4; DU-6	0.568	0.726		40	1/23/2020	Work Zone in Excavator-Dayne	10:03	2.0066	16:36	1.9771	783.04	L	6 Hr 31 Min	
SKC AirChek Touch	18803	FS-A-0124-SE	DU-6	0.182	0.178		40	1/24/2020	South Side Factory Street - King Street End	7:40	1.9727	16:09	1.8592	1019.62	L	8 Hr 29 Min	
SKC AirChek Touch	18170	FS-A-0124-SW	DU-6	0.476	0.475		40	1/24/2020	South Side Factory Street - Waterhouse Street End	7:44	2.0306	16:05	1.9129	1001.85	L	8 Hr 20 Min	
SKC AirChek Touch	18770	FS-A-0124-NW	DU-6	0.143	0.142		40	1/24/2020	North Side Factory Street - Waterhouse Street End	7:45	1.9523	16:07	1.8425	1005.09	L	8 Hr 22 Min	
SKC AirChek Touch	18876	FS-A-0124-NE	DU-6	0.148	0.145		40	1/24/2020	North Side Factory Street - King Street End	7:41	2.0047	16:11	1.8943	1021.06	L	8 Hr 30 Min	
SKC AirChek Touch	18913	FS-A-0124-WZ	DU-6	0.842	0.813		40	1/24/2020	Work Zone in Excavator-Dayne	7:38	2.0525	16:15	1.9316	1035.81	L	8 Hr 37 Min	
SKC AirChek Touch	18803	FS-A-0125-SE	DU-6	<0.025	<0.0265	U	40	1/25/2020	South Side Factory Street - King Street End	7:50	2.0343	15:41	1.8465	942.15	L	7 Hr 50 Min	
SKC AirChek Touch	18770	FS-A-0125-SW	DU-6	0.221	0.233		40	1/25/2020	South Side Factory Street - Waterhouse Street End	7:43	1.9541	15:36	1.8122	947.27	L	7 Hr 53 Min	
SKC AirChek Touch	18876	FS-A-0125-NW	DU-6	0.137	0.143		40	1/25/2020	North Side Factory Street - Waterhouse Street End	7:41	1.9931	15:37	1.8404	953.89	L	7 Hr 56 Min	
SKC AirChek Touch	18913	FS-A-0125-NE	DU-6	<0.025	<0.0266	U	40	1/25/2020	North Side Factory Street - King Street End	7:53	2.0343	15:43	1.9136	940.8	L	7 Hr 50 Min	
SKC AirChek Touch	18170	FS-A-0125-WZ	DU-6	0.207	0.215		40	1/25/2020	Work Zone in Excavator-Dayne	7:45	2.0302	15:46	1.9093	961.32	L	8 Hrs	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18770	FS-A-0127-SE	DU-5	<0.025	<0.0247	U	40	1/27/2020	South Side Factory Street - King Street End	7:44	1.9495	16:10	1.884	1011.8	L	8 Hr 26 Min	
SKC AirChek Touch	18776	FS-A-0127-SE-D	DU-5	0.03	0.0296		40	1/27/2020	South Side Factory Street - King Street End (Duplicate)	7:44	1.9865	16:10	1.9117	1012.1	L	8 Hr 26 Min	
SKC AirChek Touch	18789	FS-A-0127-SW	DU-5	0.373	0.381		40	1/27/2020	South Side Factory Street - Waterhouse Street End	7:54	1.9658	16:02	1.8012	979.73	L	8 Hr 9 Min	
SKC AirChek Touch	18913	FS-A-0127-NW	DU-5	0.0874	0.0885		40	1/27/2020	North Side Factory Street - Waterhouse Street End	7:50	2.0317	16:03	1.9214	987.3	L	8 Hr 13 Min	
SKC AirChek Touch	18803	FS-A-0127-NE	DU-5	<0.025	<0.0249	U	40	1/27/2020	North Side Factory Street - King Street End	7:47	1.9541	16:08	1.8747	1004.62	L	8 Hr 22 Min	
SKC AirChek Touch	18170	FS-A-0127-WZ	DU-5	<0.025	<0.0237	U	40	1/27/2020	Work Zone in Excavator-Dayne	7:37	2.0211	16:26	1.9115	1056.89	L	8 Hr 48 Min	
SKC AirChek Touch	18789	FS-A-0129-SE	DU-5; DU-6	Not Analyzed	Not Analyzed		40	1/29/2020	South Side Factory Street - King Street End	7:46	1.9678	16:20	1.8612	1026.73	L	8 Hr 33 Min	
SKC AirChek Touch	18170	FS-A-0129-SW	DU-5; DU-6	Not Analyzed	Not Analyzed		40	1/29/2020	South Side Factory Street - Waterhouse Street End	7:47	2.0236	16:19	1.8912	909.03	L	7 Hr 34 Min	
SKC AirChek Touch	18770	FS-A-0129-NW	DU-5; DU-6	Not Analyzed	Not Analyzed		40	1/29/2020	North Side Factory Street - Waterhouse Street End	7:50	1.9500	16:19	1.8414	1019.16	L	8 Hr 29 Min	
SKC AirChek Touch	18803	FS-A-0129-NE	DU-5; DU-6	Not Analyzed	Not Analyzed		40	1/29/2020	North Side Factory Street - King Street End	7:51	1.9649	16:20	1.8605	949.21	L	7 Hr 56 Min	Flow fault - Indicates the pump was out of flow tolerance and automatically restarted.
SKC AirChek Touch	18913	FS-A-0129-WZ	DU-5; DU-6	0.313	0.301		40	1/29/2020	Work Zone in Excavator-Dayne	7:41	2.0514	16:21	1.902	1041.15	L	8 Hr 40 Min	
SKC AirChek Touch	18770	FS-A-0130-SE	DU-5	Not Analyzed	Not Analyzed		40	1/30/2020	South Side Factory Street - King Street End	7:41	1.9476	16:57	1.8391	1109.81	L	9 Hr 15 Min	
SKC AirChek Touch	18913	FS-A-0130-SW	DU-5	Not Analyzed	Not Analyzed		40	1/30/2020	South Side Factory Street - Waterhouse Street End	7:38	2.0574	16:58	1.8525	1121.67	L	9 Hr 20 Min	
SKC AirChek Touch	18789	FS-A-0130-NW	DU-5	Not Analyzed	Not Analyzed		40	1/30/2020	North Side Factory Street - Waterhouse Street End	7:40	1.9611	16:58	1.8662	1115.89	L	9 Hr 17 Min	
SKC AirChek Touch	18803	FS-A-0130-NE	DU-5	Not Analyzed	Not Analyzed		40	1/30/2020	North Side Factory Street - King Street End	7:42	1.9604	16:56	1.8465	1107.39	L	9 Hr 13 Min	
SKC AirChek Touch	18170	FS-A-0130-WZ	DU-5	Not Analyzed	Not Analyzed		40	1/30/2020	Field Tech - Robert	7:38	2.0279	16:22	1.9107	1052.3	L	8 Hr 46 Min	Flow fault - Indicates the pump was out of flow tolerance and automatically restarted.
SKC AirChek Touch	18803	FS-A-0131-SE	DU-5	Not Analyzed	Not Analyzed		40	1/31/2020	South Side Factory Street - King Street End	7:45	1.9632	15:28	1.9028	927.5	L	7 Hr 43 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18789	FS-A-0131-SW	DU-5	Not Analyzed	Not Analyzed		40	1/31/2020	South Side Factory Street - Waterhouse Street End	7:38	1.9742	15:29	1.8747	941.96	L	7 Hr 50 Min	
SKC AirChek Touch	18913	FS-A-0131-NW	DU-5	Not Analyzed	Not Analyzed		40	1/31/2020	North Side Factory Street - Waterhouse Street End	7:36	2.0580	15:36	1.9588	961.5	L	8 Hr	
SKC AirChek Touch	18170	FS-A-0131-NE	DU-5	Not Analyzed	Not Analyzed		40	1/31/2020	North Side Factory Street - King Street End	7:44	2.0182	15:45	1.9535	961.99	L	8 Hr 1 Min	
SKC AirChek Touch	18770	FS-A-0131-WZ	DU-5	Not Analyzed	Not Analyzed		40	1/31/2020	Excavator Cab - Dayne	7:37	1.9456	15:36	1.8636	970.77	L	8 Hr 5 Min	
SKC AirChek Touch	18789	FS-A-0201-SE	DU-5	Not Analyzed	Not Analyzed		40	2/1/2020	South Side Factory Street - King Street End	7:35	1.9432	10:43	1.9003	376.41	L	3 Hr 8 Min	
SKC AirChek Touch	18170	FS-A-0201-SW	DU-5	Not Analyzed	Not Analyzed		40	2/1/2020	South Side Factory Street - Waterhouse Street End	7:31	2.0096	10:42	1.8893	381.45	L	3 Hr 10 Min	
SKC AirChek Touch	18913	FS-A-0201-NW	DU-5	Not Analyzed	Not Analyzed		40	2/1/2020	North Side Factory Street - Waterhouse Street End	7:28	2.0312	10:42	1.9161	387.85	L	3 hr 13 Min	
SKC AirChek Touch	18803	FS-A-0201-NE	DU-5	Not Analyzed	Not Analyzed		40	2/1/2020	North Side Factory Street - King Street End	7:34	1.9544	10:44	1.8619	378.24	L	3 Hr 9 Min	
SKC AirChek Touch	18770	FS-A-0201-WZ	DU-5	Not Analyzed	Not Analyzed		40	2/1/2020	Excavator Cab - Dayne	7:27	1.9516	10:52	1.8835	416.06	L	3 Hr 28 Min	
SKC AirChek Touch	18170	FS-A-0203-NW	DU-6	Not Analyzed	Not Analyzed		40	2/3/2020	North Side Factory Street - Waterhouse Street End	10:32	2	16:25	1.95	708.26	L	5 Hr 54 Min	
SKC AirChek Touch	18770	FS-A-0203-NW-D	DU-6	Not Analyzed	Not Analyzed		40	2/3/2020	North Side Factory Street - Waterhouse Street End	10:32	2	16:31	1.96	719.53	L	5 Hr 59 Min	
SKC AirChek Touch	18789	FS-A-0203-SE	DU-6	Not Analyzed	Not Analyzed		40	2/3/2020	South Side Factory Street - King Street End	10:40	2	16:20	1.93	683.54	L	5 Hr 41 Min	
SKC AirChek Touch	18803	FS-A-0203-SW	DU-6	Not Analyzed	Not Analyzed		40	2/3/2020	South Side Factory Street - Waterhouse Street End	10:33	2	16:33	1.94	719.86	L	5 Hr 59 Min	
SKC AirChek Touch	18913	FS-A-0203-NE	DU-6	Not Analyzed	Not Analyzed		40	2/3/2020	North Side Factory Street - King Street End	10:38	2	16:11	1.96	664.14	L	5 Hr 31 Min	
SKC AirChek Touch	18405	FS-A-0203-WZ	DU-6	<0.31	<0.454	U	40	2/3/2020	Excavator Cab - Dayne	10:42	2	17:00	1.92	683.54	L	5 Hr 41 Min	
SKC AirChek Touch	18405	FS-A-0204-NW	DU-6	Not Analyzed	Not Analyzed		40	2/4/2020	North Side Factory Street - Waterhouse Street End	7:37	2.0065	17:04	1.8969	1134.51	L	9 Hr 27 Min	
SKC AirChek Touch	18803	FS-A-0204-SE	DU-6	Not Analyzed	Not Analyzed		40	2/4/2020	South Side Factory Street - King Street End	7:35	2.0128	17:03	1.9121	1138.79	L	9 Hr 28 Min	
SKC AirChek Touch	18913	FS-A-0204-SW	DU-6	Not Analyzed	Not Analyzed		40	2/4/2020	South Side Factory Street - Waterhouse Street End	7:38	2.0066	17:05	1.9106	1132.97	L	9 Hr 26 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18789	FS-A-0204-NE	DU-6	Not Analyzed	Not Analyzed		40	2/4/2020	North Side Factory Street - King Street End	7:36	2.0146	17:03	1.9634	1136.97	L	9 Hr 28 Min	
SKC AirChek Touch	18770	FS-A-0204-WZ	DU-6	<0.31	<0.309	U	40	2/4/2020	Excavator Cab - Dayne	8:47	2.0233	17:09	1.9228	1002.31	L	8 Hr 21 Min	
SKC AirChek Touch	18789	FS-A-0205-NW-1	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	North Side Factory Street - Waterhouse Street End	8:20	2.0168	10:12		225.29	L	1 Hr 52 Min	Sample stopped due to rain on site.
SKC AirChek Touch	18789	FS-A-0205-NW-2	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	North Side Factory Street - Waterhouse Street End	11:01		14:05	1.9497	369.47	L	3 Hr 4 Min	Sample FS-A-0205-NW-1 continued as FS-A-0205-NW-2
SKC AirChek Touch	18803	FS-A-0205-SW-1	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	Sourth Side Factory Street-Waterhouse End	8:17	2.0159	10:12		230.65	L	1 Hr 55 Min	Sample stopped due to rain on site.
SKC AirChek Touch	18803	FS-A-0205-SW-2	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	South Side Factory Street - Waterhouse Street End	10:49		14:06	1.9104	395.06	L	3 Hr 17 Min	Sample FS-A-0205-SW-1 continued as FS-A-0205-SW-2
SKC AirChek Touch	18876	FS-A-0205-NE-1	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	North Side Factory Street - King Street End	8:25	1.9897	10:14		219.01	L	1 Hr 49 Min	Sample stopped due to rain on site.
SKC AirChek Touch	18876	FS-A-0205-NE-2	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	North Side Factory Street - King Street End	11:02		14:09	1.9264	375.71	L	3 Hr 7 Min	Sample FS-A-0205-NE-1 continued as FS-A-0205-NE-2
SKC AirChek Touch	18785	FS-A-0205-WZ	DU-6	<0.31	<0.349	U	40	2/5/2020	Excavator Cab - Dayne	8:08	2.0278	15:30	1.8674	887.32	L	7 Hr 23 Min	
SKC AirChek Touch	18913	FS-A-0205-SE-1	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	South Side Factory Street - King Street End	8:28	2.0501	10:13		211.26	L	1 Hr 45 Min	Sample stopped due to rain on site.
SKC AirChek Touch	18913	FS-A-0205-SE-2	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	South Side Factory Street - King Street End	10:59		14:25	1.9016	412.32	L	3 Hr 26 Min	Sample FS-A-0205-SE-1 continued as FS-A-0205-SE-2
SKC AirChek Touch	18405	FS-A-0205-SE-D-1	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	South Side Factory Street - King Street End	8:28	2.002	10:13		211.24	L	1 Hr 45 Min	Sample stopped due to rain on site.
SKC AirChek Touch	18405	FS-A-0205-SE-D-2	DU-6	Not Analyzed	Not Analyzed		40	2/5/2020	South Side Factory Street - King Street End	11:00		14:22	1.8947	405.39	L	3 Hr 22 Min	Sample FS-A-0205-SE-D-1 continued as FS-A-0205-SE-D-2
Field Blank		FS-A-0205-FB-1		<0.31		U	40										
Field Blank		FS-A-0205-FB-2		<0.31		U	40										
SKC AirChek Touch	18770	FS-A-0206-NW	DU-4	Not Analyzed	Not Analyzed		40	2/6/2020	North Side Factory Street - Waterhouse Street End	7:50	2.0184	15:52	1.9811	964.32	L	8 Hr 02 Min	
SKC AirChek Touch	18170	FS-A-0206-SW	DU-4	Not Analyzed	Not Analyzed		40	2/6/2020	South Side Factory Street - Waterhouse Street End	7:44	2.0119	15:47	2.0075	950.74	L	8 Hr 02 Min	
SKC AirChek Touch	18789	FS-A-0206-NE	DU-4	Not Analyzed	Not Analyzed		40	2/6/2020	North Side Factory Street - King Street End	7:51	2.0116	15:53	1.9814	947.36	L	8 hr 01 Min	
SKC AirChek Touch	18290	FS-A-0206-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/6/2020	Excavator Cab - Dayne	7:38	1.9959	15:49	1.9959	982.29	L	8 Hr 11 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18860	FS-A-0206-SE	DU-4	Not Analyzed	Not Analyzed		40	2/6/2020	South Side Factory Street - King Street End	7:45	1.971	15:48	1.9416	963.56	L	8 Hr 01 Min	
SKC AirChek Touch	18770	FS-A-0207-NW	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	North Side Factory Street - Waterhouse Street End	10:49	2.0241	16:40	1.9681	673.22	L	5 Hr 48 Min	
SKC AirChek Touch	18860	FS-A-0207-SW	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	South Side Factory Street - Waterhouse Street End	10:45	2.1153	16:26	1.9005	525.25	L	6 Hr 5 Min	
SKC AirChek Touch	18803	FS-A-0207-NE	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	North Side Factory Street - King Street End	10:47	2.0142	16:46	1.9508	713.87	L	5 Hr 56 Min	
SKC AirChek Touch	18290	FS-A-0207-NE-D	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	North Side Factory Street - King Street End	10:49	2.0241	16:40	1.9681	673.22	L	5 Hr 48 Min	
SKC AirChek Touch	18789	FS-A-0207-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	Excavator Cab - Dayne	11:59	2.1153	16:26	1.9005	525.25	L	4 Hr 22 Min	
SKC AirChek Touch	18170	FS-A-0207-SE	DU-4	Not Analyzed	Not Analyzed		40	2/7/2020	South Side Factory Street - King Street End	10:46	2.0132	16:49	1.9227	723.56	L	6 Hr 1 Min	
SKC AirChek Touch	18860	FS-A-0208-NW	DU-4	Not Analyzed	Not Analyzed		40	2/8/2020	North Side Factory Street - Waterhouse Street End	7:55	1.9782	15:10	1.8751	872.2	L	7 Hr 16 Min	
SKC AirChek Touch	18803	FS-A-0208-SW	DU-4	Not Analyzed	Not Analyzed		40	2/8/2020	South Side Factory Street - Waterhouse Street End	7:58	2.0247	7:10	1.9558	861.3	L	7 Hr 10 Min	
SKC AirChek Touch	18789	FS-A-0208-NE	DU-4	Not Analyzed	Not Analyzed		40	2/8/2020	North Side Factory Street - King Street End	8:06	2.0148	15:04	1.804	834.63	L	6 Hr 57 min	
SKC AirChek Touch	18290	FS-A-0208-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/8/2020	Excavator Cab - Dayne	7:37	2.0015	15:00	1.9137	891.25	L	7 Hr 25 Min	
SKC AirChek Touch	18170	FS-A-0208-SE	DU-4	Not Analyzed	Not Analyzed		40	2/8/2020	South Side Factory Street - King Street End	8:03	2.0201	15:03	1.8703	863.35	L	7 Hr 11 Min	
SKC AirChek Touch	18170	FS-A-0210-NW	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	North Side Factory Street - Waterhouse Street End	8:01	2.021	16:33	1.9868	1025.04	L	8 Hr 32 Min	
SKC AirChek Touch	18860	FS-A-0210-SW	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	South Side Factory Street - Waterhouse Street End	7:57	1.9934	16:29	1.9589	1025.3	L	8 Hr 32 Min	
SKC AirChek Touch	18803	FS-A-0210-NE	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	North Side Factory Street - King Street End	8:11	2.0355	16:32	1.9774	995.89	L	8 Hr 18 Min	
SKC AirChek Touch	18789	FS-A-0210-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	Excavator Cab - Dayne	7:47	2.0183	16:20	1.911	1039.6	L	8 Hr 40 Min	
SKC AirChek Touch	18770	FS-A-0210-SE	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	South Side Factory Street - King Street End	8:20	2.0311	16:35	1.9944	993.14	L	8 Hr 16 Min	
SKC AirChek Touch	18290	FS-A-0210-SW-D	DU-4	Not Analyzed	Not Analyzed		40	2/10/2020	South Side Factory Street - Waterhouse Street End	8:06	2.0113	16:30	1.9928	1001.3	L	8 Hr 20 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18789	FS-A-0211-NW	DU-4	Not Analyzed	Not Analyzed		40	2/11/2020	North Side Factory Street - Waterhouse Street End	7:57	2.0105	13:57	1.521	724.35	L	6 Hr 2 Min	
SKC AirChek Touch	18803	FS-A-0211-SW	DU-4	Not Analyzed	Not Analyzed		40	2/11/2020	South Side Factory Street - Waterhouse Street End	8:11	2.036	13:55	1.9797	691.32	L	5 Hr 45 Min	
SKC AirChek Touch	18770	FS-A-0211-NE	DU-4	Not Analyzed	Not Analyzed		40	2/11/2020	North Side Factory Street - King Street End	8:00	2.0356	13:50	1.9577	701.01	L	5 Hr 50 Min	
SKC AirChek Touch	18170	FS-A-0211-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/11/2020	Excavator Cab - Dayne	7:31	2.0172	13:31	1.9037	682.52	L	5 Hr 40 Min	
SKC AirChek Touch	18290	FS-A-0211-SE	DU-4	Not Analyzed	Not Analyzed		40	2/11/2020	South Side Factory Street - King Street End	8:08	2.0278	13:46	1.9484	680.73	L	5 Hr 40 Min	
SKC AirChek Touch	18290	FS-A-0212-NW	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	North Side Factory Street - Waterhouse Street End	7:51	2.0856	17:13	2.0012	562	L	9 Hr 22 Min	
SKC AirChek Touch	18789	FS-A-0212-SW	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	South Side Factory Street - Waterhouse Street End	7:58	2.0295	17:16	1.9456	558	L	9 Hr 18 Min	
SKC AirChek Touch	18860	FS-A-0212-NE	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	North Side Factory Street - King Street End	7:44	1.9851	17:36	1.9126	592	L	9 Hr 52 Min	
SKC AirChek Touch	18803	FS-A-0212-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	Excavator Cab - Dayne	7:36	2.0611	17:34	1.9729	598	L	9 Hr 58 Min	
SKC AirChek Touch	18770	FS-A-0212-SE	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	South Side Factory Street - King Street End	7:56	2.0653	17:20	2.002	564	L	9 Hr 24 Min	
SKC AirChek Touch	18290	FS-A-0212-NW-D	DU-4	Not Analyzed	Not Analyzed		40	2/12/2020	North Side Factory Street - Waterhouse Street End	7:51	2.0661	17:10	2.012	559	L	9 Hr 19 Min	
SKC AirChek Touch	18803	FS-A-0213-NW	DU-4	Not Analyzed	Not Analyzed		40	2/13/2020	North Side Factory Street - Waterhouse Street End	7:46	2.0652	15:22	1.9688	913.54	L	7 Hr 36 Min	
SKC AirChek Touch	18720	FS-A-0213-NE	DU-4	Not Analyzed	Not Analyzed		40	2/13/2020	North Side Factory Street - King Street End	7:55	2.0481	15:30	1.9723	911.67	L	7 Hr 45 Min	
SKC AirChek Touch	18789	FS-A-0213-WZ	DU-4	Not Analyzed	Not Analyzed		40	2/13/2020	Excavator Cab - Dayne	8:01	1.9933	9:40	1.9413	197.29	L	1 Hr 40 Min	Flow fault - Indicates the pump was out of flow tolerance and automatically restarted.
SKC AirChek Touch	18170	FS-A-0213-SE	DU-4	Not Analyzed	Not Analyzed		40	2/13/2020	South Side Factory Street - King Street End	7:53	2.0653	15:26	2.0033	909.23	L	7 Hr 34 Min	
SKC AirChek Touch	18290	FS-A-0213-SW	DU-4	Not Analyzed	Not Analyzed		40	2/13/2020	South Side Factory Street - Waterhouse Street End	7:44	2.0654	15:19	2.0205	917.1	L	7 Hr 38 Min	
SKC AirChek Touch	18770	FS-A-0214-NW	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	North Side Factory Street - Waterhouse Street End	7:57	2.0689	15:58	1.9834	958.39	L	8 Hr 1 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18789	FS-A-0214-NE-1	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	North Side Factory Street - King Street End	8:23	2.0485	13:02	1.967	197.5	L	4 Hr 39 Min	Flow fault - Indicates the pump was out of flow tolerance and automatically restarted.; Multiple fault errors; Instrument removed from service.
SKC AirChek Touch	18876	FS-A-0214-WZ	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	Excavator Cab - Dayne	7:52	1.9738	16:58	NA	1092.77	L	9 Hr 6 Min	Did not obtain final flow rate; Drycal unit froze.
SKC AirChek Touch	18170	FS-A-0214-SE	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	South Side Factory Street - King Street End	8:11	2.0915	16:04	2.0214	945.76	L	7 Hr 53 Min	
SKC AirChek Touch	18290	FS-A-0214-SW	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	South Side Factory Street - Waterhouse Street End	8:07	2.0789	15:56	1.9459	938.54	L	7 Hr 49 Min	
SKC AirChek Touch	18803	FS-A-0214-SE-D	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	South Side Factory Street - King Street End	8:16	2.066	16:06	1.9967	939.33	L	7 Hr 50 Min	
SKC AirChek Touch	18913	FS-A-0214-NE-2	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	North Side Factory Street - King Street End	13:08	2.0155	16:02	1.9925	349.58	L	2 Hr 54 Min	
SKC AirChek Touch	18770	FS-A-0214-NW	DU-3	Not Analyzed	Not Analyzed		40	2/14/2020	North Side Factory Street - Waterhouse Street End	7:57	2.0689	15:58	1.9834	958.22	L	8 Hr 1 Min	
SKC AirChek Touch	18405	FS-A-0215-NW	DU-3	Not Analyzed	Not Analyzed		40	2/15/2020	North Side Factory Street - Waterhouse Street End	7:42	2.0041	14:48	1.9331	851.16	L	7 Hr 6 Min	
SKC AirChek Touch	18876	FS-A-0215-SE	DU-3	Not Analyzed	Not Analyzed		40	2/15/2020	South Side Factory Street - King Street End	8:06	2.006	14:44	1.9263	795.26	L	6 Hr 37 Min	
SKC AirChek Touch	18803	FS-A-0215-SW	DU-3	Not Analyzed	Not Analyzed		40	2/15/2020	South Side Factory Street - Waterhouse Street End	7:49	2.0608	14:52	1.9853	847.57	L	7 Hr 3 Min	
SKC AirChek Touch	18290	FS-A-0215-NE	DU-3	Not Analyzed	Not Analyzed		40	2/15/2020	North Side Factory Street - King Street End	8:01	2.0663	14:42	1.9908	805.29	L	6 Hr 41 Min	
SKC AirChek Touch	18170	FS-A-0215-WZ	DU-3	Not Analyzed	Not Analyzed		40	2/15/2020	Excavator Cab - Dayne	7:36	2.0886	15:20	1.9708	941.78	L	7 Hr 44 Min	
SKC AirChek Touch	18876	FS-A-0217-NW	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	North Side Factory Street - Waterhouse Street End	8:00	2.0081	14:35	1.9384	792.35	L	6 Hr 36 Min	
SKC AirChek Touch	18913	FS-A-0217-SE	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	South Side Factory Street - King Street End	8:14	2.0424	14:48	1.9753	794.34	L	6 Hr 37 Min	
SKC AirChek Touch	18405	FS-A-0217-SW	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	South Side Factory Street - Waterhouse Street End	8:09	2.0192	14:40	1.9583	784.46	L	6 Hr 32 Min	
SKC AirChek Touch	18803	FS-A-0217-NE	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	North Side Factory Street - King Street End	7:57	2.0017	14:45	1.9263	815.49	L	6 Hr 47 Min	
SKC AirChek Touch	18170	FS-A-0217-NW-D	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	North Side Factory Street - Waterhouse Street End	8:05	2.0037	14:35	1.925	781.41	L	6 Hr 30 Min	

Table 4-7: Factory Street Removal Action Lead in Air Sampling Data

Instrument Make/Model	Serial Number	Sample ID	Decision Unit	Lead Result (ug/sample)	Lead Result (ug/m3)	Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA	Date	Location/Orientation	START Time	Initial Flow Rate (liters/minute)	End Time	Final Flow Rate (liters/minte)	Volume	Volume Unit	Run Time	Comments
SKC AirChek Touch	18290	FS-A-0217-WZ	DU-3	Not Analyzed	Not Analyzed		40	2/17/2020	Excavator Cab - Dayne	7:35	2.083	15:53	1.9877	986.58	L	8 Hr 18 Min	
SKC AirChek Touch	18405	FS-A-0218-NW	DU-3	Not Analyzed	Not Analyzed		40	2/18/2020	North Side Factory Street - Waterhouse Street End	7:52	1.9777	15:00	1.9452	855.93	L	7 Hr 7 Min	
SKC AirChek Touch	18913	FS-A-0218-SE	DU-3	Not Analyzed	Not Analyzed		40	2/18/2020	South Side Factory Street - King Street End	8:00	2.0225	15:10	1.9398	858.83	L	7 Hr 9 Min	
SKC AirChek Touch	18803	FS-A-0218-SW	DU-3	Not Analyzed	Not Analyzed		40	2/18/2020	South Side Factory Street - Waterhouse Street End	7:57	2.0225	15:05	1.9258	856.99	L	7 Hr 8 Min	
SKC AirChek Touch	18170	FS-A-0218-NE	DU-3	Not Analyzed	Not Analyzed		40	2/18/2020	North Side Factory Street - King Street End	8:06	1.9892	15:15	1.9252	857.51	L	7 Hr 8 Min	
SKC AirChek Touch	18876	FS-A-0218-WZ	DU-3	Not Analyzed	Not Analyzed		40	2/18/2020	Excavator Cab - Dayne	7:44	1.9818	16:41	1.9204	1067.66	L	8 Hr 53 Min	
SKC AirChek Touch	18170	FS-A-0219-NW	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	North Side Factory Street - Waterhouse Street End	8:20	1.9914	12:00	1.9332	442.71	L	3 Hr 40 Min	Raining at the start of the day. Instrument deployment was withheld until rain ceased.
SKC AirChek Touch	18913	FS-A-0219-SE	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	South Side Factory Street - King Street End	8:35	2.058	12:15	1.9815	446.46	L	3 Hr 40 Min	Raining at the start of the day. Instrument deployment was withheld until rain ceased.
SKC AirChek Touch	18290	FS-A-0219-SW	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	South Side Factory Street - Waterhouse Street End	8:10	2.0634	12:09	2.0075	481.00	L	3 Hr 59 Min	Raining at the start of the day. Instrument deployment was withheld until rain ceased.
SKC AirChek Touch	18876	FS-A-0219-NE	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	North Side Factory Street - King Street End	8:25	1.9976	12:13	1.9341	535.47	L	3 Hr 48 Min	Raining at the start of the day. Instrument deployment was withheld until rain ceased.
SKC AirChek Touch	18405	FS-A-0219-SW-D	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	South Side Factory Street - Waterhouse Street End	8:15	2.0105	12:03	1.9668	437.84	L	3 Hr 48 Min	Raining at the start of the day. Instrument deployment was withheld until rain ceased.
SKC AirChek Touch	18803	FS-A-0219-WZ	DU-3	Not Analyzed	Not Analyzed		40	2/19/2020	Excavator Cab - Dayne	7:17	2.0167	13:16	1.9641	718.74	L	4 Hr 59 Min	

Notes:  
TWA = time weighted average  
µg/m3 = microgram per cubic meter  
µg/sample = microgram per sample  
J = Sample results qualified as estimated due to relative percent differences being outside of quality control criteria  
U = Sample results reported by laboratory were below laboratory reporting limits and above method detection limit

**Table 4-8: A Comparison between Factory Street Removal Action Lead in Air Sampling and Total Particulate Monitoring Data**

Date	Dust-Trak Serial Number	pDR Serial Number	Data File Identifier	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Air Sample ID	Lead in Air Sample Result (µg/sample)	Lead in Air Sample Result (µg/m3)	Air Sample Qualifier	Lead in Air Action Level = 40 ug/m3 based on 10-hour TWA
1/20/2020	8533171402		DT-A-0120-NW	0.001	4.29	0.025	FS-A-0120-NW	<0.025	<0.0864	U	40
1/20/2020	8533171403		DT-A-0120-SE	0.001	4.29	0.014	FS-A-0120-SE	<0.025	<0.0767	U	40
1/20/2020	8533171401		DT-A-1020-SW	0.002	4.29	0.042	FS-A-0120-SW	0.0399	0.129		40
1/20/2020	8533164204		DT-A-0120-NE	0.005	4.29	4.05	FS-A-0120-NE	<0.025	<0.0808	U	40
1/20/2020		3859	FS-A-0120-WZ	0.052	4.29	4.006	FS-A-0120-WZ	0.0636	0.364		40
1/21/2020	8533171402		DT-A-0121-SE	0.002	0.81	0.013	FS-A-0121-SE	0.354	0.333		40
1/21/2020	8533171401		DT-A-0121-NW	0.003	0.81	0.041	FS-A-0121-NW	0.0362	0.0347		40
1/21/2020	8533171403		DT-A-0121-NE	0.005	0.81	0.023	FS-A-0121-NE	0.0576	0.0543		40
1/21/2020	8533164204		DT-A-0121-SW	0.013	0.81	16.8	FS-A-0121-SW	0.0325	0.031		40
1/21/2020		3859	FS-A-0121-WZ-1	0.0000	0.81	0.242	FS-A-0121-WZ-1	0.303	0.605		40
1/21/2020		3859	FS-A-0121-WZ-2	0.023	0.81	2.619	FS-A-0121-WZ-2				
1/22/2020	8533164402		DT-A-0122-NE	0.01	0.81	0.071	FS-A-0122-NE	0.0449	0.0421		40
1/22/2020	8533171401		DT-A-0122-SW	0.004	0.81	0.055	FS-A-0122-SW	0.0436	0.0415		40
1/22/2020	8533171402		DT-A-0122-NW	0.001	0.81	0.024	FS-A-0122-NW	0.0637	0.0618		40
1/22/2020	8533171403		DT-A-0122-SE	0.003	0.81	0.017	FS-A-0122-SE	0.481	0.462		40
1/22/2020		283	FS-A-0122-WZ	0.0000	0.81	0.588	FS-A-0122-WZ	0.0543	0.0669		40
1/22/2020	8533171402		FS-A-0122-NE	0.01	0.81	0.071	FS-A-0122-NE-D	0.0616	0.0649		40
1/22/2020	8533171403		DT-A-0122-SE	0.003	0.81	0.017	FS-A-0122-SE-D	0.507	0.518		40
1/22/2020		3859	FS-A-0122-NE	0.0000	0.81	1.807	FS-A-0122-NE	0.0449	0.0421		40
1/23/2020	8533164204		DT-A-0123-SW	0.011	0.81	0.083	FS-A-0123-SW	0.21	0.212		40
1/23/2020	8533171401		DT-A-0123-NW	0.004	0.81	0.076	FS-A-0123-NW	0.257	0.26		40
1/23/2020	8533171402		DT-A-0123-NE	0.003	0.81	0.189	FS-A-0123-NE	0.81	0.799		40
1/23/2020	8533171403		DT-A-0123-SE	0.006	0.81	0.089	FS-A-0123-SE	0.392	0.397		40
1/23/2020	8533171403		DT-A-0123-SE	0.006	0.81	0.089	FS-A-0123-SE-D	0.274	0.261		40
1/23/2020		2835	FS-A-0123-WZ	0.012	0.81	3.691	FS-A-0123-WZ	0.568	0.726		40
1/24/2020	8533164204		DT-A-0124-SW	0.011	0.81	0.048	FS-A-0124-SW	0.476	0.475		40
1/24/2020	8533171403		DT-A-0124-NW	0.004	0.81	0.025	FS-A-0124-NW	0.143	0.142		40
1/24/2020	8533171401		DT-A-0124-NE	0.005	0.81	0.035	FS-A-0124-NE	0.148	0.145		40
1/24/2020	8533171402		DT-A-0124-SE	0.002	0.81	0.012	FS-A-0124-SE	0.182	0.178		40
1/24/2020		3857	FS-A-0124-WZ	0.014	0.81	0.962	FS-A-0124-WZ	0.842	0.813		40
1/25/2020	8533171402		DT-A-0125-SW	0.002	0.81	0.017	FS-A-0125-SW	0.221	0.233		40
1/25/2020	8533164204		DT-A-0125-NW	0.01	0.81	0.069	FS-A-0125-NW	0.137	0.143		40
1/25/2020	8533171401		DT-A-0125-NE	0.004	0.81	0.062	FS-A-0125-NE	ND<0.025	<0.0266	U	40

**Table 4-8: A Comparison between Factory Street Removal Action Lead in Air Sampling and Total Particulate Monitoring Data**

Date	Dust-Trak Serial Number	pDR Serial Number	Data File Identifier	Total Particulate TWA (mg/m3)	Total Particulate 10-hr TWA Screening Level (mg/m3)	Total Particulate Maximum Concentration (mg/m3)	Air Sample ID	Lead in Air Sample Result (µg/sample)	Lead in Air Sample Result (µg/m3)	Air Sample Qualifier	Lead in Air Action Level = 40 µg/m3 based on 10-hour TWA
1/25/2020	8533171403		DT-A-0125-SE	0.003	0.81	0.035	FS-A-0125-SE	ND<0.025	<0.0265	U	40
1/25/2020		3859	FS-A-0125-WZ	0	0.81	1.134	FS-A-0125-WZ	0.207	0.215		40
1/27/2020	8533171402		DT-A-0127-SW	0.004	2.37	0.037	FS-A-0127-SW	0.373	0.381		40
1/27/2020	8533171401		DT-A-0127-NW	0.004	2.37	0.02	FS-A-0127-NW	0.0874	0.0885		40
1/27/2020	8533171403		DT-A-0127-NE	0.003	2.37	0.026	FS-A-0127-NE	ND<0.025	<0.0249	U	40
1/27/2020	8533164204		DT-A-0127-SE	0.004	2.37	0.032	FS-A-0127-SE	ND<0.025	<0.0247	U	40
1/27/2020	8533164204		DT-A-0127-SE	0.004	2.37	0.032	FS-A-0127-SE-D	0.03	0.0296		40
1/27/2020		2835	FS-A-0127-WZ	0.006	2.37	1.643	FS-A-0127-WZ	ND<0.025	<0.0237	U	40
1/29/2020		2835	FS-A-0129-WZ	0.007	2.37	1.232	FS-A-0129-WZ	0.313	0.000301		40
2/3/2020		3857	FS-A-0203-WZ	0.013	0.81	2.034	FS-A-0203-WZ	ND<0.310	<0.000454	U	40
2/4/2020		3857	FS-A-0204-WZ	0.02	0.81	1.113	FS-A-0204-WZ	ND<0.310	<0.000309	U	40
2/5/2020		3859	FS-A-0205-WZ	0.011	0.81	4.477	FS-A-0205-WZ	ND<0.310	<0.000349	U	40

**Notes:**  
 hr = hour  
 pDR = personal DataRAM  
 TWA = time weighted average  
 mg/m3 = milligram per cubed meter  
 µg/m3 = microgram per cubed meter  
 µg/sample = microgram per sample  
 U = Sample results reported by laboratory were below laboratory reporting limits and above method detection limits

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**APPENDIX A**  
**SITE CONSTRUCTION QUALITY ASSURANCE (QA)/QUALITY**  
**CONTROL (QC) PLAN**

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THE MATERIAL QUALITY AND COMPACTION REQUIREMENTS FOR THE PAVEMENT SECTION MATERIALS SHALL FOLLOW THE CITY AND COUNTY OF HONOLULU, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, DATED SEPTEMBER 1986.

FOR APPROVAL OF THE PROJECT CONSTRUCTION, THE FOLLOWING QA & QC PROCEDURES FOR MATERIALS TESTING AND INSPECTION OF THE PAVEMENT CONSTRUCTION WILL BE FOLLOWED:

1. Laboratory test submittals relating to all of the proposed pavement section materials shall be provided by the vendor to the Engineer for review and approval two (2) weeks prior to the commencement of construction. Any material that does not meet the material specifications as indicated in the attached City and County of Honolulu Standard Specifications for Public Works Construction, dated September 1986 will be rejected.
2. Laboratory test submittal will include review of the concrete mix design; however, concrete materials testing will be performed by another entity per the Concrete Notes section of the Factory Street Reconstruction Civil Improvement Plan.
3. Upon removal of the existing roadway base and subbase (contaminated) material within the designated roadway work area, the exposed subgrade material shall be visually inspected and a minimally-disturbing 1/4-inch probe shall be made of the exposed subgrade material to verify that the soil is very stiff to hard in consistency. In lieu of visual observations and probing, field Dynamic Cone Penetration (DCP) tests (per the ASTM D6951 test procedure) may be performed to verify that the subgrade soil has a minimum CBR value of 5.9 which the design pavement section is based upon. A minimum of 2 DCP tests shall be performed in each exposed subgrade area. The field technician shall provide the results of the visual observations and probing (or DCP test) of the soil (subgrade material) in the excavated areas to the Engineer and the Contractor prior to placement of base course material.
4. Placement of the base course material (after removal of the contaminated material) shall be constructed in maximum 6-inch compacted lifts. The base course material shall be 1-1/2" maximum in accordance with Table 1-31 of Section 31 – Aggregate Base Course of the Standard Specifications. The field technician shall perform at least one (1) field density (compaction) test for the base course material in each area using a nuclear gauge (ASTM D6398-17a test procedure) to determine the degree of compaction for the base course material. A minimum of one (1) compaction test shall be performed per 1,000 SF (or fraction thereof). Test results will be provided to the Engineer and the Contractor upon completion of the tests. The minimum degree of compaction shall be 95% of the maximum dry density as determined by the ASTM D1557-12 test procedure. Any area where the degree of compaction fails to meet the required minimum of 95% shall be further compacted and re-tested until the area meets the required minimum 95% compaction.
5. Before placement of the Asphalt Treated Base (ATB), a prime coat shall be applied over the compacted base course. See the attached City and County of Honolulu Standard Specifications, Section 33.2 for the prime coat material specifications. The 4-in Asphalt Treated Base (ATB) material shall be spread and compacted in one layer; the maximum compacted thickness of one layer shall not exceed 4-in. The field technician shall perform at least one (1) compaction test per 1,000 SF of pavement area using a nuclear gauge (ASTM D6398-17a test procedure) to measure the field density for the ATB material. The ATB shall be thoroughly compacted to a relative specific gravity of not less than 95 percent of the specific gravity of the combined mixture without voids. The specific gravity of the material shall be provided by the material vendor. Test results will be provided to the Engineer and the Contractor upon completion of the tests. Any area(s) that fail to meet the required minimum degree of compaction shall be further compacted and re-tested until the area meets the required minimum degree of compaction.
6. The Asphalt Concrete Pavement shall be Mix III as per Table 1-34 of Section 34 – Asphalt Concrete Pavement of the Standard Specifications. Placement of the 2-in Asphalt Concrete (AC) pavement shall be spread and rolled in one layer; the maximum compacted thickness of one layer shall not exceed 2 1/2-in. If the 2-in AC pavement is spread and rolled in multiple lifts, the minimum thickness of each lift shall be 1-in. Rolling shall continue until the compressed pavement has attained a relative

specific gravity of not less than 91% of the specific gravity of the combined mixture without voids. The specific gravity of the material shall be provided by the material vendor. The test to determine compaction of the AC pavement shall be done in accordance to ASTM D 2041 (Rice Method). The field technician shall perform at least one (1) compaction test per 1,000 SF or fraction thereof. The final rolling shall be performed by a steel-wheeled roller weighing not less than 10 tons. Test results will be provided to the Engineer and the Contractor upon completion of the tests. Any area(s) that fail to meet the required minimum degree of compaction shall be further compacted and re-tested until the area meets the required minimum degree of compaction.

7.Placement of concrete sidewalks shall conform with Section 42 – Concrete Sidewalks of the Standard Specifications. Concrete materials testing will be performed by a separate entity and is described in the Concrete Notes section of the Factory Street Reconstruction Civil Improvement Plan. The entity performing concrete materials testing will provide concrete testing results to the Contractor.

The Final Report would include the following:

8. Final Grading Report and Certification - HEG
9. Final Geotechnical Report (including all test data) – SHINSATO ENGINEERING. This report will include the following, at a minimum:
  - a. All compaction and other test data, requirements to pass tests, and whether tests were passed
  - b. A summary of the mix designs that were reviewed, requirements for materials to meet material specifications, and whether each material passed the data review.

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**APPENDIX B  
PHOTOGRAPH LOG**

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<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>1</b>	<b>Date:</b> 01/16/2020
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**Direction Photo Taken:** South-Southeast

**Description:**  
Prior to mobilization of field equipment, lay-down yards were inspected and photo-documented to note damage and present conditions.



<b>Photo No.</b> <b>2</b>	<b>Date:</b> 01/16/2020
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**Direction Photo Taken:** South-Southeast

**Description:**  
The lay-down yard at Ham Produce and Seafood Inc. on the corner of Factory Street and Waterhouse Street prior to Site mobilization



**Project Name:**  
Factory Street Lead Site

**Site Location:** Honolulu, Honolulu County, Hawaii

**DCN:** 0003-08-AAGF

**Photo No.**  
**3**

**Date:**  
01/16/2020

**Direction Photo Taken:** South-Southeast

**Description:**  
The Site lay-down area prior to mobilization of office trailer, field equipment, bathroom facilities, and wash station.

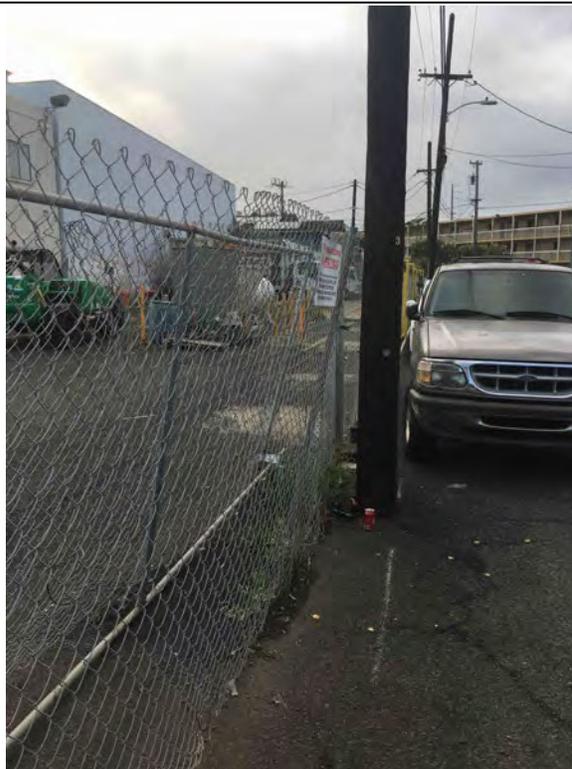


**Photo No.**  
**4**

**Date:**  
01/16/2020

**Direction Photo Taken:** South-Southeast

**Description:**  
Perimeter fencing around the Ham Produce, and Seafood Inc. lot prior to mobilization of field equipment.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 00003-08-AAGF
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<b>Photo No.</b> <b>5</b>	<b>Date:</b> 01/16/2020
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**Direction Photo Taken:** Southwest

**Description:**  
The Site lay-down yard at the United Food & Commercial Workers (UFCW) Union Local 480 prior to Site mobilization.



<b>Photo No.</b> <b>6</b>	<b>Date:</b> 01/16/2020
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**Direction Photo Taken:** Southwest

**Description:**  
A location outside of the UFCW Local 480 is coned off where a shipping container will be staged to safely store hazardous lead contaminated soil excavated from decision unit (DU) 6.



<b>Project Name:</b> Factory Street Lead Site		<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
<b>Photo No.</b> <b>7</b>	<b>Date:</b> 01/16/2020		
<b>Direction Photo Taken:</b> South			
<b>Description:</b>  The Site lay-down yard at the UFCW Local 480 prior to Site mobilization.			

<b>Photo No.</b> <b>8</b>	<b>Date:</b> 01/16/2020		
<b>Direction Photo Taken:</b> West			
<b>Description:</b>  A view through the entrance gate of the UFCW Local 480 lay-down yard.			

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>9</b>	<b>Date:</b> 01/16/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> The Site lay-down yard at the Hawaii Department of Agriculture (HDOA).		

<b>Photo No.</b> <b>10</b>	<b>Date:</b> 01/16/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Another view of the Site lay-down yard at HDOA.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>11</b>	<b>Date:</b> 01/16/2020
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**Direction Photo Taken:** Southeast

**Description:**  
Shipping containers staged at HDOA will be loaded with cubic yard boxes filled with non-hazardous waste soil excavated from the Project Area for transport off-island to a disposal facility.



<b>Photo No.</b> <b>12</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** East

**Description:**  
Halawa Valley Quarry was visited prior to the commencement of field work. Base course to be used in backfilling of the Project Area was field screened and laboratory analyzed prior to the commencement of excavation operations.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>13</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** Northeast

**Description:**  
Base course to be used for the project was in-situ field tested for heavy metals using an Olympus Delta Professional x-ray fluorescence(XRF) spectrometer. Five point composite samples were collected and submitted to an analytical laboratory for analysis.



<b>Photo No.</b> <b>14</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** East

**Description:**  
Base course being stockpiled at Halawa Valley Quarry.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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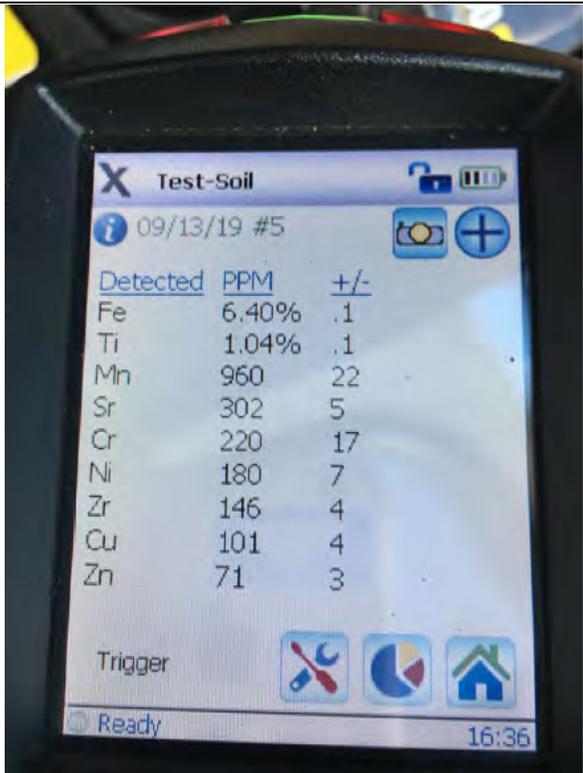
<b>Photo No.</b> <b>15</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> Stockpiled base course at Halawa Valley Quarry.		

<b>Photo No.</b> <b>16</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A close-up of the base course showing fine particulates.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>17</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Each 5-point composite sample was collected using dedicated sampling equipment. Base course was transferred to a dedicated Ziploc bag and field screened with an Olympus Delta Professional XRF spectrometer.		

<b>Photo No.</b> <b>18</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> The Olympus Delta Professional XRF spectrometer was used to provide real-time data screening of base course for heavy metals.		



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>19</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> <p>A total of 40 grams of base course was collected at each of the five increment locations within a 25 cubic yard bulk sample using dedicated Terra Core Samplers™, nitrile gloves, soil scoops, Ziploc bags and glass jars.</p>		

<b>Photo No.</b> <b>20</b>	<b>Date:</b> 09/13/2019	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> <p>Five-point composite samples were transferred from a Ziploc bag to a glass jar after field screening, labeled, and place in a cooler on ice for shipment to laboratory under chain-of-custody control.</p>		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>21</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** N/A

**Description:**  
A total of seven (7) five-point composite samples of base course were collected at Halawa Valley Quarry.



<b>Photo No.</b> <b>22</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** N/A

**Description:**  
Glass jars containing base course were bagged with the same Ziploc used to field screen that particular sample to protect the sample and label during shipment.



**Project Name:** Factory Street Lead Site      **Site Location:** Honolulu, Honolulu County, Hawaii      **DCN:** 0003-08-AAGF

**Photo No. 23**      **Date:** 09/13/2019

**Direction Photo Taken:** N/A

**Description:**  
Composite samples were double bagged and place inside a cooler and shipped to laboratory for analysis under chain-of-custody control.



**Photo No. 24**      **Date:** 09/13/2019

**Direction Photo Taken:** N/A

**Description:**  
Completed chain-of-custody record.

**Chain of Custody Record**

Project Manager: Tom W. L. ...      Date: 9/13/19

Sample Identification	Sample Date	Sample Time	Type	Media	Lab	Analysis	Remarks
FS-BC-01	9/13/19	1323	C	sub	1	X	
FS-BC-02		1330			1	X	
FS-BC-03		1336			1	X	
FS-BC-04		1342			1	X	
FS-BC-05		1348			1	X	
FS-BC-06		1365			1	X	

Special Instructions: METALIC BULK, M/M/S/D, REFERRED STANDARDS (10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100)

Requested by: SHAWN CARROLL      Date/Time: 9/13/19

Form No. CAC-WA-002, Rev. 4.25, dated 7/25/09

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>25</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** N/A

**Description:**  
 Chain-of-custody record taped to the underside of the cooler lid.



<b>Photo No.</b> <b>26</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** N/A

**Description:**  
 Composite samples placed in a cooler on ice for shipment to laboratory under chain-of-custody control.



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<b>Photo No.</b> <b>27</b>	<b>Date:</b> 09/13/2019
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**Direction Photo Taken:** N/A

**Description:**  
 Cooler containing composite samples of base course packed and ready for shipment to laboratory under chain-of-custody control.



<b>Photo No.</b> <b>28</b>	<b>Date:</b> 01/17/2020
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**Direction Photo Taken:** North

**Description:**  
 Background air monitoring was conducted prior to the commencement of intrusive activities to provide a baseline.



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<b>Photo No.</b> <b>29</b>	<b>Date:</b> 01/17/2020
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**Direction Photo Taken:** West

**Description:**  
Community outreach was conducted by personnel from the United States Environmental Protection Agency (EPA) and the Hawaii Department of Health (HDOH) prior to the commencement of intrusive activities.



<b>Photo No.</b> <b>30</b>	<b>Date:</b> 01/17/2020
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**Direction Photo Taken:** Northwest

**Description:**  
Outreach materials were presented in Tagalog, Ilocano, and English, the three predominant languages/dialects spoken by the immediate community of the project site.



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<b>Photo No.</b> <b>31</b>	<b>Date:</b> 01/20/2020
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**Direction Photo Taken:** West

**Description:**  
 Important features of the Project Area are measured prior to marking with paint.



<b>Photo No.</b> <b>32</b>	<b>Date:</b> 01/20/2020
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**Direction Photo Taken:** North

**Description:**  
 The Project Area boundary of Factory Street at North King Street is marked with white paint.



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<b>Photo No.</b> <b>33</b>	<b>Date:</b> 01/20/2020
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**Direction Photo Taken:** East

**Description:**  
A walk behind concrete cutter saw is used to cut the road.



<b>Photo No.</b> <b>34</b>	<b>Date:</b> 01/20/2020
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**Direction Photo Taken:** N/A

**Description:**  
The concrete cutter saw is used to make cuts along the boundaries of the Project Area.



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<b>Photo No.</b> <b>35</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** North

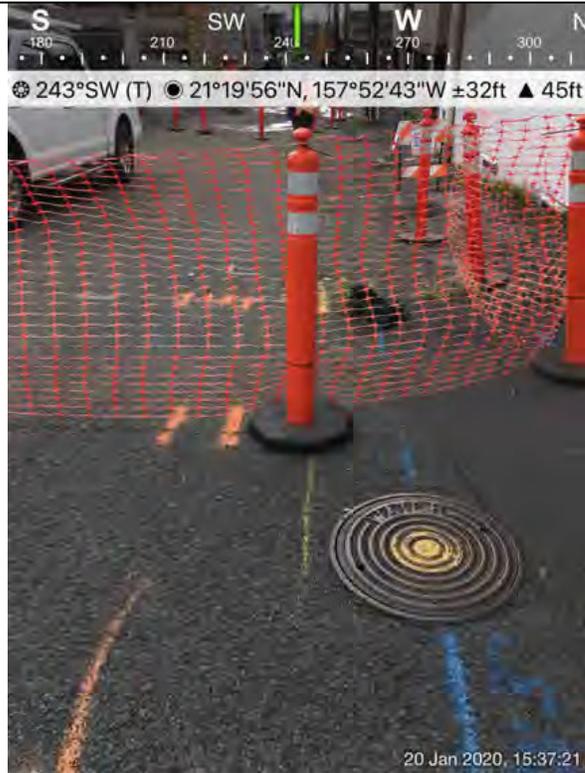
**Description:**  
The concrete cutter saw is used to cut a boundary of the Factory Street Project Area.



<b>Photo No.</b> <b>36</b>	<b>Date:</b> 01/20/2020
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**Direction Photo Taken:** West-Southwest

**Description:**  
Utility markings were photographed to document locations in the event markings faded.



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<b>Photo No.</b> <b>37</b>	<b>Date:</b> 01/20/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Photo documenting utility locates.		

<b>Photo No.</b> <b>38</b>	<b>Date:</b> 01/20/2020	
<b>Direction Photo Taken:</b> Northeast		
<b>Description:</b> Important street features such as curbs and adjacent building features were photo documented prior to commencement of intrusive activities.		

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<b>Photo No.</b> <b>39</b>	<b>Date:</b> 01/20/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
Other important street features such as meter boxes were also photo documented prior to the commencement of intrusive operations.



<b>Photo No.</b> <b>40</b>	<b>Date:</b> 01/20/2020
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<b>Direction Photo Taken:</b> East
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**Description:**  
Temporary anchor foundations to brace utility poles are cut with a concrete cutter saw.



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<b>Photo No.</b> <b>41</b>	<b>Date:</b> 01/23/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Anchors for utility pole bracing being excavated.		

<b>Photo No.</b> <b>42</b>	<b>Date:</b> 01/22/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Hand digging anchors for utility pole shoring.		

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<b>Photo No.</b> <b>43</b>	<b>Date:</b> 01/23/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
 Utility pole shoring anchor excavation.



<b>Photo No.</b> <b>44</b>	<b>Date:</b> 01/23/2020
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<b>Direction Photo Taken:</b> North
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**Description:**  
 Metal plates were used to cover utility pole shoring anchor excavations.



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<b>Photo No.</b> <b>45</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
Metal plates were used to cover excavated utility pole shorings until cement could be poured.



<b>Photo No.</b> <b>46</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** N/A

**Description:**  
Hawaiian cement truck arrives on-site to pour cement for utility pole shoring anchors.



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<b>Photo No.</b> <b>47</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
Utility pole shoring anchor excavations are filled with cement.



<b>Photo No.</b> <b>48</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
Utility pole shoring anchor cement is smoothed prior to curing.



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<b>Photo No.</b>	<b>Date:</b>
<b>49</b>	01/28/2020

**Direction Photo Taken:**  
Northeast

**Description:**  
Pole shoring collar being affixed to utility pole.



<b>Photo No.</b>	<b>Date:</b>
<b>50</b>	01/28/2020

**Direction Photo Taken:** North

**Description:**  
Utility pole shoring operations.



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<b>Photo No.</b> <b>51</b>	<b>Date:</b> 01/28/2020
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<b>Direction Photo Taken:</b> North
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**Description:**  
 Pole brace affixed to utility pole.



<b>Photo No.</b> <b>52</b>	<b>Date:</b> 01/31/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
 Utility pole brace anchored to cement.



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<b>Photo No.</b> <b>53</b>	<b>Date:</b> 01/31/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
Utility pole shoring system.



<b>Photo No.</b> <b>54</b>	<b>Date:</b> 01/21/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
Material from excavated utility pole shoring anchors was transferred to lined cubic yard boxes and was disposed of as either non-hazardous or hazardous waste dependent upon its origin.



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Factory Street Lead Site

**Site Location:** Honolulu, Honolulu County, Hawaii

**DCN:** 0003-08-AAGF

**Photo No.**  
**55**

**Date:**  
01/21/2020

**Direction Photo Taken:** North

**Description:**  
Excavated soil from utility pole shoring anchors was containerized in lined cubic yard boxes.



**Photo No.**  
**56**

**Date:**  
01/21/2020

**Direction Photo Taken:**  
Southeast

**Description:**  
Excavated materials from utility pole excavation being containerized.



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<b>Photo No.</b> <b>57</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** North

**Description:**  
 Containerized soil excavated from the Project Area.



<b>Photo No.</b> <b>58</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** North

**Description:**  
 Containerized soil is marked based on container number and whether the soil is hazardous waste or non-hazardous waste.



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<b>Photo No.</b> <b>59</b>	<b>Date:</b> 01/21/2020
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**Direction Photo Taken:** N/A

**Description:**  
 The second lined cubic yard box containing non-hazardous waste soil ID N-002.



<b>Photo No.</b> <b>60</b>	<b>Date:</b> 01/21/2020
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**Direction Photo Taken:** West

**Description:**  
 Containerized non-hazardous waste soil from the Project Area being transported to the flatbed truck.



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<b>Photo No.</b> <b>61</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** N/A

**Description:**  
Non-hazardous waste soil is transported by flat bed truck to the HDOA lay down yard and transferred to shipping containers for shipment to its disposal facility.



<b>Photo No.</b> <b>62</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** North

**Description:**  
Shipping container being delivered to the Site where hazardous waste soil excavated from DU-6 of the Project Area will be staged prior to being shipped to a hazardous waste disposal facility.



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<b>Photo No.</b> <b>63</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** N/A

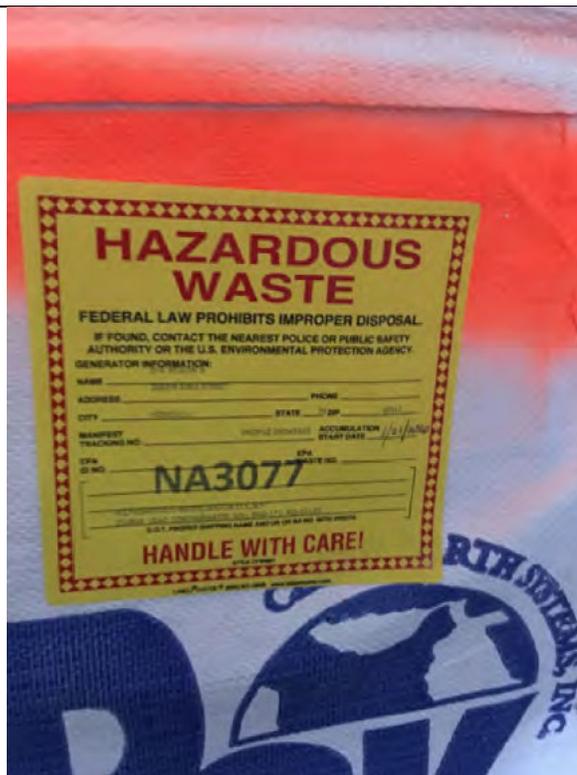
**Description:**  
 Hazardous waste soil is staged on-site in a secured shipping container until full. Once full the shipping container is transported to a hazardous waste disposal facility.



<b>Photo No.</b> <b>64</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** N/A

**Description:**  
 Containerized hazardous waste soil is labeled as hazardous waste.



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<b>Photo No.</b> <b>65</b>	<b>Date:</b> 02/05/2020
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**Direction Photo Taken:** West

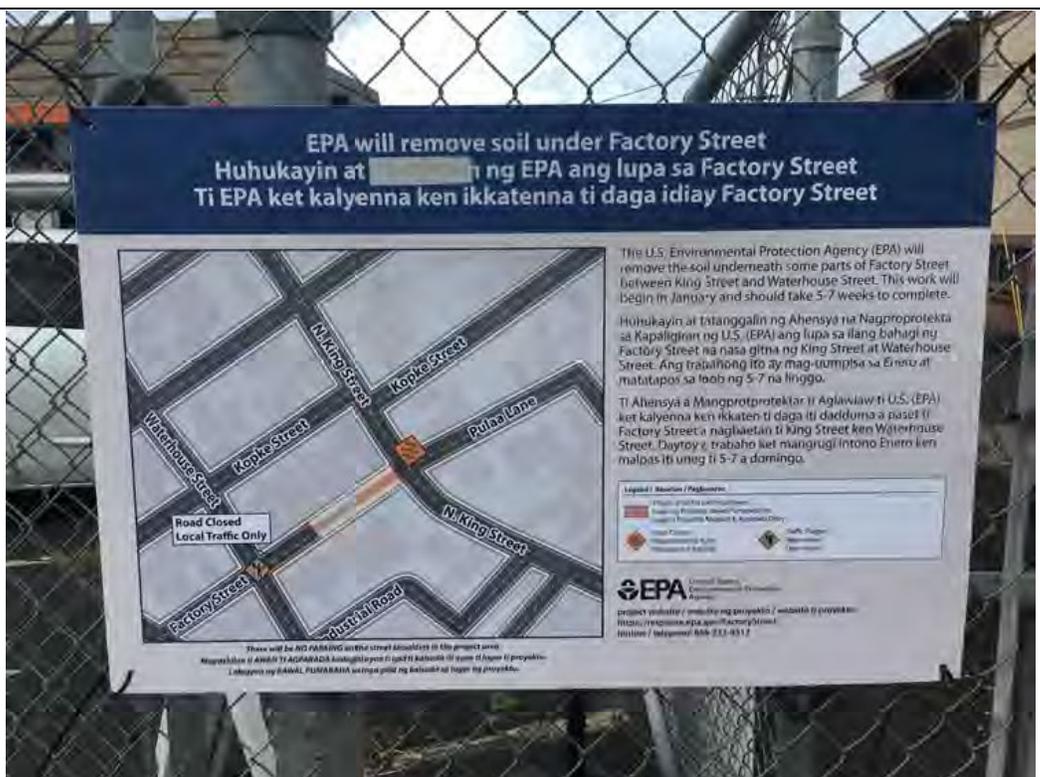
**Description:**  
A site specific project information poster is affixed to fencing at the entrance to Factory Street at both the North King Street and Waterhouse Street intersections.



<b>Photo No.</b> <b>66</b>	<b>Date:</b> 02/05/2020
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**Direction Photo Taken:** N/A

**Description:**  
Site specific project information poster presented in English, Tagalog and Ilocano.



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<b>Photo No.</b> <b>67</b>	<b>Date:</b> 01/21/2020
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**Direction Photo Taken:** Northeast

**Description:**  
 An air monitoring station containing a TSI DustTrak aerosol monitor and an SKC AirChek Touch air sampling pump.



<b>Photo No.</b> <b>68</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** Southeast

**Description:**  
 A second air monitoring station containing a TSI DustTrak aerosol monitor and an SKC AirChek Touch air sampling pump.



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<b>Photo No.</b> <b>69</b>	<b>Date:</b> 01/23/2020
<b>Direction Photo Taken:</b> West	
<b>Description:</b>  The excavator removing the asphalt covering in DU-6, the DU with the highest lead in soil concentration.	



<b>Photo No.</b> <b>70</b>	<b>Date:</b> 01/23/2020
<b>Direction Photo Taken:</b> North	
<b>Description:</b>  At the onset of intrusive activities, removal work was conducted in level C personal protective equipment (PPE) until sufficient data was collected to support PPE downgrade decisions.	



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<b>Photo No.</b> <b>71</b>	<b>Date:</b> 01/21/2020
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**Direction Photo Taken:** Northeast

**Description:**  
Project equipment and personnel work in DU-6.



<b>Photo No.</b> <b>72</b>	<b>Date:</b> 01/21/2020
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**Direction Photo Taken:** Northeast

**Description:**  
A self leveling rotary laser level is used to establish depth of excavation.



**Project Name:**  
Factory Street Lead Site

**Site Location:** Honolulu, Honolulu County, Hawaii

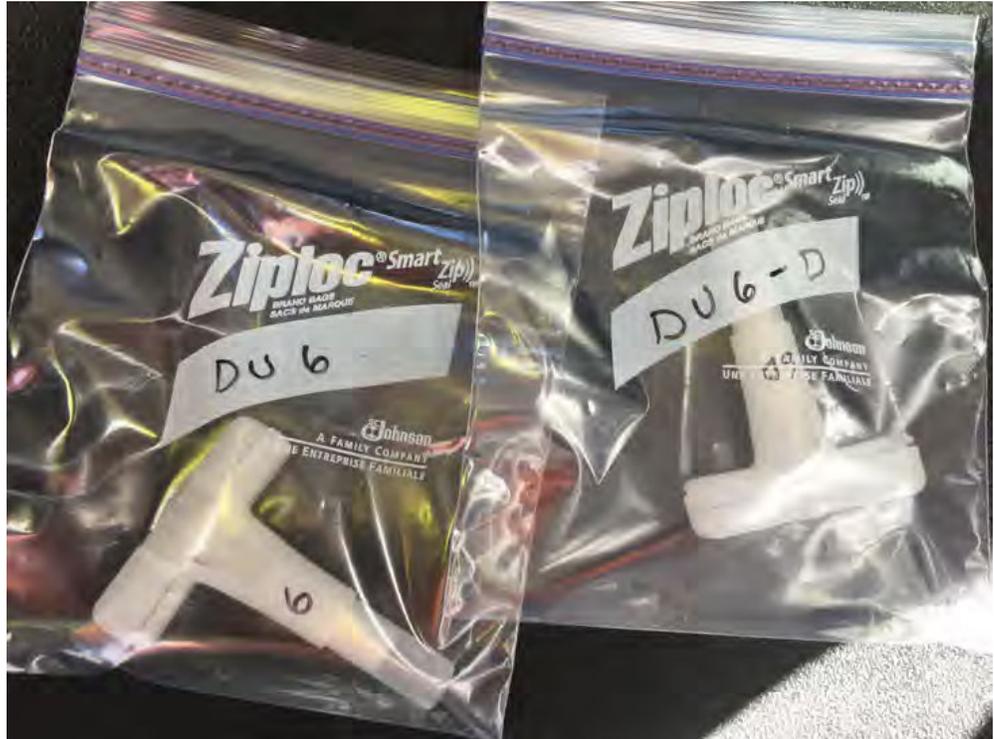
**DCN:** 00003-08-AAGF

**Photo No.**  
**73**

**Date:**  
01/22/2020

**Direction Photo Taken:** N/A

**Description:**  
Upon completion of excavation for the day, soil increments were collected using dedicated sampling equipment.



**Photo No.**  
**74**

**Date:**  
01/24/2020

**Direction Photo Taken:** Northwest

**Description:**  
Testing the stiffness of the native material at the limits of excavation in DU-6.



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<b>Photo No.</b> <b>75</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** West

**Description:**  
 Testing the stiffness of the native material at the limits of excavation in DU-6.



<b>Photo No.</b> <b>76</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
 Once daily soil increments were collected, construction fencing is laid to demarcate the limits of excavation.



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<b>Photo No.</b> <b>77</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
 Construction fencing is used to delineate excavation limits prior to backfill.



<b>Photo No.</b> <b>78</b>	<b>Date:</b> 01/22/2020
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**Direction Photo Taken:** Northeast

**Description:**  
 Base course stockpiled on-site is used to backfill excavations at the end of each day.



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<b>Photo No.</b> <b>79</b>	<b>Date:</b> 01/23/2020
<b>Direction Photo Taken:</b> Northwest	

**Description:**  
Excavations were backfilled at the end of each day.



<b>Photo No.</b> <b>80</b>	<b>Date:</b> 01/23/2020
<b>Direction Photo Taken:</b> Northwest	

**Description:**  
The excavator bucket is used to tamp down backfill.



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<b>Photo No.</b> <b>81</b>	<b>Date:</b> 01/23/2020
<b>Direction Photo Taken:</b> West	

**Description:**

A roller is used for compaction of backfill.



<b>Photo No.</b> <b>82</b>	<b>Date:</b> 01/24/2020
<b>Direction Photo Taken:</b> North	

**Description:**

The newly backfilled and compacted excavation is covered with plastic sheeting and weighed down by sandbags at the end of each day to prevent potential run-off in the event of rain.



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<b>Photo No.</b> <b>83</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** N/A

**Description:**  
 Air samples collected were packaged and shipped to the laboratory the following day for expedited analysis.



<b>Photo No.</b> <b>84</b>	<b>Date:</b> 01/30/2020
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**Direction Photo Taken:** N/A

**Description:**  
 TSI DustTrak aerosol monitors were zero air calibrated at the beginning of each day.

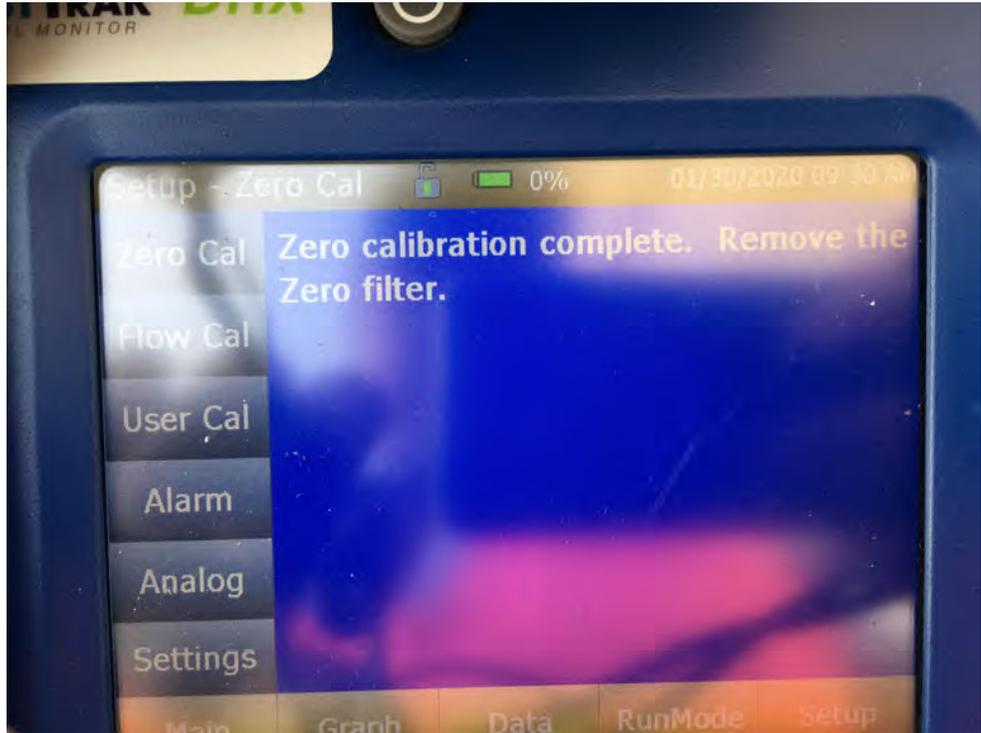


<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>85</b>	<b>Date:</b> 01/30/2020
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**Direction Photo Taken:** N/A

**Description:**  
A TSI DustTrak aerosol monitor is calibrated with a zero filter prior to commencement of intrusive activities.



<b>Photo No.</b> <b>86</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** North

**Description:**  
Excavation the following day would begin where the previous day finished.



**Project Name:**  
Factory Street Lead Site

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**DCN:** 0003-08-AAGF

**Photo No.**  
**87**

**Date:**  
01/24/2020

**Direction Photo Taken:** Northwest

**Description:**  
Excavator and lined cubic yard boxes in DU-6.



**Photo No.**  
**88**

**Date:**  
01/24/2020

**Direction Photo Taken:** Northwest

**Description:**  
DU-6 intrusive operations with DustTrak aerosol monitor and SKC AirChek Touch air sampling pump pictured in the bottom right.



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<b>Photo No.</b> <b>89</b>	<b>Date:</b> 01/24/2020
<b>Direction Photo Taken:</b> North	
<b>Description:</b> Excavating lead contaminated soil in DU-6.	



<b>Photo No.</b> <b>90</b>	<b>Date:</b> 01/24/2020
<b>Direction Photo Taken:</b> North	
<b>Description:</b> Water is sprayed on the excavation to wet the soil as an engineering control to prevent lead contaminated particulates from becoming airborne.	



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<b>Photo No.</b> <b>91</b>	<b>Date:</b> 01/24/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Excavating lead contaminated soil in DU-6.		

<b>Photo No.</b> <b>92</b>	<b>Date:</b> 01/24/2020	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> TSI DustTrak aerosol monitors and SKC AirChek Touch aerosol sampling pumps are actively measuring and collecting airborne particulates during intrusive operations.		

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<b>Photo No.</b> <b>93</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** Northeast

**Description:**  
 Construction fencing demarcating excavation limits in DU-6.



<b>Photo No.</b> <b>94</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** West

**Description:**  
 Daily backfill operations DU-6.



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<b>Photo No.</b> <b>95</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** West

**Description:**  
The excavator bucket is used to spread and tamp base coarse during backfill operations.



<b>Photo No.</b> <b>96</b>	<b>Date:</b> 01/25/2020
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**Direction Photo Taken:** East

**Description:**  
DU-6 facing North King Street.



**Project Name:**  
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**DCN:** 0003-08-AAGF

**Photo No.**  
**97**

**Date:**  
01/25/2020

**Direction Photo Taken:** North

**Description:**  
A concrete pad was unearthed in DU-6 in front of the entrance to parking for the 2003 North King Street businesses.



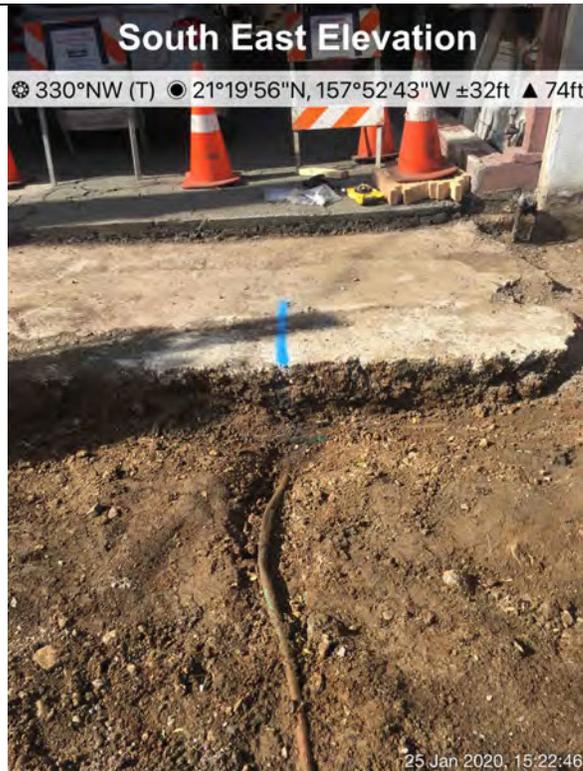
25 Jan 2020, 11:09:03

**Photo No.**  
**98**

**Date:**  
01/25/2020

**Direction Photo Taken:** North

**Description:**  
The concrete pad in DU-6 was approximately 58 square feet in size.



25 Jan 2020, 15:22:46

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<b>Photo No.</b> <b>99</b>	<b>Date:</b> 01/27/2020
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**Direction Photo Taken:** North

**Description:**  
Water was applied to the Project Area periodically throughout the day to aid in dust suppression.



<b>Photo No.</b> <b>100</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** Southwest

**Description:**  
Lined cubic yard boxes are filled with excavated soil.



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<b>Photo No.</b> <b>101</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** North

**Description:**  
Once filled, cubic yard boxes are stored on-site if hazardous waste in a secured shipping container or transported by flatbed truck to the HDOA lay-down yard if nonhazardous waste to be stored in separate secured shipping containers.



<b>Photo No.</b> <b>102</b>	<b>Date:</b> 01/23/2020
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**Direction Photo Taken:** West

**Description:**  
Non-hazardous waste soil is loaded onto a flatbed truck for transport to the HDOA lay-down yard where it will be stored in secured shipping containers.



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<b>Photo No.</b> <b>103</b>	<b>Date:</b> 01/29/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b>  Full cubic yard boxes are replaced with lined empty boxes throughout the day.		

<b>Photo No.</b> <b>104</b>	<b>Date:</b> 01/29/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b>  A closer look at the lined cubic yard boxes being used for storage of excavated soil.		

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<b>Photo No.</b> <b>105</b>	<b>Date:</b> 01/29/2020
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**Direction Photo Taken:** N/A

**Description:**  
 Once shipping containers are full they are packed and braced for transport to their respective hazardous waste or non-hazardous waste disposal facility.



<b>Photo No.</b> <b>106</b>	<b>Date:</b> 02/05/2020
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**Direction Photo Taken:** N/A

**Description:**  
 Shipping container loaded with hazardous waste soil from DU-6.



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<b>Photo No.</b> <b>107</b>	<b>Date:</b> 02/05/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A custody seal with a unique identifying serial number is used to secure shipping container doors.		

<b>Photo No.</b> <b>108</b>	<b>Date:</b> 02/05/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A close-up of the locking custody seal and its associated serial number.		

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<b>Photo No.</b> <b>109</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** Northwest

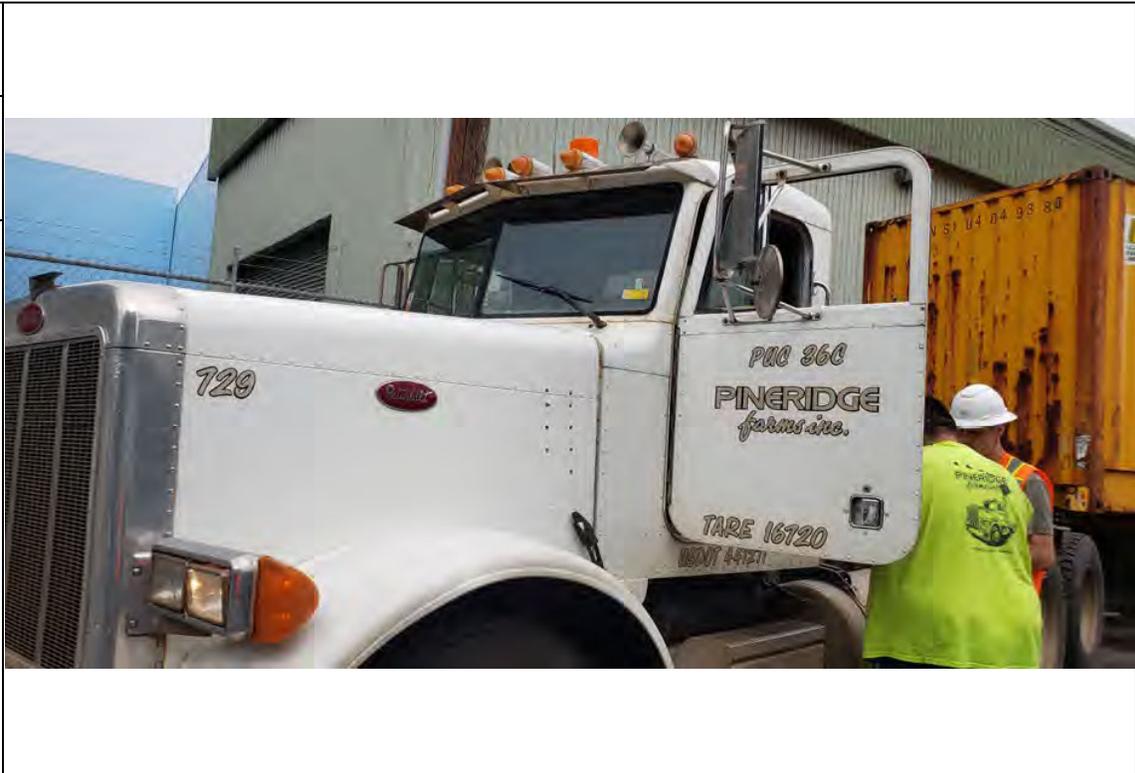
**Description:**  
  
Shipping container with hazardous waste soil is being prepared for removal from site.



<b>Photo No.</b> <b>110</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** N/A

**Description:**  
  
The transporter of a shipping container filled with hazardous waste soil reviews paperwork prior to removal from the Site.



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<b>Photo No.</b> <b>111</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** N/A

**Description:**  
A shipping container filled with hazardous waste soil is removed from site by Pineridge Farms Incorporated.



<b>Photo No.</b> <b>112</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** East

**Description:**  
The site location is quite narrow resulting in the transporter having to back the loaded shipping container down the street to remove it from the site.



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<b>Photo No.</b> <b>113</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** East

**Description:**  
 A loaded shipping container is removed from the project site.



<b>Photo No.</b> <b>114</b>	<b>Date:</b> 01/31/2020
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**Direction Photo Taken:** N/A

**Description:**  
 A shipping container full of non-hazardous waste soil is prepared for transport to a waste disposal facility.



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<b>Photo No.</b> <b>115</b>	<b>Date:</b> 03/04/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Inflatable bags are used to help secure contents of the shipping container.		

<b>Photo No.</b> <b>116</b>	<b>Date:</b> 02/06/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A shipping container full of non-hazardous waste soil is prepared for transport to a waste disposal facility.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>117</b>	<b>Date:</b> 02/04/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> During excavation on February 4, 2020, a broken and buried sewer clean-out port was unexpectedly discovered during activities in front of 922 Factory Street.		

<b>Photo No.</b> <b>118</b>	<b>Date:</b> 02/04/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Broken section of the sewer clean-out port had surface oxidation indicating it was broken prior to EPA excavation during removal operations.		

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<b>Photo No.</b> <b>119</b>	<b>Date:</b> 02/04/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A close-up of the broken sewer clean-out port in front of 922 Factory Street showing latitudinal and longitudinal coordinates.		

<b>Photo No.</b> <b>120</b>	<b>Date:</b> 02/04/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Emergency and Rapid Response Services (ERRS) personnel clear the sewer line of any soil that may have inadvertently fell in during excavation operations.		

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<b>Photo No.</b> <b>121</b>	<b>Date:</b> 02/05/2020	<p><b>West Elevation</b></p> <p>85°E (T) 21°19'56"N, 157°52'44"W ±32ft ▲ 67ft</p> 
<b>Direction Photo Taken:</b> N/A		
<p><b>Description:</b></p> <p>A polyvinyl chloride extension was attached to the broken sewer clean-out port and a concrete collar was poured around the repaired clean-out port.</p>		

<b>Photo No.</b> <b>122</b>	<b>Date:</b> 02/05/2020	
<b>Direction Photo Taken:</b> East		
<p><b>Description:</b></p> <p>Clean backfill was used to further reinforce the repaired clean-out port.</p>		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>123</b>	<b>Date:</b> 02/05/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A close-up photo of the repaired sewer clean-out port		

<b>Photo No.</b> <b>124</b>	<b>Date:</b> 02/06/2020	<div style="text-align: center;"> <p><b>North West Elevation</b></p> <p>           149°SE (T) ● 21°19'56"N, 157°52'44"W ±32ft ▲ 41ft         </p> </div>  <div style="text-align: right; font-size: small;">           06 Feb 2020, 10:11:56         </div>
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> During excavation on February 6, 2020, a substantial void space was encountered directly in front of the mailboxes at 922 Factory Street.		

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<b>Photo No.</b> <b>125</b>	<b>Date:</b> 02/06/2020
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**Direction Photo Taken:** Northwest

**Description:**  
The void space was immediately northeast of the manhole (showing the year 1917 on the plate cover).



<b>Photo No.</b> <b>126</b>	<b>Date:</b> 01/24/2020
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**Direction Photo Taken:** N/A

**Description:**  
A MultiRae photoionizing detector was used to assess the void for volatile organic compounds and noxious gases.



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<b>Photo No.</b> <b>127</b>	<b>Date:</b> 02/06/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
 A close-up of the void space.



<b>Photo No.</b> <b>128</b>	<b>Date:</b> 02/06/20120
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<b>Direction Photo Taken:</b> North
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**Description:**  
 EPA On-Scene Coordinator evaluating the void space.



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<b>Photo No.</b> <b>129</b>	<b>Date:</b> 02/06/2020		
<b>Direction Photo Taken:</b> N/A			
<b>Description:</b> Excavated void space.			

<b>Photo No.</b> <b>130</b>	<b>Date:</b> 02/06/2020		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> Several active and abandoned utility (water and gas) lines were cleared of soil and the extent of the void space was identified.			

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<b>Photo No.</b>	<b>Date:</b>
<b>131</b>	02/06/2020

**Direction Photo Taken:** Northeast

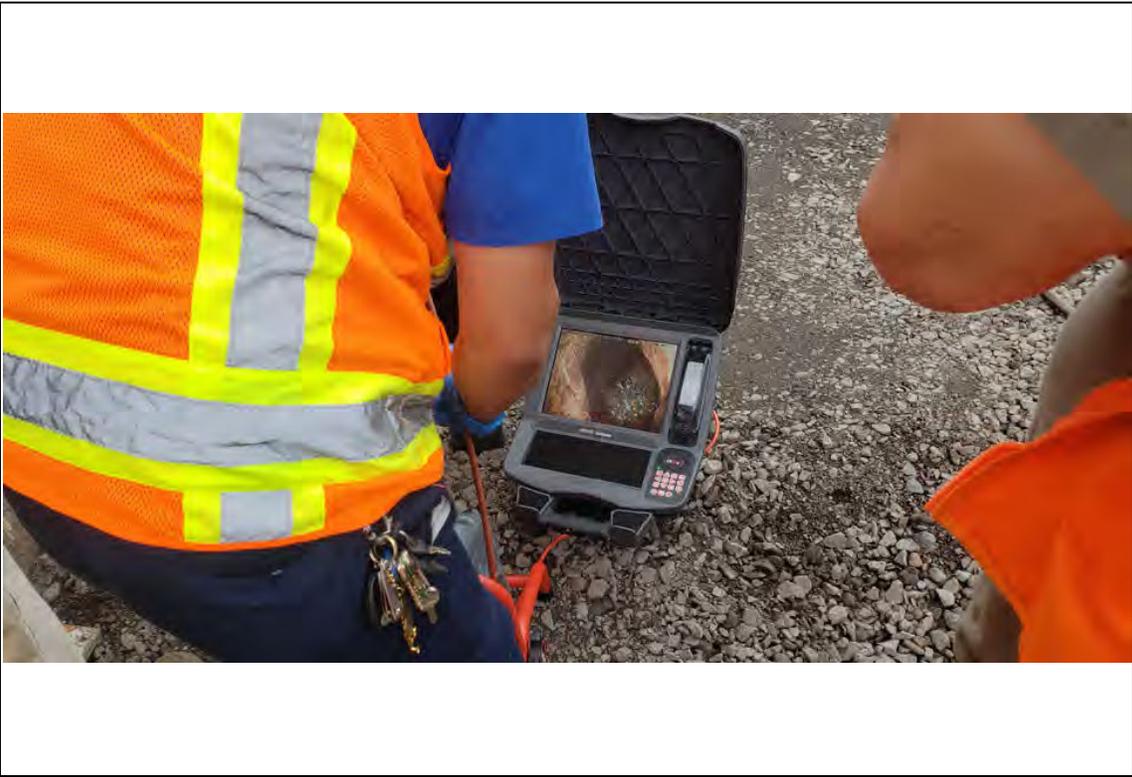
**Description:**  
 Roto-rooter was subcontracted by ERRS and brought a camera to Site to scope the sewer line to evaluate whether the void space had been caused by a broken sewer line.



<b>Photo No.</b>	<b>Date:</b>
<b>132</b>	02/06/2020

**Direction Photo Taken:** N/A

**Description:**  
 During the Roto-rooter camera survey, the upgradient private sewer line was observed to be intact and fully operational.



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<b>Photo No.</b> <b>133</b>	<b>Date:</b> 02/07/2020
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**Direction Photo Taken:** West

**Description:**  
EPA used a geotextile fabric to encase the northeast side of the sewer manhole (where the void was observed) prior to backfill to ensure that soil will no longer be able to flow into the sewer from the surrounding subsurface.



<b>Photo No.</b> <b>134</b>	<b>Date:</b> 02/07/2020
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**Direction Photo Taken:** North

**Description:**  
Fabric was placed on the northeast side only, as this was the location the void space was encountered on-site, and therefore the only side of the manhole with deep enough excavation to allow for placing the fabric.

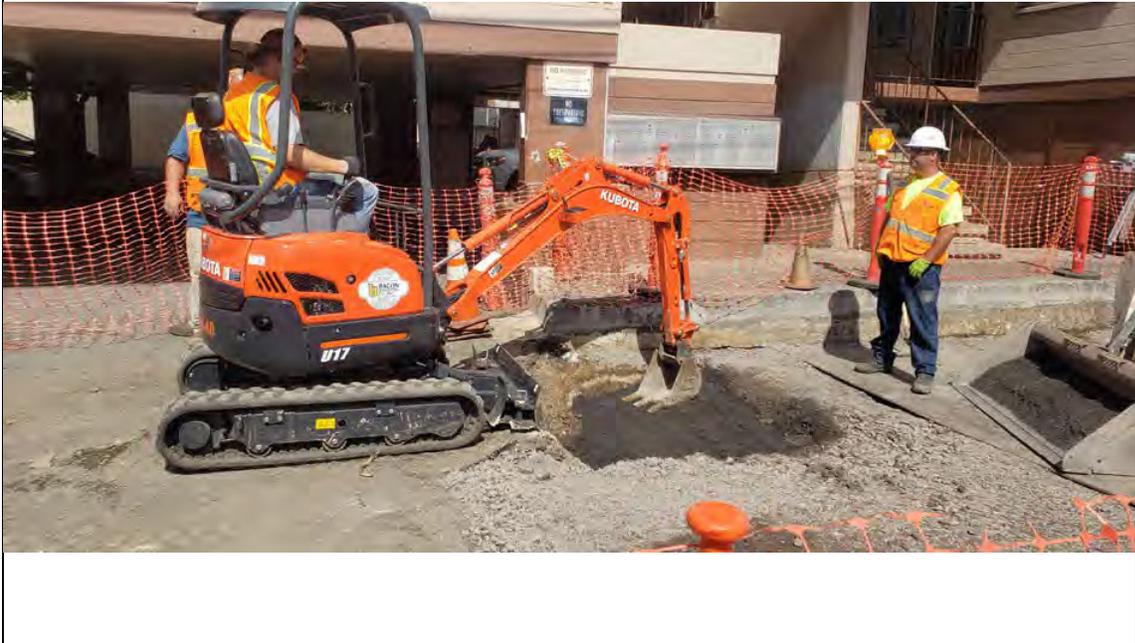


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<b>Photo No.</b> <b>135</b>	<b>Date:</b> 02/07/2020
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**Direction Photo Taken:** North

**Description:**  
Clean soil generated during exploration of the void space mixed with base course already staged on-site was used to bring the void space up to grade and sand was brought in and used as bedding for the active utility lines during backfilling operations.



<b>Photo No.</b> <b>136</b>	<b>Date:</b> 02/08/2020
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**Direction Photo Taken:** N/A

**Description:**  
On February 8, 2020 a second sewer clean-out port was unearthed and broken by the excavator operator in the northeast portion of DU-4 at 1 foot below ground surface.

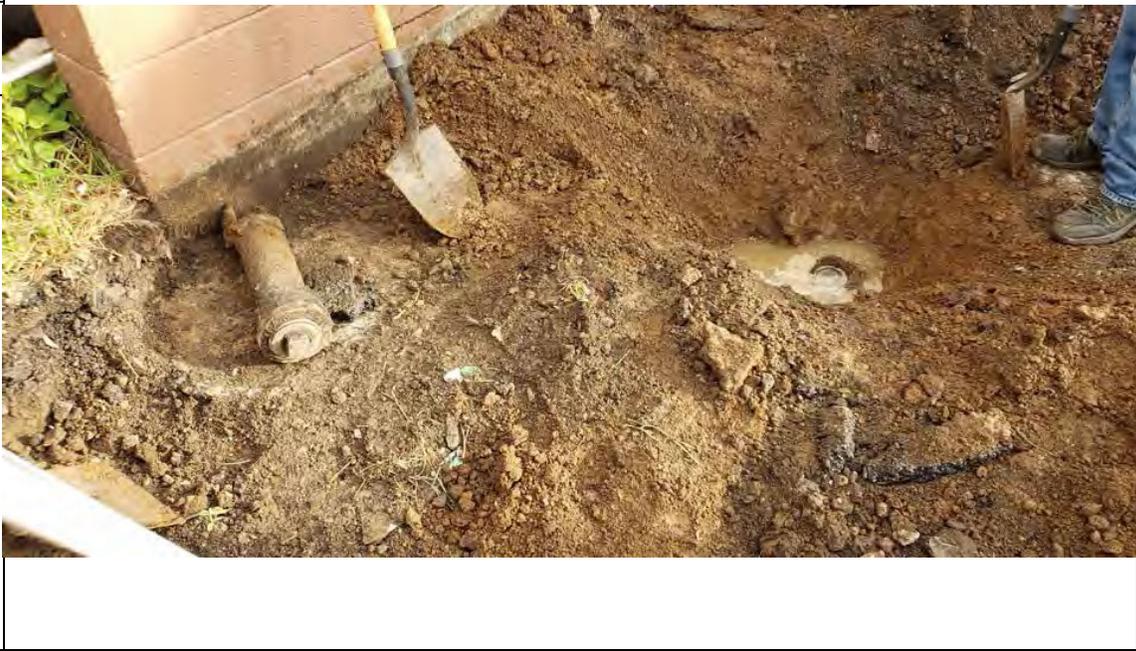


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<b>Photo No.</b> <b>137</b>	<b>Date:</b> 02/08/2020
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**Direction Photo Taken:** N/A

**Description:**  
Water from broken sewer clean-out port backing up into DU-4.



<b>Photo No.</b> <b>138</b>	<b>Date:</b> 02/08/2020
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**Direction Photo Taken:** Northeast

**Description:**  
ERRS personnel snaking broken clean-out port to clear blockage.



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**Site Location:** Honolulu, Honolulu County, Hawaii

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**Photo No.**  
**139**

**Date:**  
02/08/2020

**Direction Photo Taken:** N/A

**Description:**  
ERRS personnel snaking a second clean-out port located in the parking garage of the 922 Factory Street building.



**Photo No.**  
**140**

**Date:**  
02/08/2020

**Direction Photo Taken:** N/A

**Description:**  
ERRS personnel applying Quikrete concrete mix to the repaired sewer clean-out port.



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<b>Photo No.</b> <b>141</b>	<b>Date:</b> 02/08/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
The repaired sewer clean-out port.



<b>Photo No.</b> <b>142</b>	<b>Date:</b> 02/11/2020
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<b>Direction Photo Taken:</b> North
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**Description:**  
ERRS personnel breaking up concrete with the use of a jack hammer in front of 914 Factory Street.



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<b>Photo No.</b> <b>143</b>	<b>Date:</b> 02/11/2020
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**Direction Photo Taken:** N/A

**Description:**  
 ERRS personnel edging the concrete slab using a breaker bar fronting 914 Factory Street.



<b>Photo No.</b> <b>144</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** Northwest

**Description:**  
 ERRS personnel working in DU-4.



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<b>Photo No.</b> <b>145</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** Northwest

**Description:**  
ERRS personnel using a concrete cutter saw to cut the centerline between DU-3 and DU-4.



<b>Photo No.</b> <b>146</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** North

**Description:**  
Removing concrete in DU-4 fronting 914 Factory Street.



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<b>Photo No.</b> <b>147</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** West

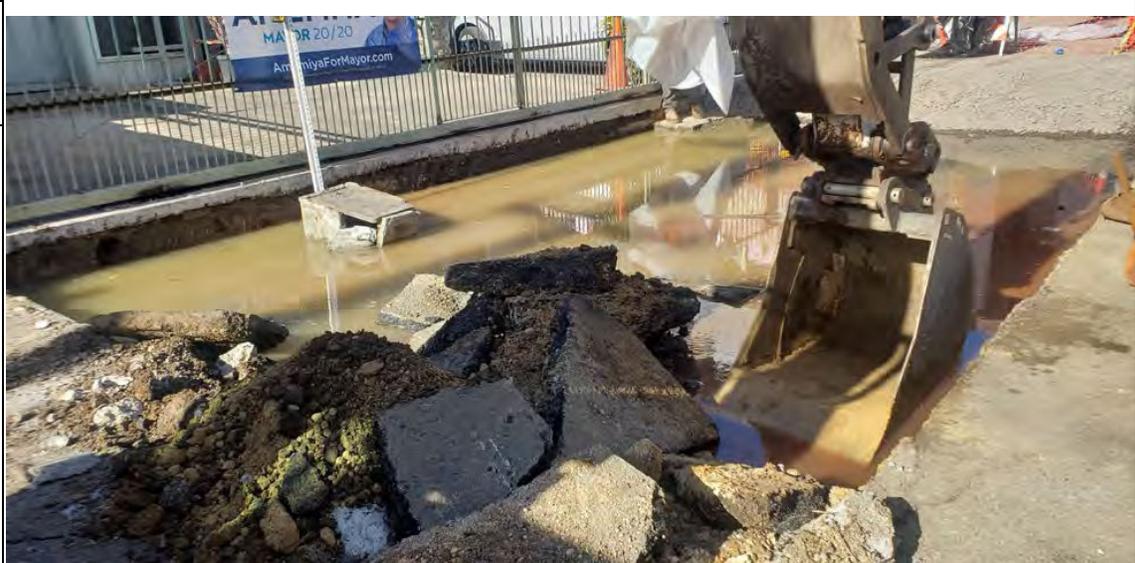
**Description:**  
Concrete being removed from DU-4.



<b>Photo No.</b> <b>148</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** Northeast

**Description:**  
During excavation in DU-4 a water line was clipped.



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<b>Photo No.</b> <b>149</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** West

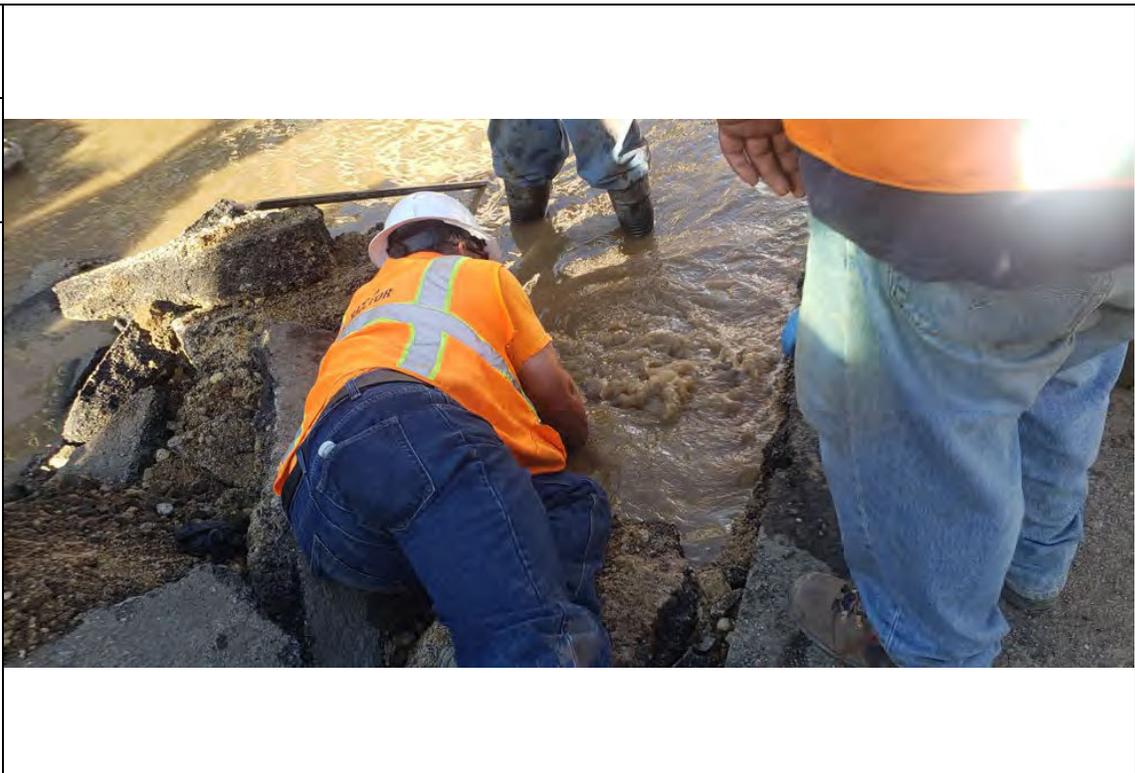
**Description:**  
A plumber from diamond head plumbing arrives on site to assist with repair.



<b>Photo No.</b> <b>150</b>	<b>Date:</b> 02/12/2020
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**Direction Photo Taken:** N/A

**Description:**  
ERRS personnel locating the break in the water line.



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<b>Photo No.</b> <b>151</b>	<b>Date:</b> 02/12/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A clamp is used to crimp the water line to stem the flow per instructions from the water company.		

<b>Photo No.</b> <b>152</b>	<b>Date:</b> 02/12/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A sawzall cutting saw is used to remove a portion of the broken water pipe.		

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<b>Photo No.</b> <b>153</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** N/A

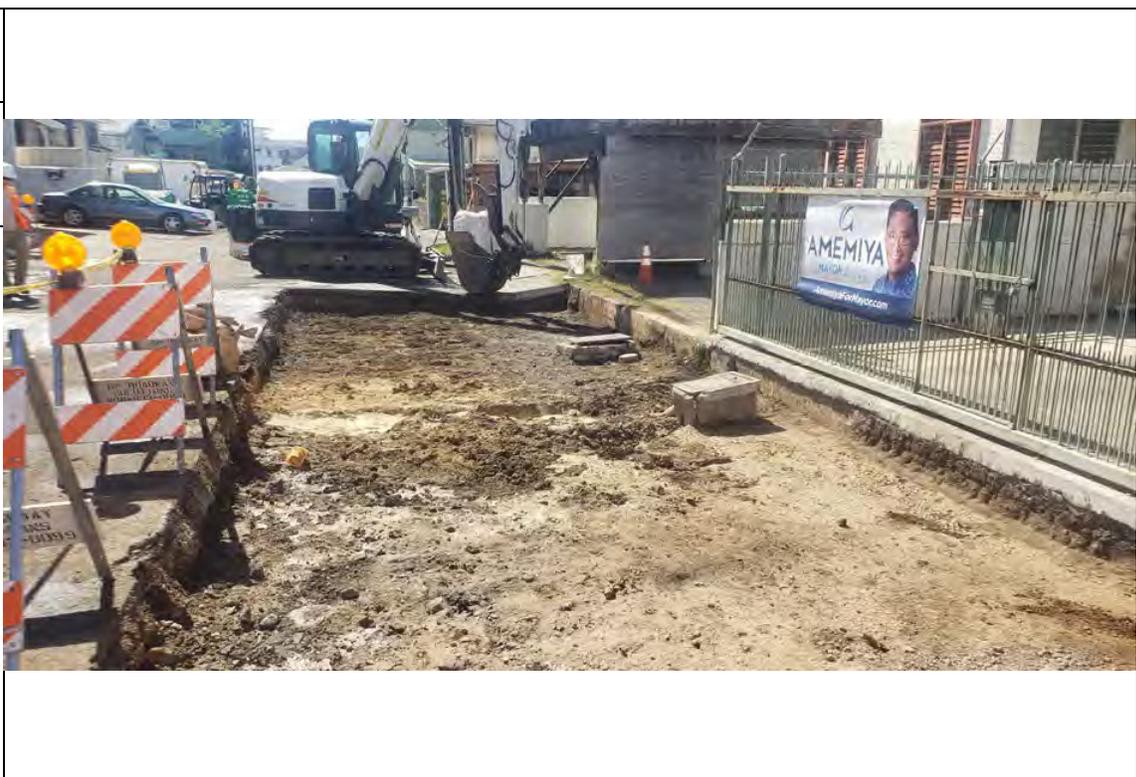
**Description:**  
The repaired water line.



<b>Photo No.</b> <b>154</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** West

**Description:**  
Excavation in DU-4.

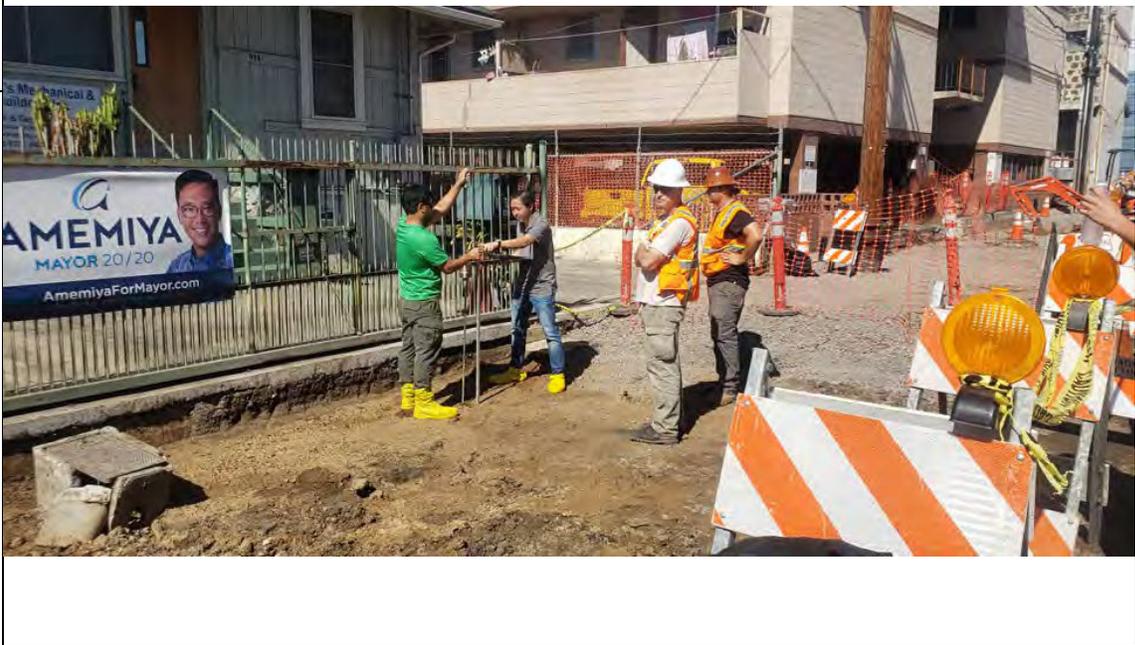


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<b>Photo No.</b> <b>155</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** Northeast

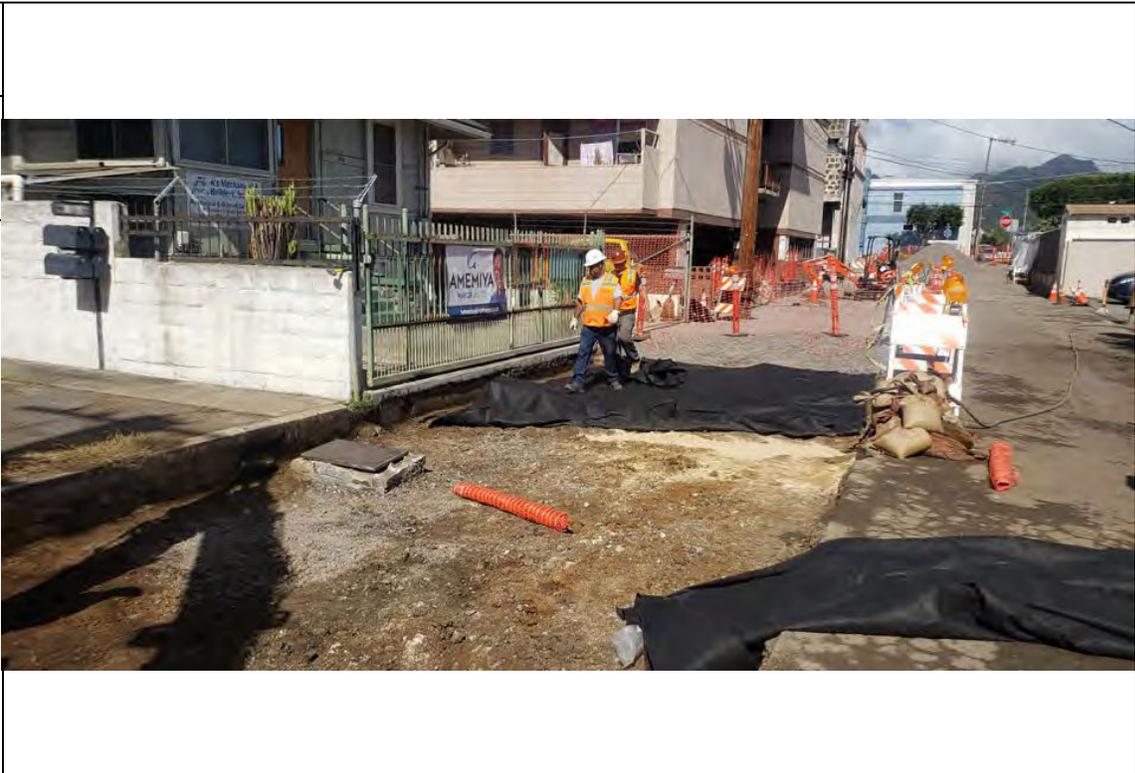
**Description:**  
Testing stiffness of the native material at the limits of excavation in DU-4.



<b>Photo No.</b> <b>156</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** East

**Description:**  
High tensile geotextile placed along eastern half of excavated area where flooding occurred to provide added support.



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<b>Photo No.</b> <b>157</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** Northeast

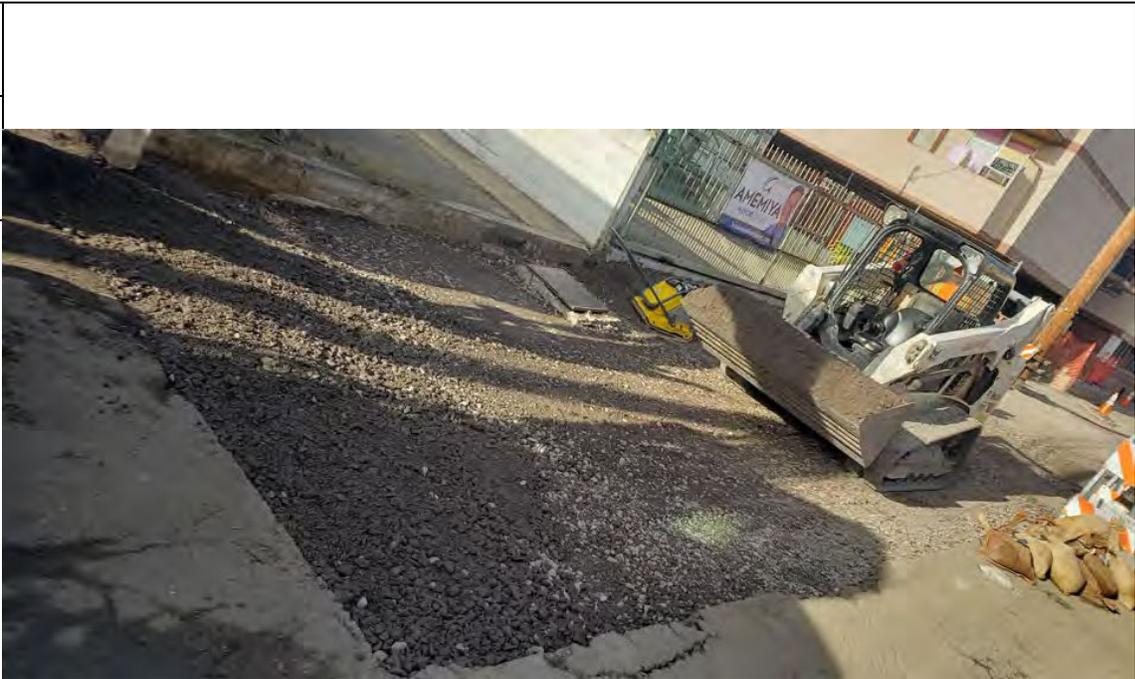
**Description:**  
Construction fencing placed in the excavation to demarcate limits of excavation.



<b>Photo No.</b> <b>158</b>	<b>Date:</b> 02/13/2020
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**Direction Photo Taken:** Northeast

**Description:**  
Backfilling operations in DU-4.



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<b>Photo No.</b> <b>159</b>	<b>Date:</b> 02/14/2020
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**Direction Photo Taken:** South

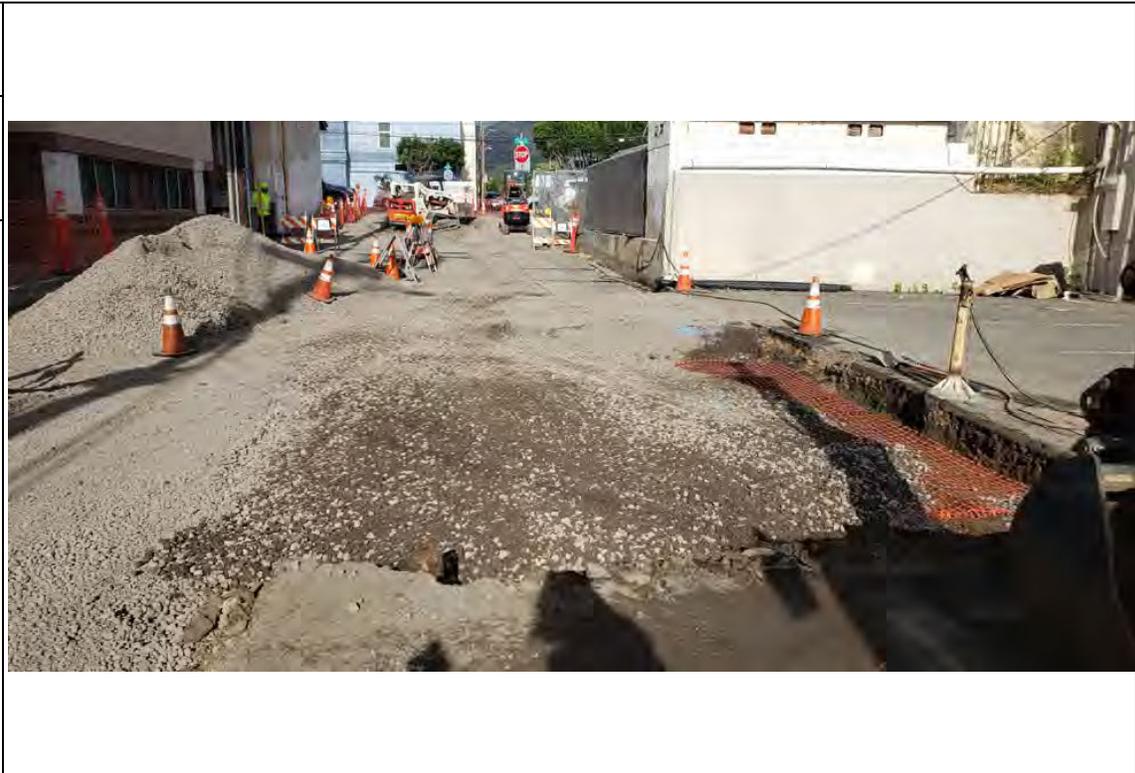
**Description:**  
 Excavation operations in DU-3.



<b>Photo No.</b> <b>160</b>	<b>Date:</b> 02/14/2020
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**Direction Photo Taken:** East

**Description:**  
 A shot of Factory Street facing North King Street.



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<b>Photo No.</b> <b>161</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** West

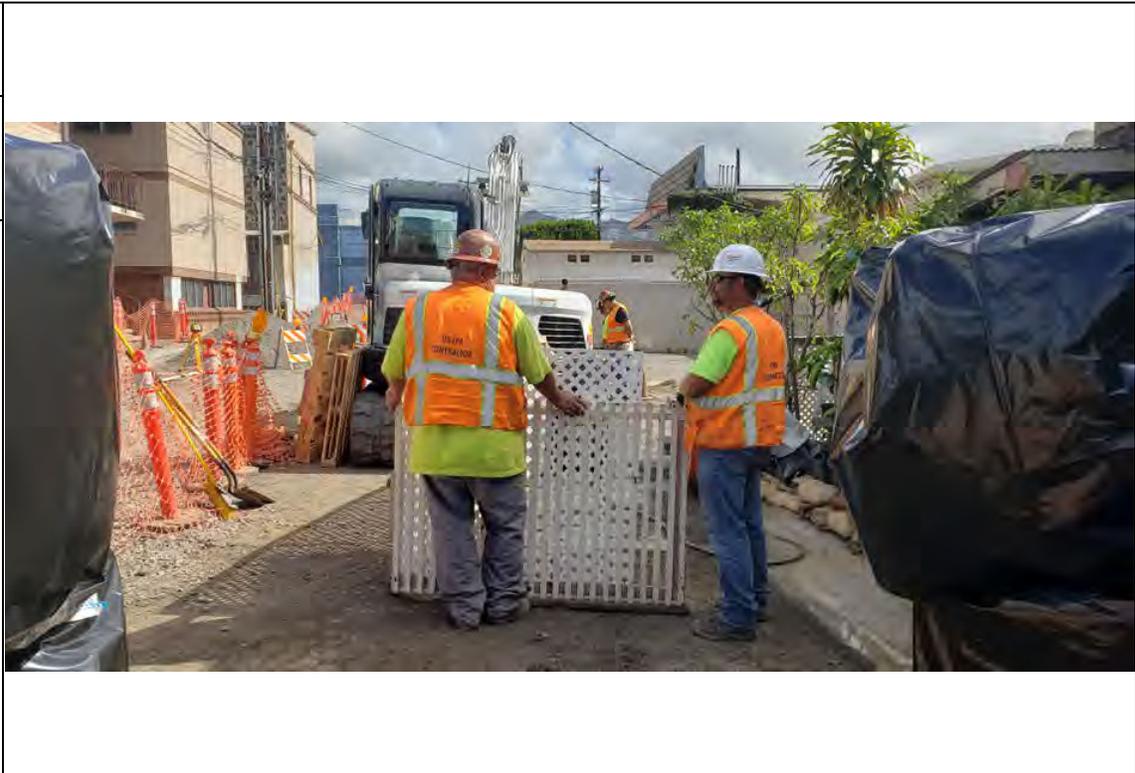
**Description:**  
ERRS personnel installs plastic sheeting around a residential fence to reduce dust.



<b>Photo No.</b> <b>162</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** East

**Description:**  
Fencing used to delineate a property line along Factory Street needed to be temporarily removed to cut project boundaries along the southern border of the Project Area.

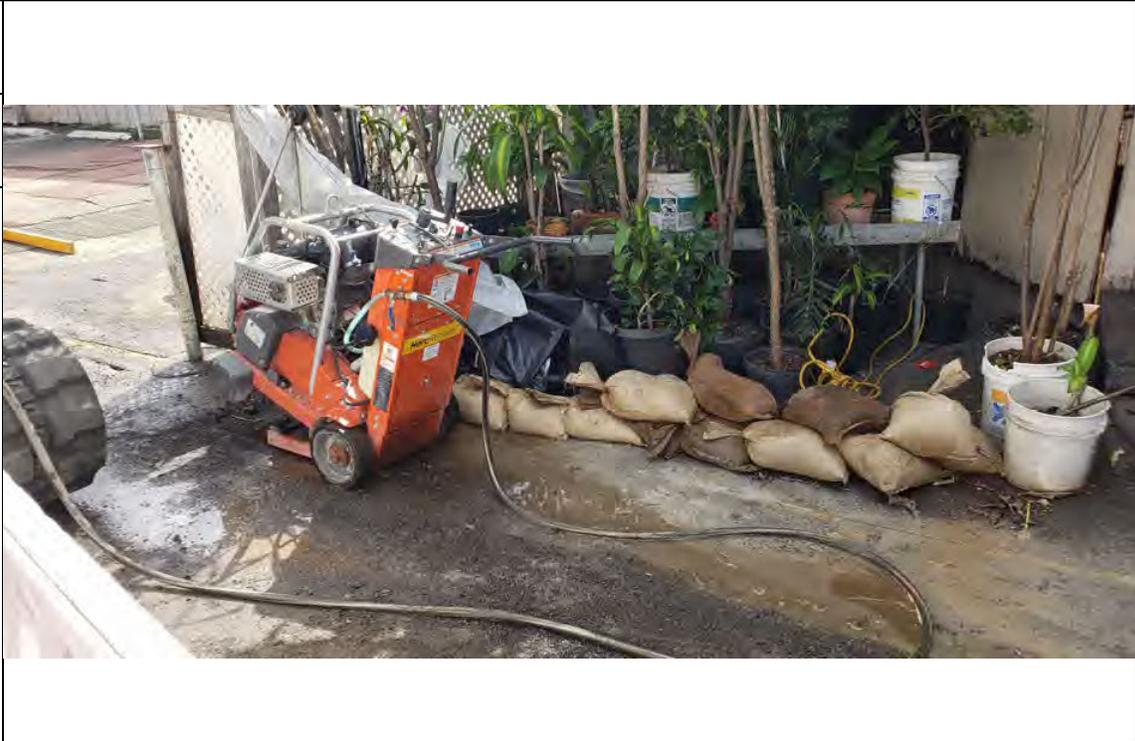


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<b>Photo No.</b> <b>163</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** N/A

**Description:**  
A concrete cutter saw is used to cut the southern Project Area boundary in front of a residential dwelling.



<b>Photo No.</b> <b>164</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** Southwest

**Description:**  
Excavation in DU-3.



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<b>Photo No.</b> <b>165</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** West

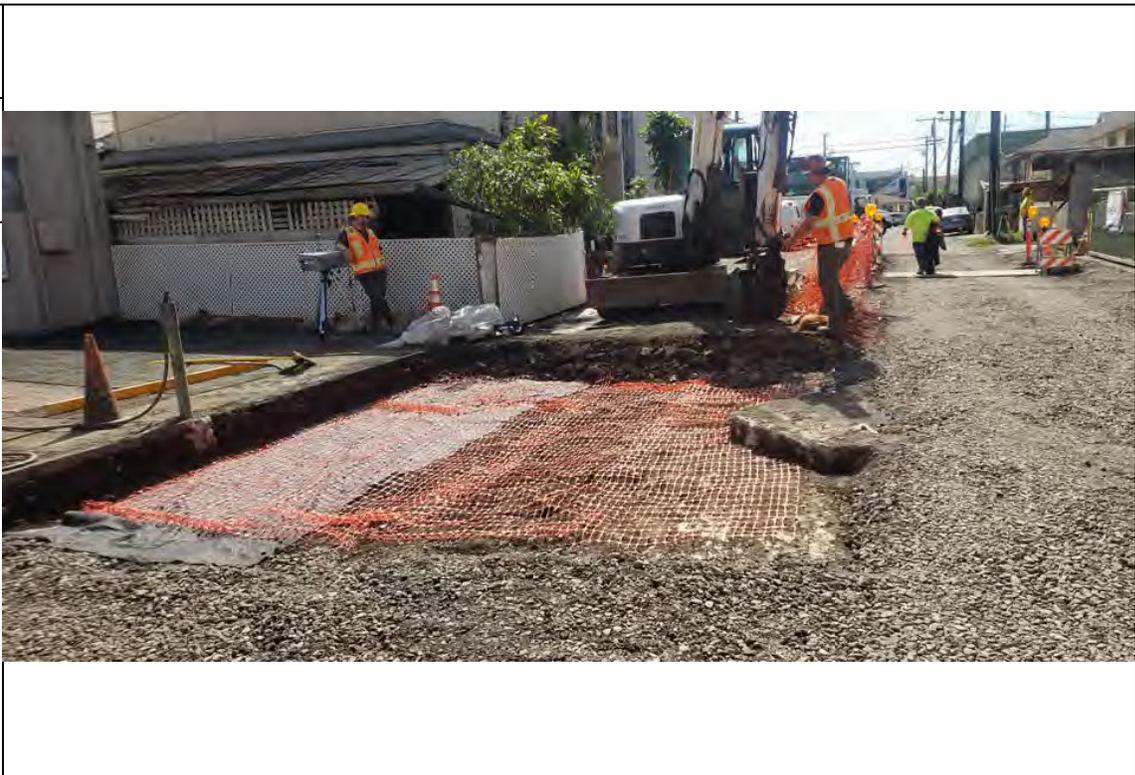
**Description:**  
 Excavating in DU-3.



<b>Photo No.</b> <b>166</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** West

**Description:**  
 Construction fencing in DU-3 demarcating the excavation limit.



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<b>Photo No.</b> <b>167</b>	<b>Date:</b> 02/15/2020
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**Direction Photo Taken:** East

**Description:**  
Sandbags on the working excavation to mitigate run-off in the event of rain.



<b>Photo No.</b> <b>168</b>	<b>Date:</b> 02/17/2020
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**Direction Photo Taken:** West

**Description:**  
A water line running along the southern boundary of the Project Area.



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<b>Photo No.</b> <b>169</b>	<b>Date:</b> 02/17/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Backfilling DU-3 excavation at the end of the day.		

<b>Photo No.</b> <b>170</b>	<b>Date:</b> 02/18/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A small leak was discovered in the 3 inch water line in DU-5 on February 18, 2020.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>171</b>	<b>Date:</b> 02/18/2020
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**Direction Photo Taken:** N/A

**Description:**  
A plumber from Roto-Rooter was called in to repair the water line.



<b>Photo No.</b> <b>172</b>	<b>Date:</b> 02/18/2020
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**Direction Photo Taken:** N/A

**Description:**  
A small section of the pipe was removed using a pipe cutter.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 00003-08-AAGF
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<b>Photo No.</b> <b>173</b>	<b>Date:</b> 02/18/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> The removed section of water line was replaced with a new section of pipe.		

<b>Photo No.</b> <b>174</b>	<b>Date:</b> 02/18/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> The repaired water line in DU-5.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>175</b>	<b>Date:</b> 02/19/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
Repairing leaking water line in DU-4 on February 19, 2020.



<b>Photo No.</b> <b>176</b>	<b>Date:</b> 02/19/2020
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<b>Direction Photo Taken:</b> N/A
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**Description:**  
A section of the water line is removed in DU-4.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>177</b>	<b>Date:</b> 02/19/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> A new section of pipe is used to repair the water line in DU-4.		

<b>Photo No.</b> <b>178</b>	<b>Date:</b> 02/19/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> Completion of excavation work.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>179</b>	<b>Date:</b> 02/19/2020
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**Direction Photo Taken:** East

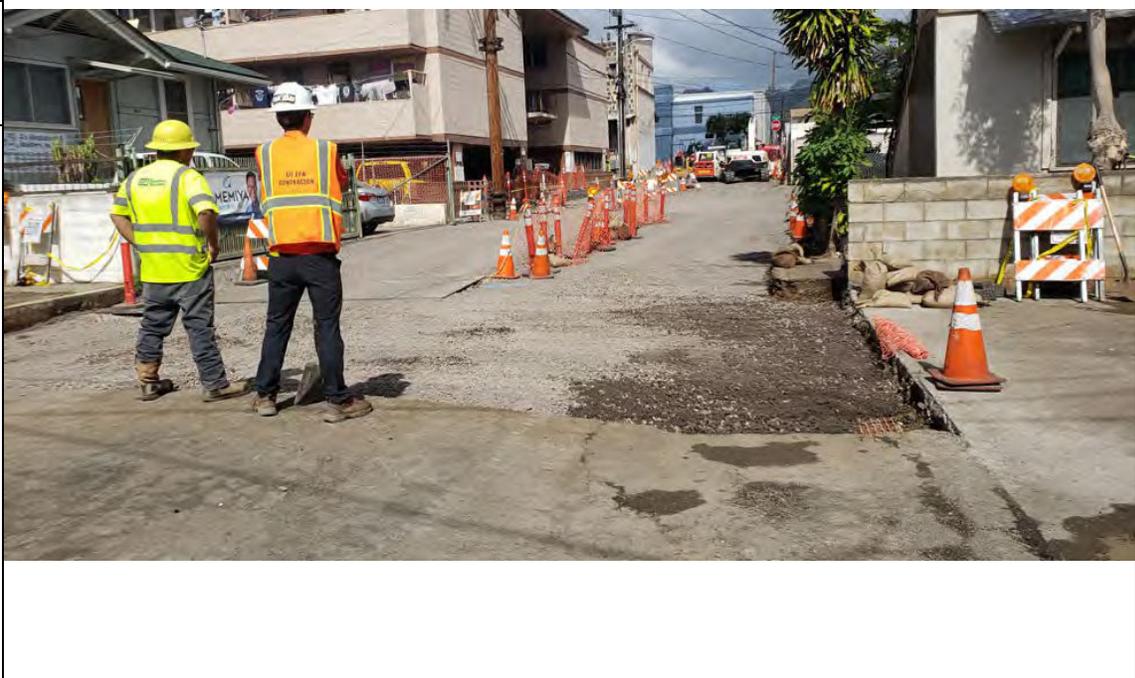
**Description:**  
A view of the Factory Street Project Area facing North King Street.



<b>Photo No.</b> <b>180</b>	<b>Date:</b> 02/19/2020
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**Direction Photo Taken:** East

**Description:**  
Site workers evaluating the Project Area facing North King Street.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>181</b>	<b>Date:</b> 02/19/2020
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**Direction Photo Taken:** East

**Description:**  
Another view of the Project Area facing North King Street.



<b>Photo No.</b> <b>182</b>	<b>Date:</b> 03/02/2020
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**Direction Photo Taken:** East

**Description:**  
Construction of sidewalk framing.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>183</b>	<b>Date:</b> 03/02/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Sidewalk framing along the southern boundary of the Project Area.		

<b>Photo No.</b> <b>184</b>	<b>Date:</b> 03/03/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> Sidewalk framing along the southern boundary of the Project Area.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>185</b>	<b>Date:</b> 03/03/2020
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**Direction Photo Taken:** West

**Description:**  
 Framing of sidewalk on northern boundary of the Project Area.



<b>Photo No.</b> <b>186</b>	<b>Date:</b> 03/07/2020
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**Direction Photo Taken:** East

**Description:**  
 Framing around utility pole for concrete to allow for removal of pole shoring ahead of asphalt pour on northeastern boundary of Project Area.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>187</b>	<b>Date:</b> 02/26/2020
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**Direction Photo Taken:** N/A

**Description:**  
Reinforcing wire laid for the sidewalk to add structural integrity to the driveway entering the 922 Factory Street building.



<b>Photo No.</b> <b>188</b>	<b>Date:</b> 02/25/2020
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**Direction Photo Taken:** Southeast

**Description:**  
Replacing water meter boxes in Project Area.

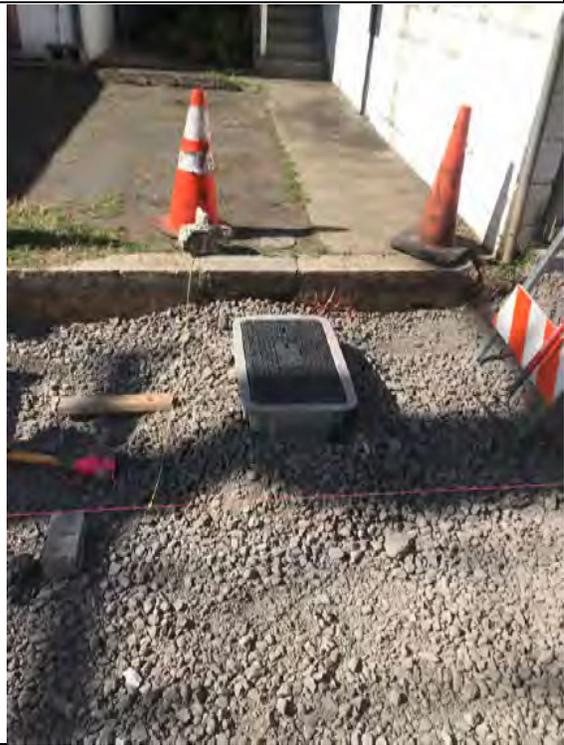


<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>189</b>	<b>Date:</b> 02/25/2020
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**Direction Photo Taken:** Northeast

**Description:**  
 Replaced water meter box in DU-4.



<b>Photo No.</b> <b>190</b>	<b>Date:</b> 02/26/2020
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**Direction Photo Taken:** South

**Description:**  
 Replaced series of three utility boxes in DU-3.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>191</b>	<b>Date:</b> 02/28/2020
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**Direction Photo Taken:** West

**Description:**  
 Pouring concrete for the sidewalk on the northern boundary of the Project Area.



<b>Photo No.</b> <b>192</b>	<b>Date:</b> 02/28/2020
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**Direction Photo Taken:** West

**Description:**  
 Smoothing sidewalk concrete.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>193</b>	<b>Date:</b> 02/28/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Sidewalk concrete work.		

<b>Photo No.</b> <b>194</b>	<b>Date:</b> 02/28/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Recently poured sidewalk along the northern boundary of the Project Area.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>195</b>	<b>Date:</b> 02/28/2020	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Smoothing the concrete around the northeastern utility pole.		

<b>Photo No.</b> <b>196</b>	<b>Date:</b> 02/28/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Working on the sidewalk on the northern boundary of the Project Area.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>197</b>	<b>Date:</b> 02/27/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Working on the sidewalk on the southern boundary of the Project Area.		

<b>Photo No.</b> <b>198</b>	<b>Date:</b> 02/28/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Finished sidewalk curing.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>199</b>	<b>Date:</b> 03/03/2020	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> A platform was used to allow tenants access to their property while the sidewalk cured.		

<b>Photo No.</b> <b>200</b>	<b>Date:</b> 02/25/2020	
<b>Direction Photo Taken:</b> N/A		
<b>Description:</b> Compaction testing of the backfill was conducted after all excavation work was completed, before paving operations.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>201</b>	<b>Date:</b> 02/25/2020
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**Direction Photo Taken:** North

**Description:**  
 Compaction testing in DU-5.



<b>Photo No.</b> <b>202</b>	<b>Date:</b> 02/25/2020
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**Direction Photo Taken:** Northeast

**Description:**  
 Compaction testing at the project site.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>203</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> Southeast		
<b>Description:</b> Resurfacing of the Project Area on Factory Street begins.		

<b>Photo No.</b> <b>204</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> Asphalt treated base course is transferred to paving equipment.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>205</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> Southeast		
<b>Description:</b> Resurfacing of Factory Street.		

<b>Photo No.</b> <b>206</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> Southeast		
<b>Description:</b> Asphalt being transferred to paving equipment.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>207</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> Resurfacing of Factory Street.		

<b>Photo No.</b> <b>208</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> Resurfacing of Factory Street Project Area.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>209</b>	<b>Date:</b> 03/05/2020
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<b>Direction Photo Taken:</b> East
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**Description:**  
 The Project Area of Factory was closed for street curing.



<b>Photo No.</b> <b>210</b>	<b>Date:</b> 03/06/2020
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<b>Direction Photo Taken:</b> North
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**Description:**  
 A feature was engineered on the eastern edge of 914 Factory Street to improve drainage.



<b>Project Name:</b> Factory Street Lead Site		<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 00003-08-AAGF
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<b>Photo No.</b> <b>211</b>	<b>Date:</b> 03/06/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Another feature was engineered in front of 915 Factory Street to help facilitate drainage away from the property.		

<b>Photo No.</b> <b>212</b>	<b>Date:</b> 03/07/2020	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> A view of the drainage feature between 914 Factory Street and 922 Factory Street properties.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>213</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Another view of the draining feature between the 914 Factory Street and 922 Factory Street properties.		

<b>Photo No.</b> <b>214</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Drainage feature on eastern boundary of 914 Factory Street property.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>215</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> West-Southwest		
<b>Description:</b> Replaced water meter box fronting 914 Factory Street.		

<b>Photo No.</b> <b>216</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> South-Southeast		
<b>Description:</b> Replaced water meter boxes fronting 915 Factory Street.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>217</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** North-Northwest

**Description:**  
Resurfaced pavement surrounding manhole cover on Factory Street.



<b>Photo No.</b> <b>218</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** South-Southeast

**Description:**  
A view of the southeastern corner of the North King Street and Factory Street intersection where the City & County of Honolulu completed resurfacing efforts.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>219</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> West-Southwest		
<b>Description:</b> A view of the resurfaced Project Area facing Waterhouse Street.		

<b>Photo No.</b> <b>220</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> West-Southwest		
<b>Description:</b> A view of the newly installed sidewalk fronting the 922 Factory Street building.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>221</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> Southwest		
<b>Description:</b> Another view to the sidewalk and wall of the 922 Factory Street building.		

<b>Photo No.</b> <b>222</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> A view of the finished sewer clean-out port.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>223</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** West-Northwest

**Description:**  
The manhole cover fronting 922 Factory Street.



<b>Photo No.</b> <b>224</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** East-Northeast

**Description:**  
A view of the resurfaced Project Area facing North King Street.



<b>Project Name:</b> Factory Street Lead Site		<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
<b>Photo No.</b> <b>225</b>	<b>Date:</b> 03/09/2020		
<b>Direction Photo Taken:</b> Northeast			
<b>Description:</b> Precipitation draining away from the 915 Factory Street property.			

<b>Photo No.</b> <b>226</b>	<b>Date:</b> 03/07/2020		
<b>Direction Photo Taken:</b> Southwest			
<b>Description:</b> A view of the resurfaced Project Area facing Waterhouse Street.			

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>227</b>	<b>Date:</b> 03/20/2020	
<b>Direction Photo Taken:</b> East		
<b>Description:</b> A view of the resurfaced Project Area facing North King Street.		

<b>Photo No.</b> <b>228</b>	<b>Date:</b> 03/20/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> The finished resurfaced Project Area facing Waterhouse Street.		

<p><b>Project Name:</b> Factory Street Lead Site</p>		<p><b>Site Location:</b> Honolulu, Honolulu County, Hawaii</p>	<p><b>DCN:</b> 0003-08-AAGF</p>
<p><b>Photo No.</b> <b>229</b></p>	<p><b>Date:</b> 03/20/2020</p>		
<p><b>Direction Photo Taken:</b> East</p>			
<p><b>Description:</b> The finished resurfaced Project Area facing North King Street.</p>			

<p><b>Photo No.</b> <b>230</b></p>	<p><b>Date:</b> 03/09/2020</p>	
<p><b>Direction Photo Taken:</b> South-Southeast</p>		
<p><b>Description:</b> Ham Produce and Seafood lay-down yard post-demobilization.</p>		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>231</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> East-Northeast		
<b>Description:</b> Ham Produce and Seafood lay-down yard post-demobilization.		

⊗ 423°N (T)   ⊙ 21°19'54"N, 157°52'45"W ±32ft   ▲ 52ft

09 Mar 2020, 11:00:25

<b>Photo No.</b> <b>232</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> Southeast		
<b>Description:</b> The Ham Produce and Seafood lay-down yard after demobilizing Site office trailers, washroom facilities, and field equipment.		

⊗ 146°SE (T)   ⊙ 21°19'55"N, 157°52'45"W ±32ft   ▲ 44ft

09 Mar 2020, 11:06:24

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>233</b>	<b>Date:</b> 03/09/2020
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<b>Direction Photo Taken:</b> South
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**Description:**  
The former location of the site office trailer post-demobilization.



<b>Photo No.</b> <b>234</b>	<b>Date:</b> 03/09/2020
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<b>Direction Photo Taken:</b> Southwest
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**Description:**  
Ham Produce and Seafood lay-down entrance post-demobilization.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>235</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> South		
<b>Description:</b> Ham Produce and Seafood lay-down yard post-demobilization.		

<b>Photo No.</b> <b>236</b>	<b>Date:</b> 03/09/2020	
<b>Direction Photo Taken:</b> Northwest		
<b>Description:</b> Fencing of Ham Produce and Seafood lay-down yard along Waterhouse Street.		

<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>237</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** Northwest

**Description:**  
The Site lay-down area at the UFCW Local 480 post-demobilization.



<b>Photo No.</b> <b>238</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** Southwest

**Description:**  
The Site lay-down area at the UFCW Local 480 post-demobilization.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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<b>Photo No.</b> <b>239</b>	<b>Date:</b> 03/09/2020
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**Direction Photo Taken:** Southwest

**Description:**  
Outside of the UFWC Local 480 where the shipping container storing hazardous lead contaminated soil excavated from DU-6 was staged.



<b>Photo No.</b> <b>240</b>	<b>Date:</b> 03/05/2020
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**Direction Photo Taken:** East

**Description:**  
The Site lay-down area at the HDOA post-demobilization.



**Project Name:**  
Factory Street Lead Site

**Site Location:** Honolulu, Honolulu County, Hawaii

**DCN:** 0003-08-AAGF

**Photo No.**  
**241**

**Date:**  
03/05/2020

**Direction Photo Taken:** West

**Description:**

Another view of the Site lay-down area at HDOA post-demobilization.



**Photo No.**  
**242**

**Date:**  
03/05/2020

**Direction Photo Taken:** South

**Description:**

The location of shipping containers being loaded with non-hazardous waste soil post-demobilization.



<b>Project Name:</b> Factory Street Lead Site	<b>Site Location:</b> Honolulu, Honolulu County, Hawaii	<b>DCN:</b> 0003-08-AAGF
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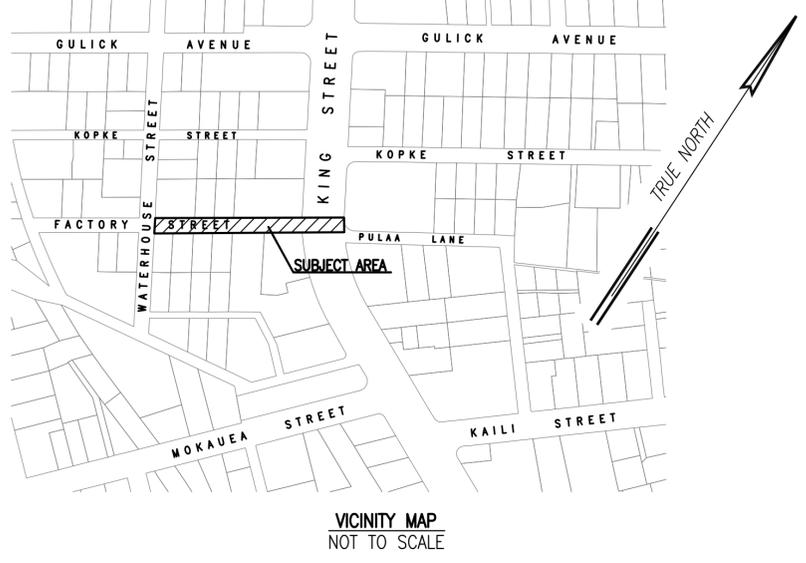
<b>Photo No.</b> <b>243</b>	<b>Date:</b> 03/05/2020	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> HDOA lay-down yard post-demobilization.		

<b>Photo No.</b>	<b>Date:</b>	
<b>Direction Photo Taken:</b>		

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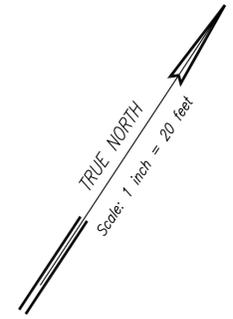
**APPENDIX C**  
**TOPOGRAPHIC AND BOUNDARY SURVEY**

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Abbreviations:

A/C	Asphaltic Concrete
BC	Bottom Curb
BFP	Back Flow Preventer
BW	Bottom Wall
C/O	Clean Out
CLF	Chain Link Fence
Conc.	Concrete
CRM	Concrete Rubble Masonry
DS	Downspout
fld.	Found
G	Ground
GP	Guard Post
GTE	General Telephone
GW	Guy Wire
H	Height
HCTC	Invert
Inv.	Invert
MB	Mailbox
MH	Manhole
SDMH	Storm Drain Manhole
SMH	Sewer Manhole
T	Top
T/W	Tile Wall
TC	Top Curb
TP	Telephone Pole
TW	Top Wall
WM	Water Meter
WMH	Water Manhole
WV	Water Valve
WW	Walkway



Notes:

Azimuths are referred to Government Survey Triangulation Station "PUNCHBOWL"  $\Delta$ .

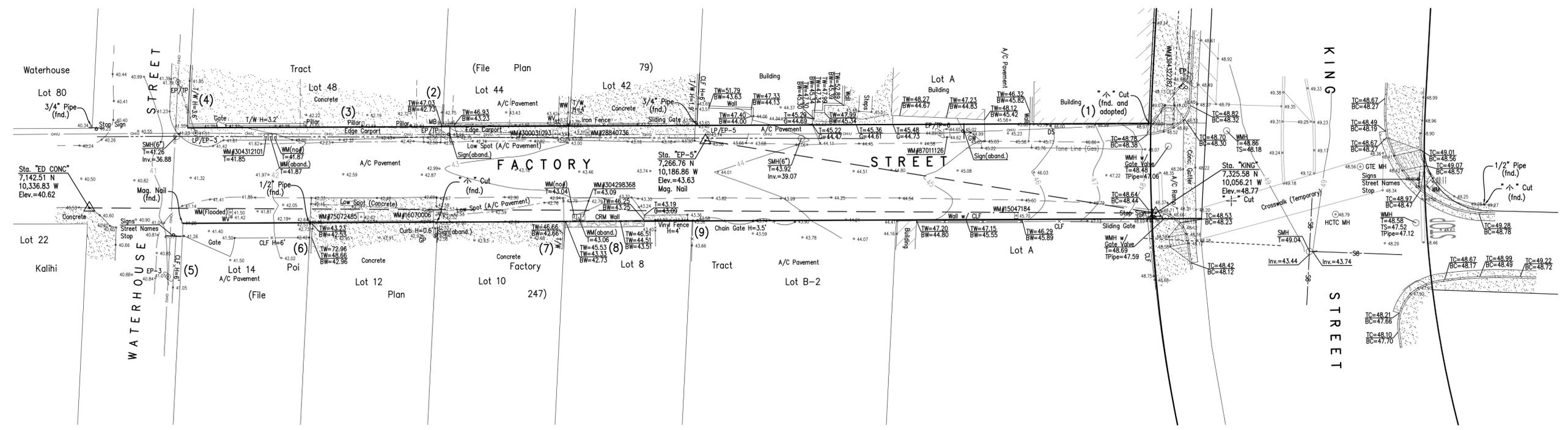
Boundaries shown are from record data.

Elevations are based on Station HCTC-53, which is a 3-1/2" brass disk stamped City & County of Honolulu, having an elevation of 15.125 feet.

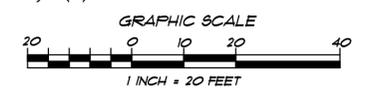
All visible utility structures have been located in the field, however, connection of underground utility lines as shown are unverified and compiled from existing data.

Underground utilities shown hereon are for information only, having been obtained from the best available sources, but from others not connected with this company. Therefore, no guarantee is made on the accuracy or completeness of said information.

- Boundary Notes:
- (1) A building along the east corner of Lot A, being Lots 35, 36, 38 and 40 of Waterhouse Tract (File Plan 79), crosses into the Factory Street right of way
  - (2) A wall along the southwest property line of Lot 44 crosses into Lot 48 of Waterhouse Tract (File Plan 79)
  - (3) The roof of a carport along the southeast property line of Lot 48 of Waterhouse Tract (File Plan 79) crosses into the Factory Street right of way
  - (4) A tile wall along the south property line of Lot 48 of Waterhouse Tract (File Plan 79) crosses into the Waterhouse Street right of way
  - (5) A chain link fence along the west property line of Lot 14 of Poi Factory Tract (File Plan 247) crosses into the Waterhouse Street right of way
  - (6) A building wall along the west property line of Lot 12 crosses into Lot 14 of Poi Factory Tract (File Plan 247)
  - (7) A tile wall along the north property line of Lot 10 crosses into Lot 8 of Poi Factory Tract (File Plan 247)
  - (8) A CRM wall along the northwest property line of Lot 8 of Poi Factory Tract (File Plan 247) crosses into the Factory Street right of way
  - (9) A chain post along the northwest property line of Lot B-2, being all of Lots 6 and 7 and portions of Lots 4 and 5 of Poi Factory Tract (File Plan 247), crosses into the Factory Street right of way



Topographic and Boundary Survey  
Portion Factory Street  
at Kalihi, Honolulu, Oahu, Hawaii  
Tax Map Key: (1) 1-2-001: Road and 1-2-011: Road



R. M. Towill Corporation

4/30/20  
Dan L.M. Akita Expiration Date  
Licensed Professional Land Surveyor  
Certificate Number 12749  
Email: Dan@RMTowill.com

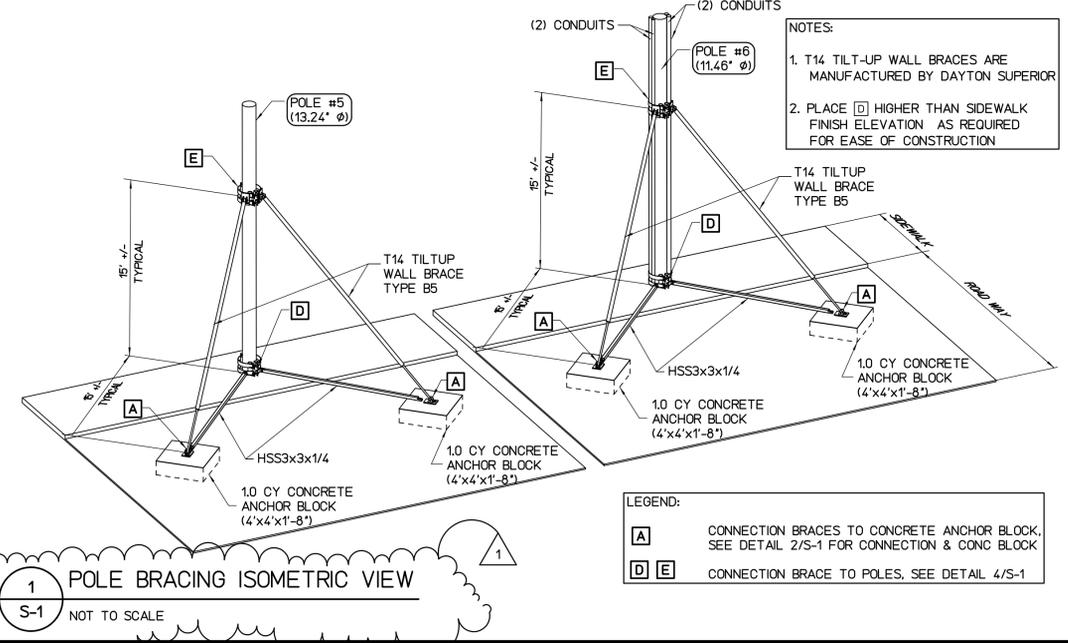
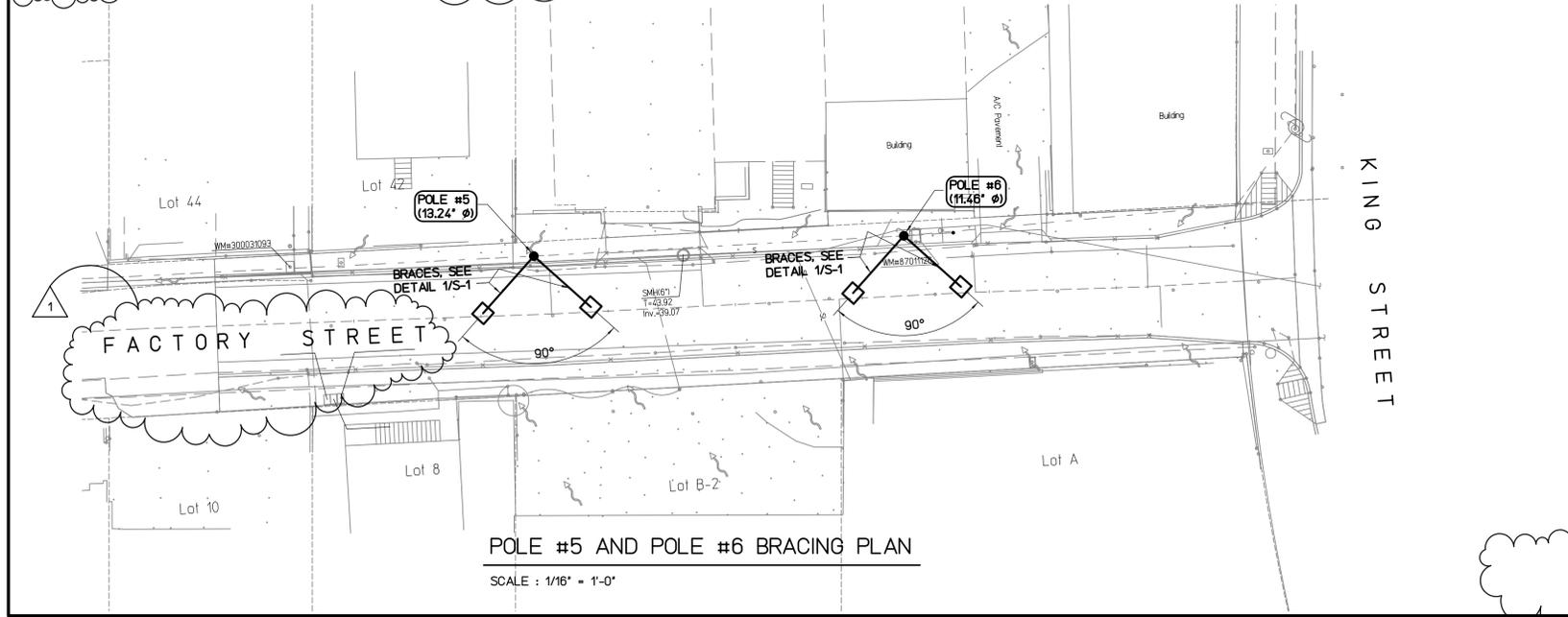
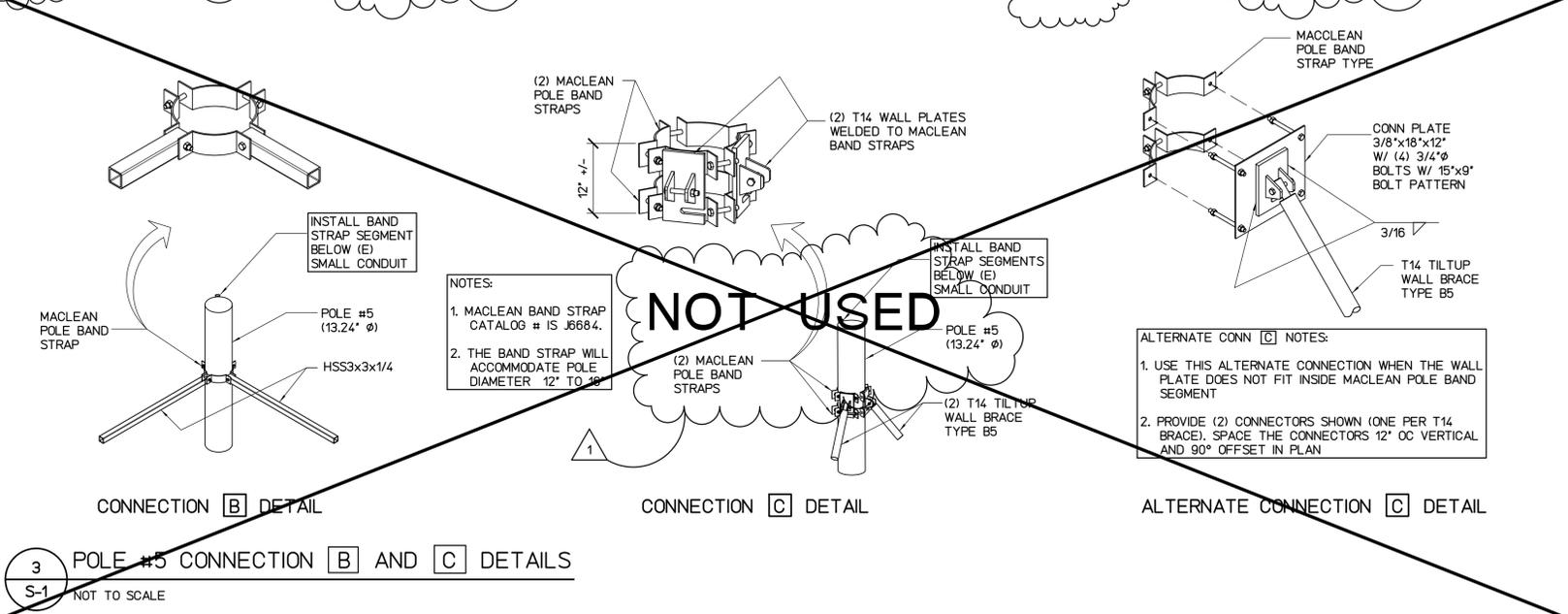
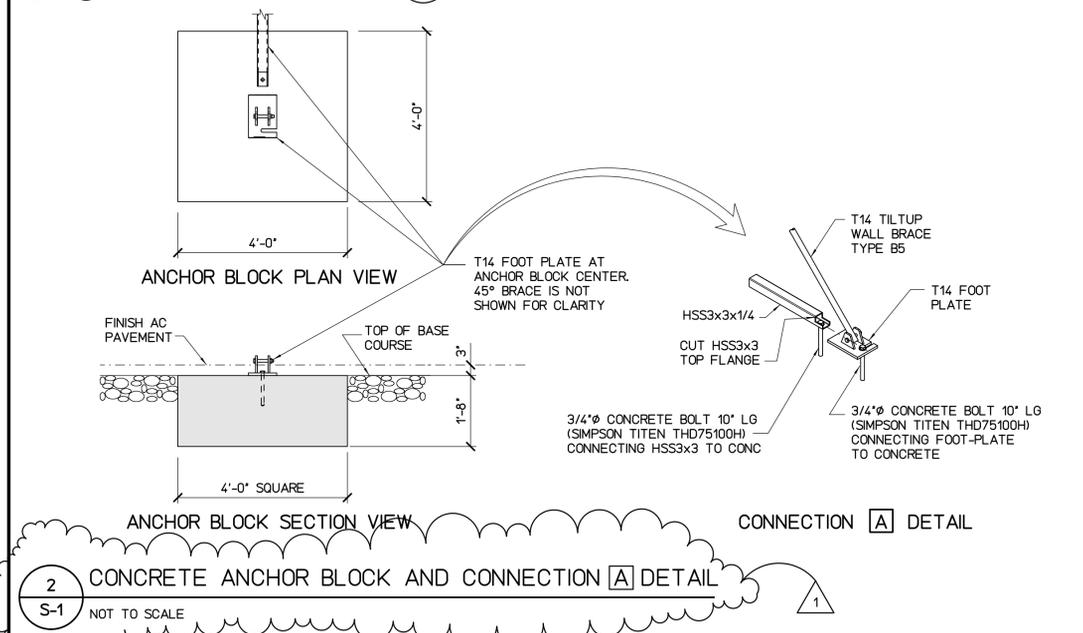
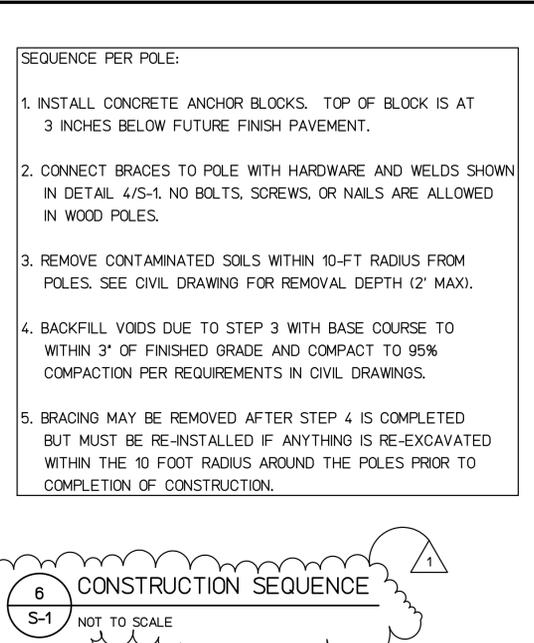
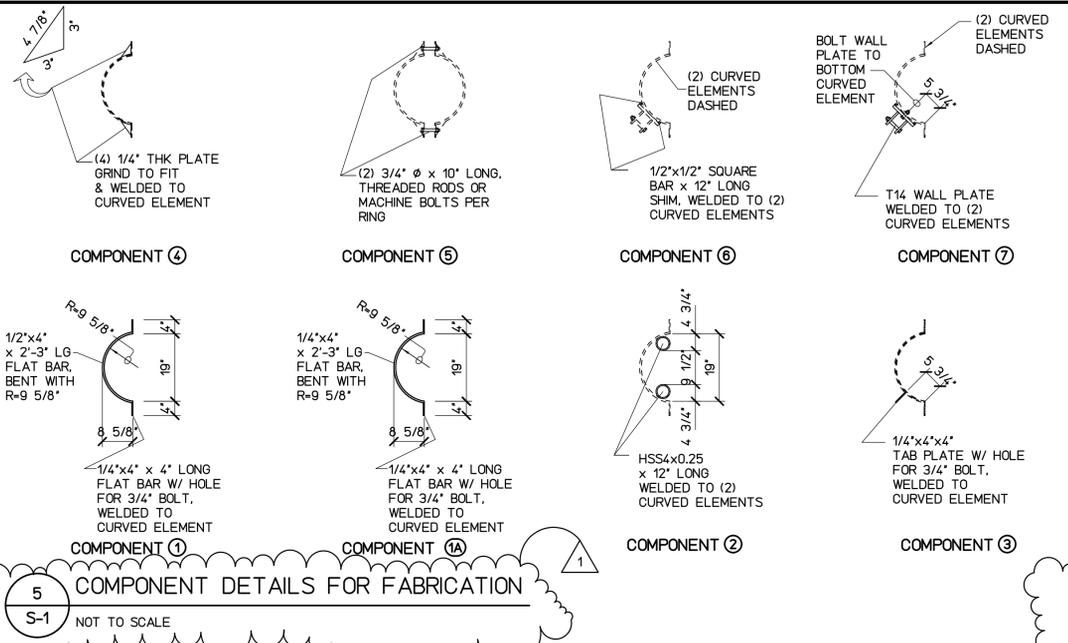
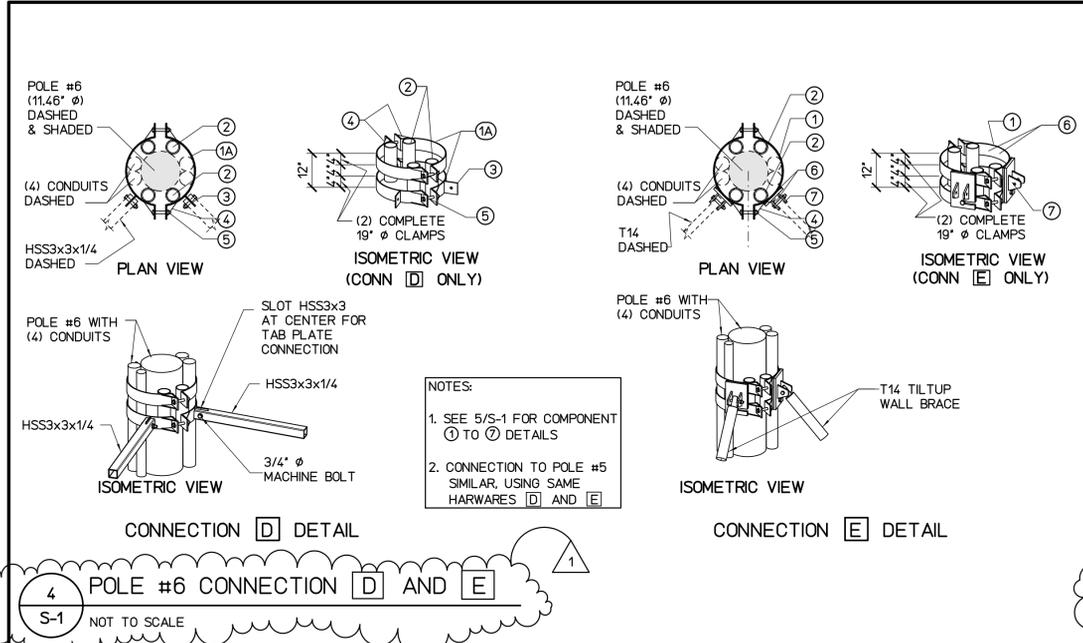
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**APPENDIX D**  
**POLE SHORING PLAN**

---

Plot date: 4-Dec-2019

Full Size Plot



**HAWAII ENGINEERING GROUP, Inc.**  
Civil & Structural Engineers

ATHER R. DAR  
LICENSED PROFESSIONAL ENGINEER  
No. 7808-S  
HAWAII, U.S.A.  
EXPIRATION DATE OF LICENSE: 04/30/2020

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

**PROJECT:**  
FACTORY STREET LEAD REMOVAL  
HECO POLE BRACING  
FACTORY STREET  
HONOLULU, HAWAII 96819

T.M.K.:

**SHEET TITLE:**  
BRACING PLAN AND DETAILS  
CONSTRUCTION PHASE

**ISSUANCE/REVISIONS:**  
12/2/19 REVISIONS DUE TO FIELD VERIFICATION

**Date:** 09/26/2019  
**Scale:** AS NOTED  
**Drawn By:** DL, TPP  
**Design By:** TPP  
**Checked By:** AD  
**Job:** 19-053

**Sheet:** S-1  
1 Of 1 Sheets

---

**APPENDIX E**  
**FINAL CONSTRUCTION REPORT**

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# Final Report Factory Street Lead Removal

Factory Street, Honolulu, Hawaii



Contents	Page #
1. Soil Investigation report .....	1
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5. Approved AC State Mix IV .....	38
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9. Concrete cylinder test report .....	71
10. Grading Certification letter .....	73
11. As built site survey .....	75

Prepared for  
Environmental Quality Management, Inc.  
18939 120<sup>th</sup> Avenue NE, Suite 103  
Bothell, Washington 98011



Hawaii Engineering Group, Inc.  
Consulting Civil Engineers, Structural Engineers & Land Surveyors

1088 Bishop Street, Suite 2506  
Honolulu, Hawaii 96813

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

Dated 05-28-2020

**REPORT  
GEOTECHNICAL INVESTIGATION  
PROPOSED PAVEMENT RECONSTRUCTION  
FACTORY STREET  
HONOLULU, HAWAII 96819**

for

**HAWAII ENGINEERING GROUP**

Project No. 19-0081  
August 26, 2019

---

**SHINSATO ENGINEERING, INC.**  
98-747 KUAHAO PLACE, #E  
PEARL CITY, HI 96782

# **SHINSATO ENGINEERING, INC.**

*CONSULTING GEOTECHNICAL ENGINEERS*

98-747 KUAHAO PLACE, SUITE E  
PEARL CITY, HAWAII 96782  
PHONE: (808) 487-7855  
FAX: (808) 487-7854

---

August 26, 2019  
Project No. 19-0081

Hawaii Engineering Group, Inc.  
Attention: Ather Dar  
1088 Bishop Street, Suite 2506  
Honolulu, Hawaii 96813

Subject: Geotechnical Investigation Report  
Proposed Pavement Reconstruction  
Factory Street  
Honolulu, Hawaii 96819

Gentlemen:

This report presents the results of a geotechnical investigation for the subject project.

## 1.0 INTRODUCTION

This investigation was made for the purpose of obtaining information on the subsurface conditions from which to base recommendations for pavement design for the reconstruction of Factory Street in Honolulu, Hawaii. The location of the site, relative to the existing streets and landmarks, is shown on the Vicinity Map, Plate 1.

## 2.0 SCOPE OF WORK

The services included drilling 2 test borings to the depths of 4.0 and 5.0 feet below existing grade, performing 2 Dynamic Cone Penetrometer (DCP) tests, and performing an engineering analysis to determine the recommended pavement sections. Due to the contamination of the subgrade soils, no soil materials were removed from the site.

The following information is provided for use by the Architect and/or Engineer:

- 1) General subsurface conditions, as disclosed by the test borings.
- 2) Physical characteristics of the soils encountered including the results of the DCP tests.
- 3) Recommendations for pavement design.
- 4) Recommendations for placement of fill and backfill.
- 5) Special considerations.

## 3.0 PLANNED DEVELOPMENT

From the information provided, the project will consist of reconstructing the roadway pavement by removing the lead contaminated soils underlying Factory Street to a depth of approximately one foot below existing grade and repaving the roadway. The work will extend from the corner of North King Street and Factory Street about 150 feet to the southwest. The new work is to be done in accordance with the current City and County standards.

#### 4.0 SITE CONDITIONS

##### 4.1 Surface

Factory Street is located in Kalihi between the intersections of North King Street and Stanley Street. Waterhouse Street is located between North King Street and Stanley Street. The section of roadway under investigation is from North King Street to Waterhouse Street. There are no sidewalks or storm drains on the street. The roadway is bordered by commercial and residential structures.

In general, the roadway surface slopes moderately to slightly downward from North King Street toward Waterhouse Street.

##### 4.2 Subsurface

The subsurface condition at the site was explored by drilling 2 test borings to depths of 4.0 and 5.0 feet below existing grade. The locations of the borings are shown on the Plot Plan, Plate 2. Detailed logs of the borings are presented in the Log of Borings, Plates 3 and 4.

In general, the borings disclosed the site to underlain by 1.0 to 3.5 inches of AC PAVEMENT, followed by medium dense silty GRAVEL with sand to depths of 1.0 feet, followed by medium stiff to stiff CLAY to the final depths of the borings. No groundwater was encountered in the borings at the time of the field investigation.

From the USDA Soil Conservation Service "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii," the site is located in an area designated as Honouliuli clay, 0 to 2 percent slopes (HxA). This series consists of well-drained soils on coastal plains on the island of Oahu in the Ewa area. These soils developed in alluvium derived from basic igneous material. On this soil, permeability is moderately slow. Runoff is slow, and the erosion hazard is no more than slight (USDA, 1972, pg. 43, Plate 61).

##### 4.3 Dynamic Cone Penetrometer Testing

Due to the contamination of the underlying soils, no soil materials were removed from the site. Field testing was performed to determine the approximate California Bearing Ratio (CBR) of the underlying subgrade soils. The field test was performed using a Dynamic Cone Penetrometer (DCP) apparatus in general conformance with the ASTM D6951 test procedure.

The results of the DCP tests indicate field CBR values ranging from approximately 5.9 to 77 percent. The variations of the test results are likely due to the presence of gravel and cobbles.

#### 5.0 CONCLUSIONS AND RECOMMENDATIONS

##### 5.1 Pavement Design

Traffic data for Factory Street was not available at the time of writing this report. In accordance with the City and County of Honolulu Engineering Memorandum No. CEB-1-06, it is assumed that the proposed pavement structure meets the criteria for Low-Volume Pavements which are as follows:

- 1) Fewer than 1 million equivalent single axle loads (ESALs) anticipated over the design life of the pavement. For a design life of 40 years, this gives 25,000 ESALs/yr if traffic growth is neglected.

- 2) No regular bus routes. This includes routes of city, school and private buses.

Using a CBR value of 5.9 for the subgrade material, the recommended pavement section based on the City and County of Honolulu Engineering Memorandum No. CEB-1-06 dated February 8, 2006 is as follows:

AC - Asphaltic Concrete	2 inch
ATB - Asphalt Treated Base Course	4 inch
UTB - Aggregate Base Course	6 inch
Total Pavement Section	12 inch

The top 6 inches of pavement subgrade, and aggregate base course shall be compacted to at least 95 percent of the maximum dry density (ASTM D1557).

All material quality for the pavement sections shall be in accordance with the City and County of Honolulu, Standard Specifications for Public Road Construction, dated September 1986.

Proper safety measures and material handling shall be implemented during construction due to the soil contamination.

#### 6.0 INSPECTION

During the progress of construction, so as to evaluate compliance with the design concepts, specifications and recommendations contained in this report, it is recommended that a representative from Shinsato Engineering be present to observe the following operations:

- 1) Site preparation and grading. This includes testing and approval of the use of fill materials and periodic field density tests for soil compaction.
- 2) Any special inspection services that may apply.

#### 7.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations made at the test boring locations. If conditions are encountered during construction which appear to differ from those disclosed by the explorations, this office shall be notified so as to consider the need for modifications.

This report has been prepared for the exclusive use of Hawaii Engineering Group, Inc. and their respective design consultants. It shall not be used by or transferred to any other party or to another project without the consent and/or thorough review by this facility. Should the project be delayed beyond the period of one year from the date of this report, the report shall be reviewed relative to possible changed conditions.

Samples obtained in this investigation will deteriorate with time and will be unsuitable for further laboratory tests within one (1) month from the date of this report. Unless otherwise advised, the samples will be discarded at that time.

The following are included and complete this report:

Appendix

Field Investigation  
Laboratory Testing

Attachments

Vicinity Map ----- Plate 1  
Plot Plan ----- Plate 2  
Logs of Borings ----- Plate 3 and 4  
DCP Test Reports ----- Plate 5 and 6  
Excerpt from City and County of Honolulu  
"Structural Design Requirements for New  
Asphalt Concrete Pavements"

- o o o -

This investigation was made in accordance with generally accepted engineering procedures and included such field and laboratory tests considered necessary for the project. In the opinion of the undersigned, the accompanying report has been substantiated by mathematical data in conformity with generally accepted engineering principles and presents fairly the design information requested by your organization. No other warranty is either expressed or given.

Respectfully submitted,

SHINSATO ENGINEERING, INC.



Lawrence S. Shinsato, P.E.  
President



LSS:ks

This work was prepared by me  
or under my supervision.  
License Expires 04/30/20

**APPENDIX**

**FIELD INVESTIGATION AND LABORATORY TESTING**

## **FIELD INVESTIGATION**

### **General**

The subsurface explorations consisted of drilling test borings at the locations shown on the Plot Plan, Plate 2. The test borings were advanced with a CME 55 drill rig using continuous flight augers.

The augers are 4 inch diameter continuous helical flight augers with the lead auger having a head equipped with changeable cutting teeth. Soil cuttings are brought to the surface by the continuous flights. After the bore hole is advanced to the required depth and cleaned of cuttings by additional rotation of the augers, the augers are retracted for soil sampling or in-situ testing.

### **Soil Sampling**

Samples of the underlying soils were obtained from the boring by driving a soil sampler into the subsurface material using an automatic hammer that has an energy equivalent to a 140 pound safety hammer falling from a height of 30 inches. The sampler was driven approximately 18 inches into the soil (or until refusal is encountered) and the number of blows required to drive the sampler was recorded at 6 inch intervals. The blow count for the last 12 inches of sampling are shown on the boring log.

The sampler is retracted from the bore hole and a section of the retrieved soil is placed in a close fitting waterproof container in order to retain field conditions until completion of the laboratory tests. Samples are then transported to the laboratory for testing.

Soil samples were obtained using a modified California Sampler which is a 3 inch outside diameter, 2.5 inch inside diameter steel sampler with an interior lining of 1 inch long, thin brass rings, or a split spoon sampler which is a 2 inch outside diameter, 1-3/8 inch inside diameter steel sampler.

### **Field Logging**

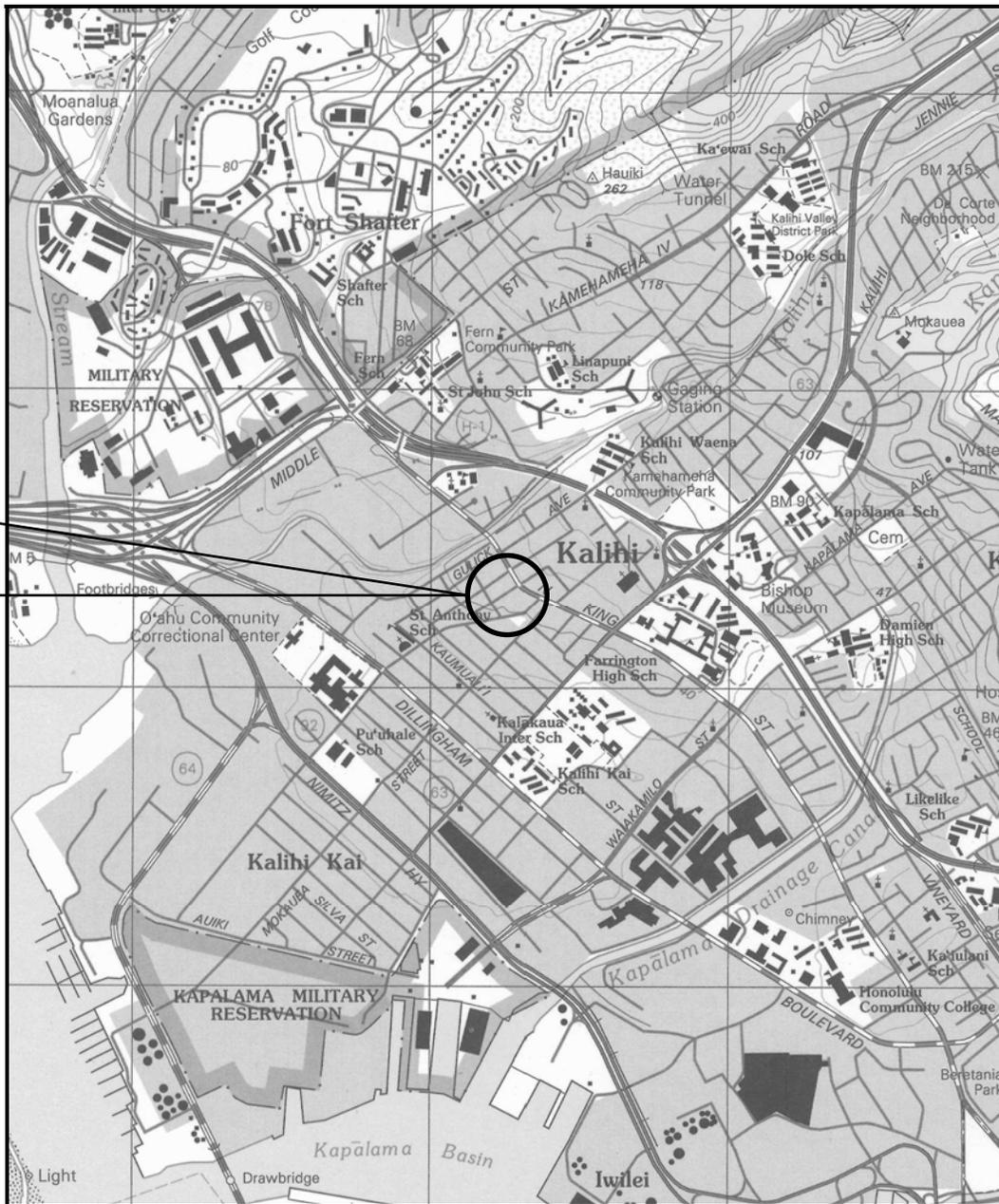
During the subsurface explorations, continuous logs of the borings were kept. The logs included visual classification of the soils encountered using the Unified Soil Classification System as well as other pertinent information which were gathered during the drilling process. The final boring logs included in this report incorporates engineering analysis and results of the laboratory tests.

### **Dynamic Cone Penetrometer Testing**

Field testing to determine the approximate California Bearing Ratio (CBR) of the underlying subgrade soils was performed using Dynamic Cone Penetrometer (DCP) testing. The tests were performed in general conformance with the ASTM D6951 test procedure. The DCP apparatus consists of a steel rod with a steel cone attached to the end. The cone is driven into the subgrade by means of a sliding hammer. Depending on the consistency and type of subgrade soil, the hammer weight can be either 8 kg. (17.6 lbs.) or 4.6 kg (10.1 lbs.). The free fall of the hammer is 575 mm. (22.6 inches).

The depth of cone penetration is measured at selected hammer drop intervals. From these measurements, a Kessler DCP index is determined which is then correlated to an approximate field CBR value. The results of the dynamic cone penetrometer tests are attached to this report.

# VICINITY MAP



TRUE NORTH



SITE LOCATION

**REFERENCE:**  
 USGS TOPOGRAPHIC MAP  
 HONOLULU QUADRANGLE  
 DATED 1998  
 SCALE: 1"=2000'



Project: FACTORY STREET PAVEMENT  
 HONOLULU, HAWAII 96819  
 Project No.: 17-0081

**SHINSATO ENGINEERING, INC.**  
 CONSULTING GEOTECHNICAL ENGINEERS  
 98-747 KUAHAO PL. #E, PEARL CITY, HI 96782

**PLATE**  
**1**

Note: Actual conditions may differ.



**PLOT PLAN**  
SCALE: 1" = 60'

**LEGEND:**

 APPROXIMATE TEST BORING & DCP TEST LOCATION

Project: FACTORY STREET PAVEMENT  
HONOLULU, HAWAII 96819  
Project No.: 19-0081

**SHINSATO ENGINEERING, INC.**  
CONSULTING GEOTECHNICAL ENGINEERS  
98-747 KUAHAO PL. #E, PEARL CITY, HI 96782

**PLATE  
2**

# LOG OF BORING NO. 1

DRILLING METHOD: **CME 55 Drill Rig**  
 HAMMER WEIGHT (lbs): **140**  
 HAMMER DROP (in): **30**

ELEVATION (FT.): **Unknown**  
 DEPTH OF BORING (FT.): **5**  
 DEPTH TO GROUNDWATER (FT.): **Unknown**  
 DATE DRILLED: **August 15, 2019**

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)	PENETROMETER (TSF)	TORVANE STRENGTH (TSF)
0		<b>GM</b>	3.5" AC PAVEMENT; silty GRAVEL; with sand			gray brown	medium moist	medium dense				
1		<b>CH</b>	CLAY;			brown	moist	medium stiff				
2					5							
3		<b>(PRB)</b>	PROBE TO DETERMINE SOIL CONSISTENCY;					stiff				
4					9							
5			END OF BORING		16							
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

Project: **FACTORY STREET PAVEMENT**  
**HONOLULU, HAWAII 96819**  
 Project No.: **19-0081**

**SHINSATO ENGINEERING, INC.**  
 CONSULTING GEOTECHNICAL ENGINEERS  
 98-747 KUAHAO PL. #E, PEARL CITY, HI 96782

**PLATE**  
**3**

# LOG OF BORING NO. 2

DRILLING METHOD: **CME 55 Drill Rig**  
 HAMMER WEIGHT (lbs): **140**  
 HAMMER DROP (in): **30**

ELEVATION (FT.): **Unknown**  
 DEPTH OF BORING (FT.): **4**  
 DEPTH TO GROUNDWATER (FT.): **Unknown**  
 DATE DRILLED: **August 15, 2019**

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	BLOWS/FOOT	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)	PENETROMETER (TSF)	TORVANE STRENGTH (TSF)
0		<b>GM</b>	1" AC PAVEMENT; silty GRAVEL; with sand			gray brown	medium moist	medium dense				
1		<b>CH</b>	CLAY; trace gravel and sand		10	brown	moist	stiff				
3		<b>(PRB)</b>	PROBE TO DETERMINE SOIL CONSISTENCY;		13							
4			END OF BORING									
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

Project: **FACTORY STREET PAVEMENT**  
**HONOLULU, HAWAII 96819**  
 Project No.: **19-0081**

**SHINSATO ENGINEERING, INC.**  
 CONSULTING GEOTECHNICAL ENGINEERS  
 98-747 KUAHAO PL. #E, PEARL CITY, HI 96782

**PLATE**  
**4**





DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 7<sup>TH</sup> FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 523-4432 • FAX: (808) 527-6743  
DEPT. WEB SITE: [www.honoluluodpp.org](http://www.honoluluodpp.org) • CITY WEB SITE: [www.honolulu.gov](http://www.honolulu.gov)

MUFI HANNEMANN  
MAYOR



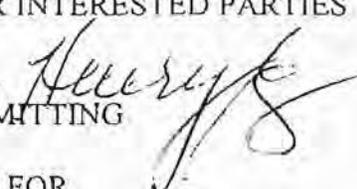
HENRY ENG, FAICP  
DIRECTOR

DAVID K. TANQUE  
DEPUTY DIRECTOR

February 8, 2006

ENGINEERING AND POLICY MEMORANDUM NO. CEB-1-06

TO: ENGINEERS, DEVELOPERS, AND OTHER INTERESTED PARTIES

FROM: HENRY ENG, FAICP, DIRECTOR  
DEPARTMENT OF PLANNING AND PERMITTING 

SUBJECT: STRUCTURAL DESIGN REQUIREMENTS FOR  
NEW ASPHALT CONCRETE PAVEMENTS

Attached is our *Structural Design Requirements for New Asphalt Concrete Pavements*. This new standard, which becomes effective on March 1, 2006, will supersede the *Design Standards for Flexible Pavements* under Engineering and Policy Memorandum No. CEB-1-02, dated February 6, 2002.

Should there be any questions, please call Mr. Weston Wataru of our Civil Engineering Branch at 527-6303.

HE:dl  
Attachment

# Structural Design Requirements for New Asphalt Concrete Pavements

## Applicability

The following standard applies to the design of new flexible pavements only. This standard is not applicable to the design of asphalt concrete resurfacing or the rehabilitation of existing pavement structures.

## Design Life

New flexible pavements shall be designed for a minimum life of 40 years based on anticipated traffic. It is anticipated that over this life one or more surface layer rehabilitation efforts will be necessary to maintain the pavement in acceptable condition.

## Pavement Materials

When specialized design with the participation of a geotechnical engineer is not required, pavement structure shall consist of the following three layers:

**Table 1: Pavement Materials**

Pavement Layer	Approved Materials <sup>a</sup>
Surface course	Mix #3, Mix #4, or other asphalt concrete materials approved by the City
Asphalt treated base course (second course)	Plant mix asphalt treated base, or other asphalt concrete materials approved by the City
Aggregate base course (first course)	Aggregate base course with a minimum CBR of 85, or other materials approved by the City

a. For material definitions, see *Standard Specifications for Public Works Construction*, September, 1986.

## Subgrade Support

Required pavement structure is determined by the amount of support offered by the subgrade. Measurements of subgrade resilient modulus ( $M_R$ ), resistance value (R-Value) or California Bearing Ratio (CBR) are acceptable. In order to use Table 3,  $M_R$  and R-Value measurements may be converted to CBR values using the following equations with the following limitations:

**Table 2: Subgrade Support Conversion Equations**

Conversion Equation	Limitation
$M_R (psi) = 1500 \times CBR$	Fine grained soils with a soaked CBR of 10 or less
$M_R (psi) = 1155 + 555 \times (R - value)$	Fine grained soils with an R-value of 20 or less
$R - value = \frac{1500(CBR) - 1155}{555}$	Fine grained, non-expansive soils with a soaked CBR of 8 or less

Other correlations between  $M_R$ , R-value and CBR may be used if they are substantiated by local data to the satisfaction of the City.

DEPARTMENT OF PLANNING AND  
PERMITTING  
CITY AND COUNTY OF HONOLULU

STRUCTURAL DESIGN REQUIREMENTS  
FOR NEW ASPHALT CONCRETE PAVEMENTS

Sheet 1 of 2

Effective March 1, 2006

APPROVED:

DIRECTOR, DDP

DATE

*Newly*  
2/16/06

## Pavement Structure

Pavement structural design is divided into two classes depending upon expected pavement loading. Coordination with the City is required in order to determine existing or future plans for traffic, bus routes and development (including phased developments), all of which can affect expected loading.

### Low-Volume Pavements

Low-volume pavements are those pavements likely to support relatively few loads over their design life. Their design is often controlled by constructability and the ability to accommodate future rehabilitation efforts. Low-volume pavements are defined as those pavements that meet all of the following criteria:

1. Fewer than 1 million equivalent single axle loads (ESALs) anticipated over the design life of the pavement. For a design life of 40 years, this gives 25,000 ESALs/yr if traffic growth is neglected.
2. No regular bus routes. This includes routes of City, school and private buses.

**Table 3: Required Pavement Layer Depths for Low-Volume Pavements<sup>a, b</sup>**

Subgrade CBR (%)	Expansion Value (%)	Surface Course	Asphalt Treated Base Course	Aggregate Base Course
> 10	0 to 3.0	2 inches	3 inches	6 inches
> 5 to 10	> 3.0 to 4.5	2 inches	4 inches	6 inches
> 3 to 5	> 4.5 to 6.0	2 inches	4 inches	12 inches
≤ 3	> 6.0	2 inches	Specialized design with participation of a geotechnical engineer	

- a. Approved materials are listed in Table 1.
- b. When measured values of subgrade CBR and expansion value give different designs, use the more conservative, or thicker, design.

Low-volume pavements may also be designed using methods discussed in the "High-Volume Pavements" section. If this is done, Table 3 shall represent minimum layer thicknesses.

### High-Volume Pavements

Pavements that do not meet low-volume criteria are considered "high-volume" pavements because they must support an appreciable amount of loading and their design is likely controlled by this loading.

High volume pavement must be designed using an approved structural design method. Table 3 serves as minimum pavement layer thicknesses, when using approved design methods. The City has approved the following methods:

- American Association of State Highway and Transportation Officials (AASHTO) *Guide for Design of Pavement Structures*, 1993 edition.
- *Pavement Design Manual, Revision March 2002*, prepared by Department of Transportation, State of Hawaii
- Asphalt Institute method as described in MS-1 *Thickness Design - Highways & Streets*, 9<sup>th</sup> edition. The software version of this method, SW-1, may also be used.
- Perpetual Pavement design as done by *PerRoad* software (version 2.4 or later) available for free from the Asphalt Pavement Alliance.

Other pavement design methods must be approved by the City.

This supersedes the Design Standards for Flexible Pavements dated February 6, 2002.

DEPARTMENT OF PLANNING AND  
PERMITTING  
CITY AND COUNTY OF HONOLULU

STRUCTURAL DESIGN REQUIREMENTS  
FOR NEW ASPHALT CONCRETE PAVEMENTS

Sheet 2 of 2

Effective March 1, 2006

APPROVED:

*Nancy J. [Signature]* 2/6/06

DIRECTOR, DPP

DATE

# **Shinsato Engineering, Inc.**

*Consulting Geotechnical Engineers*

98-747 KUAHAO PLACE, SUITE E  
PEARL CITY, HAWAII 96782  
PHONE: (808) 487-7855  
FAX: (808) 487-7854

---

May 15, 2020  
Project No. 19-0081

Mr. Ather Dar  
Hawaii Engineering Group, Inc.  
1088 Bishop Street, Suite 2506  
Honolulu, Hawaii 96813

Subject:           Compaction Test Report  
                      Pavement Reconstruction  
                      Factory Street  
                      Honolulu, Hawaii

Dear Mr. Dar:

Submitted herewith are the results of the construction monitoring and testing performed at the subject project. The work included DCP and field density tests.

1.       Dynamic Cone Penetration Test (DCP) (ASTM D6951)

Due to the possible contamination of the underlying soils, no soil materials were removed from the site for laboratory testing. Field DCP testing was performed to determine the approximate in-situ California Bearing Ratio (CBR) of the underlying subgrade soil. The CBR value is a soil strength parameter used as a basis for pavement design.

The DCP test was performed in general conformance with the ASTM D6951 test procedure. This included driving a metal cone into the ground by repeatedly striking it with a 17.6 lb. (8 Kg) weight dropped from a height of 2.26 feet (575 mm). The penetration of the cone was measured after each blow and recorded. The test result was used to determine the in-situ CBR of the subgrade soil.

DCP tests (DCP-1 and DCP-2) were done prior to the site excavation and roadway reconstruction. The test results indicated the initial field CBR values ranging from approximately 5.9 to 77 percent. The variations of the test results were likely due to the presence of gravel and cobbles. The CBR value of 5.9 (lowest value) was used for the pavement design.

During construction, DCP field tests were performed on the exposed subgrade soil to determine the in-situ CBR strength. Where the CBR value was 5.9 or higher, it was deemed acceptable to place the untreated base course (UTB) on the subgrade soil without remedial work.

2.       Recommended Construction Procedure

The recommended construction procedure included:

- a)       Excavate the existing pavement section to expose the subgrade soil. The excavated materials will be hauled away.

- b) Have the geotechnical engineer or his representatives perform a Dynamic Cone Penetration (DCP) test to determine the CBR (California Bearing Ratio) of the subgrade soil. Soil probes shall also be performed using a #4 rebar next to the DCP test locations to provide a correlation between the CBR value and the soil consistency from the probes. The probing maybe used for other areas to determine if the subgrade material is acceptable to receive the untreated base course (UTB) and also as a means of expediting the construction process.
- c) If the CBR is 5.9 or higher, the UTB may be placed over the subgrade soil. The UTB surface shall be ironed rolled until firm to allow temporary traffic flow (no compaction testing is needed at this time).
- d) If the CBR is less than 5.9, remedial work would be required. This may include one of the following:
  - i) Remove the unsatisfactory soil (maximum 12-inches) and replace it with compacted UTB placed in 6-inch lifts, or
  - ii) Place geotextile fabric or a geogrid over the exposed subgrade soil, then place the UTB over the geotextile. Roll the top of the UTB until firm.
- e) After completion of the UTB placement, the surface of the UTB shall be fine-graded to remove any temporary driveway ramps. The regraded surface shall be compacted to a minimum of 95% of the maximum dry density (ASTM D1557). Any UTB surface material that has been contaminated with soil, or other debris shall be scraped off and be replaced with compacted UTB material. Perform field density (compaction) tests to verify that the UTB has been properly compacted.
- f) Place and compact the asphalt treated base (ATB) and asphaltic concrete (AC) pavement per plans and specs.

3. Field Quality Control and Density Testing

The results of the field DCP tests (DCP-3 and DCP-4) performed during construction indicated that the subgrade soils had a CBR value of 5.9 and greater. Therefore, no remedial work was deemed necessary prior to placement of the untreated base course gravel. The locations of the DCP tests are shown on the attached plate. It was recommended to proof-roll the exposed subgrade soil prior to placing and spreading the untreated base course gravel.

Field density tests were performed using a nuclear gauge in accordance with the ASTM D6938-17a test procedure (nuclear method; shallow depth).

The degree of compaction for the untreated base course (UTB) was based on the measured field density as compared to the maximum dry density as determined by the ASTM D1557 test procedure. The results of the test are as follows:

gray GRAVEL, with sand and fines (Base Course- Halawa Quarry)		
Maximum dry density (ASTM D1557)	=	130.8 pcf
Maximum dry density (ASTM D1557)	=	136.0 pcf (rock correction)*

Optimum moisture content = 6.4%

\*A rock correction factor (ASTM D4718) was applied to the maximum dry density for oversized particles.

Laboratory test results for the asphalt-treated base (ATB) and the asphalt concrete pavement (AC) were provided by the material provider. This included the specific gravity of the combined mixture without voids for the ATB, and the specific gravity for the AC as determined by the Rice Method (ASTM D2041).

The material data results are as follows:

Asphalt Treated Base			
Specific Gravity (combined mixture without voids)	=	2.589	
Target (Theoretical) Maximum Density	=	161.6 pcf.	
State Asphalt Concrete Mix #4			
Specific Gravity (determined by the Rice Method)	=	2.684	
Target (Theoretical) Maximum Density (Grace Pacific)	=	167.5 pcf.	

The specifications for compaction of the materials was based on the City and County of Honolulu, Standard Specifications for Public Works Construction", dated September 1986, with the exception of the UTB. For the UTB, in lieu of performing field CBR testing (which would require a large reaction weight and additional testing time), the criteria for acceptance was based on a minimum of 95% of the maximum dry density (ASTM D1557 test procedure). This criteria is similar to the State of Hawaii Standard Specifications for Road and Bridge Construction, dated 2005.

The specific gravity value for each particular material multiplied by 62.4 pcf provided the theoretical maximum density. Using a nuclear gauge, the density of the in-place compacted material was compared to the theoretical maximum dry density to determine the degree of compaction.

At each test location that did not meet the minimum required degree of compaction, the area was recompacted until it was determined to be acceptable by additional re-tests and or observations by the engineer prior to the placement of additional materials.

The acceptance criteria for compaction were as follows:

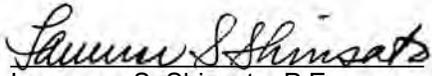
UTB:	minimum 95% of the maximum dry density (ASTM D 1557)
ATB	relative specific gravity of not less than 95% of the specific gravity of the combined mixture without voids; degree of compaction determined based on the theoretical maximum density.
AC:	relative specific gravity of not less than 91% of the specific gravity of the combined mixture without voids; degree of compaction determined based on the theoretical maximum density.

Should you have any questions, please do not hesitate to contact us.

Hawaii Engineering Group, Inc.  
May 15, 2020  
Page Four

Very truly yours,

SHINSATO ENGINEERING, INC.



Lawrence S. Shinsato, P.E.  
President

LSS:rd



This work was prepared by me  
or under my supervision.  
License Expires 04/30/22

**PLOT PLAN: LOCATIONS OF FIELD TESTS**

SCALE: 1" = 60'



**LEGEND:**

Approximate Field Density Test Locations: ○ UTB Tests 1 through 13; ◇ ATB Tests 14 through 19; △ AC Tests 20 through 25

Approximate DCP Test Locations: ⊕ DCP-3 and DCP-4

Project: **FACTORY STREET PAVEMENT**  
**HONOLULU, HAWAII 96819**  
Project No.: 19-0081

*Shinsato Engineering, Inc.*  
*Consulting Geotechnical Engineers*

98-747 Kuahao Pl. #E, Pearl City, HI 96782

**PLATE**  
**A**

**SUMMARY OF COMPACTION TESTS**

Date	Test No.	Location (see plan)	Approx. Elev.	Max. Dry Density (pcf)	Field Moisture %	Field Dry Density (pcf)	Min. Comp. Req'd	% of Max. Dry Density	Remarks
2/25/2020	1	Pavement	UTB	136	5.4	129.8	95	95.4	Pass
2/25/2020	2	Pavement	UTB	136	5.3	126.4	95	92.9	Fail; See Test 2A for retest
2/25/2020	3	Sidewalk	UTB	136	6.5	114.9	95	84.5	Fail; See Test 3A for retest
2/25/2020	4	Sidewalk	UTB	136	4.5	107.9	95	79.3	Fail; See Test 4A for retest
2/25/2020	2A	Retest	UTB	136	5.0	132.9	95	97.7	Pass
2/25/2020	3A	Retest	UTB	136	9.3	128.3	95	94.3	Pass/RR
2/25/2020	4A	Retest	UTB	136	5.7	128.0	95	94.1	Pass/RR
2/25/2020	5	Sidewalk	UTB	136	6.8	130.1	95	95.7	Pass
2/25/2020	6	Sidewalk	UTB	136	5.9	127.8	95	94.0	Pass/RR
3/2/2020	7	Sidewalk	UTB	136	6.6	127.4	95	93.7	Pass/RR
3/2/2020	8	Sidewalk	UTB	136	5.6	129.8	95	95.4	Pass
3/2/2020	9	Sidewalk	UTB	136	6.1	130.3	95	95.8	Pass
3/2/2020	10	Sidewalk	UTB	136	5.5	128.6	95	94.6	Pass/RR
3/4/2020	11	Pavement	UTB	136	6.2	128.8	95	94.7	Pass/RR
3/4/2020	12	Pavement	UTB	136	6.8	129.5	95	95.2	Pass
3/4/2020	13	Pavement	UTB	136	4.8	128.4	95	94.4	Pass/RR

**SUMMARY OF COMPACTION TESTS**

Date	Test No.	Location (see plan)	Approx. Elev.	Max. Dry Density (pcf)	Field Moisture %	Field Dry Density (pcf)	Min. Comp. Req'd	% of Max. Dry Density	Remarks
3/5/2020	14	Pavement	ATB	161.6	4.3	157.0	95	97.2	Pass
3/5/2020	15	Pavement	ATB	161.6	4.2	152.6	95	94.4	Pass/RR
3/5/2020	16	Pavement	ATB	161.6	3.3	155.3	95	96.1	Pass
3/5/2020	17	Pavement	ATB	161.6	3.9	159.7	95	98.8	Pass
3/5/2020	18	Pavement	ATB	161.6	3.5	156.7	95	97.0	Pass
3/5/2020	19	Pavement	ATB	161.6	3.4	155.2	95	96.0	Pass
3/5/2020	20	Pavement	AC	167.5	4.0	151.9	91	90.7	Pass/RR
3/5/2020	21	Pavement	AC	167.5	3.8	153.6	91	91.7	Pass
3/5/2020	22	Pavement	AC	167.5	3.8	151.7	91	90.6	Pass/RR
3/5/2020	23	Pavement	AC	167.5	3.5	151.7	91	90.6	Pass/RR
3/5/2020	24	Pavement	AC	167.5	3.8	151.6	91	90.5	Pass/RR
3/5/2020	25	Pavement	AC	167.5	3.9	152.4	91	91.0	Pass

NOTE: UTB: Untreated base course  
 ATB: Asphalt treated base  
 AC: Asphalt Concrete  
 RR: Re-rolled (additional rolling/compacting of the area was done by the contractor; area deemed acceptable)





## Summary of Approved Submittals

- 1. Approved Concrete Mix design:** The approved concrete mix design conformed to the 'Standard Specifications for Public Works Construction "City and County of Honolulu of the State of Hawaii sections 39 (Portland cement concrete) and section 42 (concrete side walk). These specifications require the concrete to be Class "B" (min compressive strength 2500psi at 28 days) and a slump of max 4" +/- . The actual tests met or exceeded these requirements.

**Material Vendor:** Hawaiian cement

**Mix design submittal:** Mix design was submitted on Feb 20, 2020 to general contractor (BC Construction) and approved by HEG on Feb. 21, 2020.
- 2. Approved AC State Mix IV:** The approved AC State Mix IV conformed to the 'Standard Specifications for Public Works Construction "City and County of Honolulu of the State of Hawaii section 34 (Asphalt Concrete Pavement). These specifications require the Asphalt Concrete Mix Design to conform to the specifications for Mix IV specified in section 34. The mix design submitted by the contractor conformed to these requirements.

**Material Vendor:** Grace Pacific LLC

**Mix design submittal:** Mix design was submitted by the contractor (BC Construction, LLC) and approved by HEG on Feb. 24, 2020.
- 3. Approved ATB Mix:** The approved ATB mix conformed to the 'Standard Specifications for Public Works Construction "City and County of Honolulu of the State of Hawaii section 32 (Treated Bases). These specifications require the ATB mix to conform to the specifications for plant mix asphalt treated bases. The mix design submitted by the contractor conformed to these requirements.

**Material Vendor:** Grace Pacific LLC

**Mix design submittal:** Mix design was submitted by the contractor (BC Construction, LLC) and approved by HEG on Feb. 27, 2020.
- 4. Approved Untreated Base Course (UTB):** The approved UTB mix conformed to the 'Standard Specifications for Public Works Construction "City and County of Honolulu of the State of Hawaii section 31 (Aggregate Base Course). The mix design submitted by the contractor conformed to these requirements.

**Material Vendor:** Hawaiian Cement

**Mix design submittal:** Mix design was submitted by the contractor (BC Construction, LLC) and approved by Shinsato Engineering on Jan. 11, 2020.

February 20, 2020

BC Construction, LLC  
P.O. Box 894516  
Mililani, Hawaii 96789-8326

Attn: Kara Borges

Project: **FACTORY STREET**

Aloha Kara,

HEG Note:  
Provide information about how much (if any) HRWR superplasticizer/admixture is added at the plant and/or jobsite, and how much water (if any) is added at the jobsite, with slump measured before and after.

No plasitcizers or water was added to concrete at the site. See attached letter from contractor "BC Construction" on following page

<input type="checkbox"/>	REVIEWED
<input checked="" type="checkbox"/>	REVIEWED AS NOTED
<input type="checkbox"/>	REVISE AND RESUBMIT
<input type="checkbox"/>	FOR YOUR INFORMATION AND USE
<input type="checkbox"/>	INCOMPLETE SUBMITTAL
<input type="checkbox"/>	NOT REVIEWED

Checking is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.

Hawaii Engineering Group, Inc.  
Date: 02/21/2020 By: *Luigi O. Gato*

We hereby submit for your approval as requested the attached Concrete Mix Design(s), for use on the subject project.

<u>Mix Number</u>	<u>Mix Description</u>	<u>Slump</u>
4523066521	C&C:A 3000-3/4 W/C 6.6	3+/-1"
4523067551	C&C:A 3000-3/4 PUMP W/C 6.6	4+/-1"

Please return two (2) copies of MIX DESIGN SUBMITTAL marked approved or not approved with your comments for our files. Concrete ordered without prior approval will be the contractor's responsibility. To avoid confusion, please order concrete by the MIX NUMBER (Product Code), MIX DESCRIPTION and SLUMP.

For statistical evaluation and quality control acceptance, please forward your field testing data to Hawaiian Cement, per ASTM C-94 Standard Specification for Ready-Mixed Concrete section 4.6.

If you have additional needs or any questions regarding this submittal, please feel free to call me at our Oahu Concrete and Aggregate Division Office at 808-483-3396 or on my mobile phone at 808-282-5094.

Thank you for choosing Hawaiian Cement as your ready mix concrete supplier.

Sincerely,



Kevin McCary  
Quality Control Supervisor



# BC Construction

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April 10, 2020

Mr. Bryan Chernick  
EQM  
18939 120th Ave. NE #103  
Bothell, WA 98011

Dear Mr. Chernick:

This letter serves as confirmation that BC Construction did not add superplasticizer or water to the mix on the pours dated 02/27/20 and 03/03/20 at the project named Factory St. Lead Site located on Factory St. between N. King St. and Waterhouse St., Honolulu, HI.

Should you have any questions, please do not hesitate to contact me at 808.589.8844.

Respectfully,

Rey Borges  
Owner



ATTACHMENT  
CONCRETE MIX DESIGN SUBMITTAL

To: Contractor  
Subject: Concrete Testing Services/Personnel

The Cement and Concrete Products Industry of Hawaii and its Ready-mixed concrete producers uphold the ACI and ASTM standards related to concrete testing of concrete materials delivered to referenced project.

In compliance to these industry standards, please provide the following information of testing services to be used for the project:

ACI 301-10 Section 1.6.1.1. Name of Testing Services Company: **Construction Engineering Labs**  
(Shall meet the requirements of ASTM C1077) \_\_\_\_\_

ACI 301-10 Section 1.6.1.2 Full names of ACI Concrete Field Testing Technician Grade I assigned to the project (to be updated for changes) :

Name: **Kameran Self-Gomes** Certification No. **01247271 - Exp. April 2024**  
Name: \_\_\_\_\_ Certification No. \_\_\_\_\_  
Name: \_\_\_\_\_ Certification No. \_\_\_\_\_

**As a compliance check of concrete testing procedures and practices, please have the project’s concrete testing service personnel review all testing procedure standards and acknowledge the following items of emphasis:**

ACI 301 Sec 1.6.3.2.e - Owner’s testing agency will conduct concrete strength tests during construction by making and curing test specimens in accordance with ASTM C31/C31M and testing them according to ASTM C39/C39M. Unless otherwise specified, concrete strengths for acceptance shall be the average of at least two 6 by 12 in. or at least three 4 by 8 in. cylinders tested at 28 days.

ACI 301 1.6.3.2e (ASTM C 31) – “Standard Practice for Making and Curing Concrete Test Specimens in the Field” refers to only “**standard**” cured cylinders when these specimens are tested for strength “acceptance” of concrete as specified.

If specimens are made and “**field**” cured, the resulting strength test data are to be used for the determination of whether the structure is capable of being put into service, for adequacy of curing and protection of concrete in the structure, or for form/shoring removal time requirements.

02-20-20 FACTORY STREET

□ACI 301-10 Sec. 1.6.2.2d (ASTM C31) on cylinder curing requirements for strength acceptance... “Immediately after molding and finishing, the specimens shall be stored for a period up to **48hours in a temperature range from 60 to 80 °F** and in an environment preventing moisture loss from the specimens.” Cylinders that are not initially cured under these conditions are not valid strength “acceptance” specimens.

Article 1.6.3.2.d dictates that the Contractor is responsible for providing “the testing agency adequate facilities for the **safe storage and proper curing** of concrete test specimens on the project site for initial curing as required by ASTM C 31.” These requirements should be expressed to the contractor/owner so that proper storage (wooden box) and curing will be provided.

(Various procedures are available during the initial curing period to maintain the specified moisture and temperature conditions, i.e. store in properly constructed wooden boxes or insulated curing boxes. Also, the transporting of these specimens to the lab requires special care and handling).

□ACI 301-10 Sec. 1.6.3.1c ... “The Owner’s testing agency will report test and inspection results of the Work to Owner, Architect/Engineer, Contractor, and Concrete Supplier **within 7 days** after tests and inspections are performed.

□ASTM C39, “Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens”, is another source of serious concern among our member producers. This standard requires that each specimen **must be tested to complete failure**. Testing is not complete when the first “stall” or decrease in load is observed. Often times, it’s noticed that concrete specimens are discarded with little or no visible failure; therefore, these specimens could not have been tested to “complete failure”. Too often loading is terminated when the first sign of load decrease is noticed. This practice fails to complete a legitimate test, but intentionally avoids the related clean up of a successful test. It is recommended that the person conducting compression test have a current ACI Concrete Strength Testing Technician certification.

□ACI 301-10 Sec.1.6.6.1.b - No strength test result should fall below  $f_c'$  (specified concrete strength) by more than **500 psi**, when  $f_c'$  is 5000 psi or less, or by more than  $0.10f_c'$  when  $f_c'$  is more than 5000 psi. However, in the event that test results exceed these limits, then steps shall be taken to ensure that the load carrying capacity of the structure is not jeopardized. Strength testing technician should always note any deviations from test standards, i.e. visible defects in test specimen. It’s an industry practice to retain all specimens that fail to meet the specified strength to aid in potential investigations.



**CONCRETE MIX DESIGN**  
SATURATED SURFACE DRY WEIGHTS PER CU. YD.

AGENCY

MIX NO.	MATERIALS: TYPE: SOURCE: SP GRAVITY: ABSORPTION:  ASTM C 94 (OPTION-C)	CEMENT TYPE I-II HAWAIIAN	3FW BASALT HALAWA 2.71 2.9	N4H BASALT HALAWA 2.78 2.36	BC SAND GLACIAL SECHLT 2.69 0.8	WATER C1602 CITY 1.00	CEMENT TYPE I-II HAWAIIAN 3.15	MasterPozzolith 322 A, B & D BASF-MB	MasterMatrix VMA 362 VMA BASF-MB			
	MIX DESCRIPTION AGG. NOM. SIZE	CEM/SKS	3FW 3/4"x #4 LBS/CY (kg/m3)	N4H #4X200 LBS/CY (kg/m3)	BCS #8X #100 LBS/CY (kg/m3)	WATER LBS/CY (kg/m3)	CEM LBS/CY (kg/m3)	WR OZ/CY (L/m3)	VMA OZ/CY (L/m3)	W/CM RATIO	AIR %	SLUMP INCHES  (mm)
4523066521	C&C:A 3000-3/4 W/C 6.6	5.25	1541	1317	442	288	494	0 - 24.7	0.0	0.58 MAX	2.00 +/- 1.5	3+/-1"
4523067551	C&C:A 3000-3/4 PUMP W/C 6.6	5.50	1365	1390	465	302	517	0 - 25.9	0 - 20.7	0.58 MAX	2.50 +/- 1.5	4+/-1"

CONTR: **BC Construction, LLC**  
PROJECT: **Factory Street**  
LOCATION: **Island of Oahu, Hawaii**

REMARKS: **HRWR SUPERPLASTICIZERS MAY BE ADDED TO CONCRETE MIXES AT PLANT/JOB SITE FOR PLACEMENT AND WORKABILITY.**

MIX DESIGN SUBJECT TO MODIFICATION TO MAINTAIN YIELD, STRENGTH, WORKABILITY AND SETTING TIME. UPON ARRIVAL AT JOB SITE, MIXING WATER MAY BE ADDED TO THE LOAD, ON A ONE TIME BASIS, (NOT MORE THAN TWO (2) GALS/CUBIC YARD) IN THE EVENT THE CONCRETE SLUMP IS LESS THAN SPECIFIED AND WITHIN 90 MINUTES FROM THE TIME BATCHED AND NOT TO EXCEED W/C RATIO AS ALLOWED BY ASTM C94.

**SIEVE ANALYSIS OF COARSE AGGREGATES**  
A.S.T.M. STANDARD SPECIFICATIONS.  
NOMINAL SIZE - 3/4" X No.4 (19mm X 4.75mm)

SIEVE SIZE		SPECS PERCENT PASSING		TYPICAL 3FW
INCHES / MESH	(Metric)	ASTM C33 SIZE 67	SH:DOT SIZE 67	%PASS
1 1/2"	37.5mm	100 - 100	100 - 100	100
1"	25mm	100 - 100	100 - 100	100
3/4"	19mm	90 - 100	90 - 100	100
1/2"	12.5mm	-	-	70
3/8"	9.5mm	20 - 55	20 - 55	37
No.4	4.75mm	0 - 10	0 - 10	3
No.8	2.36mm	0 - 5	0 - 5	2
NO.200	75um	0 - 1.5	0 - 1.5	1.2
FM		6.90 - 6.30		6.53
FLAT/ELONGATED (D4791)		8% Max		0.0
CLAY LUMPS (C142)		5% Max		0.0
CHERT (C123/C295)		5% Max		NA
COAL/LIGNITE (C123)		0.5% Max		NA
LA ABRASION (C 131)		40% Max		17.1
SOUNDNESS (C 88)		10% Max		2.0
ASR (C 1293)		0.04% Max		0.01
ASR (C 1567) -25% "F" FA		0.08% Max		0.07

REMARKS:

**Specification compliance in accordance to A.S.T.M. C 33 concrete coarse aggregate - Size 67 (3/4" X No.4) - 3/4" maximum nominal size.**

**\*Note: Reference to C 33 Section 11.3 - Coarse aggregate having test results exceeding the limits specified in Table 3 shall be regarded as meeting the requirements of this section provided the supplier demonstrates that concrete gives satisfactory service.**

CONTRACTOR: **BC Construction, LLC**  
PROJECT: **Factory Street**  
LOCATION: **Island of Oahu, Hawaii**

*Timothy S. Folks*

Timothy S. Folks, FACI  
Manager, Technical Services

02-20-20 FACTORY STREET

**SIEVE ANALYSIS OF FINE AGGREGATES**  
**A.S.T.M. STANDARD SPECIFICATIONS.**  
**NOMINAL SIZE - NO.4 X NO.100 (4.75mm X 150um)**

SIEVE SIZE MESH	(Metric)	SPECS PERCENT PASSING		INDIVIDUAL AGGREGATE		COMBINATIONS OF AGGREGATES		
				N4H	BC SAND	N4H	BC SAND	100%
		ASTM C33	SH:DOT	%PASS	%PASS	74.9%	25.1%	PASSING
3/8"	9.5mm	100 - 100	100 - 100	100.0	100.0	74.9	25.1	100.0
NO. 4	4.75mm	95 - 100	95 - 100	99.6	99.7	74.6	25.1	99.6
NO. 8	2.36mm	80 - 100	80 - 100	88.3	87.7	66.1	22.0	88.1
NO. 16	1.18mm	50 - 85	50 - 85	58.1	72.2	43.5	18.1	61.6
NO. 30	600um	25 - 60	25 - 60	34.7	50.7	26.0	12.7	38.7
NO. 50	300um	5 - 30	10 - 30	18.6	20.8	13.9	5.2	19.2
NO.100	150um	0 - 10	2 - 12	10.9	6.7	8.2	1.7	9.8
NO.200	75um		0 - 5	7.5	3.6	5.6	0.9	6.5 *
FM (2.3-3.1)		3.45 - 2.15	3.38 - 2.13	2.90	2.62	2.17	0.66	2.83
S.E. (70 MIN)				89	86	67	22	88
CLAY LUMPS (C 142)		3% Max		0.0	0.0	0.0	0.0	0.0
COAL/LIGNITE (C123)		1% Max		0.0	0.0	0.0	0.0	0.0
ORGANICS (C40)		Equal		0.0	0.0	0.0	0.0	0.0
SOUNDNESS (C 88)		10% Max		3.7	1.5	2.8	0.4	3.1
ASR (C 1293)		0.04% Max		0.01	0.02	0.01	0.01	0.01
ASR(C1567)-25%"F"FA		0.08% Max		0.08	0.06	0.06	0.02	0.07

REMARKS: Specification Compliance in accordance to A.S.T.M. C 33 concrete sand.

\*Note: Reference to C 33 Section 6 - GRADING, Subsection 6.3 in lieu of gradation requirement approval based on acceptable performance record for concrete.

CONTRACTOR: **BC Construction, LLC**  
PROJECT: **Factory Street**  
LOCATION: **Island of Oahu, Hawaii**

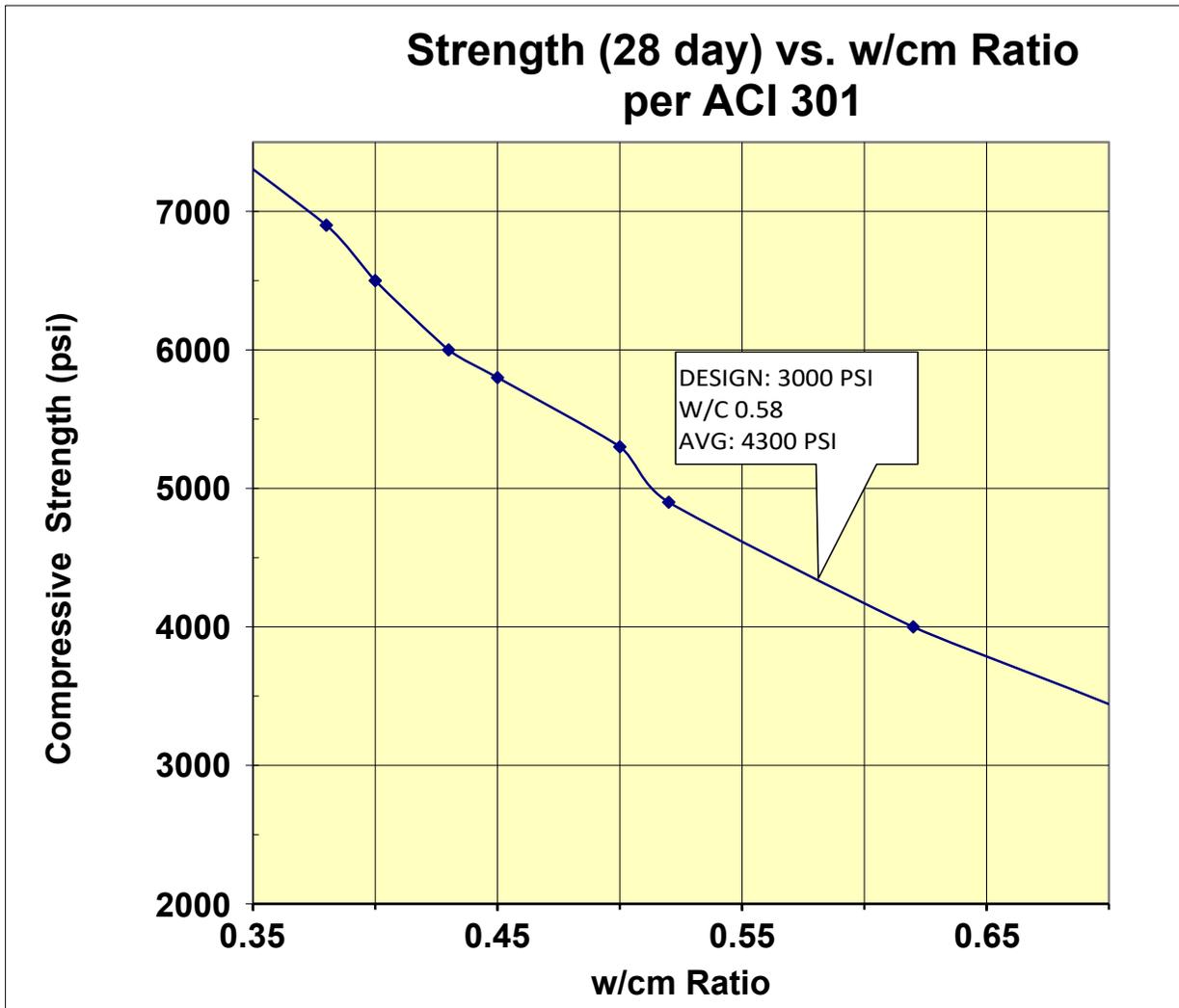
*Timothy S. Folks*  


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Timothy S. Folks, FACI  
Manager, Technical Services

02-20-20 FACTORY STREET

CONTRACTOR: BC Construction, LLC  
PROJECT: Factory Street  
LOCATION: Island of Oahu, Hawaii



**Remarks: Cement and Fly Ash Mixes w/ Halawa Basaltic and Blend Aggregates**  
Modified three-point curve of concrete strength versus water to cementitious (w/cm) ratio is outlined in ACI 301 "Specification for Structural Concrete", section 4.2.3.4.a. This equal alternative qualifies the compressive strength of our mixes as effectively as does the 30 consecutive tests method. In this method, field data for our various concrete mixtures using the same raw materials (cement, fly ash {if used}, Halawa aggregate, Pozzolith 322N, etc.) is compiled to develop a curve using the strength versus w/cm ratio. We believe this to be a superior method to using the three test batches to develop the curve (section 4.2.3.4.b), because it combines the best of both methods (dozens of historical / field breaks and three point curve).

*Timothy S. Folks*

Timothy S. Folks, FACI  
Manager, Technical Services



## Laboratory Test Certificate

### PORTLAND CEMENT - TYPE I/II

Source: Asia Cement-Hualein Plant, Taiwan

Chemical (C114)			Physical Properties		
Item (%)	Value	Limit	Comp. Strength	Value	(Min.)
Silicon Dioxide (SiO <sub>2</sub> ) . . . . .	20.6		3 Days	4140 psi	1740 psi
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ) . . . . .	3.9	6.0 Max		(28.5 MPa)	(12.0 MPa)
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ) . . . . .	3.1	6.0 Max	7 Days	5080 psi	2760 psi
Calcium Oxide (CaO) . . . . .	63.1			(35.0 MPa)	(19.0 MPa)
Magnesium Oxide (MgO) . . . . .	4.3	6.0 Max	28 Days**	6570 psi	4060*psi
Sulfur Trioxide (SO <sub>3</sub> ) . . . . .	2.5	3.0 Max		(45.3 MPa)	(28.0*MPa)
Sodium Oxide (Na <sub>2</sub> O) . . . . .	0.25				
Potassium Oxide (K <sub>2</sub> O) . . . . .	0.44		Blaine Fineness:	3820 cm <sup>2</sup> /gr	
Loss on Ignition (LOI) . . . . .	0.99	3.0 Max	Air Content:	8.2 %	12.0 %Max
Insoluble Residue . . . . .	0.19	1.50 Max			
Potential phase composition (%)			Gilmore Initial Set:	160 min.	60 Min
C <sub>3</sub> S . . . . .	62.3		Gilmore Final Set:	230 min.	600 Max
C <sub>2</sub> S . . . . .	12.0		Autoclave Expansion:	0.04 %	0.80 %Max
C <sub>3</sub> A . . . . .	5.2	8 Max	Paste False Set:	83 %	50*% Min
C <sub>4</sub> AF . . . . .	9.4				
Alkali Equivalent (NaEq) . . . . .	0.54	0.60*Max			

\* - optional requirements , Table 2 & 4.  
 \*\* - 28 Days Compressive Strength from previous month.

**We certify that the above described cement, at the time of shipment, meets the standard chemical and physical requirements of ASTM C150-18, Type I/II, low alkali (Tables 1 & 3).**

**Cement Division**

Office: 99-1300 Halawa Valley Street  
 Aiea, HI 96701  
 Phone (808) 532-3400

  
Daniel K. Paaaina III  
 Chemist



We create chemistry

January 6, 2020

RE: Hawaiian Cement  
Aiea, HI 96701-3289  
Certificate of Conformance  
MasterPozzolith® 322 Admixture formerly Pozzolith 322 N  
BASF Corporation Admixture for Concrete

TO WHOM IT MAY CONCERN:

State of Ohio )  
County of Cuyahoga ) ss

Before me, a Notary Public, in and for the aforesaid State and County, personally appeared Mark E. Piechuta, who being duly sworn, deposes and says:

That MasterPozzolith 322 admixture is a BASF Corporation Water-Reducing Admixture for concrete; and

That MasterPozzolith 322 and Pozzolith 322 N admixture are the same product having identical composition, differing only in designation; and

That no calcium chloride or chloride-based ingredient is used in the manufacture of MasterPozzolith 322 admixture; and

That MasterPozzolith 322 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00024 percent (2.4 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and

That MasterPozzolith 322 admixture meets the requirements for a Type A, Water Reducing, Type B, Retarding, and Type D, Water Reducing and Retarding Admixture specified in ASTM C494/C494M and AASHTO M194, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Type A, Type B and Type D admixtures as specified in Corps of Engineers' CRD-C 87.

Mark E. Piechuta  
BASF Corporation

Subscribed and sworn to before me  
This 6th day of January 2020

Brigitte M. Keil  
Notary Public, State of Ohio  
My Commission Expires 8/21/2021  
(Recorded in Geauga County)



BRIGITTE M. KEIL  
NOTARY PUBLIC  
STATE OF OHIO  
Recorded in  
Gauga County  
My Comm. Exp. 8/21/2021

BASF Corporation  
Construction Chemicals  
23700 Chagrin Boulevard  
Cleveland, Ohio 44122  
Telephone (216) 839-7500



02-20-20 FACTORY STREET



We create chemistry

January 6, 2020

RE: Hawaiian Cement  
Aiea, HI 96701-3289  
Certificate of Conformance  
MasterMatrix® VMA 362 Admixture formerly Rheomac VMA 362  
BASF Corporation Viscosity Modifying Admixture for Concrete

TO WHOM IT MAY CONCERN:

State of Ohio )  
County of Cuyahoga ) ss

Before me, a Notary Public, in and for the aforesaid State and County, personally appeared Mark E. Piechuta, who being duly sworn, deposes and says:

That MasterMatrix VMA 362 admixture is a ready-to-use high performance admixture formulated to control the rheological properties of shotcrete, ready-mixed concrete and grout; and

That MasterMatrix VMA 362 admixture and Rheomac VMA 362 admixture are the same product having identical composition, differing only in designation; and

That no calcium chloride or chloride-based ingredient is used in the manufacture of MasterMatrix VMA 362 admixture; and

That MasterMatrix VMA 362 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00016 percent (1.6 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and

That MasterMatrix VMA 362 admixture meets the requirements for a Type S, Specific Performance Admixture as specified in Table 1 of ASTM C494/C494M and AASHTO M194, the Standard Specification for Chemical Admixtures for Concrete.

Mark E. Piechuta  
BASF Corporation

Subscribed and sworn to before me  
This 6th day of January 2020

Brigitte M. Keil  
Notary Public, State of Ohio  
My Commission Expires 8/21/2021  
(Recorded in Geauga County)



BRIGITTE M. KEIL  
NOTARY PUBLIC  
STATE OF OHIO  
Recorded in  
Gauga County  
My Comm. Exp. 8/21/2021

BASF Corporation  
Construction Chemicals  
23700 Chagrin Boulevard  
Cleveland, Ohio 44122  
Telephone (216) 839-7500



02-20-20 FACTORY STREET

**MATERIALS TESTING LAB  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION**

DOT 4-152  
(HWY-R 03-97)

Materials Testing & Research Engineer

**JOB MIX FORMULA FOR ASPHALTIC CONCRETE  
(SUBMIT FOR APPROVAL PRIOR TO COMMENCING PAVING)**

TO: Material Testing & Research Engineer  
FROM: Grace Pacific LLC

- REVIEWED
- REVIEWED AS NOTED
- REVISE AND RESUBMIT
- FOR YOUR INFORMATION AND USE
- INCOMPLETE SUBMITTAL
- NOT REVIEWED

Checking is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.

Hawaii Engineering Group, Inc.

Date: 02/24/2020 By: Greg O. Sato

**JOB MIX FORMULA:** 19C-STIVR-01 Drum / Campbell  
Mix No. Type and Location of Plant

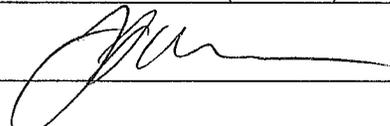
Sieves	Percent Passing	Aggregate ( Cold Feed & Percentage Breakdown)		
		Bin or Cold Feed		
1-1/4"	_____			
1"	_____	3 FINE	22 %	GRACE PACIFIC
3/4"	100	Size		Source
1/2"	92	CHIPS	16 %	GRACE PACIFIC
3/8"	81	Size		Source
No. 4	56	4 FINE	30 %	GRACE PACIFIC
No. 8	37	Size		Source
No. 16	23	WASHED 4 FINE	12 %	GRACE PACIFIC
No. 30	16	Size		Source
No. 50	12	F-RAP	20	GRACE PACIFIC
No. 100	9	Size		Source
No. 200	7.2		%	
A.C. %	5.1% T.W.M.	Size		Source
	5.4% D.W.A.		%	
		Size		Source
			%	
		Size		Source

Temperature of Mix 300+ degrees F @ Spreader

Bituminous Material  
ASPHALT CEMENT PG 64-16 ASPHALT HAWAII  
Grade Source

TACK COAT SS-1H GP MAINTENANCE SOLUTIONS  
Grade Source

REMARKS: - STATE MIX IV  
- REFERENCE: ASPHALT INSTITUTE MS-2. Design @ 75 Blows Per Side  
- Asphalt Cement Content (Total Mix) = 4.07% Neat Asphalt + 1.03% Reclaimed from RAP

SUBMITTED BY:  DATE: April 29, 2019

# PAVING MIXTURE PROPERTIES

## MARSHALL METHOD

AASHTO T-245, T-269, T-209, T-166

Project Name :

Project No. : 19C-STIVR-01

April 29, 2019

Lab No. : Punhale

### Summary of Trial Mixture Data

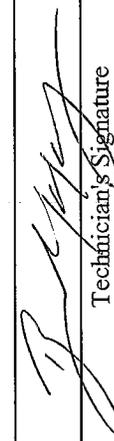
Asphalt Content (%)	Actual Specific Gravity ( $G_{mb}$ )	Unit Weight (pcf)	Rice Specific Gravity ( $G_r$ )	Theoretical Specific Gravity ( $G_t$ )	Marshall Stability (lb.)	Marshall Flow (lb/100 in.)	Air Voids (%)	VMA (%)	VFA (%)
4.50	2.559	159.7	---	2.707	3171	11.7	5.47	14.43	62.11
5.00	2.571	160.4	2.684	2.684	3041	12.0	4.21	14.48	70.92
5.50	2.582	161.1	---	2.662	2901	12.3	3.01	14.57	79.37

### Optimum Binder Mixture Properties

Properties	Determined	Selected	Specification
Optimum Binder %	5.09	5.10	4.3 - 6.5
Unit Weight, pcf	160.6	160.6	- <sub>3</sub>
Marshall Stability, lb	3017	3013	1800min
Marshall Flow, 0.01 inch	12.1	12.1	8.0 - 16.0
Air Voids (%)	4.00	3.97	3.0 - 5.0
Voids in Mineral Aggregate (VMA), %	14.50	14.50	14min
Voids Filled in Agg. (VFA), %	72.4	72.6	- <sub>3</sub>

\* Determined Optimum Binder : 4% Air Void, User defined

Remarks :



Technician's Signature



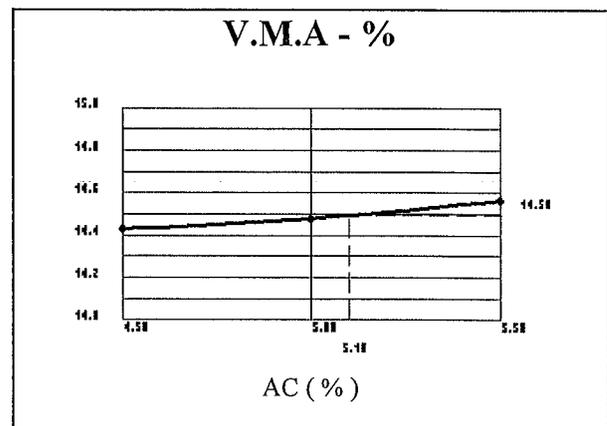
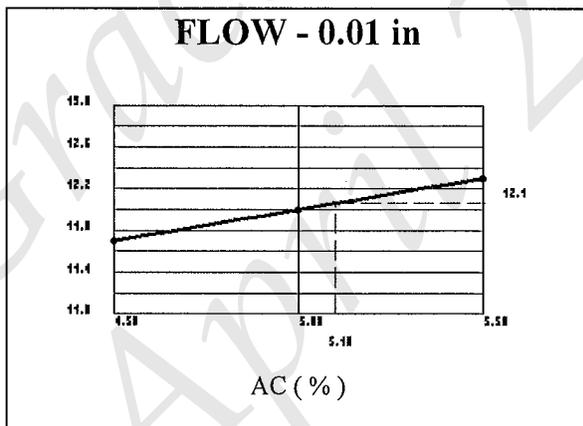
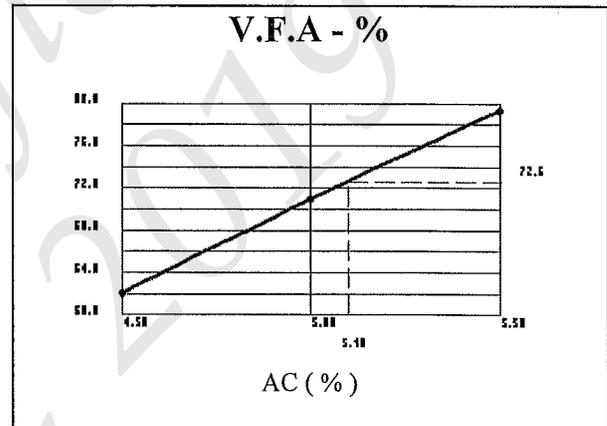
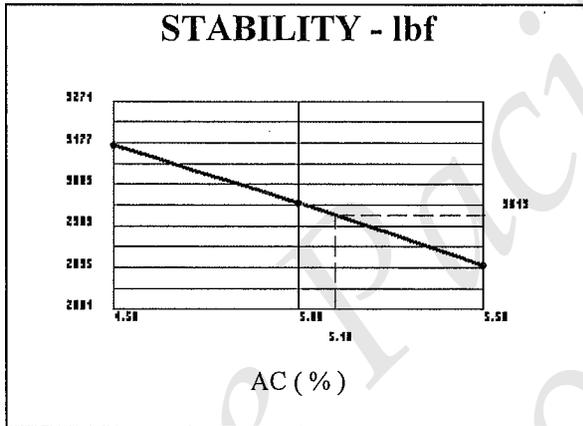
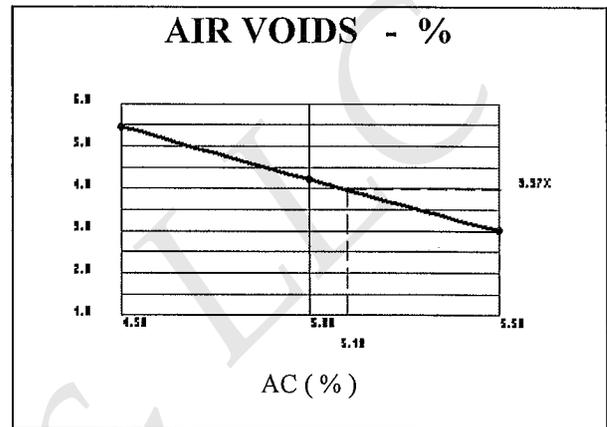
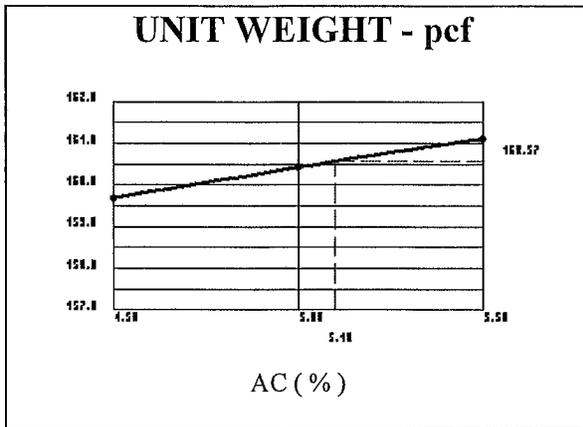
Supervisor's Signature

# TEST PROPERTY CURVES

Marshall Method

Project Name :  
Project No. : 19C-STIVR-01

Lab No. : Kapolei



# Aggregate Proportions

Lab No. : Kapolei  
 Mode : Input

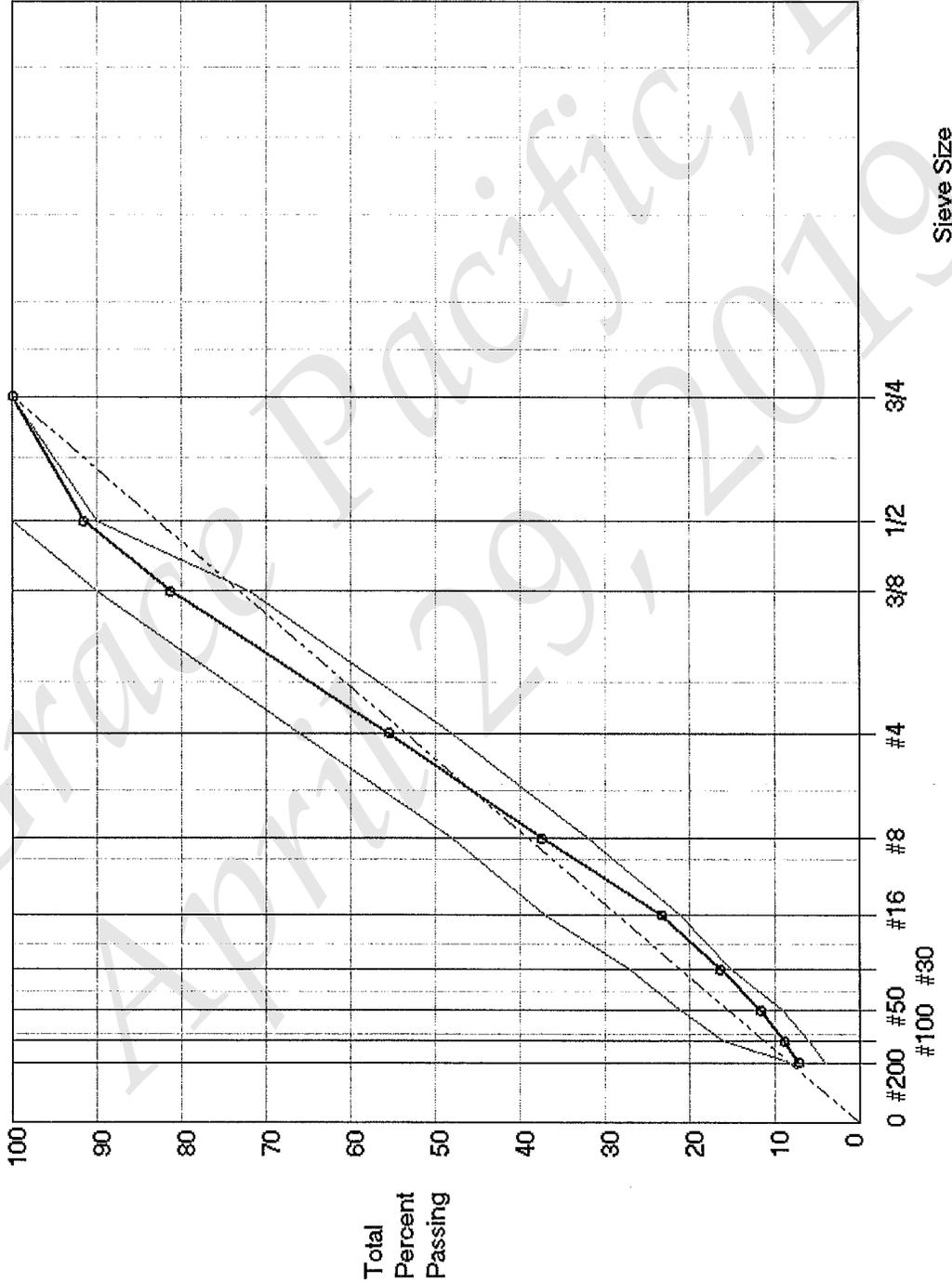
	Agg. Name	Prop. (%)
1	3 Fine	22.0
2	Chips	16.0
3	4 Fine	30.0
4	Washed 4 Fine	12.0
5	F-RAP	20.0

## Sect.703.09(2005) User Defined

Sieve	JMF	Spec
3/4	100.0	100
1/2	91.6	90-100
3/8	81.3	72-90
#4	55.5	48-66
#8	37.4	32-48
#16	23.3	21-37
#30	16.3	15-27
#50	11.6	9-21
#100	8.9	6-16
#200	7.2	4-8

Cost	AC(%)
.00	.00

Sieve Size Raised to 0.45 Power



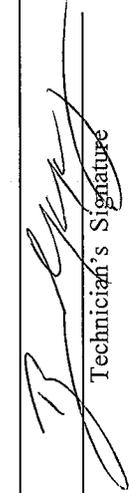
# SIEVE ANALYSIS RAW DATA SHEET

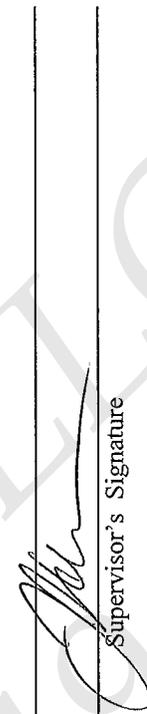
Project Name : April 29, 2019  
 Project No. : 19C-STIVR-01 Lab No. : Kapolei  
 Hawaii-Marshall-Sect.703.09(2005)- User Defined

Percentage Passing at Each Sieve Size (%)

Sieve Size	3 Fine	Chips	4 Fine	Washed 4 Fine	F-RAP
3/4	100.0	100.0	100.0	100.0	100.0
1/2	62.0	100.0	100.0	100.0	100.0
3/8	19.4	96.7	100.0	100.0	97.5
#4	2.1	13.2	90.4	90.3	74.9
#8	1.7	2.6	62.4	59.3	53.9
#16	1.5	2.1	39.0	32.9	35.5
#30	1.4	2.0	27.5	19.5	25.6
#50	1.3	1.9	20.1	10.8	18.7
#100	1.3	1.8	15.7	6.1	14.3
#200	1.2	1.7	12.7	4.1	11.5

Remarks :

  
 Technician's Signature

  
 Supervisor's Signature

# JOB MIX FORMULA SHEET

Project Name : April 29, 2019  
 Project No. : 19C-STIVR-01 Lab No. : Kapolei

**Materials Source Description**

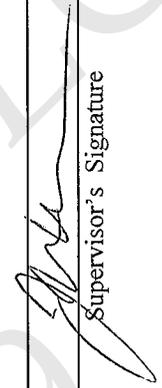
Agg #	Name	Source	Location	Product No.
Agg1	3 Fine	Grace Pacific	Makakilo Quarry	
Agg2	Chips	Grace Pacific	Makakilo Quarry	
Agg3	4 Fine	Grace Pacific	Makakilo Quarry	
Agg4	Washed 4 Fine	Grace Pacific	Makakilo Quarry	
Agg5	F-RAP	Grace Pacific	Various	
PG 64-16				
Asphalt Hawaii				

**Job Mix Formula ( JMF ) Results ( Total % Passing )**

Sieve	3 Fine	Chips	4 Fine	Washed 4 Fine	F-RAP	JMF	Specification
	Prop :22.0%	16.0%	30.0%	12.0%	20.0%		
3/4	22.0	16.0	30.0	12.0	20.0	100.0	100
1/2	13.6	16.0	30.0	12.0	20.0	91.6	90-100
3/8	4.3	15.5	30.0	12.0	19.5	81.3	72-90
#4	0.5	2.1	27.1	10.8	15.0	55.5	48-66
#8	0.4	0.4	18.7	7.1	10.8	37.4	32-48
#16	0.3	0.3	11.7	3.9	7.1	23.3	21-37
#30	0.3	0.3	8.3	2.3	5.1	16.3	15-27
#50	0.3	0.3	6.0	1.3	3.7	11.6	9-21
#100	0.3	0.3	4.7	0.7	2.9	8.9	6-16
#200	0.3	0.3	3.8	0.5	2.3	7.2	4-8

Remarks :

  
 Technician's Signature

  
 Supervisor's Signature

**DRY-BULK-APP SPECIFIC GRAVITY  
RAW DATA SHEET**

AASHTO T-84 & T-85

Project Name :  
Project No. : 19C-STIVR-01

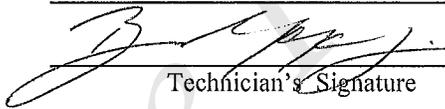
April 29, 2019  
Lab No. : Kapolei

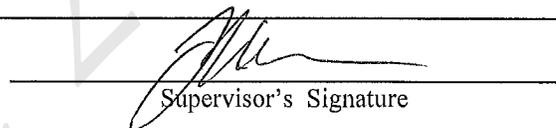
Aggregate Name	Gbdry	Gbssd	Gapp	Wabs.%
Agg1: 3 Fine	2.958	2.992	3.062	1.10
Agg2: Chips	2.955	2.997	3.084	1.40
Agg3: 4 Fine	2.738	2.832	3.021	3.40
Agg4: Washed 4 Fine	2.848	2.913	3.045	2.30
Agg5: F-RAP	2.863			

Note :

Gbdry = Dry Specific Gravity ; Gbssd = Bulk Specific Gravity ; GbApp = Apparent Specific Gravity  
Wabs = Water Absorption.

Remarks :

  
\_\_\_\_\_  
Technician's Signature

  
\_\_\_\_\_  
Supervisor's Signature

**ACTUAL SPECIFIC GRAVITY OF  
MOLDED SPECIMEN SATURATED WITH ASPHALT  
RAW DATA SHEET**  
AASHTO T-166

Project Name : \_\_\_\_\_ April 29, 2019  
 Project No. : 19C-STIVR-01 Lab No. : Kapolei

AC, %	Spec.	Dry Wt. in air (grams)	SSD Wt. in air (grams)	SSD Wt. submerge in water (grams)	Bulk Sp.Gr. of Compacted Spec.	Average Sp.Gr. Gmb	Unit Weight (lb/cu ft.)
4.50	1	1295.8	1298.5	792.0	2.558	2.559	159.7
	2	1293.2	1296.1	791.1	2.561		
	3	1295.7	1299.2	792.9	2.559		
5.00	4	1306.8	1309.3	800.9	2.570	2.571	160.4
	5	1309.2	1311.7	802.5	2.571		
	6	1310.4	1312.3	802.6	2.571		
5.50	7	1316.6	1317.7	808.6	2.586	2.582	161.1
	8	1312.9	1314.3	805.5	2.580		
	9	1315.1	1316.9	806.9	2.579		

Remarks : \_\_\_\_\_  
 \_\_\_\_\_  
 Technician's Signature  
 \_\_\_\_\_  
 Supervisor's Signature



**MAXIMUM THEORETICAL SPECIFIC GRAVITY (RICE TEST)  
AASHTO T 209**

Project:	19C-STIVR-01	Date:	4/29/2019
Mix Type:	STATE MIX IV	Technician:	B. LIMA <i>BL</i>

SAMPLE ID#			
Weight of Bowl in Air, gm			
Weight of Bowl & Sample in Air, gm			
Weight of Sample in Air, gm (A)		1849.3	1854.8
Weight of Bowl Submerged, gm (B)		1502.4	1502.4
Weight of Bowl & Sample Submerged, gm (C)		2663.7	2665.2
Maximum Specific Gravity ( $G_{mm}$ ) [ $A/(A-(C-B))$ ]		2.688	2.680
% Asphalt Content (%AC)		5.0	5.0
Specific Gravity of AC ( $G_b$ )		1.040	1.040
Effective Specific Gravity of the Stone ( $G_{se}$ ) ( $(100 - \%AC)/((100/G_{mm}) - (\%AC/G_b))$ )		2.933	2.923

$G_{se} =$

$$\frac{100 - 5}{\frac{100}{2.684} - \frac{5}{1.04}}$$

$G_{se} = 2.928$

$G_{mm} @ 4.5$

$$\frac{100}{\frac{95.5}{2.928} + \frac{4.5}{1.04}}$$

$$\frac{100}{32.616 + 4.327}$$

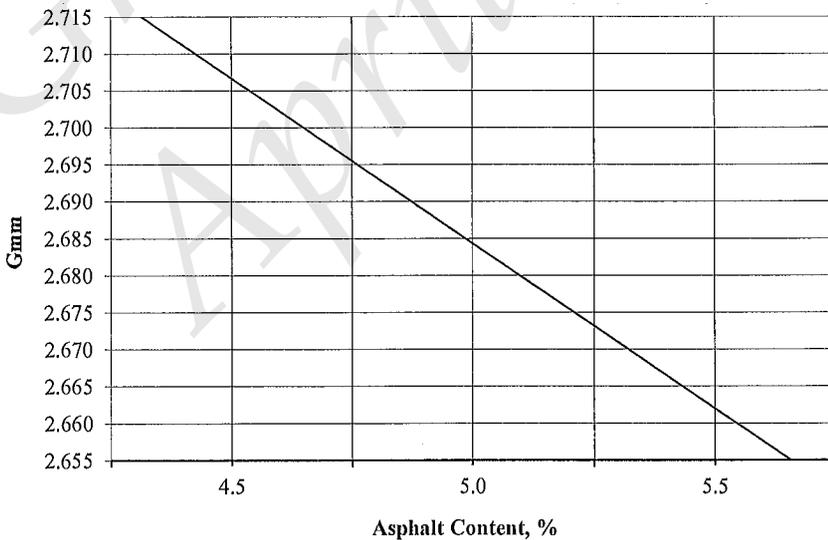
$G_{mm} = 2.707$

$G_{mm} @ 5.5$

$$\frac{100}{\frac{94.5}{2.928} + \frac{5.5}{1.04}}$$

$$\frac{100}{32.275 + 5.288}$$

$G_{mm} = 2.662$



AC, %	G <sub>mm</sub>
4.5	2.707
5.0	2.684
5.5	2.662

VOLUMETRIC PROPERTIES

Project No :19C-STIVR-01

Mix Type : STATE MIX IV

Date : 4/29/2019

	AGG	AGG Percent%	G <sub>bdry</sub>	G <sub>bssd</sub>	G <sub>bapp</sub>	W <sub>abs%</sub>	AC % =
P1	3 FINE	22	2.958	2.992	3.062	1.1	5.1
P2	CHIPS	16	2.955	2.997	3.084	1.4	
P3	4 FINE	30	2.738	2.832	3.021	3.4	
P4	ASHED 4 FI	12	2.848	2.913	3.045	2.3	
P5	F-RAP	20	2.863				
P6							
P7							
P8							

1) Bulk Specific Gravity of Aggregate (G<sub>sb</sub>)

$$G_{sb} = \frac{P_1 + P_2 + \dots + P_n}{\frac{P_1}{G_1} + \frac{P_2}{G_2} + \dots + \frac{P_n}{G_n}} = \frac{22}{2.958} + \frac{16}{2.955} + \frac{30}{2.738} + \frac{12}{2.848} + \frac{20}{2.863} + \dots$$

$$G_{sb} = \boxed{2.856} = \frac{100}{7.44 + 5.41 + 10.96 + 4.21 + 6.99 + \dots} = \frac{100}{35.01}$$

2) Effective Specific Gravity of Aggregate (G<sub>se</sub>)

$$G_{se} = \frac{P_{mm} - P_b}{\frac{P_{mm} - P_b}{G_{mm}} + \frac{P_b}{G_b}} = \frac{100 - 5.0}{\frac{100 - 5.0}{2.684} + \frac{5.0}{1.04}}$$

Per Mix Design  
optimum AC content = 5.1  
MIX POINT 5.0

G<sub>se</sub> =  $\boxed{2.928}$

G<sub>mm</sub> = Maximum Specific Gravity (SpG)  
P<sub>mm</sub> = % By Weight of Total Loose Mixture = 100  
P<sub>b</sub> = Asphalt Content  
G<sub>b</sub> = Specific Gravity of Asphalt  
\*per Certificate G<sub>b</sub> = 1.04

5  
51  
52  
53  
54  
55

3) Asphalt Absorption (P<sub>ba</sub>)

$$P_{ba} = 100 \times \frac{G_{se} - G_{sb}}{G_{sb} \times G_{se}} \times G_b = 100 \times \frac{2.928 - 2.856}{2.856 \times 2.928} \times 1.04$$

P<sub>ba</sub> =  $\boxed{0.90}$

G<sub>se</sub> = Effective Specific Gravity of Aggregate  
G<sub>sb</sub> = Bulk Specific gravity of Aggregate

4) Effective Asphalt Content of a Paving Mixture (P<sub>be</sub>)

$$P_{be} = P_b - \frac{P_{ba}}{100} \times P_s$$

Per Mix Design  
optimum AC content = 5.1  
\* P<sub>b</sub> = 5.1

$$P_{be} = 5.1 - \frac{0.9}{100} \times 94.9$$

P<sub>be</sub> =  $\boxed{4.25}$

P<sub>b</sub> = Asphalt Content, % by total weight of mixture  
P<sub>ba</sub> = Absorbed Asphalt, % by weight of aggregate  
P<sub>s</sub> = Aggregate Content, % by total weight of mixture

**5) Percent VMA in Compacted Paving Mixture (VMA)**

$$VMA = 100 - \frac{G_{mb} - P_s}{G_{sb}}$$

*Per Mix Design*

$$G_{mb} = \frac{160.6}{62.4}$$

$$G_{mb} = 2.574$$

$$VMA = \boxed{14.5}$$

VMA = Voids in Mineral Aggregate (VMA)

$G_{sb}$  = Bulk Specific Gravity of Total Aggregate

$G_{mb}$  = Bulk Specific Gravity of compacted Mixture

$P_s$  = Aggregate Content, % by Total weight of mixture

$$VMA = 100 - \frac{2.574 - 5.1}{2.856}$$

**6) Percent Air Voids in Compacted Mixture ( $V_a$ )**

$$V_a = 100 \times \frac{G_{mm} - G_{mb}}{G_{mm}}$$

*Per Mix Design*

$$\text{optimum AC content} = 5.1$$

$$G_{mm} = 2.680$$

$$V_a = 100 \times \frac{2.680 - 2.574}{2.680}$$

$$V_a = \boxed{4.0}$$

$G_{mm}$  = Maximum Specific Gravity of paving Mixture

$G_{mb}$  = Bulk Specific Gravity of compacted Mixture

$$G_{mm} = \frac{P_{mm}}{\frac{P_s}{G_{so}} + \frac{P_b}{G_b}}$$

$$= \frac{100}{\frac{100 - 5.1}{2.928} + \frac{5.1}{1.040}}$$

$$= 2.680$$

**7) Percent VFA in Compacted Mixture (VFA)**

$$VFA = 100 \times \frac{VMA - V_a}{VMA}$$

$$VFA = 100 \times \frac{14.5 - 4.00}{14.47}$$

$$VFA = \boxed{72.6}$$

VFA = Voids Filled with Asphalt, %VMA

**8) Dust to Binder Ratio or "Dust Proportion" (DP)**

$$DP = \frac{P_{0.075}}{P_{b0}}$$

*Per Mix Design*

$$\#200 = 7.2$$

$$DP = \boxed{1.7}$$

$P_{0.075}$  = % passing #200 Sieve

$P_{b0}$  = Effective Asphalt Cement

$$DP = \frac{7.2}{4.25}$$



# ASPHALT TECHNOLOGIES, INC.



## CERTIFICATE OF ANALYSIS

March 4, 2019

Report For: Asphalt Hawaii  
P.O. Box 78  
Honolulu, HI 96810

Attn: Sara Daniels

Email: [sdaniels@asphalt-hawaii.com](mailto:sdaniels@asphalt-hawaii.com)

Sample ID: PG 64-16	Sample Date: -	Project #: GRPC 96-02-01A
Tank: 4	Date Received: 03/01/19	Label: Asphalt Hawaii

**OBJECTIVE:** Evaluate for compliance with AASHTO M 320, Table 1 Performance Grade specifications for PG 64-16.

**DATA / RESULTS:**

PROPERTIES		TEST METHODS	SPECIFICATIONS	RESULTS		
<b>ORIGINAL BINDER</b>						
Flash Point, °C (°F) (COC)		T 48	230 min.	>332 (>630)		
Viscosity, Pa·s		135°C	T 316	3.0 max. 0.413		
Specific Gravity		15.6°C	T 228	Report 1.040		
Dynamic Shear		64°C	T 315	1.0 min.	G/sinδ	δ°
					G/kPa	δ°
		70°C			1.21	1.21
					<b>0.584</b>	<b>0.583</b>
						<b>88.8</b>
<b>AFTER RTFOT</b>						
Mass Change, % (Mass Loss is reported as Negative)		T 240	1.0 max.	-0.146		
Dynamic Shear		64°C	T 315	2.2 min.	G/sinδ	δ°
					G/kPa	δ°
		70°C			2.62	2.61
					<b>1.22</b>	<b>1.22</b>
						<b>85.8</b>
<b>PRESSURE AGING RESIDUE (100°C, 300 psi, 20 hr)</b>		R 28				
Dynamic Shear		28°C	T 315	5,000 max.	G/sinδ	δ°
					G/kPa	δ°
					2,700	3,410
		25°C			4,120	5,470
		22°C			<b>6,010</b>	<b>8,460</b>
						<b>45.2</b>
Creep Stiffness	Stiffness, MPa (60 sec.)	-6°C	T 313	300 max.	84	
	m Value			0.300 min.	0.407	
	Stiffness, MPa (60 sec.)	-12°C		300 max.	199	
	m Value			0.300 min.	0.337	
	Stiffness, MPa (60 sec.)	-18°C		300 max.	<b>400</b>	
	m Value			0.300 min.	<b>0.265</b>	
AASHTO M 320, Table 1 Performance Grade, PG		AASHTO M 320			64-16	
True Performance Grade		ASTM D 7643			65.4-25.1	

**DISCUSSION:** The sample met the requirements of AASHTO M 320, Table 1 Requirements for PG 64-16 with a "True Grade" of 65.4-25.1.

Tested by: Nick Johnson  
Nick Johnson, Paving Binder Technician

Date: March 4, 2019

Reviewed by: Damian Jamroz  
Damian Jamroz, Assistant Client Manager

Date: March 4, 2019



# ASPHALT TECHNOLOGIES, INC.



## CERTIFICATE OF ANALYSIS

March 4, 2019

Report For: Asphalt Hawaii  
P.O. Box 78  
Honolulu, HI 96810

Attn: Sara Daniels

Email: [sdaniels@asphalthawaii.com](mailto:sdaniels@asphalthawaii.com)

Sample ID: PG 64-16	Sample Date: -	Project #: GRPC 96-02-01
Tank: 4	Date Received: 03/01/19	Label: Asphalt Hawaii

**OBJECTIVE:** Evaluate binder to develop a laboratory mixing and compaction chart.

### DATA/RESULTS:

PROPERTIES	TEST METHODS	SPECIFICATIONS	RESULTS
<b>ORIGINAL BINDER</b>			
<b>AASHTO M 320 Requirements</b>			
Specific Gravity	15.6°C	T 228	1.040
API Gravity	275°F		4.56
Viscosity, Pa·s	293°F	T 316	0.413
	311°F		0.260
	329°F		0.172
	347°F		0.118
			0.084

**DISCUSSION:** The Mixing Temperature Range for the PG 64-16, corresponding to a viscosity range of 0.15 to 0.19 Pa-s, is 308-319°F. The Compaction Temperature Range for the PG 64-16, corresponding to a viscosity range of 0.25 to 0.31 Pa-s, is 286-296°F. See temperature/viscosity chart on the following page.

Tested by:   
Nick Johnson, Paving Binder Technician

Date: March 4, 2019

Reviewed by:   
Damian Jamroz, Assistant Client Manager

Date: March 4, 2019

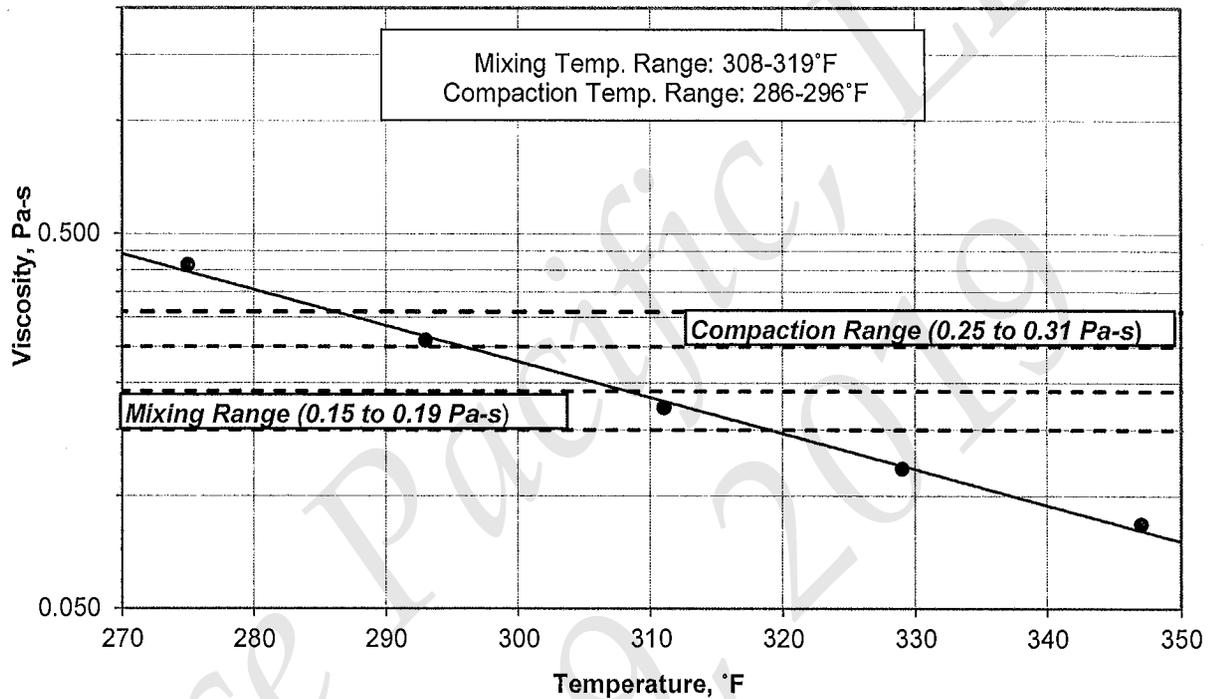


# ASPHALT TECHNOLOGIES, INC.

Sara Daniels/Asphalt Hawaii  
Certificate of Analysis  
March 4, 2019, Page 2 of 2

## DATA/RESULTS:

### Asphalt Hawaii PG 64-16 March 2019 Mixing & Compaction Temperature



This is an approximation for laboratory mixing and compaction use.

**MATERIALS TESTING LAB  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION**

DOT 4-152  
(HWY-R 03-97)

Materials Testing & Research Engineer

**JOB MIX FORMULA FOR ASPHALTIC CONCRETE  
(SUBMIT FOR APPROVAL PRIOR TO COMMENCING PAVING)**

TO: Material Testing & Research Engineer  
FROM: Grace Pacific LLC

- REVIEWED
- REVIEWED AS NOTED
- REVISE AND RESUBMIT
- FOR YOUR INFORMATION AND USE
- INCOMPLETE SUBMITTAL
- NOT REVIEWED

Checking is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.

Hawaii Engineering Group, Inc.

Date: 02/27/2020 By: *Yung O. Sato*

**JOB MIX FORMULA:** 19C-RATB-03 Drum / Campbell  
Mix No. Type and Location of Plant

Sieves	Percent Passing	Aggregate ( Cold Feed & Percentage Breakdown)		
		Bin or Cold Feed		
1-1/4"	100			
1"	100	3 Coarse	23 %	GRACE PACIFIC
3/4"	93	Size		Source
1/2"	70	3 Fine	10 %	GRACE PACIFIC
3/8"	59	Size		Source
No. 4	44	4 Fine	37 %	GRACE PACIFIC
No. 8	30	Size		Source
No. 16	21	C-RAP	30 %	GRACE PACIFIC
No. 30	16	Size		Source
No. 50	12			
No. 100	9	Size		Source
No. 200	7.5			
A.C. %	4.2%	Size	%	Source
	4.4%	Size	%	Source
		Size	%	Source
		Size	%	Source

T.W.M.  
D.W.A.

Temperature of Mix 300+ degrees F @ Spreader

Bituminous Material  
ASPHALT CEMENT PG 64-16 ASPHALT HAWAII  
Grade Source

TACK COAT \_\_\_\_\_  
Grade Source

REMARKS: - This design complies with the Standard Specifications for Public Works Construction, City and County of Honolulu, Section 32.2 - PLANT MIX ASPHALT TREATED BASE (ATB)  
- REFERENCE: ASPHALT INSTITUTE MS-2. Design @ 75 Blows Per Side  
- Asphalt Cement Content (Total Mix) = 3.21% Neat Asphalt + 0.99% Reclaimed from RAP

SUBMITTED BY: *[Signature]* DATE: December 5, 2019

# PAVING MIXTURE PROPERTIES

## MARSHALL METHOD

AASHTO T-245, T-269, T-209, T-166

Project Name :

Project No. : 19C-RATB-03

December 5, 2019

Lab No. : Kapolei

### Summary of Trial Mixture Data

Asphalt Content (%)	Actual Specific Gravity ( $G_{mb}$ )	Unit Weight (pcf)	Rice Specific Gravity ( $G_r$ )	Theoretical Specific Gravity ( $G_t$ )	Marshall Stability (lb)	Marshall Flow (1/100 in)	Air Voids (%)	VMA (%)	VFA (%)
3.50	2.573	160.1	---	2.763	3233	12.0	6.88	13.12	47.60
4.00	2.589	161.6	2.740	2.740	3361	12.7	5.51	13.04	57.72
4.50	2.596	162.0	---	2.717	3415	13.3	4.45	13.25	66.40

### Optimum Binder Mixture Properties

Properties	Determined	Selected	Specification
Optimum Binder %	4.24	4.20	4.0 - 5.0
Unit Weight, pcf	161.8	161.7	---
Marshall Stability, lb	3387	3382	2000min
Marshall Flow, 0.01 inch	13.0	12.9	8.0 - 16.0
Air Voids (%)	5.00	5.09	4.0 - 8.0
Voids in Mineral Aggregate (VMA), %	13.14	13.12	12min
Voids Filled in Agg. (VFA), %	61.9	61.2	---

\* Determined Optimum Binder : 5% Air Void, User defined

Remarks :

\_\_\_\_\_

Technician's Signature

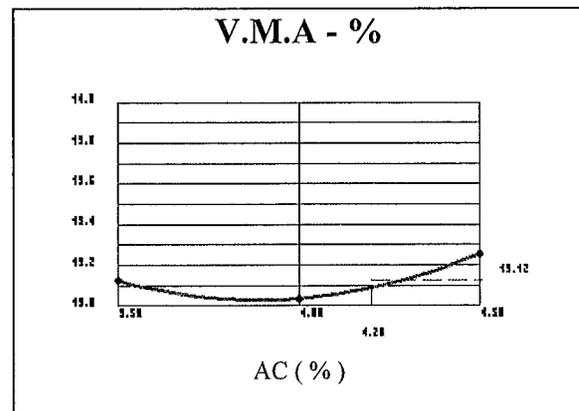
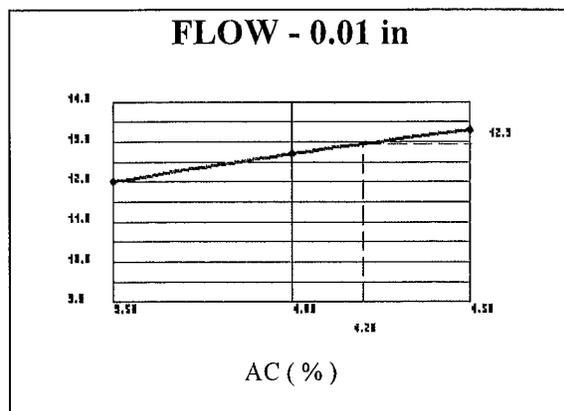
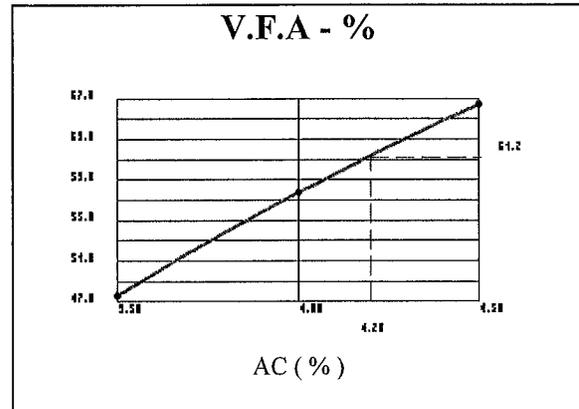
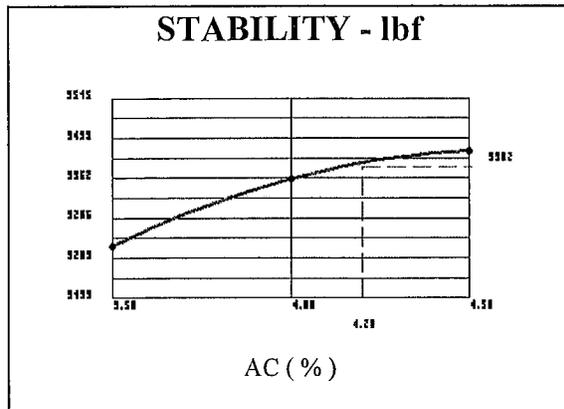
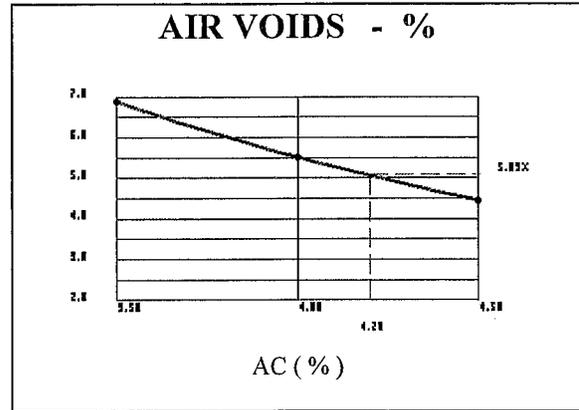
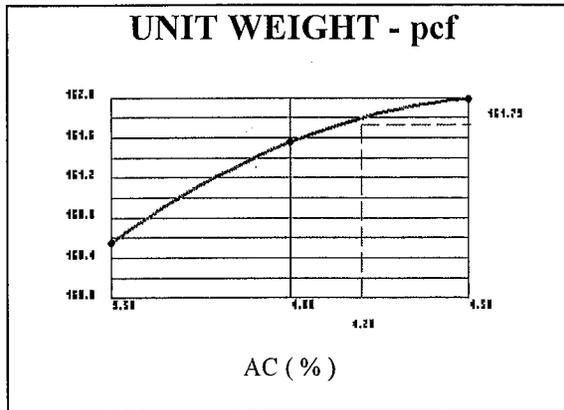
Supervisor's Signature

# TEST PROPERTY CURVES

Marshall Method

Project Name :  
Project No. : 19C-RATB-03

Lab No. : Kapolei





# SIEVE ANALYSIS RAW DATA SHEET

Project Name :  
Project No. : 19C-RATB-03

December 5, 2019

Lab No. : Kapolei

Hawaii-Marshall-Sect.703.03(2005)- User Defined

Percentage Passing at Each Sieve Size (%)

Sieve Size	3 Coarse	3 Fine	4 Fine	C-RAP
1 1/4	100.0	100.0	100.0	100.0
1 in	100.0	100.0	100.0	100.0
3/4	69.8	100.0	100.0	99.9
1/2	7.1	62.3	100.0	85.3
3/8	3.5	18.9	100.0	63.4
#4	2.2	2.9	88.3	33.3
#8	1.9	2.4	60.5	24.2
#16	1.8	2.1	41.1	17.4
#30	1.7	1.9	29.7	13.2
#50	1.6	1.8	22.1	10.0
#100	1.5	1.7	17.3	7.9
#200	1.3	1.6	13.8	6.3

Remarks :

\_\_\_\_\_  
Technician's Signature

\_\_\_\_\_  
Supervisor's Signature

# JOB MIX FORMULA SHEET

Project Name :  
 Project No. : 19C-RATB-03  
 December 5, 2019  
 Lab No. : Kapolei

### Materials Source Description

Agg #	Name	Source	Location	Product No.
Agg1	3 Coarse	Grace Pacific	Makakilo Quarry	
Agg2	3 Fine	Grace Pacific	Makakilo Quarry	
Agg3	4 Fine	Grace Pacific	Makakilo Quarry	
Agg4	C-RAP	Grace Pacific	Various	
Asphalt	PG 64-16	Asphalt Hawaii	Campbell	

### Job Mix Formula ( JMF ) Results ( Total % Passing )

Sieve	3 Coarse	3 Fine	4 Fine	C-RAP	JMF	Specification
	Prop : 23.0%	10.0%	37.0%	30.0%		
1 1/4	23.0	10.0	37.0	30.0	100.0	100
1 in	23.0	10.0	37.0	30.0	100.0	85-100
3/4	16.1	10.0	37.0	30.0	93.1	-
1/2	1.6	6.2	37.0	25.6	70.4	60-85
3/8	0.8	1.9	37.0	19.0	58.7	-
#4	0.5	0.3	32.7	10.0	43.5	40-55
#8	0.4	0.2	22.4	7.3	30.3	30-40
#16	0.4	0.2	15.2	5.2	21.0	-
#30	0.4	0.2	11.0	4.0	15.6	12-21
#50	0.4	0.2	8.2	3.0	11.8	-
#100	0.3	0.2	6.4	2.4	9.3	7-14
#200	0.3	0.2	5.1	1.9	7.5	1-8

Remarks :

\_\_\_\_\_  
 Technician's Signature

  
 Supervisor's Signature

**DRY-BULK-APP SPECIFIC GRAVITY  
RAW DATA SHEET**  
AASHTO T-84 & T-85

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Project Name :  
Project No. : 19C-RATB-03

December 5, 2019  
Lab No. : Kapolei

Aggregate Name	Gbdry	Gbssd	Gapp	Wabs.%
Agg1: 3 Coarse	2.956	2.984	3.040	0.90
Agg2: 3 Fine	2.952	2.983	3.048	1.10
Agg3: 4 Fine	2.753	2.857	3.072	3.80
Agg4: C-RAP	2.891			

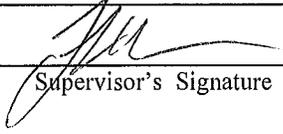
Note :

**Gbdry** = Dry Specific Gravity ; **Gbssd** = Bulk Specific Gravity ; **GbApp** = Apparent Specific Gravity  
**Wabs** = Water Absorption.

Remarks :

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\_\_\_\_\_  
Technician's Signature

  
\_\_\_\_\_  
Supervisor's Signature

**ACTUAL SPECIFIC GRAVITY OF  
MOLDED SPECIMEN SATURATED WITH ASPHALT  
RAW DATA SHEET**  
AASHTO T-166

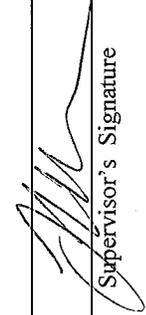
December 5, 2019

Project Name :  
Project No. : 19C-RATB-03

Lab No. : Kapolei

AC, %	Spec.	Dry Wt. in air (grams)	SSD Wt. in air (grams)	SSD Wt. submerge in water (grams)	Bulk Sp.Gr. of Compacted Spec.	Average Sp.Gr. Gmb	Unit Weight (lb/cu. ft)	
3.50	1	1262.6	1268.9	778.4	2.574			
	2	1261.7	1269.0	778.1	2.570			
	3	1263.0	1269.7	779.4	2.576			
							2.573	160.6
4.00	4	1270.7	1276.9	785.0	2.583			
	5	1273.1	1278.7	787.9	2.594			
	6	1272.2	1279.9	788.8	2.591			
							2.589	161.6
4.50	7	1284.0	1287.8	793.8	2.599			
	8	1283.5	1287.5	792.6	2.593			
	9	1283.1	1286.9	792.7	2.596			
							2.596	162.0

Remarks :

  
Supervisor's Signature

Technician's Signature

# MARSHALL STABILITY AND FLOW RAW DATA SHEET

December 5, 2019

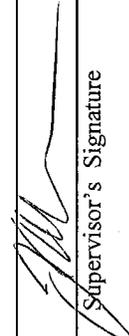
Project Name :  
Project No. : 19C-RATB-03

Lab No. : Kapolei

AC, %	Spec.	Thickness (inch)	Stability Uncorr. (lb)	Corr. Factor	Stability Corr. (lb)	Flow (1/100inch)	Avg. Stability (lb)	Avg. Flow (1/100inch)
3.50	1	2 1/2	3283	1.00	3283	12.0		
	2	2 1/2	3190	1.00	3190	12.0		
	3	2 1/2	3225	1.00	3225	12.0		
							3233	12.0
4.00	4	2 1/2	3303	1.00	3303	12.0		
	5	2 1/2	3385	1.00	3385	13.0		
	6	2 1/2	3394	1.00	3394	13.0		
							3361	12.7
4.50	7	2 1/2	3406	1.00	3406	13.0		
	8	2 1/2	3394	1.00	3394	13.0		
	9	2 1/2	3445	1.00	3445	14.0		
							3415	13.3

Remarks :

\_\_\_\_\_  
Technician's Signature

  
Supervisor's Signature

**MAXIMUM THEORETICAL SPECIFIC GRAVITY (RICE TEST)  
AASHTO T 209**

Project:	19C-RATB-03		Date:	12/5/2019
Mix Type:	RATB		Technician:	F. Hammann <i>FH</i>
SAMPLE ID#				
Weight of Bowl in Air, gm				
Weight of Bowl & Sample in Air, gm				
Weight of Sample in Air, gm (A)		2102.9	2101.1	
Weight of Bowl Submerged, gm (B)		1507.4	1507.4	
Weight of Bowl & Sample Submerged, gm (C)		2841.8	2842.5	
Maximum Specific Gravity ( $G_{mm}$ ) [A/(A-(C-B))]		2.736	2.743	2.740
% Asphalt Content (%AC)		4.00	4.00	
Specific Gravity of AC ( $G_b$ )		1.043	1.043	
Effective Specific Gravity of the Stone ( $G_{se}$ ) ( $G_{se} = (100 - \%AC) / ((100/G_{mm}) - (\%AC/G_b))$ )		2.934	2.943	2.939

$$G_{se} = \frac{100.0 - 4.0}{\frac{100.0}{2.740} - \frac{4.0}{1.043}}$$

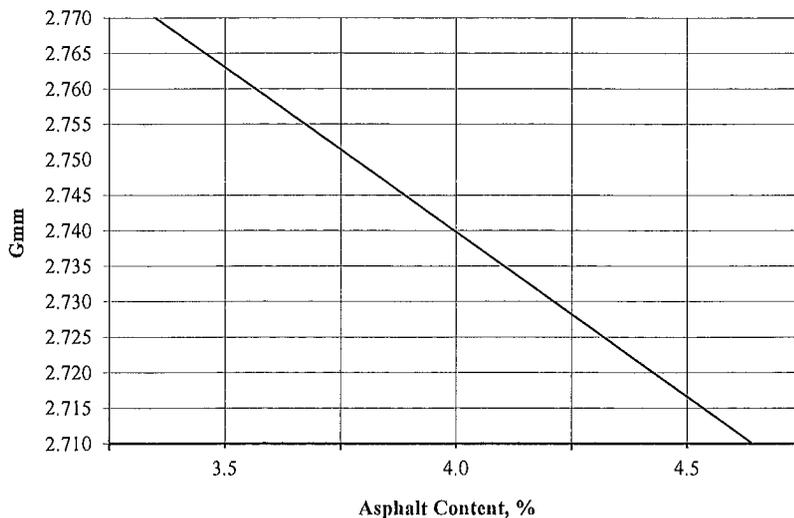
$$G_{se} = 2.939$$

$$G_{mm} @ 3.5 = \frac{100.0}{\frac{96.5}{2.939} + \frac{3.5}{1.043}}$$

$$G_{mm} = 2.763$$

$$G_{mm} @ 4.5 = \frac{100.0}{\frac{95.5}{2.939} + \frac{4.5}{1.043}}$$

$$G_{mm} = 2.717$$



AC, %	G <sub>mm</sub>
3.5	2.763
4.0	2.740
4.5	2.717

VOLUMETRIC PROPERTIES

Project No : 19C-RATB-03

Mix Type : RATB

Date : 12/5/2019

	AGG	AGG Percent%	G <sub>bdry</sub>	G <sub>hssd</sub>	G <sub>bapp</sub>	W <sub>abs%</sub>	AC % =
P1	3 Coarse	23	2.956	2.984	3.040	0.9	4.2
P2	3 Fine	10	2.951	2.983	3.048	1.1	
P3	4 Fine	37	2.753	2.857	3.072	3.8	
P4	C-RAP	30	2.891				
P5							
P6							
P7							
P8							

1) Bulk Specific Gravity of Aggregate (G<sub>sb</sub>)

$$G_{sb} = \frac{P_1 + P_2 + \dots + P_n}{\frac{P_1}{G_1} + \frac{P_2}{G_2} + \dots + \frac{P_n}{G_n}} = \frac{23}{2.956} + \frac{10}{2.951} + \frac{37}{2.753} + \frac{30}{2.891} + \frac{0}{2.871} + \dots$$

$$G_{sb} = \boxed{2.858} = \frac{100}{7.78 + 3.39 + 13.44 + 10.38 + 0 + \dots} = \frac{100}{34.99}$$

2) Effective Specific Gravity of Aggregate (G<sub>se</sub>)

$$G_{se} = \frac{P_{mm} - P_b}{\frac{P_{mm} - P_b}{G_{mm}} + \frac{P_b}{G_b}} = \frac{100 - 4.0}{\frac{100 - 4.0}{2.740} + \frac{4.0}{1.043}}$$

Per Mix Design

optimum AC content = 4.2  
MIX POINT 4.0

G<sub>se</sub> =  $\boxed{2.939}$

G<sub>mm</sub> = Maximum Specific Gravity (SpG)  
P<sub>mm</sub> = % By Weight of Total Loose Mixture = 100  
P<sub>b</sub> = Asphalt Content  
G<sub>b</sub> = Specific Gravity of Asphalt  
\*per Certificate G<sub>b</sub> = 1.043

3) Asphalt Absorption (P<sub>ba</sub>)

$$P_{ba} = 100 \times \frac{G_{se} - G_{sb}}{G_{sb} \times G_{se}} \times G_b = 100 \times \frac{2.939 - 2.858}{2.858 \times 2.939} \times 1.043$$

P<sub>ba</sub> =  $\boxed{1.01}$

G<sub>se</sub> = Effective Specific Gravity of Aggregate  
G<sub>sb</sub> = Bulk Specific gravity of Aggregate

4) Effective Asphalt Content of a Paving Mixture (P<sub>be</sub>)

$$P_{be} = P_b - \frac{P_{ba}}{100} \times P_s$$

Per Mix Design

optimum AC content =  $\boxed{4.2}$   
\* P<sub>b</sub> = 4.2

$$P_{be} = 4.2 - \frac{1.01}{100} \times 95.8$$

P<sub>be</sub> =  $\boxed{3.24}$

P<sub>b</sub> = Asphalt Content, % by total weight of mixture  
P<sub>ba</sub> = Absorbed Asphalt, % by weight of aggregate  
P<sub>s</sub> = Aggregate Content, % by total weight of mixture

VOLUMETRIC PROPERTIES

**5) Percent VMA in Compacted Paving Mixture (VMA)**

$$VMA = 100 - \frac{G_{mb} - P_s}{G_{sb}}$$

*Per Mix Design*

$$G_{mb} = \frac{161.7}{62.4}$$

$$G_{mb} = 2.591$$

$$VMA = \boxed{13.1}$$

VMA = Voids in Mineral Aggregate (VMA)

$G_{sb}$  = Bulk Specific Gravity of Total Aggregate

$G_{mb}$  = Bulk Specific Gravity of compacted Mixture

$P_s$  = Aggregate Content, % by Total weight of mixture

$$VMA = 100 - \frac{2.591 \times 100 - 4.2}{2.858}$$

**6) Percent Air Voids in Compacted Mixture ( $V_a$ )**

$$V_a = 100 \times \frac{G_{mm} - G_{mb}}{G_{mm}}$$

*Per Mix Design*

$$\text{optimum AC content} = 4.2$$

$$G_{mm} = 2.731$$

$$V_a = 100 \times \frac{2.731 - 2.591}{2.731}$$

$$V_a = \boxed{5.1}$$

$G_{mm}$  = Maximum Specific Gravity of paving Mixture

$G_{mb}$  = Bulk Specific Gravity of compacted Mixture

$$G_{mm} = \frac{P_{mm}}{\frac{P_a}{G_{sa}} + \frac{P_b}{G_b}}$$

$$= \frac{100}{\frac{100 - 4.2}{2.939} + \frac{4.2}{1.043}}$$

$$= 2.731$$

**7) Percent VFA in Compacted Mixture (VFA)**

$$VFA = 100 \times \frac{VMA - V_a}{VMA}$$

$$VFA = 100 \times \frac{13.1 - 5.1}{13.14}$$

$$VFA = \boxed{61.2}$$

VFA = Voids Filled with Asphalt, %VMA

**8) Dust to Binder Ratio or "Dust Proportion" (DP)**

$$DP = \frac{P_{0.075}}{P_{be}}$$

*Per Mix Design*

$$\#200 = 7.5$$

$$DP = \boxed{2.3}$$

$P_{0.075}$  = % passing #200 Sieve

$P_{be}$  = Effective Asphalt Cement

$$DP = \frac{7.5}{3.236}$$



# ASPHALT TECHNOLOGIES, INC.



## CERTIFICATE OF ANALYSIS

November 15, 2019

Report For: Asphalt Hawaii  
P.O. Box 78  
Honolulu, HI 96810

Attn: Richard Levins

Email: [rlevins@asphalthawaii.com](mailto:rlevins@asphalthawaii.com)

Sample ID: PG 64-16	Sample Date: 11/07/19	Project #: GRPC 100-02-02A
Tank: 2	Date Received: 11/13/19	Label: Asphalt Hawaii

**OBJECTIVE:** Evaluate for compliance with AASHTO M 320, Table 1 Performance Grade specifications for PG 64-16.

**DATA / RESULTS:**

PROPERTIES		TEST METHODS	SPECIFICATIONS	RESULTS		
<b>ORIGINAL BINDER</b>						
Flash Point, °C (°F) (COC)		T 48	230 min.	>316 (>600)		
Viscosity, Pa•s		T 316	3.0 max.	0.450		
Specific Gravity (API)		T 228	Report	1.043 (4.17)		
Dynamic Shear	---	T 315	1.0 min.	G*/sinδ	G* kPa	δ, °
	64°C			1.26	1.26	87.8
	70°C			<b>0.614</b>	<b>0.614</b>	<b>88.7</b>
<b>AFTER RTFOT</b>						
Mass Change, % (Mass Loss is reported as Negative)		T 240	1.0 max.	-0.084		
Dynamic Shear	---	T 315	2.2 min.	G*/sinδ	G* kPa	δ, °
	64°C			2.75	2.74	85.6
	70°C			<b>1.26</b>	<b>1.26</b>	<b>87.1</b>
<b>PRESSURE AGING RESIDUE (100°C, 300 psi, 20 hr.)</b>		R 28				
Dynamic Shear	---	T 315	5,000 max.	G*/sinδ	G* kPa	δ, °
	28°C			2,350	2,900	54.1
	25°C			3,670	4,750	50.6
	22°C			<b>5,580</b>	<b>7,620</b>	<b>47.1</b>
Creep Stiffness	Stiffness, MPa (60 sec.)	T 313	300 max.	88		
	m Value		0.300 min.	0.416		
	Stiffness, MPa (60 sec.)		300 max.	203		
	m Value		0.300 min.	0.343		
	Stiffness, MPa (60 sec.)		300 max.	428		
	m Value		0.300 min.	0.265		
AASHTO M 320, Table 1 Performance Grade, PG		AASHTO M 320		64-16		
"True" Performance Grade		ASTM D7643		65.7-25.1		

**DISCUSSION:** The sample met the requirements of AASHTO M 320, Table 1 Requirements for PG 64-16 with a "True Grade" of 65.7-25.1.

Tested by: Nick Johnson  
Nick Johnson, Paving Binder Technician

Date: November 15, 2019

Reviewed by: Damian Jamroz  
Damian Jamroz, Client Manager

Date: November 15, 2019

GRPC 100-02-02A

PRI's Accreditations: AASHTO/AAP; ISO/IEC 17025 Lab

The test results, opinions, or interpretations are based on the material supplied by the client. This report is for the exclusive use of stated client. No reproduction or facsimile in any form can be made without the client's permission. PRI Asphalt Technologies, Inc. assumes no responsibility nor makes a performance or warranty statement for this material or products and processes containing this material in connection with this report.

PRI Asphalt Technologies, Inc. 6408 Badger Drive Tampa, FL 33610 • Tel: 813-621-5777 • Fax: 813-621-5840 • e-mail: [djamroz@priasphalt.com](mailto:djamroz@priasphalt.com) • Website: <http://www.priasphalt.com>



# ASPHALT TECHNOLOGIES, INC.



## CERTIFICATE OF ANALYSIS

November 15, 2019

Report For: Asphalt Hawaii  
P.O. Box 78  
Honolulu, HI 96810

Attn: Richard Levins

Email: [rlevins@asphalthawaii.com](mailto:rlevins@asphalthawaii.com)

Sample ID: PG 64-16	Sample Date: 11/07/19	Project #: GRPC 100-02-02C
Tank: 2	Date Received: 11/13/19	Label: Asphalt Hawaii

**OBJECTIVE:** Evaluate binder to develop a laboratory mixing and compaction chart.

### DATA/RESULTS:

PROPERTIES	TEST METHODS	SPECIFICATIONS	RESULTS
<b>ORIGINAL BINDER</b>			
<b>AASHTO M 320 Requirements</b>			
Specific Gravity	15.6°C	T 228	1.043
API Gravity	275°F		4.17
Viscosity, Pa•s	293°F	T 316	0.450
	311°F		0.282
	329°F		0.185
	347°F		0.127
		Report	0.090

**DISCUSSION:** The Mixing Temperature Range for the PG 64-16, corresponding to a viscosity range of 0.15 to 0.19 Pa-s, is 312-322°F. The Compaction Temperature Range for the PG 64-16, corresponding to a viscosity range of 0.25 to 0.31 Pa-s, is 290-299°F. See temperature/viscosity chart on the following page.

Tested by:   
Nick Johnson, Paving Binder Technician

Date: November 15, 2019

Reviewed by:   
Damian Jamroz, Client Manager

Date: November 15, 2019

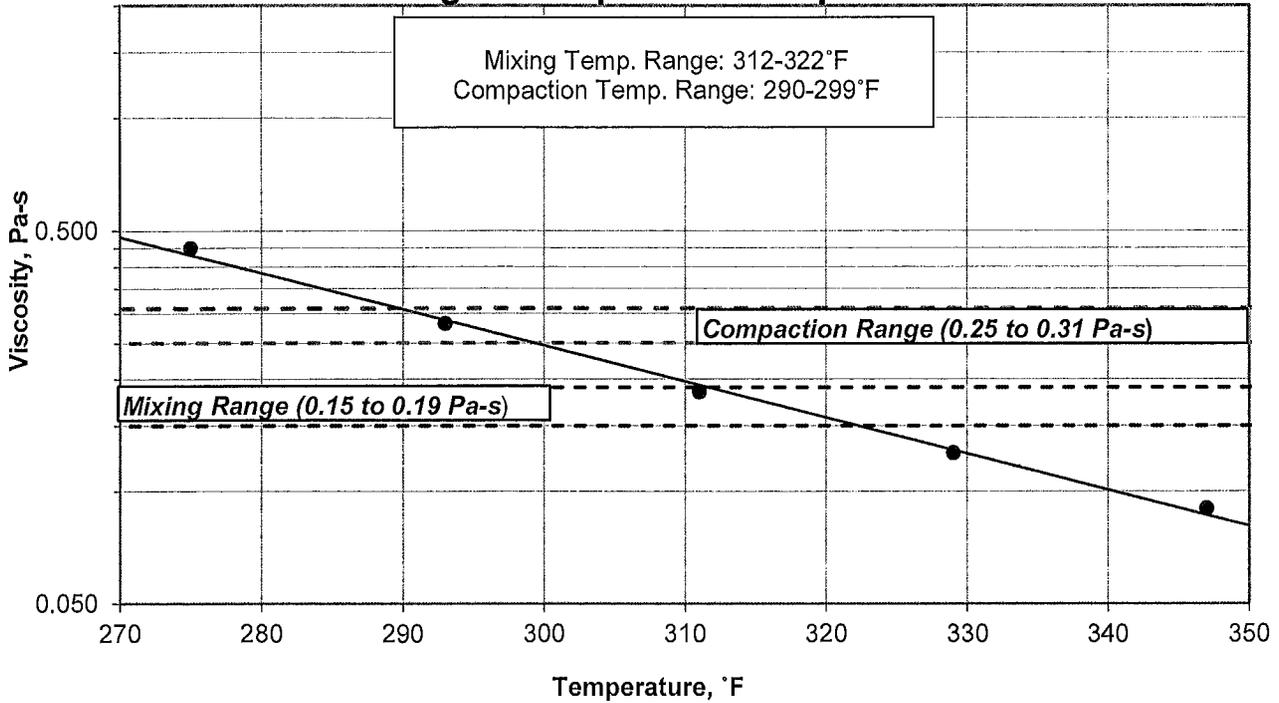


# ASPHALT TECHNOLOGIES, INC.

Richard Levins/Asphalt Hawaii  
Certificate of Analysis  
November 15, 2019, Page 2 of 2

## DATA/RESULTS:

### Asphalt Hawaii PG 64-16 November 2019 Mixing & Compaction Temperature



This is an approximation for laboratory mixing and compaction use.

# SHINSATO ENGINEERING, INC.

Consulting Geotechnical Engineers

98-747 KUAHAO PLACE, SUITE E  
PEARL CITY, HAWAII 96782  
PHONE: (808) 487-7855  
FAX: (808) 487-7854

January 11, 2020  
Project No. 19-0081

Hawaii Engineering Group, Inc.  
Attention: Ather Dar  
1088 Bishop Street, Suite 2506  
Honolulu, Hawaii 96813

Subject: Review of Material Submittal  
Proposed Pavement Reconstruction  
Factory Street  
Honolulu, Hawaii 96819

Gentlemen:

We have reviewed the product submittal for the untreated aggregate base course material from Hawaiian Cement. No exceptions taken (see below).

Should you have any questions or require any further information, please do not hesitate to contact us.

Very truly yours,

SHINSATO ENGINEERING, INC.



Lawrence S. Shinsato, P.E.  
President



LSS:ls

This work was prepared by me  
or under my supervision.  
License Expires 04/30/20

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO EXCEPTION TAKEN | <input type="checkbox"/> MAKE CORRECTION NOTED |
| <input type="checkbox"/> REJECTED                      | <input type="checkbox"/> REVISE AND RESUBMIT   |
| <input type="checkbox"/> SUBMIT SPECIFIED ITEM         |  |

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; satisfactory performance of this work.

SHINSATO ENGINEERING, INC.

Date: January 11, 2020 By: Lawrence S. Shinsato

**TYPICAL AGGREGATE DATA SHEET**

**DATE: September 9, 2019**  
**CONTRACTOR: Environmental Quality Management, Inc.**  
**PROJECT: Factory Street Lead Site, Honolulu, HI**  
**LOCATION: Island of O'ahu, Hawaii**

(37.5mm) x (0)

<b>PRODUCT: BASE COARSE</b>	<b>PRODUCT NUMBER: 452090</b>	<b>SIZE: 1.5" x 0</b>
<b>SOURCE: Halawa Quarry</b>		<b>TYPE: Basaltic</b>

UNIT WEIGHT ASTM		
	Loose	Rodded
LBS/CU.FT	96.24	114.49
LBS/CU.YD	2598	3091
TNS/CU.YD	1.30	1.54

*TYPICAL MAXIMUM DENSITY (100%) ASTM D1557 C, C136, D2216			
	Dry	Wet	Optimum Moisture
LBS/CU.FT	130.8		6.4
LBS/CU.YD			
TNS/CU.YD	1.77		

**SCREEN ANALYSIS ASTM C136 & D1140			
Sieve Size (Metric SI)	ST DOT	(%) PASSING	
2" (50mm)	100	100	
1.5" (37.5mm)	90-100	100	
1"		94.5	
3/4" (19mm)	50-90	82	
1/2"		65.6	
3/8"		56.5	
No.4 (4.75mm)	25-50	39.4	
No.8		28	
No.16		18.5	
No.30		12.7	
No.50		8.7	
No.100		6.6	
No.200 (75um)	3-9	5.3	

*PHYSICAL TEST RESULTS			
	ASTM	ST DOT	TEST DATA
Classification:	D2487		GW-GM
Sand Equivalent:	D2419	30 MIN	55
Liquid Limit:	D4318		
Plastic Limit:	D4318		
Plasticity Index:	D4318	6 MAX	N/P
SpG-Bulk SSD:	C127		
LA 500 Rev:	C131	40 MAX	24.6
CBR 0.2" Pen:	D1883		
Swell:			
CBR 0.1" Pen:	D1883		85.9
Swell:			0
Flats & Elongate:	D4791	25 MAX	0
Soundness:	C88		5.2



**Kevin McCary**  
Quality Control Supervisor

**REMARKS:**  
Because the liquid limit could not be determined (CNBD), the material is non-plastic (N/P).  
*\*note: physical test results based off of annual certifications performed by a 3rd party testing lab.*  
*\*\*note: screen analysis is based off of monthly average in house test results.*

## **Summary of Concrete Cylinder Test Report**

The project sidewalk concrete was poured in two separate batches, one on February 27, 2020 and the second on March 3, 2020. One set of 3 (6" x12") cylinders were made from each pour. The approved project plans call out for a concrete mix design of 3000 psi compressive strength concrete. The City and County "Standard Specifications for Public Works" require min. class B (2500 psi) concrete for sidewalks. An independent concrete quality control and testing company "Construction Engineering Labs" (CEL) was engaged to by HEG to monitor the concrete pours and sample concrete for strength verification. CEL documented concrete temp during each pour, took slump tests for concrete and made one set of 3 6" dia x 12" cylinders for testing concrete strength from each pour. The measured temperature and concrete slump were within acceptable ranges of (<90 deg. F) and (3.5", +/- 1") respectively.

The test specimens were made and cured in accordance with ASTM C31 "Standard Practice for Making and Curing Concrete Test Specimens in the field". The test specimens were tested in accordance with ASTM C39 "Standard Test Method for Compressive Strength of Cylindrical concrete specimens". The specimens were tested for 7 day compressive strength and 28 day compressive strength. The test results either met or exceeded the required compressive strength of concrete at 28 days.

The concrete vendor was "Hawaiian cement" and the contractor responsible for concrete pour was "BC Construction, LLC".



# Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000002

Report Date: 3/26/2020

Sample: 1466

96-1173 Waihona St. Unit B-7  
 Pearl City, HI 96782  
 Phone: 808-455-1522  
 Fax: 808-455-1384

**Client:**  
 Hawaii Engineering Group  
 1088 Bishop Street  
 Suite 2506  
 Honolulu, HI 96813

**Project:**  
 Hawaii Engineering Group 001  
 Factory Street Lead  
 901 Factory Street  
 2344 Pahounui Dr  
 Honolulu, HI 96819

Sample Details			
<b>Set #:</b>	1	<b>Technician:</b>	Kameran Self-Gomes
<b>Specimen Size:</b>	6" X 12"	<b>Cast By:</b>	Kameran Self-Gomes
<b>Specimens In Set:</b>	3	<b>Date Cast:</b>	02/27/20
<b>Truck / Ticket #:</b>	50656671 / 1638	<b>Sampled From:</b>	Chute
<b>Contractor:</b>		<b>Placement Method:</b>	
<b>Batched:</b>		<b>Sampled From:</b>	Chute
<b>Sampled:</b>	07:48 HAST	<b>Truck Empty:</b>	
<b>Cast:</b>	07:51 HAST	<b>Placement Time:</b>	

Location	
<b>Placement Location:</b>	1-See Below
<b>Location Details:</b>	Sidewalk and curb
<b>Sample Location / Notes:</b>	Job

Batch Log	Specifications
<b>Supplier:</b> Hawaiian Cement	<b>Strength:</b> 3000 (psi)
<b>On-Site Admixtures:</b> None	

Field Measurements		
<b>Weather:</b>	<b>Slump (in):</b> 4 (ASTM C 143)	<b>Plastic Unit Weight:</b>
<b>Air Temperature (F):</b>	<b>Concrete Temp (F):</b> 84 (ASTM C 1078)	<b>Air Content:</b>
		<b>Load Volume:</b>

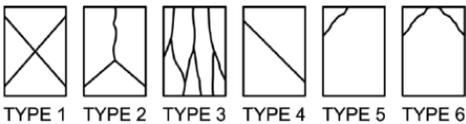
### Lab Test Results

Testing Lab: Pearl City, 96-1173 Waihona St Unit B-7, Pearl City, HI, 96782

Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
1-1	7	03/05/20	1 / 6	6.00	28.27	75,275	2,660	5		N
1-2	28	03/26/20	1 / 27	6.00	28.27	123,750	4,380	5		N
1-3	28	03/26/20	1 / 27	6.00	28.27	118,675	4,200	5		N

Test Age Average Strengths (psi): 7 Day - 2660, 28 Day - 4290

Capping Methods	
<b>Tested By:</b> Lab Tech (1,2,3)	<b>N:</b> Neoprene Pads Unbonded (ASTM C1231)
<b>Checked In :</b> 02/28/2020 (1,2,3)	



REVIEWED

REVIEWED AS NOTED

REVISE AND RESUBMIT

FOR YOUR INFORMATION AND USE

INCOMPLETE SUBMITTAL

NOT REVIEWED

Checking is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

Hawaii Engineering Group, Inc.

Date: 4-02-20 By: A Dar

By: Ronald A. Pickering  
 Its: President



# Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000003

Report Date: 3/31/2020

Sample: 1500

96-1173 Waihona St. Unit B-7  
 Pearl City, HI 96782  
 Phone: 808-455-1522  
 Fax: 808-455-1384

**Client:**  
 Hawaii Engineering Group  
 1088 Bishop Street  
 Suite 2506  
 Honolulu, HI 96813

**Project:**  
 Hawaii Engineering Group 001  
 Factory Street Lead  
 901 Factory Street  
 2344 Pahounui Dr  
 Honolulu, HI 96819

Sample Details			
<b>Set #:</b>	2	<b>Technician:</b>	Kameran Self-Gomes
<b>Specimen Size:</b>	6" X 12"	<b>Cast By:</b>	Kameran Self-Gomes
<b>Specimens In Set:</b>	3	<b>Date Cast:</b>	03/03/20
<b>Truck / Ticket #:</b>		<b>Sampled From:</b>	Chute
<b>Contractor:</b>		<b>Placement Method:</b>	
<b>Batched:</b>		<b>Sampled From:</b>	Chute
<b>Sampled:</b>	02:02 HAST	<b>Truck Empty:</b>	
<b>Cast:</b>	02:09 HAST	<b>Placement Time:</b>	

Location	
<b>Placement Location:</b>	1-See Below
<b>Location Details:</b>	Sidewalk and curb
<b>Sample Location / Notes:</b>	Job

Batch Log	Specifications
<b>Supplier:</b> Hawaiian Cement	<b>Strength:</b> 3000 (psi)
<b>On-Site Admixtures:</b> None	

Field Measurements		
<b>Weather:</b>	<b>Slump (in):</b> 3-1/2 (ASTM C 143)	<b>Plastic Unit Weight:</b>
<b>Air Temperature (F):</b>	<b>Concrete Temp (F):</b> 86 (ASTM C 1078)	<b>Air Content:</b>
		<b>Load Volume:</b>

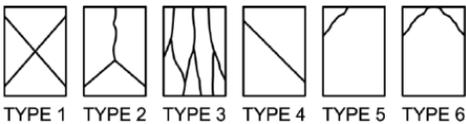
### Lab Test Results

Testing Lab: Pearl City, 96-1173 Waihona St Unit B-7, Pearl City, HI, 96782

Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
2-1	7	03/10/20	3 / 4	6.00	28.27	54,670	1,930	3		N
2-2	28	03/31/20	3 / 25	6.00	28.27	95,265	3,370	5		N
2-3	28	03/31/20	3 / 25	6.00	28.27	93,700	3,310	5		N

Test Age Average Strengths (psi): 7 Day - 1930, 28 Day - 3340

Capping Methods	
<b>Tested By:</b> Lab Tech (1,2,3)	<b>N:</b> Neoprene Pads Unbonded (ASTM C1231)
<b>Checked In :</b> 03/06/2020 (1,2,3)	



REVIEWED

REVIEWED AS NOTED

REVISE AND RESUBMIT

FOR YOUR INFORMATION AND USE

INCOMPLETE SUBMITTAL

NOT REVIEWED

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Hawaii Engineering Group, Inc.  
 Date: 4-01-20 By: A Dar

*Ronald A. Pickering*  
 By: Ronald A. Pickering  
 Its: President



**HAWAII  
ENGINEERING  
GROUP, INC.**

Reference #18-220

Consulting Civil & Structural Engineers  
US (SBA), 8(a), SDB & DBE Certified

April 6, 2020

Ms. Kathy K. Sokugawa, Acting Director  
Department of Planning and Permitting  
650 S. King Street 7<sup>th</sup> Floor  
Honolulu, HI 96813

Dear Ms. Sokugawa,

Subject: Grading Certificate  
Factory Street  
Hawaii Engineering Group (Plan Maker)  
Environmental Quality Management, Inc. (Contractor)  
Kalihi, Oahu, Hawaii  
TMK(s): (1) 1-2-001: Road and (1) 1-2-011: Road

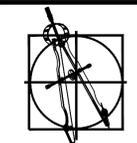
This is to inform you that the grading of the site, within Tax Map parcel (1) 9-4-049: parcel 047 has been completed, and substantially conforms to the elevations as shown on the Factory Street Reconstruction After Lead Removal, Between 0+00 to Sta 2+02 dated 9/12/2019 with an Issuance/Revisions date of 01/10/2020.

Sincerely yours,  
Hawaii Engineering Group

Michael T. Kutaka  
Licensed Professional Surveyor  
Certificate Number 9488  
Expiration Date: 4/30/2022



Copy of Factory Street  
Reconstruction Plan attached



**HAWAII ENGINEERING GROUP, Inc.**  
Civil & Structural Engineers



Exp. Date: 4-30-20

*Gregory D. Santoro*  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

**PROJECT**  
FACTORY STREET RECONSTRUCTION  
AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02  
CIVIL IMPROVEMENT PLANS  
KALIHI, HONOLULU, OAHU, HAWAII

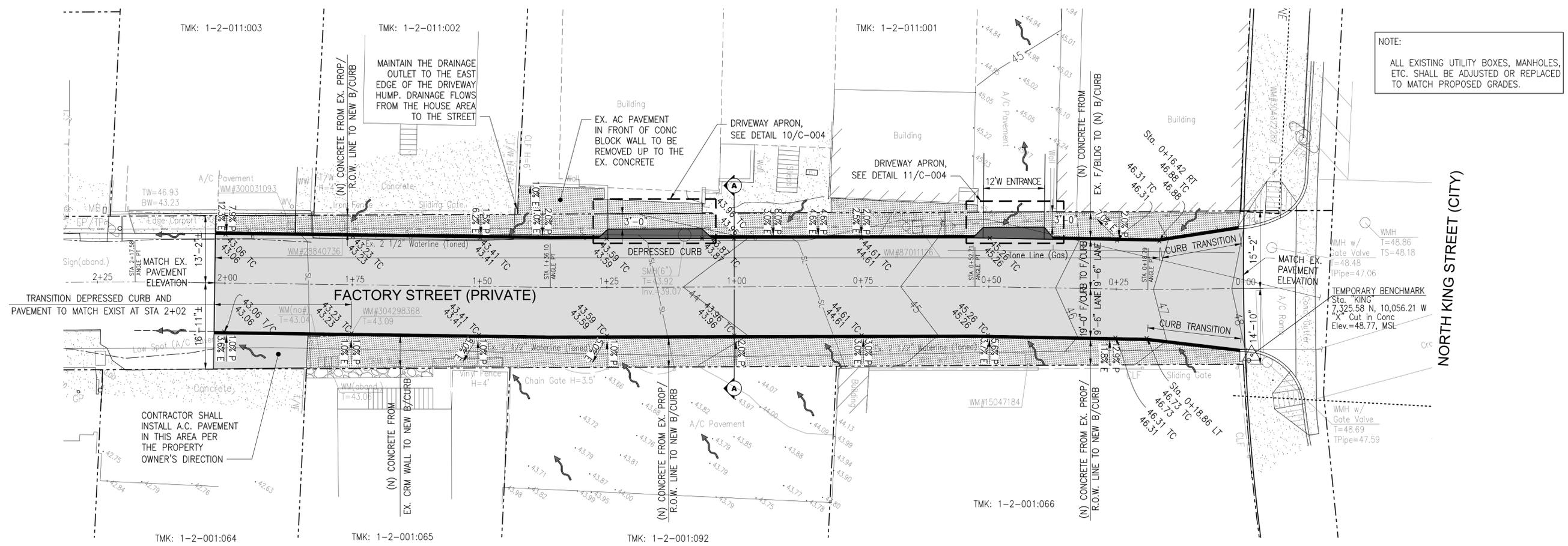
T.M.K. : 1-2-001:ROAD & 1-2-011:ROAD

**SHEET TITLE**  
CIVIL SITE PLAN AND PROFILE

**ISSUANCE/REVISIONS**

Date 09/12/2019  
Scale AS NOTED  
Drawn By DL  
Design By GS  
Checked By GS  
Job 19-053

Sheet  
**C-003**  
4 Of 6 Sheets

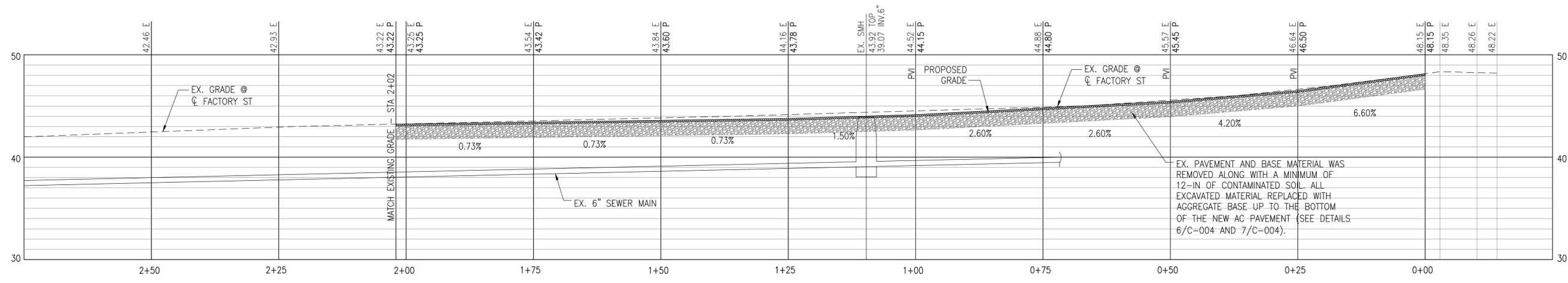


**NOTE:**  
ALL EXISTING UTILITY BOXES, MANHOLES, ETC. SHALL BE ADJUSTED OR REPLACED TO MATCH PROPOSED GRADES.

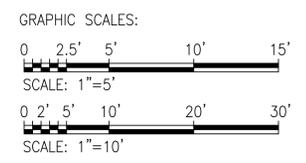
**LEGEND:**

	PROPOSED CONCRETE, SEE DETAIL 8/C-004		PROPERTY LINE
	PROPOSED AC PAVEMENT, SEE DETAIL 6/C-004		DRAINAGE FLOW
	EX. CONTOURS		EX. STREET CENTER LINE ELEVATION
	PROPOSED CONTOURS		PROPOSED STREET CENTER LINE ELEVATION (FINISHED GRADE)
	EX. SPOT ELEVATION		EX. 6" SEWER LATERAL
	PROPOSED ELEVATION		

**1 CIVIL SITE PLAN**  
C-003 SCALE: 1" = 10'-0"



**2 PROPOSED STREET PROFILE**  
C-003 SCALE: 1" = 10' (HORZ.) 1" = 5' (VERT.)





---

**APPENDIX F**  
**FACTORY STREET RECONSTRUCTION CIVIL IMPROVEMENT PLAN**

---

# FACTORY STREET RECONSTRUCTION AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02 CIVIL IMPROVEMENT PLANS

KALIHI, OAHU, HAWAII 96819  
TMK: 1-2-001:ROAD AND 1-2-011: ROAD



*Gregory D. Santoro*  
THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION AND  
CONSTRUCTION OF THIS PROJECT  
WILL BE UNDER MY OBSERVATION

PROJECT  
 FACTORY STREET RECONSTRUCTION  
 AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02  
 CIVIL IMPROVEMENT PLANS  
 KALIHI, HONOLULU, OAHU, HAWAII

GENERAL NOTES	PREPARED BY	PREPARED FOR	ZONING DATA														
<ol style="list-style-type: none"> <li>THE INFORMATION CONTAINED HEREIN IS BASED UPON LIMITED FIELD INVESTIGATIONS AND AVAILABLE RECORD DRAWINGS.</li> <li>DRAWINGS ARE INTENDED TO PROVIDE A GRAPHIC ILLUSTRATION OF DESIGN CONCEPT, ONLY, AND DEPICT THE GENERAL PLACEMENT OF CERTAIN COMPONENTS IN RELATION TO EACH OTHER.</li> <li>FOR CLARITY, DETAIL DRAWINGS DO NOT SHOW ALL COMPONENTS OR ILLUSTRATE ALL FIELD CONDITIONS THAT MAY BE PRESENT.</li> <li>CONTRACTOR SHALL TAKE MEASUREMENTS AND FIELD-VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION.</li> <li>ALL CONSTRUCTION SHALL CONFORM TO THE FOLLOWING BUILDING CODES: 2006 IBC 2012 NFPA 1, UFC 2006 UPC WITH STATE AMENDMENTS 2006 IECC 2008 NEC TITLE 11 CHAPTER 39</li> </ol>	<p><u>CIVIL ENGINEER</u></p> <p>HAWAII ENGINEERING GROUP, INC. 1088 BISHOP STREET, SUITE 2506 HONOLULU, HAWAII 96813</p> <p>CONTACT: GREGORY D. SANTORO, P.E.</p>	<p><u>PROJECT CONTRACTOR</u></p> <p>ENVIRONMENTAL QUALITY MANAGEMENT, INC. 18939 120TH AVENUE NE, SUITE 103 BOTHELL, WASHINGTON 98011</p> <p>CONTACT: BRYAN CHERNICK</p>	<p>ZONING: ROAD TMK: 1-2-001:ROAD AND 1-2-011:ROAD LOT AREA: N/A</p> <p>HEIGHT LIMIT: N/A FLOOD ZONE: X SPECIAL MANAGEMENT AREA (SMA): NOT IN SMA SPECIAL DISTRICT: NOT IN SPECIAL DISTRICT STATE LAND USE: BMX-3 COMMUNITY BUSINESS MIXED USE AND IMX-1 INDUSTRIAL MIXED USE STREET SETBACK: NONE</p>														
<p>ISLAND MAP</p> <p>SEE LOCATION MAP</p>	<p>LOCATION MAP</p>		<p>INDEX TO DRAWINGS</p> <table border="1"> <thead> <tr> <th>DWG. NO.</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>T-001</td> <td>TITLE SHEET</td> </tr> <tr> <td>C-001</td> <td>CIVIL NOTES AND ABBREVIATIONS</td> </tr> <tr> <td>C-002</td> <td>EXISTING SITE PLAN AND PROFILE</td> </tr> <tr> <td>C-003</td> <td>CIVIL SITE PLAN AND PROFILE</td> </tr> <tr> <td>C-004</td> <td>CIVIL DETAILS</td> </tr> <tr> <td>C-005</td> <td>RECONSTRUCTION OF EX. MANHOLE COVER DETAILS</td> </tr> </tbody> </table>	DWG. NO.	DESCRIPTION	T-001	TITLE SHEET	C-001	CIVIL NOTES AND ABBREVIATIONS	C-002	EXISTING SITE PLAN AND PROFILE	C-003	CIVIL SITE PLAN AND PROFILE	C-004	CIVIL DETAILS	C-005	RECONSTRUCTION OF EX. MANHOLE COVER DETAILS
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T.M.K. : 1-2-001:ROAD & 1-2-011:ROAD

SHEET TITLE  
TITLE SHEET

ISSUANCE/REVISIONS  
01/10/2020

Date 09/12/2019  
Scale AS NOTED  
Drawn By DL  
Design By GS  
Checked By GS  
Job 19-053

Sheet  
T-001  
1 Of 6 Sheets

**GRADING NOTES:**

- ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 14, ARTICLES 13, 14, 15 AND 16, AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED.
- NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60.1, "AIR POLLUTION CONTROL".
- THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
- ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
- ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
- THE GENERAL CONTRACTOR/DEVELOPER/OWNER OF THE PROJECT SHALL BE RESPONSIBLE FOR ALL GRADING OPERATIONS TO BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS," AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS.

- WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
- TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
- IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFOM THE CIVIL ENGINEERING BRANCH, D.P.P. (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.
- ALL GRADING AND CONSTRUCTION WORK SHALL IMPLEMENT MEASURES TO ENSURE THAT THE DISCHARGE OF POLLUTANTS FROM THE CONSTRUCTION SITE WILL BE REDUCED TO THE MAXIMUM EXTENT PRACTICABLE AND WILL NOT CAUSE OR CONTRIBUTE TO AN EXCEEDANCE OF WATER QUALITY STANDARDS.
- NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHALL COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE VIOLATOR. FURTHERMORE, VIOLATORS SHALL BE SUBJECTED TO ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES.
- BASIS OF ELEVATION: STA HCTC-53, WHICH IS A 3-1/2" BRASS DISK STAMPED CITY & COUNTY OF HONOLULU, HAVING AN ELEVATION OF 15.125 FT, MEAN SEA LEVEL (MSL). TEMPORARY BENCHMARK TO BE USED FOR THE PROJECT: STA "KING", 7325.58 N, 10056.21 W, "X" CUT IN CONCRETE, ELEVATION = 48.77 FT, MSL.

**PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES:**

- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE COUNTY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
- NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATIONS SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION(S) OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
- THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
- THE CONTRACTOR ATTENTION IS DIRECTED TO TITLE II, ADMINISTRATIVE RULES, CHAPTER 46 PUBLIC HEALTH REGULATIONS DEPARTMENT OF HEALTH, STATE OF HAWAII "COMMUNITY NOISE CONTROL" IN WHICH MAXIMUM ALLOWABLE NOISE LEVELS HAVE BEEN SET. THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46Z E AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS.

**CONSTRUCTION NOTES:**

- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986 AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
- THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
- CONFINED SPACE  
  
FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
  - ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
    - FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
    - LIFELINE AND ASSOCIATED CLIPS.
    - INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
    - TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
    - EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
    - CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
    - CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20- FEET AWAY).
    - PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
  - CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
  - ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.
- FOR PROJECTS ABUTTING STATE HIGHWAYS' RIGHTS-OF WAY, THE OWNER OR HIS AUTHORIZED REPRESENTATIVE SHALL NOTIFY THE STATE DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION, OAHU DISTRICT, DRAINAGE DISCHARGE UNIT AT 831- 6793 FOR AN ASSESSMENT OF STATE HIGHWAYS PERMIT REQUIREMENTS.
- BASIS OF ELEVATION: STA HCTC-53, WHICH IS A 3-1/2" BRASS DISK STAMPED CITY & COUNTY OF HONOLULU, HAVING AN ELEVATION OF 15.125 FT, MEAN SEA LEVEL (MSL). TEMPORARY BENCHMARK TO BE USED FOR THE PROJECT: STA "KING", 7325.58 N, 10056.21 W, "X" CUT IN CONCRETE, ELEVATION = 48.77 FT, MSL.

**DISABILITY AND COMMUNICATION ACCESS BOARD (DCAB) REQUIREMENTS:**

- THIS PROJECT SHALL MEET THE ACCESSIBILITY REQUIREMENTS OF HAWAII REVISED STATUTES (HRS) 103-50 AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) PARAGRAPH 206 AND CHAPTER 402.

**LEGEND OF SYMBOLS & ABBREVIATIONS**

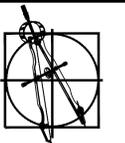
A/C	ASPHALTIC CONCRETE	ICV	IRRIGATION CONTROL VALVE
BC	BOTTOM OF CURB/CONCRETE	in.	INCH
BFP	BACK FLOW PREVENTER	GW	GUY WIRE
BLDG	BUILDING	H	HEIGHT
BS	BOTTOM OF STEP	HB	HOSE BIBB
BW	BOTTOM OF WALL	LT	LEFT
C	CORNER	MB	MAILBOX
CL	CENTERLINE	MH	MANHOLE
CLF	CHAINLINK FENCE	PT	POINT
CRM	CONCRETE RUBBLE MASONRY	RT	RIGHT
CO	CLEAN OUT	SMH	SEWER MANHOLE
CONC	CONCRETE	T	TOP
D	DIAMETER	T/W	TILE WALL
DMH	STORM DRAIN MANHOLE	TC	TOP OF CURB/CONCRETE
DS	DOWNSPOUT	TP	TELEPHONE POLE
EO	ELECTRICAL OUTLET	TS	TOP OF STEP
EP	EDGE OF PAVEMENT	TW	TOP OF WALL
EX	EXISTING	UP	UTILITY POLE
FD	FOUND	W	WIDTH
FL	FENCE LINE	W/	WITH
ft.	FEET	WMH	WATER MANHOLE
G	GROUND	WM	WATER METER
GP	GUARD POST	WV	WATER VALVE
GW	GUY WIRE	WW	WALKWAY

**CONCRETE NOTES:**

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE ACI STANDARDS 336.1, "SPECIFICATION FOR THE CONSTRUCTION OF DRILLED PIERS;" 336.3R-93, "DESIGN AND CONSTRUCTION OF DRILLED PIERS (REAPPROVED 2006);" AND ACI 318-05, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;" UNLESS OTHERWISE NOTED.
- ALL CONCRETE SHALL DEVELOP THE FOLLOWING MINIMUM ULTIMATE COMPRESSIVE STRENGTHS, WITH CORRESPONDING MAXIMUM SIZE OF AGGREGATES AND WATER/CEMENT RATIOS AS FOLLOWS (UNLESS SHOWN ELSEWHERE IN SCHEDULES):
 

28 DAY	MINIMUM	MAXIMUM	MAXIMUM
STRENGTH	CEMENT	SIZE	WATER/CEMENT
(PSI)	(LBS/CY)	AGGREGATE	RATIO
4500	610	3/4"	0.45
3000	610	3/4"	0.45
- ADMIXTURES:  
ALL SLABS: USE WATER REDUCING AND RETARDING ADMIXTURE.  
OTHER CONCRETE: USE OF ADMIXTURE AT CONTRACTOR'S OPTION, BUT SUBJECT TO ENGINEER'S APPROVAL.
- THE USE OF ANY CALCIUM CHLORIDE IN ANY CONCRETE IS PROHIBITED.
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE I OR II.
- CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BE SUBMITTED FOR REVIEW AT LEAST 14 DAYS BEFORE ACTUAL CONCRETE PLACING OPERATIONS.
- MINIMUM CLEAR COVER OF CONCRETE TO REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
 

A. FOOTINGS, ETC., CAST AGAINST EARTH .....	3"
B. SLABS EXPOSED TO WEATHER OR GROUND:	
#5 BAR OR SMALLER .....	1-1/2"
#6 BAR OR LARGER .....	2"
- ALL REINFORCING BARS, ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACEMENT OF THE CONCRETE.
- ALL INSERTS, ANCHOR BOLTS, PLATES, ETC. EMBEDDED IN CONCRETE SHALL BE HOT-DIP GALVANIZED PER ASTM A123.
- CONCRETE SAMPLING AND DELIVERY SHALL BE IN ACCORDANCE WITH ASTM C172/C172M AND TESTED IN ACCORDANCE WITH ACI 318 SECTION 5.6. SAMPLES FOR STRENGTH TESTS SHALL BE TAKEN IN ACCORDANCE WITH ASTM C172. CYLINDERS FOR STRENGTH TESTS SHALL BE MOLDED AND LABORATORY CURED (OR FIELD CURED AT THE GOVERNING AGENCY'S REQUEST) IN ACCORDANCE WITH ASTM C31 AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH ASTM C39.
- QUALIFIED FIELD TESTING TECHNICIANS SHALL PERFORM TESTS ON FRESH CONCRETE AT THE JOB SITE, PREPARE SPECIMENS REQUIRED FOR CURING UNDER FIELD CONDITIONS, PREPARE SPECIMENS REQUIRED FOR TESTING IN THE LABORATORY, AND RECORD TEMPERATURE OF THE FRESH CONCRETE WHEN PREPARING SPECIMENS FOR STRENGTH TESTS. QUALIFIED LABORATORY TECHNICIANS SHALL PERFORM ALL REQUIRED LABORATORY TESTS.
- A STRENGTH TEST SHALL BE THE AVERAGE OF THE STRENGTHS OF TWO CYLINDERS MADE FROM THE SAME SAMPLE OF CONCRETE AND TESTED AT 28 DAYS OR AT TEST AGE DESIGNATED FOR DETERMINATION OF F'c.
- THE MINIMUM STRENGTH REQUIREMENTS SHALL BE SATISFIED IF THE FOLLOWING CONDITIONS ARE MET:  
  
THE AVERAGES OF ALL SETS OF THREE CONSECUTIVE STRENGTH TEST RESULTS EQUAL OR EXCEED THE REQUIRED F'c AND NO INDIVIDUAL STRENGTH TEST RESULT FALLS BELOW THE REQUIRED F'c BY MORE THAN 500 PSI, WHERE EACH STRENGTH RESULT SHALL BE THE AVERAGE OF TWO CYLINDERS FROM THE SAME SAMPLE.
- FREQUENCY OF TESTING: SAMPLES FOR STRENGTH SHALL BE TAKEN FROM EACH CONCRETE POUR. FREQUENCY OF SAMPLES SHALL BE THREE (3) CONCRETE CYLINDER FOR EACH 50 CYD OR LESS OF CONCRETE DELIVERED.
- NOTIFY THE CONTRACTING OFFICER THREE (3) WORKING DAYS PRIOR TO ANY CONCRETE PLACEMENT. NO CONCRETE SHALL BE PLACED PRIOR TO OBSERVATION BY THE CONTRACTING OFFICER OR HIS REPRESENTATIVE.



**HAWAII ENGINEERING GROUP, Inc.**  
Civil & Structural Engineers



*Gregory D. Santoro*  
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**PROJECT**  
**FACTORY STREET RECONSTRUCTION**  
**AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02**  
**CIVIL IMPROVEMENT PLANS**  
 KALIHI, HONOLULU, OAHU, HAWAII

T.M.K. : 1-2-001:ROAD & 1-2-011:ROAD

**SHEET TITLE**

**CIVIL NOTES AND ABBREVIATIONS**

**ISSUANCE/REVISIONS**

01/10/2020

Date 09/12/2019

Scale AS NOTED

Drawn By DL

Design By GS

Checked By GS

Job 19-053

Sheet

**C-001**

2 Of 6 Sheets

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**PROJECT**  
FACTORY STREET RECONSTRUCTION  
AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02  
CIVIL IMPROVEMENT PLANS  
KALIHĪ, HONOLULU, OAHU, HAWAII

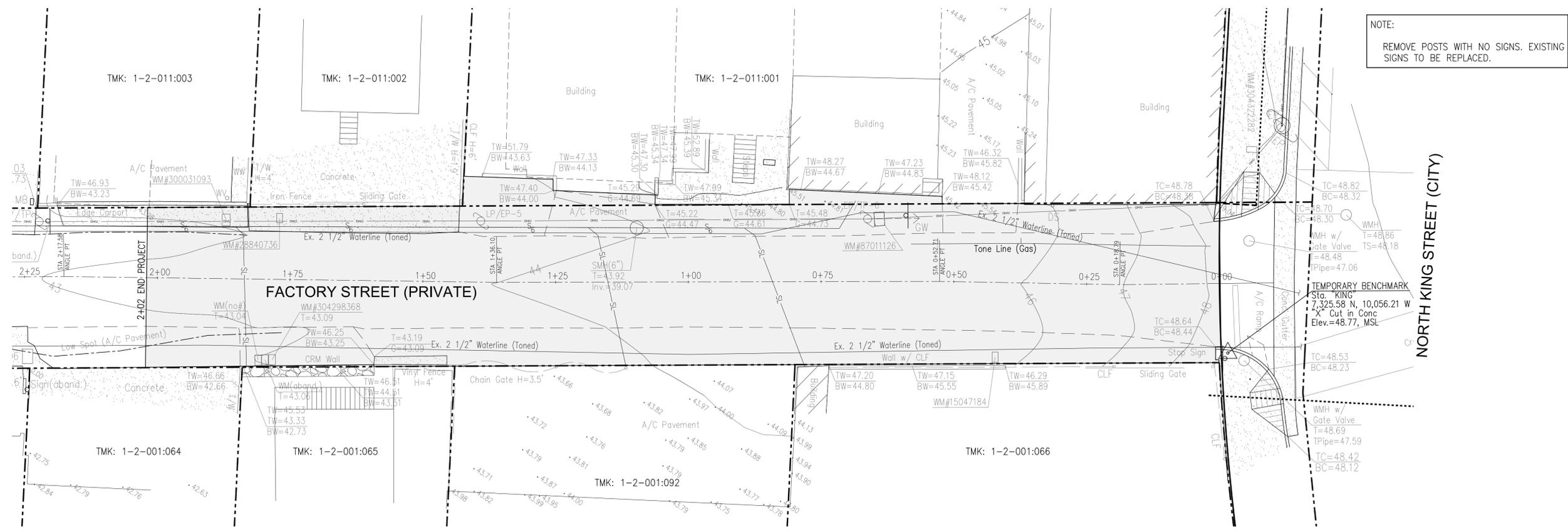
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**SHEET TITLE**  
EXISTING SITE PLAN AND PROFILE

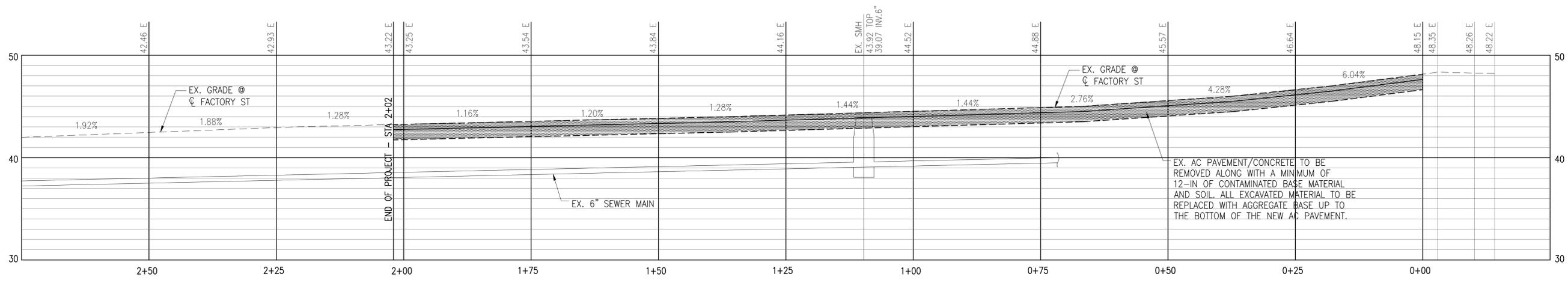
**ISSUANCE/REVISIONS**  
01/10/2020

Date 09/12/2019  
Scale AS NOTED  
Drawn By DL  
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Checked By GS  
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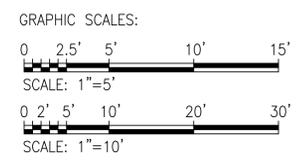
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**C-002**  
3 Of 6 Sheets



**1 EXISTING SITE PLAN**  
SCALE: 1" = 10'-0"



**2 EXISTING STREET PROFILE**  
SCALE: 1" = 10' (HORZ.) 1" = 5' (VERT.)



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**PROJECT**  
FACTORY STREET RECONSTRUCTION  
AFTER LEAD REMOVAL BETWEEN STA 0+00 & STA 2+02  
CIVIL IMPROVEMENT PLANS  
KALIHI, HONOLULU, OAHU, HAWAII

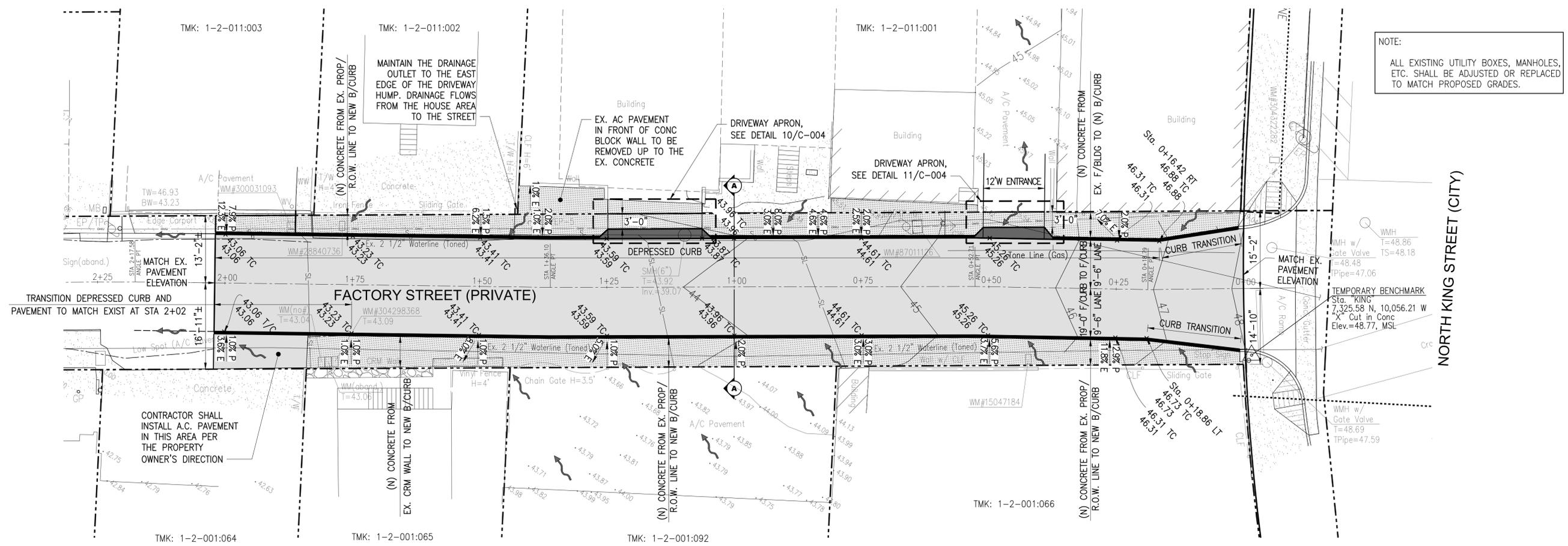
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**SHEET TITLE**  
CIVIL SITE PLAN AND PROFILE

**ISSUANCE/REVISIONS**

Date	09/12/2019
Scale	AS NOTED
Drawn By	DL
Design By	GS
Checked By	GS
Job	19-053

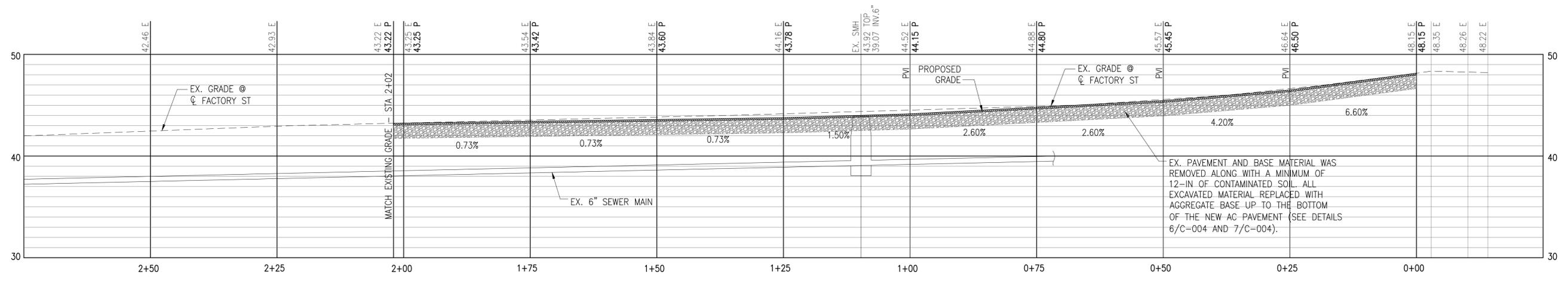
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**C-003**  
4 Of 6 Sheets



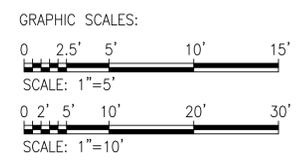
**1 CIVIL SITE PLAN**  
C-003 SCALE: 1" = 10'-0"

**LEGEND:**

	PROPOSED CONCRETE, SEE DETAIL 8/C-004		PROPERTY LINE
	PROPOSED AC PAVEMENT, SEE DETAIL 6/C-004		DRAINAGE FLOW
	EX. CONTOURS	44.88 E	EX. STREET CENTER LINE ELEVATION
	PROPOSED CONTOURS	44.52 P	PROPOSED STREET CENTER LINE ELEVATION (FINISHED GRADE)
	EX. SPOT ELEVATION		EX. 6" SEWER LATERAL
	PROPOSED ELEVATION		



**2 PROPOSED STREET PROFILE**  
C-003 SCALE: 1" = 10' (HORZ.) 1" = 5' (VERT.)



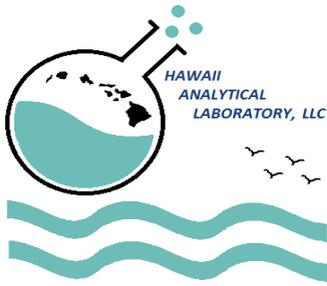




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**APPENDIX G**  
**LABORATORY DATA PACKAGES AND VALIDATION REPORTS**

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# Hawaii Analytical Laboratory ANALYTICAL REPORT

24 August 2020 issued amended report to replace original report dated 19 August 2019

Mr. Shawn Carrier  
Weston Solutions, INC.  
841 Bishop St. #2301  
Honolulu HI 96813

**Phone Number:** (808) 275-2934  
**Facsimile:**  
**Email:** shawn.carrier@westonsolutions.com

**Lab Job No:** 201906852  
**Date Submitted:** 8/15/2019  
**Project Name:** Factor/King, 8/15/19

## TCLP Cadmium #

EPA Method: 1311m / 7000Bm

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.05	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.05	mg/L	8/16/2019
Comments:				

**BATCH QC/QA**

<b>Analyte Recovery (%)</b> : MS 101.1	<b>Precision (% RPD)</b> : 0.7	<b>Blank</b> : Acceptable
MSD 100.4		
LCS 104.9		

## TCLP Chromium #

EPA Method: 1311m / 7000Bm

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.4	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.4	mg/L	8/16/2019
Comments:				

**BATCH QC/QA**

<b>Analyte Recovery (%)</b> : MS 78.0	<b>Precision (% RPD)</b> : 2.5	<b>Blank</b> : Acceptable
MSD 76.0		
LCS 102.8		

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Mr. Shawn Carrier  
Weston Solutions, INC.  
841 Bishop St. #2301  
Honolulu HI 96813

Phone Number: (808) 275-2934  
Facsimile:  
Email: shawn.carrier@westonsolutions.com

Lab Job No: 201906852  
Date Submitted: 8/15/2019  
Project Name: Factor/King, 8/15/19

### TCLP Mercury #

EPA Method: 1311m / 7470Am

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.02	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.02	mg/L	8/16/2019
Comments:				

#### BATCH QC/QA

Analyte Recovery (%): MS 21.5 \*      Precision (% RPD): 9.2      Blank: Acceptable  
MSD 19.6 \*  
LCS 99.3

\* Due to sample matrix effects, the batch MS/MSD recoveries were outside of the acceptable limit. The LCS was within acceptable limits.

#### General Comments

The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document proficiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

#### Results and Symbols Definitions

> This testing result is greater than the numerical value listed.  
< This testing result is less than the numerical value listed.  
# = Analytical methods marked with an "#" are not within our AIHA LAP, LLC Scope of Accreditation.  
MRL = Method Reporting Limit.  
MS/MSD = Matrix Spike / Matrix Spike Duplicate  
LCS = Laboratory Control Sample  
RPD = Relative Percent Difference



**Jennifer Hsu Liao**  
Laboratory Manager

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Analytical Report, rev. 3 – 20181015

## FACTORY STREET LEAD REMOVAL DATA VALIDATION REPORT

**Date:** August 26, 2020

**Laboratory:** Hawaii Analytical Laboratory, Honolulu, HI

**Laboratory Job Number:** 201906852

**Data Validation Performed By:** Tara Johnson, Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START)

**Data Validation Reviewed By:** Kelly Luck, WESTON START

**Weston Work Order #:** 20905.012.005.0003.00

This data validation report has been prepared by WESTON START under the START V U.S. Environmental Protection Agency (EPA) Region 9 contract. This report documents the data validation for 2 soil samples collected at the Factory Street Lead Removal site that were analyzed for the following parameters and EPA methods.

- Toxicity Characteristic Leaching Procedure (TCLP) Cadmium, Chromium, and Mercury by SW-846 Methods 1311/7000B/7470A (modified)

A Level II data package was received from Hawaii Analytical Laboratory, Honolulu, HI. The data validation was conducted in general accordance with the EPA “Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review” dated January 2017. The Attachment contains results summary sheets with any hand-written qualifiers applied during data validation.

### **TCLP CADMIUM, CHROMIUM, and MERCURY by SW-846 METHODS 1311/7000B/7470A (MODIFIED)**

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared		Date Analyzed	
				Mercury	Metals	Mercury	Metals
FS-DU.03.01	201940229	Soil	8/15/2019	Not reported		8/16/2019	8/16/2019
FS-DU.03.02	201940230	Soil	8/15/2019	Not reported		8/16/2019	8/16/2019

#### **1. Data Verification Check**

A data verification and completeness check was performed in accordance with the Stage 1 and 2A verification checks outlined in the EPA “Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use” dated January 13, 2009. For the TCLP metals analyses, all analytical data package items were received from the laboratory and the analyses requested were performed.

**2. Holding Times**

The samples were received at 22.1 °C, which is outside the recommended temperature limit of  $\leq 6$  °C for mercury. Samples extracted and analyzed within the recommended holding time limits of 28 days for mercury and 180 days for other metals. As samples were received at the laboratory on the day of collection, no qualification of mercury results due to preservation temperature exceedance is needed.

**3. Blank Results**

Leachate blanks (number of blanks unspecified) were analyzed with the samples and were deemed “acceptable”, presumably meaning they were free of target analyte contamination above the reporting limits (RLs).

**4. Laboratory Control Sample (LCS) Results**

One LCS recovery was reported for each of the target analytes, and each recovery was within the quality control (QC) limits of 80-120%.

**5. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results**

The sample(s) utilized for MS/MSD analyses were not identified. However, recoveries were within QC limits of 75-125% for cadmium and chromium, and outside QC limits of 80-120% for mercury (19.6 and 21.5%). Relative percent differences were within the QC limit of  $\leq 20\%$  for all three analytes. No data were qualified due to low mercury recoveries because the source of the MS/MSD samples was unknown.

**6. Field Duplicate Results**

The sample set did not include any field duplicate pairs.

**7. Overall Assessment**

The data validator applied “U” qualifiers to sample results reported by the laboratory as below the RL.

The TCLP cadmium, chromium, and mercury data are acceptable for use as qualified based on the information received.

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for but not detected above the reporting limit. The associated value is the reporting limit, corrected for dilution (if applicable).

**ATTACHMENT**

**HAWAII ANALYTICAL LABORATORY  
RESULTS SUMMARY WITH QUALIFIERS**



# Hawaii Analytical Laboratory ANALYTICAL REPORT

24 August 2020 issued amended report to replace original report dated 19 August 2019

Mr. Shawn Carrier  
Weston Solutions, INC.  
841 Bishop St. #2301  
Honolulu HI 96813

Phone Number: (808) 275-2934  
Facsimile:  
Email: shawn.carrier@westonsolutions.com

Lab Job No: 201906852  
Date Submitted: 8/15/2019  
Project Name: Factor/King, 8/15/19

## TCLP Cadmium #

EPA Method: 1311m / 7000Bm

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.05 <i>U</i>	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.05 <i>U</i>	mg/L	8/16/2019
Comments:				

**BATCH QC/QA**

Analyte Recovery (%):	MS 101.1 MSD 100.4 LCS 104.9	Precision (% RPD): 0.7	Blank: Acceptable
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## TCLP Chromium #

EPA Method: 1311m / 7000Bm

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.4 <i>U</i>	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.4 <i>U</i>	mg/L	8/16/2019
Comments:				

**BATCH QC/QA**

Analyte Recovery (%):	MS 78.0 MSD 76.0 LCS 102.8	Precision (% RPD): 2.5	Blank: Acceptable
-----------------------	----------------------------------	------------------------	-------------------

TBJ 8/26/20

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Mr. Shawn Carrier  
Weston Solutions, INC.  
841 Bishop St. #2301  
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Phone Number: (808) 275-2934  
Facsimile:  
Email: shawn.carrier@westonsolutions.com

Lab Job No: 201906852  
Date Submitted: 8/15/2019  
Project Name: Factor/King, 8/15/19

### TCLP Mercury #

EPA Method: 1311m / 7470Am

Sample No.	Sample Description	Results	Units	Date Analyzed
201940229	FS-DU.03.01	< 0.02 <i>u</i>	mg/L	8/16/2019
Comments:				
201940230	FS-DU.03.02	< 0.02 <i>u</i>	mg/L	8/16/2019
Comments:				

#### BATCH QC/QA

Analyte Recovery (%): MS 21.5 \*      Precision (% RPD): 9.2      Blank: Acceptable  
MSD 19.6 \*  
LCS 99.3

*TBJ 8/26/20*

\* Due to sample matrix effects, the batch MS/MSD recoveries were outside of the acceptable limit. The LCS was within acceptable limits.

#### General Comments

The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document proficiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

#### Results and Symbols Definitions

> This testing result is greater than the numerical value listed.

< This testing result is less than the numerical value listed.

# = Analytical methods marked with an "\*" are not within our AIHA LAP, LLC Scope of Accreditation.

MRL = Method Reporting Limit.

MS/MSD = Matrix Spike / Matrix Spike Duplicate

LCS = Laboratory Control Sample

RPD = Relative Percent Difference



Jennifer Hsu Liao  
Laboratory Manager

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Analytical Report, rev. 3 - 20181015

## ANALYTICAL REPORT

Eurofins TestAmerica, Irvine  
17461 Derian Ave  
Suite 100  
Irvine, CA 92614-5817  
Tel: (949)261-1022

Laboratory Job ID: 440-250206-1  
Laboratory Sample Delivery Group: Halawa Valley Quarry  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
9/19/2019 1:00:21 PM

Sheri Fama, Project Manager I  
(949)260-3274  
[sheri.fama@testamericainc.com](mailto:sheri.fama@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



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[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

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

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



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# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-250206-1	FS-BC-01	Solid	09/13/19 13:23	09/14/19 10:30	
440-250206-2	FS-BC-02	Solid	09/13/19 13:30	09/14/19 10:30	
440-250206-3	FS-BC-03	Solid	09/13/19 13:36	09/14/19 10:30	
440-250206-4	FS-BC-04	Solid	09/13/19 13:42	09/14/19 10:30	
440-250206-5	FS-BC-05	Solid	09/13/19 13:48	09/14/19 10:30	
440-250206-6	FS-BC-06	Solid	09/13/19 13:55	09/14/19 10:30	

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

---

**Job ID: 440-250206-1**

---

**Laboratory: Eurofins TestAmerica, Irvine**

## Narrative

---

**Job Narrative  
440-250206-1**

## Comments

No additional comments.

## Receipt

The samples were received on 9/14/2019 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5° C.

## Metals

Method(s) 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries of Chromium and Barium for preparation batch 440-568914 and analytical batch 440-569402 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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



# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

**Client Sample ID: FS-BC-01**

**Lab Sample ID: 440-250206-1**

Date Collected: 09/13/19 13:23

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
<b>Barium</b>	<b>13</b>	<b>F1</b>	1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Cadmium	ND		0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
<b>Chromium</b>	<b>33</b>	<b>F1</b>	1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Silver	ND		1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:17	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:00	1

**Client Sample ID: FS-BC-02**

**Lab Sample ID: 440-250206-2**

Date Collected: 09/13/19 13:30

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.1	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
<b>Barium</b>	<b>14</b>		1.5	0.77	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Cadmium	ND		0.51	0.26	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
<b>Chromium</b>	<b>35</b>		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Selenium	ND		3.1	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Silver	ND		1.5	0.91	mg/Kg		09/16/19 10:44	09/17/19 21:26	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:06	1

**Client Sample ID: FS-BC-03**

**Lab Sample ID: 440-250206-3**

Date Collected: 09/13/19 13:36

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
<b>Barium</b>	<b>13</b>		1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Cadmium	ND		0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
<b>Chromium</b>	<b>26</b>		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Silver	ND		1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:29	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:08	1

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

**Client Sample ID: FS-BC-04**

**Lab Sample ID: 440-250206-4**

Date Collected: 09/13/19 13:42

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
<b>Barium</b>	<b>13</b>		1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Cadmium	ND		0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
<b>Chromium</b>	<b>27</b>		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Silver	ND		1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:31	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:10	1

**Client Sample ID: FS-BC-05**

**Lab Sample ID: 440-250206-5**

Date Collected: 09/13/19 13:48

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
<b>Barium</b>	<b>14</b>		1.5	0.75	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Cadmium	ND		0.50	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
<b>Chromium</b>	<b>30</b>		1.0	0.50	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Silver	ND		1.5	0.89	mg/Kg		09/16/19 10:44	09/17/19 21:38	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:12	1

**Client Sample ID: FS-BC-06**

**Lab Sample ID: 440-250206-6**

Date Collected: 09/13/19 13:55

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
<b>Barium</b>	<b>29</b>		1.5	0.75	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Cadmium	ND		0.50	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
<b>Chromium</b>	<b>72</b>		1.0	0.50	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Silver	ND		1.5	0.89	mg/Kg		09/16/19 10:44	09/17/19 21:40	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:14	1

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL IRV
7471A	Mercury (CVAA)	SW846	TAL IRV
3050B	Preparation, Metals	SW846	TAL IRV
7471A	Preparation, Mercury	SW846	TAL IRV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

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



# Lab Chronicle

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Client Sample ID: FS-BC-01

## Lab Sample ID: 440-250206-1

Date Collected: 09/13/19 13:23

Matrix: Solid

Date Received: 09/14/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.98 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:17	TQN	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:00	EMS	TAL IRV

## Client Sample ID: FS-BC-02

## Lab Sample ID: 440-250206-2

Date Collected: 09/13/19 13:30

Matrix: Solid

Date Received: 09/14/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.96 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:26	TQN	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:06	EMS	TAL IRV

## Client Sample ID: FS-BC-03

## Lab Sample ID: 440-250206-3

Date Collected: 09/13/19 13:36

Matrix: Solid

Date Received: 09/14/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.98 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:29	TQN	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:08	EMS	TAL IRV

## Client Sample ID: FS-BC-04

## Lab Sample ID: 440-250206-4

Date Collected: 09/13/19 13:42

Matrix: Solid

Date Received: 09/14/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.97 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:31	TQN	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:10	EMS	TAL IRV

## Client Sample ID: FS-BC-05

## Lab Sample ID: 440-250206-5

Date Collected: 09/13/19 13:48

Matrix: Solid

Date Received: 09/14/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:38	TQN	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:12	EMS	TAL IRV

# Lab Chronicle

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

**Client Sample ID: FS-BC-06**

**Lab Sample ID: 440-250206-6**

**Date Collected: 09/13/19 13:55**

**Matrix: Solid**

**Date Received: 09/14/19 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	568914	09/16/19 10:44	DT	TAL IRV
Total/NA	Analysis	6010B		5			569402	09/17/19 21:40	TQN	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	569179	09/17/19 13:05	DB	TAL IRV
Total/NA	Analysis	7471A		1			569287	09/18/19 02:14	EMS	TAL IRV

### Laboratory References:

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

# QC Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Method: 6010B - Metals (ICP)

**Lab Sample ID: MB 440-568914/1-A ^5**  
**Matrix: Solid**  
**Analysis Batch: 569402**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 568914**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Barium	ND		1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Cadmium	ND		0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Chromium	ND		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Lead	ND		2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Selenium	ND		3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:11	5
Silver	ND		1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:11	5

**Lab Sample ID: LCS 440-568914/2-A ^5**  
**Matrix: Solid**  
**Analysis Batch: 569402**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 568914**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	49.3	46.2		mg/Kg		94	80 - 120
Barium	49.3	48.2		mg/Kg		98	80 - 120
Cadmium	24.6	23.6		mg/Kg		96	80 - 120
Chromium	24.6	24.4		mg/Kg		99	80 - 120
Lead	24.6	24.4		mg/Kg		99	80 - 120
Selenium	49.3	43.0		mg/Kg		87	80 - 120
Silver	24.6	24.1		mg/Kg		98	80 - 120

**Lab Sample ID: 440-250206-1 MS**  
**Matrix: Solid**  
**Analysis Batch: 569402**

**Client Sample ID: FS-BC-01**  
**Prep Type: Total/NA**  
**Prep Batch: 568914**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	ND		49.0	44.1		mg/Kg		90	75 - 125
Barium	13	F1	49.0	61.0		mg/Kg		98	75 - 125
Cadmium	ND		24.5	23.4		mg/Kg		95	75 - 125
Chromium	33	F1	24.5	43.2	F1	mg/Kg		42	75 - 125
Lead	ND		24.5	24.2		mg/Kg		99	75 - 125
Selenium	ND		49.0	40.6		mg/Kg		83	75 - 125
Silver	ND		24.5	24.8		mg/Kg		101	75 - 125

**Lab Sample ID: 440-250206-1 MSD**  
**Matrix: Solid**  
**Analysis Batch: 569402**

**Client Sample ID: FS-BC-01**  
**Prep Type: Total/NA**  
**Prep Batch: 568914**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Arsenic	ND		49.0	45.5		mg/Kg		93	75 - 125	3	20
Barium	13	F1	49.0	74.6	F1	mg/Kg		126	75 - 125	20	20
Cadmium	ND		24.5	24.3		mg/Kg		99	75 - 125	4	20
Chromium	33	F1	24.5	49.2	F1	mg/Kg		67	75 - 125	13	20
Lead	ND		24.5	25.1		mg/Kg		102	75 - 125	4	20
Selenium	ND		49.0	42.1		mg/Kg		86	75 - 125	4	20
Silver	ND		24.5	25.9		mg/Kg		106	75 - 125	4	20

# QC Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Method: 7471A - Mercury (CVAA)

**Lab Sample ID: MB 440-569179/1-A**  
**Matrix: Solid**  
**Analysis Batch: 569287**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 569179**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 01:56	1

**Lab Sample ID: LCS 440-569179/2-A**  
**Matrix: Solid**  
**Analysis Batch: 569287**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 569179**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.400	0.442		mg/Kg		111	80 - 120

**Lab Sample ID: 440-250206-1 MS**  
**Matrix: Solid**  
**Analysis Batch: 569287**

**Client Sample ID: FS-BC-01**  
**Prep Type: Total/NA**  
**Prep Batch: 569179**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		0.392	0.362		mg/Kg		92	75 - 125

**Lab Sample ID: 440-250206-1 MSD**  
**Matrix: Solid**  
**Analysis Batch: 569287**

**Client Sample ID: FS-BC-01**  
**Prep Type: Total/NA**  
**Prep Batch: 569179**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		0.408	0.355		mg/Kg		87	75 - 125	2	20

# QC Association Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Metals

### Prep Batch: 568914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-250206-1	FS-BC-01	Total/NA	Solid	3050B	
440-250206-2	FS-BC-02	Total/NA	Solid	3050B	
440-250206-3	FS-BC-03	Total/NA	Solid	3050B	
440-250206-4	FS-BC-04	Total/NA	Solid	3050B	
440-250206-5	FS-BC-05	Total/NA	Solid	3050B	
440-250206-6	FS-BC-06	Total/NA	Solid	3050B	
MB 440-568914/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 440-568914/2-A ^5	Lab Control Sample	Total/NA	Solid	3050B	
440-250206-1 MS	FS-BC-01	Total/NA	Solid	3050B	
440-250206-1 MSD	FS-BC-01	Total/NA	Solid	3050B	

### Prep Batch: 569179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-250206-1	FS-BC-01	Total/NA	Solid	7471A	
440-250206-2	FS-BC-02	Total/NA	Solid	7471A	
440-250206-3	FS-BC-03	Total/NA	Solid	7471A	
440-250206-4	FS-BC-04	Total/NA	Solid	7471A	
440-250206-5	FS-BC-05	Total/NA	Solid	7471A	
440-250206-6	FS-BC-06	Total/NA	Solid	7471A	
MB 440-569179/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-569179/2-A	Lab Control Sample	Total/NA	Solid	7471A	
440-250206-1 MS	FS-BC-01	Total/NA	Solid	7471A	
440-250206-1 MSD	FS-BC-01	Total/NA	Solid	7471A	

### Analysis Batch: 569287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-250206-1	FS-BC-01	Total/NA	Solid	7471A	569179
440-250206-2	FS-BC-02	Total/NA	Solid	7471A	569179
440-250206-3	FS-BC-03	Total/NA	Solid	7471A	569179
440-250206-4	FS-BC-04	Total/NA	Solid	7471A	569179
440-250206-5	FS-BC-05	Total/NA	Solid	7471A	569179
440-250206-6	FS-BC-06	Total/NA	Solid	7471A	569179
MB 440-569179/1-A	Method Blank	Total/NA	Solid	7471A	569179
LCS 440-569179/2-A	Lab Control Sample	Total/NA	Solid	7471A	569179
440-250206-1 MS	FS-BC-01	Total/NA	Solid	7471A	569179
440-250206-1 MSD	FS-BC-01	Total/NA	Solid	7471A	569179

### Analysis Batch: 569402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-250206-1	FS-BC-01	Total/NA	Solid	6010B	568914
440-250206-2	FS-BC-02	Total/NA	Solid	6010B	568914
440-250206-3	FS-BC-03	Total/NA	Solid	6010B	568914
440-250206-4	FS-BC-04	Total/NA	Solid	6010B	568914
440-250206-5	FS-BC-05	Total/NA	Solid	6010B	568914
440-250206-6	FS-BC-06	Total/NA	Solid	6010B	568914
MB 440-568914/1-A ^5	Method Blank	Total/NA	Solid	6010B	568914
LCS 440-568914/2-A ^5	Lab Control Sample	Total/NA	Solid	6010B	568914
440-250206-1 MS	FS-BC-01	Total/NA	Solid	6010B	568914
440-250206-1 MSD	FS-BC-01	Total/NA	Solid	6010B	568914

# Definitions/Glossary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

## Glossary

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

# Accreditation/Certification Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

## Laboratory: Eurofins TestAmerica, Irvine

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

Authority	Program	Identification Number	Expiration Date
Alaska	State	CA01531	06-30-20
Alaska	State Program	CA01531	06-30-20
Arizona	State Program	AZ0671	10-14-19 *
California	LA Cty Sanitation Districts	10256	06-30-20
California	State	2706	06-30-20
California	State Program	CA ELAP 2706	06-30-20
Guam	State Program	Cert. No. 19-005R	01-23-20
Hawaii	State Program	N/A	01-29-20
Kansas	NELAP	E-10420	07-31-20
Kansas	NELAP	E-10420	07-31-20
Nevada	State Program	CA015312019-5	07-31-20
New Mexico	State Program	N/A	01-29-20
Oregon	NELAP	4028	01-29-20
US Fish & Wildlife	Federal	058448	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P330-18-00214	07-09-21
USDA	US Federal Programs	P330-18-00214	07-09-21
Washington	State Program	C900	09-03-19 *

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



>>> Select a Laboratory <<<  
 #N/A  
 #N/A  
 #N/A  
 #N/A

# Chain of Custody Record



TestAmerica Laboratories, Inc. db/a Eurofins TestAmerica

Regulatory Program:  DW  NPDES  RCRA  Other:

Client Contact Your Company Name here <b>WESTON</b> Address <b>841 BISHOP ST. SUITE 2301</b> City/State/Zip <b>HONOLULU HI 96813</b> (xxx) xxx-xxxx <b>808 258 2560</b> Phone <b>808 258 2561</b> (xxx) xxx-xxxx FAX Project Name <b>FACTORY STREET</b> Site: <b>HALAWA VALLEY QUARRY</b> P.O.#		Project Manager: <b>SAM WAIN CARRIER</b> Email: <b>SAM.WAIN@WESTONSOLUTIONS.COM</b> Toll Fax: <b>808 258 2561</b> Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT: if different from below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input checked="" type="checkbox"/> 2 days <input type="checkbox"/> 1 day		COC No <b>1</b> of <b>1</b> COCs TALS Project # Sampler <b>SAM WAIN CARRIER</b> For Lab Use Only: Walk-in Client Lab Sampling. Job / SDG No	
Site Contact: <b>SHARON RIGG</b> Date: <b>9/13/19</b> Lab Contact: <b>NICOLE MOXABE</b> Carrier: <b>FED-EX</b>		Perform MS/MSD (Y/N) Filtered Sample (Y/N)		Sample Specific Notes  440-250206 Chain of Custody	
Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.
FS-BC-01	9/13/19	1323	C	90%L	1
FS-BC-02		1330			1
FS-BC-03		1336			1
FS-BC-04		1342			1
FS-BC-05		1348			1
FS-BC-06		1355			1

6/14/16 57

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other  
 Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  
 Special Instructions/QC Requirements & Comments:  
 COC CONTROL TEMP. BLANK METHOD BANK, MS/MSD, REFERENCE STANDARDS (IF AVAILABLE)  
 INTERNAL STANDARDS, LABORATORY CONTROL STANDARDS (1 PER SAMPLE DESIGN GROUP, PER MATRIX, PER METHOD)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return to Client  Dispose by Lab  Archive for \_\_\_\_\_ Months  
 Cooler Temp (°C) Obs'd: \_\_\_\_\_ Cor'd: \_\_\_\_\_  
 Custody Seal No.  Yes  No  
 Relinquished by **SAM WAIN CARRIER** Date/Time **9/13/19 1:00**  
 Relinquished by \_\_\_\_\_ Date/Time \_\_\_\_\_  
 Relinquished by \_\_\_\_\_ Date/Time \_\_\_\_\_  
 Received in Laboratory by **JAY** Date/Time **9/14/19 10:30**  
 Received by \_\_\_\_\_ Date/Time \_\_\_\_\_  
 Received by \_\_\_\_\_ Date/Time \_\_\_\_\_

C/S FEED # 7899 0402 6836  
 46/45 IRB

Form No. CA-C-WI-002, Rev. 4.26, dated 7/25/2019



## Login Sample Receipt Checklist

Client: Weston Solutions, Inc.

Job Number: 440-250206-1  
SDG Number: Halawa Valley Quarry

**Login Number: 250206**

**List Number: 1**

**Creator: Bonta, Lucia F**

**List Source: Eurofins TestAmerica, Irvine**

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



## Sample Login Acknowledgement

## Job 440-250206-1

<b>Client Job Description:</b>	Factory Street	<b>Report To:</b>	Weston Solutions, Inc.
<b>Purchase Order #:</b>	Purchase Order not required		Shawn Carrier
<b>Work Order #:</b>			841 Bishop Street
<b>Project Manager:</b>	Sheri M Fama		Suite 2301
<b>Job Due Date:</b>	9/19/2019		Honolulu, HI 96813
<b>Job TAT:</b>	3 Day RUSH		
<b>Max Deliverable Level:</b>	II	<b>Bill To:</b>	Weston Solutions, Inc.
			Shawn Carrier
<b>Earliest Deliverable Due:</b>	9/19/2019		841 Bishop Street
			Suite 2301
			Honolulu, HI 96813

## Login 440-250206

<b>Sample Receipt:</b>	9/14/2019 10:30:00 AM	<b>Number of Coolers:</b>	1
<b>Method of Delivery:</b>	FedEx Saturday Delivery	<b>Cooler Temperature(s) (C°):</b>	4.5;

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
Method	Method Description / Work Location				
440-250206-1	FS-BC-01	9/13/2019 1:23:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-1 MS	FS-BC-01	9/13/2019 1:23:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-1 MSD	FS-BC-01	9/13/2019 1:23:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-2	FS-BC-02	9/13/2019 1:30:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-3	FS-BC-03	9/13/2019 1:36:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-4	FS-BC-04	9/13/2019 1:42:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-5	FS-BC-05	9/13/2019 1:48:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet
440-250206-6	FS-BC-06	9/13/2019 1:55:00 PM	Solid		
6010B	RCRA 8 List-Metals / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

# Sample Login Acknowledgement

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
Method	Method Description / Work Location				
	<b>Analytes:</b>				
	Ag, As, Ba, Cd, Cr, Pb, Se				
7471A	Mercury (CVAA) / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## Sample Login Analytes / Limits

**Job 440-250206-1**

<b>Client Job Description:</b>	Factory Street	<b>Report To:</b>	Weston Solutions, Inc.
<b>Purchase Order #:</b>	Purchase Order not required		Shawn Carrier
<b>Work Order #:</b>			841 Bishop Street
<b>Project Manager:</b>	Sheri M Fama		Suite 2301
<b>Job Due Date:</b>	9/19/2019		Honolulu, HI 96813
<b>Job TAT:</b>	3 Day RUSH	<b>Bill To:</b>	Weston Solutions, Inc.
<b>Max Deliverable Level:</b>	II		Shawn Carrier
<b>Earliest Deliverable Due:</b>	9/19/2019		841 Bishop Street
			Suite 2301
			Honolulu, HI 96813

**Login 440-250206**

<b>Sample Receipt:</b>	9/14/2019 10:30:00 AM	<b>Number of Coolers:</b>	1
<b>Method of Delivery:</b>	FedEx Saturday Delivery	<b>Cooler Temperature(s) (C°):</b>	4.5;

Method	Method Description	Rpt Basis			Units	Sample #s Applicable
6010B	<b>RCRA 8 List-Metals</b>	Total	MDL	RL		1,1MS,1MSD,2,3,4,5,6
	Arsenic		1.5	3	mg/Kg	
	Barium		0.75	1.5	mg/Kg	
	Cadmium		0.25	0.5	mg/Kg	
	Chromium		0.5	1	mg/Kg	
	Lead		1	2	mg/Kg	
	Selenium		1.7	3	mg/Kg	
	Silver		0.89	1.5	mg/Kg	
7471A	<b>Mercury (CVAA)</b>	Total	MDL	RL		1,1MS,1MSD,2,3,4,5,6
	Mercury		0.012	0.02	mg/Kg	

## ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento  
880 Riverside Parkway  
West Sacramento, CA 95605  
Tel: (916)373-5600

Laboratory Job ID: 320-57931-1  
Client Project/Site: Factory Street - Soil (ISM)

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/28/2020 2:39:26 PM

Nicole McCabe, Project Manager I  
(916)374-4344  
[nicole.mccabe@testamericainc.com](mailto:nicole.mccabe@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

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

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



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# Definitions/Glossary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

## Glossary

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

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**Job ID: 320-57931-1**

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**Laboratory: Eurofins TestAmerica, Sacramento**

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**Narrative**

**Job Narrative**  
**320-57931-1**

**Comments**

No additional comments.

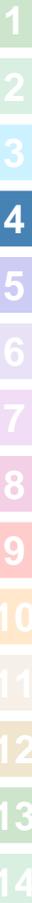
**Receipt**

The sample was received on 1/21/2020 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8° C.

**Metals**

Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-353188 and analytical batch 320-353446 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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



# Detection Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

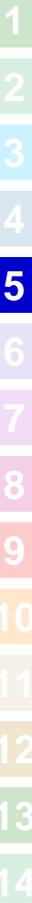
**Client Sample ID: HVQ.0117.01**

**Lab Sample ID: 320-57931-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	16	F1	1.0	0.12	mg/Kg	1		6010B	Total/NA
Chromium	19		0.50	0.14	mg/Kg	1		6010B	Total/NA
Lead	1.6		1.0	0.26	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento



# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

**Client Sample ID: HVQ.0117.01**

**Lab Sample ID: 320-57931-1**

**Date Collected: 01/17/20 10:06**

**Matrix: Solid**

**Date Received: 01/21/20 09:30**

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	F1	2.0	1.3	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
<b>Barium</b>	<b>16</b>	<b>F1</b>	1.0	0.12	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Cadmium	ND		0.20	0.030	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
<b>Chromium</b>	<b>19</b>		0.50	0.14	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
<b>Lead</b>	<b>1.6</b>		1.0	0.26	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Selenium	ND	F1	2.0	1.4	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Silver	ND		0.50	0.090	mg/Kg		01/27/20 07:00	01/27/20 21:25	1

# QC Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

## Method: 6010B - Metals (ICP)

**Lab Sample ID: MB 320-353188/1-A**  
**Matrix: Solid**  
**Analysis Batch: 353446**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 353188**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.0	1.3	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Barium	ND		1.0	0.12	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Cadmium	ND		0.20	0.030	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Chromium	ND		0.50	0.14	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Lead	ND		1.0	0.26	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Selenium	ND		2.0	1.4	mg/Kg		01/27/20 07:00	01/27/20 16:11	1
Silver	ND		0.50	0.090	mg/Kg		01/27/20 07:00	01/27/20 16:11	1

**Lab Sample ID: LCS 320-353188/2-A**  
**Matrix: Solid**  
**Analysis Batch: 353446**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 353188**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	50.0	48.3		mg/Kg		97	80 - 120
Barium	50.0	50.3		mg/Kg		101	80 - 120
Cadmium	25.0	25.3		mg/Kg		101	80 - 120
Chromium	25.0	25.7		mg/Kg		103	80 - 120
Lead	25.0	25.3		mg/Kg		101	80 - 120
Selenium	50.0	51.5		mg/Kg		103	80 - 120
Silver	4.98	5.16		mg/Kg		104	80 - 120

**Lab Sample ID: 320-57931-1 MS**  
**Matrix: Solid**  
**Analysis Batch: 353446**

**Client Sample ID: HVQ.0117.01**  
**Prep Type: Total/NA**  
**Prep Batch: 353188**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	ND	F1	51.0	40.2	F1	mg/Kg		79	80 - 120
Barium	16	F1	51.0	64.4		mg/Kg		95	80 - 120
Cadmium	ND		25.5	22.2		mg/Kg		87	80 - 120
Chromium	19		25.5	44.6		mg/Kg		101	80 - 120
Lead	1.6		25.5	24.2		mg/Kg		89	80 - 120
Selenium	ND	F1	51.0	39.6	F1	mg/Kg		78	80 - 120
Silver	ND		5.08	4.45		mg/Kg		88	80 - 120

**Lab Sample ID: 320-57931-1 MSD**  
**Matrix: Solid**  
**Analysis Batch: 353446**

**Client Sample ID: HVQ.0117.01**  
**Prep Type: Total/NA**  
**Prep Batch: 353188**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	ND	F1	52.1	41.7		mg/Kg		80	80 - 120	4	35
Barium	16	F1	52.1	57.3	F1	mg/Kg		79	80 - 120	12	35
Cadmium	ND		26.0	23.0		mg/Kg		88	80 - 120	4	35
Chromium	19		26.0	46.2		mg/Kg		105	80 - 120	4	35
Lead	1.6		26.1	24.8		mg/Kg		89	80 - 120	2	35
Selenium	ND	F1	52.1	41.8		mg/Kg		80	80 - 120	5	35
Silver	ND		5.19	4.56		mg/Kg		88	80 - 120	2	35

# QC Association Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

## Metals

### Prep Batch: 353188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-57931-1	HVQ.0117.01	Total/NA	Solid	3050B	
MB 320-353188/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 320-353188/2-A	Lab Control Sample	Total/NA	Solid	3050B	
320-57931-1 MS	HVQ.0117.01	Total/NA	Solid	3050B	
320-57931-1 MSD	HVQ.0117.01	Total/NA	Solid	3050B	

### Analysis Batch: 353446

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-57931-1	HVQ.0117.01	Total/NA	Solid	6010B	353188
MB 320-353188/1-A	Method Blank	Total/NA	Solid	6010B	353188
LCS 320-353188/2-A	Lab Control Sample	Total/NA	Solid	6010B	353188
320-57931-1 MS	HVQ.0117.01	Total/NA	Solid	6010B	353188
320-57931-1 MSD	HVQ.0117.01	Total/NA	Solid	6010B	353188

# Lab Chronicle

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

**Client Sample ID: HVQ.0117.01**

**Lab Sample ID: 320-57931-1**

**Date Collected: 01/17/20 10:06**

**Matrix: Solid**

**Date Received: 01/21/20 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.00 g	100 mL	353188	01/27/20 07:00	NIM	TAL SAC
Total/NA	Analysis	6010B		1			353446	01/27/20 21:25	GSH	TAL SAC

#### Laboratory References:

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

# Accreditation/Certification Summary

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

## Laboratory: Eurofins TestAmerica, Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-20 *
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-29-20 *
Hawaii	State	<cert No.>	01-29-20 *
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20 *
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20 *
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19 *
West Virginia (DW)	State	9930C	12-31-20
Wyoming	State Program	8TMS-L	01-28-19 *

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL SAC
3050B	Preparation, Metals	SW846	TAL SAC

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

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

- 1
- 2
- 3
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- 13
- 14

# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-57931-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-57931-1	HVQ.0117.01	Solid	01/17/20 10:06	01/21/20 09:30	

---

- 1
- 2
- 3
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- 12
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# Login Sample Receipt Checklist

Client: Weston Solutions, Inc.

Job Number: 320-57931-1

**Login Number: 57931**

**List Source: Eurofins TestAmerica, Sacramento**

**List Number: 1**

**Creator: Oropeza, Salvador**

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



# Sample Login Acknowledgement

## Job 320-57931-1

<b>Client Job Description:</b> Factory Street - Soil (ISM) <b>Purchase Order #:</b> Purchase Order not required <b>Work Order #:</b> <b>Project Manager:</b> Nicole M McCabe <b>Job Due Date:</b> 2/11/2020 <b>Job TAT:</b> 15 Days <b>Max Deliverable Level:</b> II  <b>Earliest Deliverable Due:</b> 2/11/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
--	--

## Login 320-57931

<b>Sample Receipt:</b> 1/21/2020 9:30:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b> 1.8;

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
Method	Method Description / Work Location				
320-57931-1	HVQ.0117.01	1/17/2020 10:06:00 AM	Solid		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## Sample Login Analytes / Limits

**Job 320-57931-1**

<b>Client Job Description:</b>	Factory Street - Soil (ISM)	<b>Report To:</b>	Weston Solutions, Inc.
<b>Purchase Order #:</b>	Purchase Order not required		Shawn Carrier
<b>Work Order #:</b>			841 Bishop Street
<b>Project Manager:</b>	Nicole M McCabe		Suite 2301
<b>Job Due Date:</b>	2/11/2020		Honolulu, HI 96813
<b>Job TAT:</b>	15 Days		
<b>Max Deliverable Level:</b>	II	<b>Bill To:</b>	Weston Solutions, Inc.
			Shawn Carrier
<b>Earliest Deliverable Due:</b>	2/11/2020		841 Bishop Street
			Suite 2301
			Honolulu, HI 96813

**Login 320-57931**

<b>Sample Receipt:</b>	1/21/2020 9:30:00 AM	<b>Number of Coolers:</b>	1
<b>Method of Delivery:</b>	FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>	1.8;

Method	Method Description	Rpt Basis			Units	Sample #s Applicable
6010B	<b>RCRA Metals w/o Mercury - ISM dry prep</b>	Total	MDL	RL		1
	Arsenic		1.3	2	mg/Kg	
	Barium		0.12	1	mg/Kg	
	Cadmium		0.03	0.2	mg/Kg	
	Chromium		0.14	0.5	mg/Kg	
	Lead		0.26	1	mg/Kg	
	Selenium		1.4	2	mg/Kg	
	Silver		0.09	0.5	mg/Kg	
Moisture	<b>Percent Moisture</b>	Total	RL	RL		1
	Percent Moisture		0.1	0.1	%	
	Percent Solids		0.1	0.1	%	

## ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento  
880 Riverside Parkway  
West Sacramento, CA 95605  
Tel: (916)373-5600

Laboratory Job ID: 320-59178-1  
Client Project/Site: Factory Street - Soil (ISM)

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
3/25/2020 11:54:01 AM

Nicole McCabe, Project Manager I  
(916)374-4344  
[nicole.mccabe@testamericainc.com](mailto:nicole.mccabe@testamericainc.com)

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

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



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# Definitions/Glossary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

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## Job ID: 320-59178-1

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### Laboratory: Eurofins TestAmerica, Sacramento

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#### Narrative

#### Job Narrative 320-59178-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 3/4/2020 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2° C.

#### Metals

Method 6010B: The following samples were diluted due to the nature of the sample matrix: FS-S-6 (320-59178-4) and FS-S-6-D (320-59178-5). Elevated reporting limits (RLs) are provided.

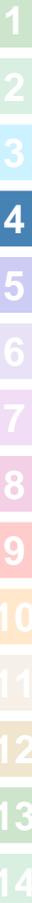
Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-362114 and 320-362954 and analytical batch 320-363690 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-362114 and 320-362954 and analytical batch 320-363971 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

#### Organic Prep

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



# Detection Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Client Sample ID: FS-S-3

## Lab Sample ID: 320-59178-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	7.3		2.0	1.3	mg/Kg	2		6010B	Total/NA
Barium	370		0.99	0.12	mg/Kg	2		6010B	Total/NA
Cadmium	0.40		0.20	0.030	mg/Kg	2		6010B	Total/NA
Chromium	160		0.50	0.14	mg/Kg	2		6010B	Total/NA
Lead	140		0.99	0.26	mg/Kg	2		6010B	Total/NA

## Client Sample ID: FS-S-4

## Lab Sample ID: 320-59178-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	6.8		2.0	1.3	mg/Kg	2		6010B	Total/NA
Barium	370		0.99	0.12	mg/Kg	2		6010B	Total/NA
Cadmium	0.52		0.20	0.030	mg/Kg	2		6010B	Total/NA
Chromium	140		0.49	0.14	mg/Kg	2		6010B	Total/NA
Lead	210		0.99	0.26	mg/Kg	2		6010B	Total/NA

## Client Sample ID: FS-S-5

## Lab Sample ID: 320-59178-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	6.7		2.0	1.3	mg/Kg	2		6010B	Total/NA
Barium	370		0.99	0.12	mg/Kg	2		6010B	Total/NA
Cadmium	0.56		0.20	0.030	mg/Kg	2		6010B	Total/NA
Chromium	140		0.49	0.14	mg/Kg	2		6010B	Total/NA
Lead	630		0.99	0.26	mg/Kg	2		6010B	Total/NA
Silver	0.15	J	0.49	0.089	mg/Kg	2		6010B	Total/NA

## Client Sample ID: FS-S-6

## Lab Sample ID: 320-59178-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	7.0	F1	2.0	1.3	mg/Kg	2		6010B	Total/NA
Barium	390		0.99	0.12	mg/Kg	2		6010B	Total/NA
Cadmium	1.4	F1	0.20	0.030	mg/Kg	2		6010B	Total/NA
Chromium	140		0.50	0.14	mg/Kg	2		6010B	Total/NA
Lead	16000		9.9	2.6	mg/Kg	20		6010B	Total/NA
Silver	0.76		0.50	0.089	mg/Kg	2		6010B	Total/NA

## Client Sample ID: FS-S-6-D

## Lab Sample ID: 320-59178-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	7.0		2.0	1.3	mg/Kg	2		6010B	Total/NA
Barium	410		1.0	0.12	mg/Kg	2		6010B	Total/NA
Cadmium	2.6		0.20	0.030	mg/Kg	2		6010B	Total/NA
Chromium	130		0.50	0.14	mg/Kg	2		6010B	Total/NA
Lead	9300		10	2.6	mg/Kg	20		6010B	Total/NA
Silver	0.72		0.50	0.090	mg/Kg	2		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Client Sample ID: FS-S-3

Date Collected: 02/19/20 12:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-1

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.3		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Cadmium	0.40		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Chromium	160		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Lead	140		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:33	2
Selenium	ND		2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Silver	ND		0.50	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:51	2

## Client Sample ID: FS-S-4

Date Collected: 02/13/20 14:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-2

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.8		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Cadmium	0.52		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Chromium	140		0.49	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Lead	210		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:37	2
Selenium	ND		2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Silver	ND		0.49	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:55	2

## Client Sample ID: FS-S-5

Date Collected: 02/01/20 10:10

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-3

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.7		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Cadmium	0.56		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Chromium	140		0.49	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Lead	630		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:41	2
Selenium	ND		2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Silver	0.15	J	0.49	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:59	2

## Client Sample ID: FS-S-6

Date Collected: 02/05/20 13:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-4

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.0	F1	2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Barium	390		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Cadmium	1.4	F1	0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Chromium	140		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Lead	16000		9.9	2.6	mg/Kg		03/09/20 06:30	03/11/20 18:53	20
Selenium	ND	F1	20	14	mg/Kg		03/09/20 06:30	03/11/20 18:53	20
Silver	0.76		0.50	0.089	mg/Kg		03/09/20 06:30	03/10/20 20:03	2

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

**Client Sample ID: FS-S-6-D**

**Lab Sample ID: 320-59178-5**

**Date Collected: 02/05/20 13:30**

**Matrix: Solid**

**Date Received: 03/04/20 09:15**

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.0		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Barium	410		1.0	0.12	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Cadmium	2.6		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Chromium	130		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Lead	9300		10	2.6	mg/Kg		03/09/20 06:30	03/11/20 19:12	20
Selenium	ND		2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Silver	0.72		0.50	0.090	mg/Kg		03/09/20 06:30	03/10/20 20:30	2

# QC Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Method: 6010B - Metals (ICP)

**Lab Sample ID: MB 320-362954/1-A**  
**Matrix: Solid**  
**Analysis Batch: 363690**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Barium	ND		1.0	0.12	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Cadmium	ND		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Chromium	ND		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Lead	ND		1.0	0.26	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Selenium	ND		2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 16:58	1
Silver	ND		0.50	0.090	mg/Kg		03/09/20 06:30	03/10/20 16:58	1

**Lab Sample ID: LCS 320-362954/2-A**  
**Matrix: Solid**  
**Analysis Batch: 363690**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	50.0	46.0		mg/Kg		92	80 - 120
Barium	50.0	47.5		mg/Kg		95	80 - 120
Cadmium	25.0	23.8		mg/Kg		95	80 - 120
Chromium	25.0	24.5		mg/Kg		98	80 - 120
Lead	25.0	24.4		mg/Kg		97	80 - 120
Selenium	50.0	46.8		mg/Kg		94	80 - 120
Silver	4.98	4.92		mg/Kg		99	80 - 120

**Lab Sample ID: 320-59178-4 MS**  
**Matrix: Solid**  
**Analysis Batch: 363690**

**Client Sample ID: FS-S-6**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	7.0	F1	24.7	23.0	F1	mg/Kg		64	80 - 120
Barium	390		24.7	403	4	mg/Kg		71	80 - 120
Cadmium	1.4	F1	12.4	11.0	F1	mg/Kg		78	80 - 120
Chromium	140		12.4	154	4	mg/Kg		95	80 - 120
Silver	0.76		2.46	3.19		mg/Kg		99	80 - 120

**Lab Sample ID: 320-59178-4 MS**  
**Matrix: Solid**  
**Analysis Batch: 363971**

**Client Sample ID: FS-S-6**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lead	16000		12.4	24200	4	mg/Kg		64548	80 - 120
Selenium	ND	F1	24.7	15.1	J F1	mg/Kg		61	80 - 120

**Lab Sample ID: 320-59178-4 MSD**  
**Matrix: Solid**  
**Analysis Batch: 363690**

**Client Sample ID: FS-S-6**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	7.0	F1	24.8	23.1	F1	mg/Kg		65	80 - 120	1	35
Barium	390		24.8	416	4	mg/Kg		125	80 - 120	3	35
Cadmium	1.4	F1	12.4	10.9	F1	mg/Kg		77	80 - 120	1	35
Chromium	140		12.4	158	4	mg/Kg		132	80 - 120	3	35

Eurofins TestAmerica, Sacramento

# QC Sample Results

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Method: 6010B - Metals (ICP) (Continued)

**Lab Sample ID: 320-59178-4 MSD**  
**Matrix: Solid**  
**Analysis Batch: 363690**

**Client Sample ID: FS-S-6**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	0.76		2.47	3.05		mg/Kg		93	80 - 120	5	35

**Lab Sample ID: 320-59178-4 MSD**  
**Matrix: Solid**  
**Analysis Batch: 363971**

**Client Sample ID: FS-S-6**  
**Prep Type: Total/NA**  
**Prep Batch: 362954**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lead	16000		12.4	18600	4	mg/Kg		19561	80 - 120	26	35
Selenium	ND	F1	24.8	17.4	J F1	mg/Kg		70	80 - 120	14	35



# QC Association Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Metals

### ISM Prep Batch: 362114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-59178-1	FS-S-3	Total/NA	Solid	Increment, prep	
320-59178-2	FS-S-4	Total/NA	Solid	Increment, prep	
320-59178-3	FS-S-5	Total/NA	Solid	Increment, prep	
320-59178-4	FS-S-6	Total/NA	Solid	Increment, prep	
320-59178-5	FS-S-6-D	Total/NA	Solid	Increment, prep	
320-59178-4 MS	FS-S-6	Total/NA	Solid	Increment, prep	
320-59178-4 MSD	FS-S-6	Total/NA	Solid	Increment, prep	

### Prep Batch: 362954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-59178-1	FS-S-3	Total/NA	Solid	3050B	362114
320-59178-2	FS-S-4	Total/NA	Solid	3050B	362114
320-59178-3	FS-S-5	Total/NA	Solid	3050B	362114
320-59178-4	FS-S-6	Total/NA	Solid	3050B	362114
320-59178-5	FS-S-6-D	Total/NA	Solid	3050B	362114
MB 320-362954/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 320-362954/2-A	Lab Control Sample	Total/NA	Solid	3050B	
320-59178-4 MS	FS-S-6	Total/NA	Solid	3050B	362114
320-59178-4 MSD	FS-S-6	Total/NA	Solid	3050B	362114

### Analysis Batch: 363690

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-59178-1	FS-S-3	Total/NA	Solid	6010B	362954
320-59178-2	FS-S-4	Total/NA	Solid	6010B	362954
320-59178-3	FS-S-5	Total/NA	Solid	6010B	362954
320-59178-4	FS-S-6	Total/NA	Solid	6010B	362954
320-59178-5	FS-S-6-D	Total/NA	Solid	6010B	362954
MB 320-362954/1-A	Method Blank	Total/NA	Solid	6010B	362954
LCS 320-362954/2-A	Lab Control Sample	Total/NA	Solid	6010B	362954
320-59178-4 MS	FS-S-6	Total/NA	Solid	6010B	362954
320-59178-4 MSD	FS-S-6	Total/NA	Solid	6010B	362954

### Analysis Batch: 363971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-59178-1	FS-S-3	Total/NA	Solid	6010B	362954
320-59178-2	FS-S-4	Total/NA	Solid	6010B	362954
320-59178-3	FS-S-5	Total/NA	Solid	6010B	362954
320-59178-4	FS-S-6	Total/NA	Solid	6010B	362954
320-59178-5	FS-S-6-D	Total/NA	Solid	6010B	362954
320-59178-4 MS	FS-S-6	Total/NA	Solid	6010B	362954
320-59178-4 MSD	FS-S-6	Total/NA	Solid	6010B	362954

# Lab Chronicle

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Client Sample ID: FS-S-3

Date Collected: 02/19/20 12:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.07 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363690	03/10/20 19:51	GSH	TAL SAC
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.07 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363971	03/11/20 18:33	GSH	TAL SAC

## Client Sample ID: FS-S-4

Date Collected: 02/13/20 14:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.14 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363690	03/10/20 19:55	GSH	TAL SAC
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.14 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363971	03/11/20 18:37	GSH	TAL SAC

## Client Sample ID: FS-S-5

Date Collected: 02/01/20 10:10

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.12 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363690	03/10/20 19:59	GSH	TAL SAC
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.12 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363971	03/11/20 18:41	GSH	TAL SAC

## Client Sample ID: FS-S-6

Date Collected: 02/05/20 13:20

Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.10 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363690	03/10/20 20:03	GSH	TAL SAC
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.10 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		20			363971	03/11/20 18:53	GSH	TAL SAC

# Lab Chronicle

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

**Client Sample ID: FS-S-6-D**

**Lab Sample ID: 320-59178-5**

**Date Collected: 02/05/20 13:30**

**Matrix: Solid**

**Date Received: 03/04/20 09:15**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.03 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		2			363690	03/10/20 20:30	GSH	TAL SAC
Total/NA	ISM Prep	Increment, prep					362114	03/05/20 11:30	VMN	TAL SAC
Total/NA	Prep	3050B			10.03 g	500 mL	362954	03/09/20 06:30	NIM	TAL SAC
Total/NA	Analysis	6010B		20			363971	03/11/20 19:12	GSH	TAL SAC

**Laboratory References:**

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



# Accreditation/Certification Summary

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Laboratory: Eurofins TestAmerica, Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-20
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20 *
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-20
Wyoming	State Program	8TMS-L	01-28-19 *

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL SAC
3050B	Preparation, Metals	SW846	TAL SAC
Increment, prep	ISM - Dry, Disaggregate, Sieve, 2 D Slabcake Subsample	EPA	TAL SAC

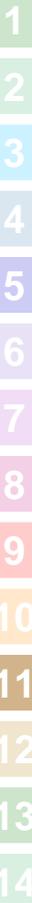
#### Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-59178-1	FS-S-3	Solid	02/19/20 12:20	03/04/20 09:15	
320-59178-2	FS-S-4	Solid	02/13/20 14:20	03/04/20 09:15	
320-59178-3	FS-S-5	Solid	02/01/20 10:10	03/04/20 09:15	
320-59178-4	FS-S-6	Solid	02/05/20 13:20	03/04/20 09:15	
320-59178-5	FS-S-6-D	Solid	02/05/20 13:30	03/04/20 09:15	

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

# Chain of Custody Record

**Eurofins TestAmerica, Sacramento**  
880 Riverside Parkway

West Sacramento, CA 95605-1500  
phone 916.373.5600 fax 303.467.7248



Environmental Testing  
TAM America

Regulatory Program:  DW  NPDES  RCRA  Other:

Project Manager: Shawn Carrier  Shawn Carrier  Other:

Client Contact: **Shawn Carrier**  
Shawn.Carrier@westionsolutions.com

Carrier: **Nicole McCabe**

COC No: 1 of 1 COCs

TALS Project #: 3/3/2020

Sampler: **E P A 6 0 0 1 0 0 B**

For Lab Use Only: Walk-in Client Lab Sampling:

Job / SDG No.:

Sample Specific Notes:

MIS - 30 increments

MIS - 30 increments

MIS - 30 increments

MIS - 30 increments. MS/MSD. No additional volume collected as Lab PM indicated none needed.

MIS - 30 increments

Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact:  Yes  No  Unknown

Relinquished by: **Shawn Carrier** Company: **Weston** Date/Time: **3/3/20 11:00**

Relinquished by: **Shawn Carrier** Company: **Weston** Date/Time: **3/3/20 11:00**

Relinquished by: **Shawn Carrier** Company: **Weston** Date/Time: **3/3/20 11:00**

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Relinquished by: **Shawn Carrier** Company: **Weston** Date/Time: **3/3/20 11:00**

Relinquished by: **Shawn Carrier** Company: **Weston** Date/Time: **3/3/20 11:00**



320-59178 Chain of Custody

Form No. CA-C-WI-002, Rev. 4.30, dated 1/1/2020



## Login Sample Receipt Checklist

Client: Weston Solutions, Inc.

Job Number: 320-59178-1

**Login Number: 59178**

**List Source: Eurofins TestAmerica, Sacramento**

**List Number: 1**

**Creator: Kovalyov, Nikita**

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

# Sample Login Acknowledgement

## Job 320-59178-1

<b>Client Job Description:</b> Factory Street - Soil (ISM) <b>Purchase Order #:</b> 0102654 <b>Work Order #:</b> <b>Project Manager:</b> Nicole M McCabe <b>Job Due Date:</b> 3/25/2020 <b>Job TAT:</b> 15 Days <b>Max Deliverable Level:</b> II  <b>Earliest Deliverable Due:</b> 3/25/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
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## Login 320-59178

<b>Sample Receipt:</b> 3/4/2020 9:15:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b> 0.2;

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>320-59178-1</b>	<b>FS-S-3</b>	<b>2/19/2020 12:20:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet
<b>320-59178-2</b>	<b>FS-S-4</b>	<b>2/13/2020 2:20:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet
<b>320-59178-3</b>	<b>FS-S-5</b>	<b>2/1/2020 10:10:00 AM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet
<b>320-59178-4</b>	<b>FS-S-6</b>	<b>2/5/2020 1:20:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet
<b>320-59178-4 MS</b>	<b>FS-S-6</b>	<b>2/5/2020 1:20:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
<b>320-59178-4 MSD</b>	<b>FS-S-6</b>	<b>2/5/2020 1:20:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
<b>320-59178-5</b>	<b>FS-S-6-D</b>	<b>2/5/2020 1:30:00 PM</b>	<b>Solid</b>		
6010B	RCRA Metals w/o Mercury - ISM dry prep / In-Lab			Total	Dry
Moisture	Percent Moisture / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

# Login Sample Receipt Checklist

Client: Weston Solutions, Inc.

Job Number: 320-59178-1

**Login Number: 59178**  
**List Number: 1**  
**Creator: Kovalyov, Nikita**

**List Source: Eurofins TestAmerica, Sacramento**

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

## Sample Login Analytes / Limits

**Job 320-59178-1**

<b>Client Job Description:</b>	Factory Street - Soil (ISM)	<b>Report To:</b>	Weston Solutions, Inc.
<b>Purchase Order #:</b>	0102654		Shawn Carrier
<b>Work Order #:</b>			841 Bishop Street
<b>Project Manager:</b>	Nicole M McCabe		Suite 2301
<b>Job Due Date:</b>	3/25/2020		Honolulu, HI 96813
<b>Job TAT:</b>	15 Days		
<b>Max Deliverable Level:</b>	II	<b>Bill To:</b>	Weston Solutions, Inc.
			Shawn Carrier
<b>Earliest Deliverable Due:</b>	3/25/2020		841 Bishop Street
			Suite 2301
			Honolulu, HI 96813

**Login 320-59178**

<b>Sample Receipt:</b>	3/4/2020 9:15:00 AM	<b>Number of Coolers:</b>	1
<b>Method of Delivery:</b>	FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>	0.2;

Method	Method Description	Rpt Basis			Units	Sample #s Applicable
6010B	<b>RCRA Metals w/o Mercury - ISM dry prep</b>	Total	MDL	RL		1,2,3,4,4MS,4MSD,5
	Arsenic		1.3	2	mg/Kg	
	Barium		0.12	1	mg/Kg	
	Cadmium		0.03	0.2	mg/Kg	
	Chromium		0.14	0.5	mg/Kg	
	Lead		0.26	1	mg/Kg	
	Selenium		1.4	2	mg/Kg	
	Silver		0.09	0.5	mg/Kg	
Moisture	<b>Percent Moisture</b>	Total	RL	RL		1,2,3,4,5
	Percent Moisture		0.1	0.1	%	
	Percent Solids		0.1	0.1	%	

**FACTORY STREET LEAD REMOVAL  
DATA VALIDATION REPORT**

**Date:** April 23, 2020

**Laboratories:** Eurofins TestAmerica; Irvine, CA and West Sacramento, CA

**Laboratory Job Numbers:** 440-250206-1, 320-57931-1, 320-59178-1

**Data Validation Performed By:** Tara Johnson, Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START)

**Data Validation Reviewed By:** Kelly Luck, WESTON START

**Weston Work Order #:** 20905.012.005.0003.00

This data validation report has been prepared by WESTON START under the START V U.S. Environmental Protection Agency (EPA) Region 9 contract. This report documents the data validation for 12 soil samples collected at the Factory Street Lead Removal site that were analyzed for the following parameters and EPA methods.

- Resource Conservation and Recovery Act (RCRA) Metals by SW-846 Methods 6010B/7471A

Level II data packages were received from Eurofins TestAmerica laboratories in Irvine, CA and West Sacramento, CA. The data validation was conducted in general accordance with the EPA “Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review” dated January 2017. The Attachment contains results summary sheets with any hand-written qualifiers applied during data validation.

**RCRA METALS by SW-846 METHODS 6010B/7471A**

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared		Date Analyzed	
				Mercury <sup>1</sup>	Metals	Mercury <sup>1</sup>	Metals
<b>Samples Analyzed at Irvine, CA Laboratory</b>							
FS-BC-01	440-250206-1	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
FS-BC-02	440-250206-2	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
FS-BC-03	440-250206-3	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
FS-BC-04	440-250206-4	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
FS-BC-05	440-250206-5	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
FS-BC-06	440-250206-6	Soil	9/13/19	9/17/19	9/16/19	9/18/19	9/17/19
<b>Samples Analyzed at West Sacramento, CA Laboratory</b>							
HVQ.0117.01	320-57931-1	Soil	1/17/20	N/A	1/27/20	N/A	1/27/20
FS-S-3	320-59178-1	Soil	2/19/20	N/A	3/9/20	N/A	3/10/20, 3/11/20
FS-S-4	320-59178-2	Soil	2/13/20	N/A	3/9/20	N/A	3/10/20, 3/11/20

Samples	Lab ID	Matrix	Date Collected	Date Prepared		Date Analyzed	
				Mercury <sup>1</sup>	Metals	Mercury <sup>1</sup>	Metals
FS-S-5	320-59178-3	Soil	2/1/20	N/A	3/9/20	N/A	3/10/20, 3/11/20
FS-S-6	320-59178-4	Soil	2/5/20	N/A	3/9/20	N/A	3/10/20, 3/11/20
FS-S-6-D	320-59178-5	Soil	2/5/20	N/A	3/9/20	N/A	3/10/20, 3/11/20

<sup>1</sup> N/A = Not applicable; sample was not analyzed for mercury.

**1. Data Verification Check**

A data verification and completeness check was performed in accordance with the Stage 1 and 2A verification checks outlined in the EPA “Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use” dated January 13, 2009. For the metals analyses, all analytical data package items were received from the laboratory and the analyses requested were performed.

**2. Holding Times**

The samples were received within the recommended temperature limit of ≤6 °C for mercury, and extracted and analyzed within the recommended holding time limits of 28 days for mercury and 180 days for all other metals.

**3. Blank Results**

Four method blanks (three for metals and one for mercury) were analyzed with the sample sets, at the correct frequency, and were free of target analyte contamination above the method detection limits (MDLs).

**4. Laboratory Control Sample (LCS) Results**

Four LCSs (three for metals and one for mercury) were analyzed with the sample sets, at the correct frequency, and all recoveries were within the quality control (QC) limits of 75-125%.

**5. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results**

The following samples were used for MS/MSD analyses: FS-BC-01, HVQ.0117.01, and FS-S-6 for metals; and FS-BC-01 for mercury. Recoveries were within QC limits of 80-120% for arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury, and relative percent differences (RPD) were within the QC limits of ≤20%, with the following exceptions:

- in sample FS-BC-01, recovery of barium (126%; MSD only) and chromium (42 and 67%); and
- in sample FS-S-6, recovery of arsenic (64 and 65%) and selenium (61 and 70%).

The results for the barium and chromium in sample FS-BC-01, and for arsenic and selenium in sample FS-S-6, were qualified as estimated (J for detects; UJ for nondetects). The study reports noted that the MS/MSD recoveries outside QC limits were likely due to matrix interference and/or non-homogeneity since the LCSs were within QC limits.

In sample FS-S-6, the MS/MSD recoveries and/or RPDs for barium, chromium, and lead were also outside QC limits, but the concentrations of the analytes in the unspiked sample were greater than four times the amount of the spiked concentrations, so no action was required.

## 6. **Field Duplicate Results**

The sample sets included one field duplicate pair: FS-S-6 and FS-S-6-D. The QC criteria for field duplication are RPD  $\leq$ 50% for concentrations greater than five times the reporting limit (RL), and absolute difference between results less than the RL for sample concentrations less than five times the RL. The QC criteria were met for all analytes with the exception of cadmium (60%) and lead (53%). The results for cadmium and lead were qualified as estimated (J) in samples FS-S-6 and FS-S-6-D.

## 7. **Overall Assessment**

Samples FS-S-06 and FS-S-06-D were diluted (20x) for determination of lead and/or selenium due to the nature of the sample matrix. Reporting limits were elevated accordingly.

Eurofins TestAmerica flagged sample results with the following laboratory qualifiers:

F1: indicates MS and/or MSD recovery exceeds control limits. These qualifiers were removed by the data validator and replaced with “J” or “UJ” qualifiers if the recovery and/or RPD was outside standard QC limits.

J: indicates result is less than the RL but greater than or equal to the MDL, and the concentration is an approximate value. These qualifiers were left in place by the data validator.

In addition to the qualifiers discussed above, the data validator applied “U” qualifiers to sample results reported by the laboratory as “ND”.

The metals data are acceptable for use as qualified based on the information received.

**ATTACHMENT**

**EUROFINS TESTAMERICA  
RESULTS SUMMARY WITH QUALIFIERS**

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

**Client Sample ID: FS-BC-01**

**Lab Sample ID: 440-250206-1**

Date Collected: 09/13/19 13:23

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Barium	13	ET J	1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Cadmium	ND	H	0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Chromium	33	ET J	1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Selenium	ND	H	3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:17	5
Silver	ND	H	1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:17	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:00	1

**Client Sample ID: FS-BC-02**

**Lab Sample ID: 440-250206-2**

Date Collected: 09/13/19 13:30

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.1	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Barium	14		1.5	0.77	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Cadmium	ND	H	0.51	0.26	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Chromium	35		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Selenium	ND	H	3.1	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:26	5
Silver	ND	H	1.5	0.91	mg/Kg		09/16/19 10:44	09/17/19 21:26	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:06	1

**Client Sample ID: FS-BC-03**

**Lab Sample ID: 440-250206-3**

Date Collected: 09/13/19 13:36

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Barium	13		1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Cadmium	ND	H	0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Chromium	26		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Selenium	ND	H	3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:29	5
Silver	ND	H	1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:29	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:08	1

TBJ 4/23/20

Eurofins TestAmerica, Irvine

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 440-250206-1  
SDG: Halawa Valley Quarry

**Client Sample ID: FS-BC-04**

**Lab Sample ID: 440-250206-4**

Date Collected: 09/13/19 13:42

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Barium	13		1.5	0.76	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Cadmium	ND	H	0.51	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Chromium	27		1.0	0.51	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Selenium	ND	H	3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:31	5
Silver	ND	H	1.5	0.90	mg/Kg		09/16/19 10:44	09/17/19 21:31	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:10	1

**Client Sample ID: FS-BC-05**

**Lab Sample ID: 440-250206-5**

Date Collected: 09/13/19 13:48

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Barium	14		1.5	0.75	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Cadmium	ND	H	0.50	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Chromium	30		1.0	0.50	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Selenium	ND	H	3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:38	5
Silver	ND	H	1.5	0.89	mg/Kg		09/16/19 10:44	09/17/19 21:38	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:12	1

**Client Sample ID: FS-BC-06**

**Lab Sample ID: 440-250206-6**

Date Collected: 09/13/19 13:55

Matrix: Solid

Date Received: 09/14/19 10:30

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	H	3.0	1.5	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Barium	29		1.5	0.75	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Cadmium	ND	H	0.50	0.25	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Chromium	72		1.0	0.50	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Lead	ND	H	2.0	1.0	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Selenium	ND	H	3.0	1.7	mg/Kg		09/16/19 10:44	09/17/19 21:40	5
Silver	ND	H	1.5	0.89	mg/Kg		09/16/19 10:44	09/17/19 21:40	5

**Method: 7471A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.020	0.012	mg/Kg		09/17/19 13:05	09/18/19 02:14	1

TBS 4/23/20

# Client Sample Results

Job ID: 320-57931-1

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

**Client Sample ID: HVQ.0117.01**

**Lab Sample ID: 320-57931-1**

Date Collected: 01/17/20 10:06

Matrix: Solid

Date Received: 01/21/20 09:30

Method: 6010B - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND	PT U	2.0	1.3	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Barium	16	PT	1.0	0.12	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Cadmium	ND	U	0.20	0.030	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Chromium	19		0.50	0.14	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Lead	1.6		1.0	0.26	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Selenium	ND	PT U	2.0	1.4	mg/Kg		01/27/20 07:00	01/27/20 21:25	1
Silver	ND	U	0.50	0.090	mg/Kg		01/27/20 07:00	01/27/20 21:25	1

TBJ 4/23/20



# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

## Client Sample ID: FS-S-3

Date Collected: 02/19/20 12:20  
Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-1

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.3		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Cadmium	0.40		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Chromium	160		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Lead	140		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:33	2
Selenium	ND	U	2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:51	2
Silver	ND	U	0.50	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:51	2

## Client Sample ID: FS-S-4

Date Collected: 02/13/20 14:20  
Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-2

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.8		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Cadmium	0.52		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Chromium	140		0.49	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Lead	210		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:37	2
Selenium	ND	U	2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:55	2
Silver	ND	U	0.49	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:55	2

## Client Sample ID: FS-S-5

Date Collected: 02/01/20 10:10  
Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-3

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.7		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Barium	370		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Cadmium	0.56		0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Chromium	140		0.49	0.14	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Lead	630		0.99	0.26	mg/Kg		03/09/20 06:30	03/11/20 18:41	2
Selenium	ND	U	2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 19:59	2
Silver	0.15	J	0.49	0.089	mg/Kg		03/09/20 06:30	03/10/20 19:59	2

## Client Sample ID: FS-S-6

Date Collected: 02/05/20 13:20  
Date Received: 03/04/20 09:15

## Lab Sample ID: 320-59178-4

Matrix: Solid

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.0	FT J	2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Barium	390		0.99	0.12	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Cadmium	1.4	FT J	0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Chromium	140		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 20:03	2
Lead	16000	J	9.9	2.6	mg/Kg		03/09/20 06:30	03/11/20 18:53	20
Selenium	ND	FT UJ	20	14	mg/Kg		03/09/20 06:30	03/11/20 18:53	20
Silver	0.76		0.50	0.089	mg/Kg		03/09/20 06:30	03/10/20 20:03	2

T&J 4/23/20

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Weston Solutions, Inc.  
 Project/Site: Factory Street - Soil (ISM)

Job ID: 320-59178-1

**Client Sample ID: FS-S-6-D**

**Lab Sample ID: 320-59178-5**

Date Collected: 02/05/20 13:30

Matrix: Solid

Date Received: 03/04/20 09:15

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.0		2.0	1.3	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Barium	410		1.0	0.12	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Cadmium	2.6	J	0.20	0.030	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Chromium	130		0.50	0.14	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Lead	9300	J	10	2.6	mg/Kg		03/09/20 06:30	03/11/20 19:12	20
Selenium	ND	U	2.0	1.4	mg/Kg		03/09/20 06:30	03/10/20 20:30	2
Silver	0.72		0.50	0.090	mg/Kg		03/09/20 06:30	03/10/20 20:30	2

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## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136699-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/24/2020 3:32:19 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)



### LINKS

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

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**Job ID: 550-136699-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

## Narrative

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**Job Narrative**  
**550-136699-1**

## Comments

No additional comments.

## Receipt

The samples were received on 1/23/2020 9:35 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

Method 7300: The method blank associated with preparation batch 550-201007 and analytical batch 550-201073 contained lead at or above reporting limit (RL). The background was subtracted from the QC samples and the client's sample(s).

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136699-1	FS-A-0120-SW	Air	01/20/20 00:00	01/23/20 09:35	
550-136699-2	FS-A-0120-WZ	Air	01/20/20 00:00	01/23/20 09:35	
550-136699-3	FS-A-0120-NW	Air	01/20/20 00:00	01/23/20 09:35	
550-136699-4	FS-A-0120-NE	Air	01/20/20 00:00	01/23/20 09:35	
550-136699-5	FS-A-0120-SE	Air	01/20/20 00:00	01/23/20 09:35	
550-136699-6	FS-A-0121-FB1	Air	01/21/20 00:00	01/23/20 09:35	
550-136699-7	FS-A-0121-FB2	Air	01/21/20 00:00	01/23/20 09:35	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

**Client Sample ID: FS-A-0120-SW**

**Lab Sample ID: 550-136699-1**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 308.99 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0399	0.000129		0.0250	01/24/20 10:47	1	ARE

**Client Sample ID: FS-A-0120-WZ**

**Lab Sample ID: 550-136699-2**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 174.81 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0636	0.000364		0.0250	01/24/20 10:49	1	ARE

**Client Sample ID: FS-A-0120-NW**

**Lab Sample ID: 550-136699-3**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 289.45 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000864		0.0250	01/24/20 10:51	1	ARE

**Client Sample ID: FS-A-0120-NE**

**Lab Sample ID: 550-136699-4**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 309.38 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000808		0.0250	01/24/20 10:53	1	ARE

**Client Sample ID: FS-A-0120-SE**

**Lab Sample ID: 550-136699-5**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 325.8 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000767		0.0250	01/24/20 10:54	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

**Client Sample ID: FS-A-0121-FB1**

**Lab Sample ID: 550-136699-6**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250				0.0250	01/24/20 10:56	1	ARE

**Client Sample ID: FS-A-0121-FB2**

**Lab Sample ID: 550-136699-7**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250				0.0250	01/24/20 10:58	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP	154268	10-01-21
AIHA-LAP, LLC	Environmental Lead Laboratory Accreditation Program (ELLAP)	154268	10-01-21
AIHA-LAP, LLC	IHLAP	154268	12-01-20 *
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21
Arizona	State	AZ0728	07-09-20
California	LA Cty Sanitation Districts	9254471	06-09-20 *
California	State	2941	06-11-20
Nevada	State	AZ1030	08-09-20
Oregon	NELAP	AZ100001	03-09-20 *
USDA	US Federal Programs	P330-19-00227	08-27-22

## Glossary

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

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303



**Chain of Custody Record**

136699



ENVIRONMENTAL TESTING

Regulatory Program:  DW  NPDES  RCHA  Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins

<b>Client Contact</b>	Shawn Carrier shawn_carrier@westonsolutions.com 808-275-2931	<b>Shawn Carrier</b>	Date: 1/21/20	<b>COC No.:</b>	
Weston Solutions 841 Bishop Street Suite 2301 Honolulu, Hawaii 96813	Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below: _____	<b>Carlene McCutcheon</b>	<b>FedEx</b>		
(xxx) xxx-xxxx FAX 8082752931	<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 1 day				
Factory Street					
Factory Street					
P O #					

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific
FS-A-0120-SW	01/20		C	AIR	1		X	308.99 L
FS-A-0120-WZ	01/20		C	AIR	1		X	174.81 L
FS-A-0120-NW	01/20		C	AIR	1		X	289.45 L
FS-A-0120-NE	01/20		C	AIR	1		X	309.38 L
FS-A-0120-SE	01/20		C	AIR	1		X	125.8 L
FS-A-0121-FBI	01/21		G	AIR	1		X	LEAD RANGE / 0.04945
FS-A-0121-FR2	01/21		G	AIR	1		X	IN RANGE / 0 L



Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

**Preservation Used:** 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other \_\_\_\_\_  
**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

1-DAY TURN-AROUND-TIME, LEAD (Pb) ONLY

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C):	Obs'd:	Cor'd:	Therm ID No.:
Relinquished by: <i>[Signature]</i>	Company: <i>[Signature]</i>	Received by: <i>[Signature]</i>	Date/Time: 1/21/20	Company: <i>[Signature]</i>	Date/Time: 1/21/20
Relinquished by: <i>[Signature]</i>	Company: <i>[Signature]</i>	Received by: <i>[Signature]</i>	Date/Time: 1/21/20	Company: <i>[Signature]</i>	Date/Time: 1/21/20

# Sample Login Acknowledgement

## Job 550-136699-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> Purchase Order Requested <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 1/24/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 1/24/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
---	--

## Login 550-136699

<b>Sample Receipt:</b> 1/23/2020 9:35:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-136699-1</b> NIOSH7300	<b>FS-A-0120-SW</b> Lead / In-Lab	1/20/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-2</b> NIOSH7300	<b>FS-A-0120-WZ</b> Lead / In-Lab	1/20/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-3</b> NIOSH7300	<b>FS-A-0120-NW</b> Lead / In-Lab	1/20/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-4</b> NIOSH7300	<b>FS-A-0120-NE</b> Lead / In-Lab	1/20/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-5</b> NIOSH7300	<b>FS-A-0120-SE</b> Lead / In-Lab	1/20/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-6</b> NIOSH7300	<b>FS-A-0121-FB1</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet
<b>550-136699-7</b> NIOSH7300	<b>FS-A-0121-FB2</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136700-1  
Client Project/Site: Factory Street  
Revision: 1

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/27/2020 5:31:02 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)

### LINKS

Review your project  
results through  
**Total Access**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

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**Job ID: 550-136700-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

## Narrative

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**Job Narrative**  
**550-136700-1**

## Comments

No additional comments.

## Receipt

The samples were received on 1/23/2020 9:35 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

Method 7300: The method blank associated with preparation batch 550-201007 and analytical batch 550-201073 contained lead at or above reporting limit (RL). The background was subtracted from the QC samples and the client's sample(s).

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136700-1	FS-A-0121-NE	Air	01/21/20 00:00	01/23/20 09:35	
550-136700-2	FS-A-0121-NW	Air	01/21/20 00:00	01/23/20 09:35	
550-136700-3	FS-A-0121-SE	Air	01/21/20 00:00	01/23/20 09:35	
550-136700-4	FS-A-0121-SW	Air	01/21/20 00:00	01/23/20 09:35	
550-136700-5	FS-A-0121-W2	Air	01/21/20 00:00	01/23/20 09:35	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

**Client Sample ID: FS-A-0121-NE**

**Lab Sample ID: 550-136700-1**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1061.65 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0576	0.0000543		0.0250	01/24/20 11:03	1	ARE

**Client Sample ID: FS-A-0121-NW**

**Lab Sample ID: 550-136700-2**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1043.67 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0362	0.0000347		0.0250	01/24/20 11:05	1	ARE

**Client Sample ID: FS-A-0121-SE**

**Lab Sample ID: 550-136700-3**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1062.1 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.354	0.000333		0.0250	01/24/20 11:07	1	ARE

**Client Sample ID: FS-A-0121-SW**

**Lab Sample ID: 550-136700-4**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1046.23 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0325	0.0000310		0.0250	01/24/20 11:09	1	ARE

**Client Sample ID: FS-A-0121-W2**

**Lab Sample ID: 550-136700-5**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 500.25 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.303	0.000605		0.0250	01/24/20 11:11	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303



**Chain of Custody Record**

134700  
 eurofins  
 ENVIRONMENTAL TESTS

TestAmerica Laboratories, Inc. db/a Eurofi

Regulatory Program:  DW  NPDES  RCRA  Other:

**Client Contact**  
 Western Solutions  
 841 Bishop Street Suite 2301  
 Honolulu, Hawaii 96813 8082752931  
 (xxx) xxx-xxxx FAX  
 Factory Street  
 Factory Street  
 P O #

**Shawn Carrier**  
 Shawn Carrier@westsolutions.com  
 808-275-2931  
**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below  
 2 weeks  
 1 week  
 2 days  
 1 day

**Shawn Carrier**  
 Carlene McCutcheon  
 Date: 1/22/20  
 FedEx

**COC No:** \_\_\_\_\_  
**TALS Project #:** \_\_\_\_\_  
**Sampler:** \_\_\_\_\_  
**For Lab Use Only:**  
 Walk-in Client: \_\_\_\_\_  
 Lab Sampling: \_\_\_\_\_  
 Job / SDG No.: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific
ES-A-6121-NE	1/21/20		C	Air 1		X	N/A	TOTAL Flow 1001.65L
ES-A-0121-NW			C	Air 1		X		" " 1073.65L
ES-A-0121-SR			C	Air 1		X		" " 1062.4L
ES-A-0121-SW			C	Air 1		X		" " 1046.23L
ES-A-0121-NW2			C	Air 1		X		" " 500.25L



**Preservation Used:** 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other  
**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  
**Special Instructions/QC Requirements & Comments:**  
 \*P6 ONLY, RUSH THE TAT\*

**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**  
 Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

**Custody Seals Intact:**  Yes  No  
**Relinquished by:** [Signature] **Company:** WESTON  
**Received by:** [Signature] **Company:** TRANE  
**Therm ID No.:** \_\_\_\_\_  
**Date/Time:** 1/22/20  
**Date/Time:** 1/22/20 935

# Sample Login Acknowledgement

## Job 550-136700-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> Purchase Order Requested <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 1/24/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 1/24/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
---	--

## Login 550-136700

<b>Sample Receipt:</b> 1/23/2020 9:35:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-136700-1</b> NIOSH7300	<b>FS-A-0121-NE</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet
<b>550-136700-2</b> NIOSH7300	<b>FS-A-0121-NW</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet
<b>550-136700-3</b> NIOSH7300	<b>FS-A-0121-SE</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet
<b>550-136700-4</b> NIOSH7300	<b>FS-A-0121-SW</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet
<b>550-136700-5</b> NIOSH7300	<b>FS-A-0121-W2</b> Lead / In-Lab	1/21/2020 12:00:00 AM	Air	Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136790-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/27/2020 5:36:41 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1



---

## Job ID: 550-136790-1

---

Laboratory: Eurofins TestAmerica, Phoenix

### Narrative

---

Job Narrative  
550-136790-1

### Comments

No additional comments.

### Receipt

The samples were received on 1/24/2020 9:30 AM; the samples arrived in good condition.

### Metals

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

### Industrial Hygiene

Method 7300: The method blank associated with preparation batch 550-201102 and analytical batch 550-201191 contained lead at or above reporting limit (RL). The background was subtracted from the QC samples and the client's sample(s).

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

# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136790-1	FS-A-0122-W2	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-2	FS-A-0122-SE	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-3	FS-A-0122-SW	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-4	FS-A-0122-NE	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-5	FS-A-0122-NW	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-6	FS-A-0122-NW-D	Air	01/22/20 00:00	01/24/20 09:30	
550-136790-7	FS-A-0122-SE-D	Air	01/22/20 00:00	01/24/20 09:30	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

**Client Sample ID: FS-A-0122-W2**

**Lab Sample ID: 550-136790-1**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 811.49 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0543	0.0000669		0.0250	01/27/20 10:20	1	ARE

**Client Sample ID: FS-A-0122-SE**

**Lab Sample ID: 550-136790-2**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1041.63 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.481	0.000462		0.0250	01/27/20 10:22	1	ARE

**Client Sample ID: FS-A-0122-SW**

**Lab Sample ID: 550-136790-3**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1051.28 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0436	0.0000415		0.0250	01/27/20 10:24	1	ARE

**Client Sample ID: FS-A-0122-NE**

**Lab Sample ID: 550-136790-4**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1064.33 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0449	0.0000421		0.0250	01/27/20 10:26	1	ARE

**Client Sample ID: FS-A-0122-NW**

**Lab Sample ID: 550-136790-5**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1030.73 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0637	0.0000618		0.0250	01/27/20 10:28	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

**Client Sample ID: FS-A-0122-NW-D**

**Lab Sample ID: 550-136790-6**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 948.75 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0616	0.000649		0.0250	01/27/20 10:29	1	ARE

**Client Sample ID: FS-A-0122-SE-D**

**Lab Sample ID: 550-136790-7**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 978.43 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.507	0.000518		0.0250	01/27/20 10:31	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303

**Chain of Custody Record**

Regulatory Program:  DW  NPDES  RCRA  Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins



Envi  
TestA

134790

COC No: \_\_\_\_\_ of \_\_\_\_\_

TALS Project #:

Sampler:

For Lab Use Only:

Walk-in Client:

Lab Sampling:

Job / SDG No.:

Sample Specific

**Client Contact**  
 Weston Solutions  
 841 Bishop Street Suite 2301  
 Honolulu, Hawaii, 96813  
 (xxx) xxx-xxxx FAX 8082752931  
 Factory Street  
 Factory Street  
 P O #

**Shawn Carrier**  
 Shawn Carrier@westonsolutions.com  
 808-275-2931  
**Shawn Carrier**  
 Carlene McCutcheon  
 Date: 1/27/20

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below \_\_\_\_\_

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
ES-A-0128-142	1/28/20	Water	Air 1	1		
ES-A-0122-142	1/22/20		Air 1	1		
ES-A-0122-5E			Air 1	1		
ES-A-0122-5W			Air 1	1		
ES-A-0122-N/E			Air 1	1		
ES-A-0122-N/W			Air 1	1		
ES-A-0122-N/W-D			Air 1	1		
ES-A-0122-S/E-D			Air 1	1		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
ES-A-0128-142	1/28/20		Water	Air 1	1		
ES-A-0122-142	1/22/20			Air 1	1		
ES-A-0122-5E				Air 1	1		
ES-A-0122-5W				Air 1	1		
ES-A-0122-N/E				Air 1	1		
ES-A-0122-N/W				Air 1	1		
ES-A-0122-N/W-D				Air 1	1		
ES-A-0122-S/E-D				Air 1	1		

550-136790 Chain of Custody



**Preservation Used:** 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

**Special Instructions/QC Requirements & Comments:**  
 24-Hour TAT; Pb Only

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Custody Seals Intact:  Yes  No  
 Cooler Temp. (°C): Obs'd: \_\_\_\_\_ Corr'd: \_\_\_\_\_  
 Therm ID No.: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_

# Sample Login Acknowledgement

## Job 550-136790-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> Purchase Order Requested <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 1/27/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 1/27/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
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## Login 550-136790

<b>Sample Receipt:</b> 1/24/2020 9:30:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-136790-1</b>	<b>FS-A-0122-W2</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-2</b>	<b>FS-A-0122-SE</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-3</b>	<b>FS-A-0122-SW</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-4</b>	<b>FS-A-0122-NE</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-5</b>	<b>FS-A-0122-NW</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-6</b>	<b>FS-A-0122-NW-D</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136790-7</b>	<b>FS-A-0122-SE-D</b>	<b>1/22/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136820-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/27/2020 5:39:34 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)



### LINKS

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results through  
**TotalAccess**

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Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

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**Job ID: 550-136820-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

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## Narrative

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**Job Narrative**  
**550-136820-1**

## Comments

No additional comments.

## Receipt

The samples were received on 1/25/2020 9:15 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136820-1	FS-A-0123-SE	Air	01/23/20 00:00	01/25/20 09:15	
550-136820-2	FS-A-0123-SW	Air	01/23/20 00:00	01/25/20 09:15	
550-136820-3	FS-A-0123-NW	Air	01/23/20 00:00	01/25/20 09:15	
550-136820-4	FS-A-0123-NE	Air	01/23/20 00:00	01/25/20 09:15	
550-136820-5	FS-A-0123-SE-D	Air	01/23/20 00:00	01/25/20 09:15	
550-136820-6	FS-A-0123-WZ	Air	01/23/20 00:00	01/25/20 09:15	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

Client Sample ID: FS-A-0123-SE

Lab Sample ID: 550-136820-1

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 987.77 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.392	0.000397		0.0250	01/27/20 10:47	1	ARE

Client Sample ID: FS-A-0123-SW

Lab Sample ID: 550-136820-2

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 989.01 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.210	0.000212		0.0250	01/27/20 10:53	1	ARE

Client Sample ID: FS-A-0123-NW

Lab Sample ID: 550-136820-3

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 987.05 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.257	0.000260		0.0250	01/27/20 10:55	1	ARE

Client Sample ID: FS-A-0123-NE

Lab Sample ID: 550-136820-4

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 1015.96 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.812	0.000799		0.0250	01/27/20 10:56	1	ARE

Client Sample ID: FS-A-0123-SE-D

Lab Sample ID: 550-136820-5

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 1051.28 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.274	0.000261		0.0250	01/27/20 10:58	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

**Client Sample ID: FS-A-0123-WZ**

**Lab Sample ID: 550-136820-6**

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 783.04 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.568	0.000726		0.0250	01/27/20 11:00	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**

4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303

**Chain of Custody Record**

136820  
 eurofins  
 Enviro  
 TestA

TestAmerica Laboratories, Inc. d/b/a Eurofins

Regulatory Program:  DW  NPDES  RCRA  Other:

<b>Client Contact</b>		<b>Shawn Carrier</b>		<b>Shawn Carrier</b>		<b>Date:</b> 1/23/2020	
Weston Solutions 841 Bishop Street Suite 2301 Honolulu, Hawaii, 96813 8082752931		shawn.carrier@westonsolutions.com 808-275-2931		Carlene McCutcheon		FedEx	
<b>Analysis Turnaround Time</b>		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS				COC No: 1 of 1	
TAT if different from Below		<input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 1 week <input type="checkbox"/> 2 weeks				TALS Project #:	
Factory Street Factory Street P O #		<input type="checkbox"/> XXXX-XXXX FAX <input type="checkbox"/>				For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:	

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)		Sample Specific
						Perform MS/MSD (Y/N)		
1 FS-A-0123-SE	1/23/20	0807-	C	Air	1	X		987.72 Total Flow (L)
2 FS-A-0123-SW	1/23/20	0810-	C	Air	1	X		989.2 L
3 FS-A-0123-NW	1/23/20	0804-	C	Air	1	X		987.25 L
4 FS-A-0123-NE	1/23/20	0854-	C	Air	1	X		1015.26 L
5 FS-A-0123-SE-D	1/23/20	0807-	C	Air	1	X		1051.28 L
6 FS-A-0123-WZ	1/23/20	1632-	C	Air	1	X		983.24 L



550-136820 Chain of Custody

Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other

Possible Hazard Identification:  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

24-Hour TAT, 16 ONLY

Special Instructions/QC Requirements & Comments:  
 Non-hazard  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C): Obsd.:	Therm ID No.:
Relinquished by: <i>MEC</i>	Company: <i>WESTON</i>	Received by: <i>Margaret</i>	Date/Time: <i>1/23/20</i>
Relinquished by:	Company:	Received by: <i>Margaret</i>	Date/Time: <i>1/23/20</i>

# Sample Login Acknowledgement

## Job 550-136820-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> Purchase Order Requested <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 1/28/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 1/28/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
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## Login 550-136820

<b>Sample Receipt:</b> 1/25/2020 9:15:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Saturday Delivery	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-136820-1</b>	<b>FS-A-0123-SE</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136820-2</b>	<b>FS-A-0123-SW</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136820-3</b>	<b>FS-A-0123-NW</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136820-4</b>	<b>FS-A-0123-NE</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136820-5</b>	<b>FS-A-0123-SE-D</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136820-6</b>	<b>FS-A-0123-WZ</b>	<b>1/23/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136831-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/28/2020 5:52:03 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)

### LINKS

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results through  
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[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1



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**Job ID: 550-136831-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

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**Narrative**

**Job Narrative**  
**550-136831-1**

**Comments**

No additional comments.

**Receipt**

The samples were received on 1/27/2020 10:20 AM; the samples arrived in good condition.

**Metals**

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

**Industrial Hygiene**

Method 7300: The Method Blank, Field Blank (or other QC results) were not used to correct client sample results associated with preparation batch 550-201227 and analytical batch 550-201294.

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

# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136831-1	FS-A-0124-SW	Air	01/24/20 00:00	01/27/20 10:20	
550-136831-2	FS-A-0124-SE	Air	01/24/20 00:00	01/27/20 10:20	
550-136831-3	FS-A-0124-NW	Air	01/24/20 00:00	01/27/20 10:20	
550-136831-4	FS-A-0124-NE	Air	01/24/20 00:00	01/27/20 10:20	
550-136831-5	FS-A-0124-INZ	Air	01/24/20 00:00	01/27/20 10:20	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1

**Client Sample ID: FS-A-0124-SW**

**Lab Sample ID: 550-136831-1**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1001.85 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.476	0.000475		0.0250	01/28/20 11:27	1	ARE

**Client Sample ID: FS-A-0124-SE**

**Lab Sample ID: 550-136831-2**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1019.62 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.182	0.000178		0.0250	01/28/20 11:29	1	ARE

**Client Sample ID: FS-A-0124-NW**

**Lab Sample ID: 550-136831-3**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1005.09 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.143	0.000142		0.0250	01/28/20 11:31	1	ARE

**Client Sample ID: FS-A-0124-NE**

**Lab Sample ID: 550-136831-4**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1020.06 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.148	0.000145		0.0250	01/28/20 11:33	1	ARE

**Client Sample ID: FS-A-0124-INZ**

**Lab Sample ID: 550-136831-5**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1035.81 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.842	0.000813		0.0250	01/28/20 11:34	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303

136831

**Chain of Custody Record**



Enviro  
TestID

TestAmerica Laboratories, Inc. d/b/a Eurofins

Regulatory Program:  DW  NPDES  RCRA  Other:

**Client Contact**  
 Shawn Carrier  
 shawn\_carrier@westonsolutions.com  
 808-275-2931

**Shawn Carrier**  
 Date: 1/25/20

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below \_\_\_\_\_

**Filtered Sample ( Y / N )**  
**Perform MS / MSD ( Y / N )**

COG No.: 1 of 1  
 TALS Project #:  
 Sampler:  
 For Lab Use Only:  
 Walk-in Client:  
 Lab Sampling:  
 Job / SDG No.:

Sample Identification  
 Sample Date Sample Time Sample Type (C=Comp, G=Grav) Matrix # of Cont.

Sample ID	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample ( Y / N )	Perform MS / MSD ( Y / N )	Volume
-01 ES-A-0124-51A	1/24/20	0944-1605	C	Air	1	X	N/A	1001.85 LITERS
-02 ES-A-0124-51B	1/24/20	0940-1609	C	Air	1	X	N/A	1019.62 LITERS
-03 ES-A-0124-N1A	1/24/20	0945-1607	C	Air	1	X	N/A	1005.09 LITERS
-04 ES-A-0124-N1B	1/24/20	0941-1611	C	Air	1	X	N/A	1021.06 LITERS
-05 ES-A-0124-1A1Z	1/24/20	0938-1615	C	Air	1	X	N/A	1035.81 LITERS

USHA



550-136831 Chain of Custody

**Preservation Used:** 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other  
**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

**Special Instructions/QC Requirements & Comments:**  
 24 Hr TH, P6 ONLY\*  
 Amb no Ice

Custody Seals Intact:  Yes  No  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Company: [Signature]  
 Date/Time: [Signature]

Received by: [Signature]  
 Date/Time: [Signature]  
 Cooler Temp. (°C): [Signature] Obs'd.: [Signature]  
 Company: [Signature]  
 Date/Time: [Signature]

FedEx

FA-PHX

1/27/20

10:20

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136874-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/30/2020 2:44:02 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)



### LINKS

Review your project  
results through  
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Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

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**Job ID: 550-136874-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

## Narrative

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**Job Narrative**  
**550-136874-1**

## Comments

No additional comments.

## Receipt

The samples were received on 1/28/2020 9:30 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

Methods 7300, 7303: The method blank associated with preparation batch 550-201329 and analytical batch 550-201476 contained lead at or above reporting limit (RL). The background was subtracted from the QC samples and the client's sample(s).

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136874-1	FS-A-0125-IW2	Air	01/25/20 00:00	01/28/20 09:30	
550-136874-2	FS-A-0125-SE	Air	01/25/20 00:00	01/28/20 09:30	
550-136874-3	FS-A-0125-SW	Air	01/25/20 00:00	01/28/20 09:30	
550-136874-4	FS-A-0125-NW	Air	01/25/20 00:00	01/28/20 09:30	
550-136874-5	FS-A-0125-NE	Air	01/25/20 00:00	01/28/20 09:30	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

**Client Sample ID: FS-A-0125-IW2**

**Lab Sample ID: 550-136874-1**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 961.32 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.207	0.000215		0.0250	01/30/20 08:36	1	ARE

**Client Sample ID: FS-A-0125-SE**

**Lab Sample ID: 550-136874-2**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 942.15 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000265		0.0250	01/30/20 08:38	1	ARE

**Client Sample ID: FS-A-0125-SW**

**Lab Sample ID: 550-136874-3**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 947.27 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.221	0.000233		0.0250	01/30/20 08:39	1	ARE

**Client Sample ID: FS-A-0125-NW**

**Lab Sample ID: 550-136874-4**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 953.89 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.137	0.000143		0.0250	01/30/20 08:41	1	ARE

**Client Sample ID: FS-A-0125-NE**

**Lab Sample ID: 550-136874-5**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 940.80 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000266		0.0250	01/30/20 08:43	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303

136874

**Chain of Custody Record**



ENVIRONMENTAL TESTS

TestAmerica Laboratories, Inc. d/b/a Eurofins

Regulatory Program:  DW  NPDES  RCRA  Other:

<b>Client Contact</b>	Shawn Carrier shawn_carrier@westonsolutions.com 808-275-2931	<b>Shawn Carrier</b>	Date: 1/22/20	<b>COC No.:</b>	
Weston Solutions 841 Bishop Street Suite 2301 Honolulu, Hawaii, 96813 8082752931	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS	<b>Carlene McCutcheon</b>		TALS Project #:	
(xxx) xxx-xxxx FAX	TAT if different from Below			Sampler:	
Factory Street	<input type="checkbox"/> 2 weeks			For Lab Use Only:	
Factory Street	<input type="checkbox"/> 1 week			Walk-in Client:	
P O #	<input type="checkbox"/> 2 days			Lab Sampling:	
	<input checked="" type="checkbox"/> 1 day			Job / SDG No.:	

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-Grnd)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific
-01 ES-A-0125-1412	01/25/20	1546	C	Air	1	X	X	961.32 Total Flow
<del>ES-A-0125-1412</del>	<del>01/25/20</del>	<del>1546</del>	<del>C</del>	<del>Air</del>	<del>1</del>	<del>X</del>	<del>X</del>	<del>947.15 Total Flow</del>
-02 ES-A-0125-5E	01/25/20	1541	C	Air	1	X	X	947.22 " "
-03 ES-A-0125-514	01/25/20	1536	C	Air	1	X	X	953.87 " "
-04 ES-A-0125-NW	01/25/20	1532	C	Air	1	X	X	940.82 " "
-05 ES-A-0125-NW	01/25/20	1533	C	Air	1	X	X	

**RUSH!**



550-136874 Chain of Custody

**Preservation Used:** 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other

**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

**Special Instructions/QC Requirements & Comments:**  
 24 Hr. TAT - \*P6 ONLY

Return to Client  Disposal by Lab  Archive for Months

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C): Obsd.:	Corrd.:	Therm ID No.:
Relinquished by: <i>Wick</i>	Company: <i>WESTON</i>	Received by: <i>[Signature]</i>	Company: <i>TAPIX</i>	Date/Time: 1/28/20 9:30
Date/Time: 1/22/20 - 100	Date/Time:	Received by: <i>[Signature]</i>	Company: <i>TAPIX</i>	Date/Time: 1/28/20 9:30

# Sample Login Acknowledgement

## Job 550-136874-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> Purchase Order Requested <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 1/29/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 1/29/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813
---	--

## Login 550-136874

<b>Sample Receipt:</b> 1/28/2020 9:30:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-136874-1</b>	<b>FS-A-0125-IW2</b>	<b>1/25/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136874-2</b>	<b>FS-A-0125-SE</b>	<b>1/25/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136874-3</b>	<b>FS-A-0125-SW</b>	<b>1/25/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136874-4</b>	<b>FS-A-0125-NW</b>	<b>1/25/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet
<b>550-136874-5</b>	<b>FS-A-0125-NE</b>	<b>1/25/2020 12:00:00 AM</b>	<b>Air</b>		
NIOSH7300_ICPMS	Lead / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-136943-1  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
1/30/2020 2:22:54 PM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)

### LINKS

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

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**Job ID: 550-136943-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

## Narrative

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**Job Narrative**  
**550-136943-1**

## Comments

No additional comments.

## Receipt

The samples were received on 1/29/2020 9:50 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

Method 7300: The method blank associated with preparation batch 550-201383 and analytical batch 550-201477 contained lead at or above reporting limit (RL). The background was subtracted from the QC samples and the client's sample(s).

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

# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-136943-1	FS-A-0127-SW	Air	01/27/20 00:00	01/29/20 09:50	
550-136943-2	FS-A-0127-SE	Air	01/27/20 00:00	01/29/20 09:50	
550-136943-3	FS-A-0127-SE-D	Air	01/27/20 00:00	01/29/20 09:50	
550-136943-4	FS-A-0127-NW	Air	01/27/20 00:00	01/29/20 09:50	
550-136943-5	FS-A-0127-NE	Air	01/27/20 00:00	01/29/20 09:50	
550-136943-6	FS-A-0127-INZ	Air	01/27/20 00:00	01/29/20 09:50	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

**Client Sample ID: FS-A-0127-SW**

**Lab Sample ID: 550-136943-1**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 979.73 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.373	0.000381		0.0250	01/30/20 09:21	1	ARE

**Client Sample ID: FS-A-0127-SE**

**Lab Sample ID: 550-136943-2**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 1011.80 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000247		0.0250	01/30/20 09:23	1	ARE

**Client Sample ID: FS-A-0127-SE-D**

**Lab Sample ID: 550-136943-3**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 1012.10 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0300	0.0000296		0.0250	01/30/20 09:24	1	ARE

**Client Sample ID: FS-A-0127-NW**

**Lab Sample ID: 550-136943-4**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 987.30 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0874	0.0000885		0.0250	01/30/20 09:26	1	ARE

**Client Sample ID: FS-A-0127-NE**

**Lab Sample ID: 550-136943-5**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 1004.62 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000249		0.0250	01/30/20 09:28	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

**Client Sample ID: FS-A-0127-INZ**

**Lab Sample ID: 550-136943-6**

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 1056.09 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000237		0.0250	01/30/20 09:30	1	ARE

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21

## Glossary

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**  
 4625 East Cotton Center Boulevard  
 Suite 189  
 Phoenix, AZ 85040-4807  
 phone 602.437.3340 fax 602.454.9303

**Chain of Custody Record**



TestAmerica Laboratories, Inc. d/b/a Eurofir

Regulatory Program:  DW  NPDES  RCRA  Other:

Shawn Carrier  
 shawn\_carrier@westonsolutions.com  
 808-275-2931  
 Date: 1/28/20  
 FedEx

Client Contact  
 Weston Solutions  
 841 Bishop Street Suite 2301  
 Honolulu, Hawaii, 96813  
 8082752931  
 (xxx) xxx-xxxx FAX  
 Factory Street  
 Factory Street  
 P O #

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
FS-A-0127-JIN	1/27/20	0754	C	AK	1	X	
FS-A-0127-SE	1/27/20	0744	C	AK	1	X	
FS-A-0127-SE-D	1/27/20	0744	C	AK	1	X	
FS-A-0127-NIN	1/27/20	0750	C	AK	1	X	
FS-A-0127-NE	1/27/20	0747	C	AK	1	X	
FS-A-0127-NEZ	1/27/20	0737	C	AK	1	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments: 24 Hr TAT - Pb Only

Shawn Carrier  
 Carlene McCutcheon  
 Date: 1/28/20  
 FedEx

Cooler Temp. (°C): Obs'd: \_\_\_\_\_  
 Custody Seal No.: \_\_\_\_\_  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]

Company: WESTON  
 Date/Time: 1/28/20-12:57  
 Company: TA-PH  
 Date/Time: 1/29/20 9:50



550-136943 Chain of Custody

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

## Sample Login Acknowledgement

## Job 550-136943-1

<b>Client Job Description:</b>	Factory Street	<b>Report To:</b>	Weston Solutions, Inc.
<b>Purchase Order #:</b>	Purchase Order Requested		Shawn Carrier
<b>Work Order #:</b>			841 Bishop Street
<b>Project Manager:</b>	Carlene McCutcheon		Suite 2301
<b>Job Due Date:</b>	1/30/2020		Honolulu, HI 96813
<b>Job TAT:</b>	1 Day RUSH	<b>Bill To:</b>	Weston Solutions, Inc.
<b>Max Deliverable Level:</b>	I		Shawn Carrier
			841 Bishop Street
<b>Earliest Deliverable Due:</b>	1/30/2020		Suite 2301
			Honolulu, HI 96813

## Login 550-136943

<b>Sample Receipt:</b>	1/29/2020 9:50:00 AM	<b>Number of Coolers:</b>	1
<b>Method of Delivery:</b>	FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>	

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
Method	Method Description / Work Location				
<b>550-136943-1</b>	<b>FS-A-0127-SW</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet
<b>550-136943-2</b>	<b>FS-A-0127-SE</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet
<b>550-136943-3</b>	<b>FS-A-0127-SE-D</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet
<b>550-136943-4</b>	<b>FS-A-0127-NW</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet
<b>550-136943-5</b>	<b>FS-A-0127-NE</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet
<b>550-136943-6</b>	<b>FS-A-0127-INZ</b>	<b>1/27/2020 12:00:00 AM</b>	<b>Air</b>		
	NIOSH7300_ICPMS Lead / In-Lab			Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-137564-1  
Laboratory Sample Delivery Group: Factory Street  
Client Project/Site: Factory Street

For:  
Weston Solutions, Inc.  
841 Bishop Street  
Suite 2301  
Honolulu, Hawaii 96813

Attn: Shawn Carrier



Authorized for release by:  
2/12/2020 6:43:45 AM

Carlene McCutcheon, Project Manager II  
(602)659-7612  
[carlene.mccutcheon@testamericainc.com](mailto:carlene.mccutcheon@testamericainc.com)

### LINKS

Review your project  
results through  
**Total Access**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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

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

# Case Narrative

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

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**Job ID: 550-137564-1**

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**Laboratory: Eurofins TestAmerica, Phoenix**

## Narrative

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**Job Narrative**  
**550-137564-1**

## Comments

No additional comments.

## Receipt

The samples were received on 2/7/2020 9:50 AM; the samples arrived in good condition.

## Metals

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

## Industrial Hygiene

Method 7300: The Method Blank, Field Blank (or other QC results) were not used to correct client sample results associated with preparation batch 550-202304 and analytical batch 550-202444.

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



# Sample Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
550-137564-1	FS-A-0205-FB-1	Air	02/05/20 00:00	02/07/20 09:50	
550-137564-2	FS-A-0205-FB-2	Air	02/05/20 00:00	02/07/20 09:50	
550-137564-3	FS-A-0129-WZ	Air	01/29/20 00:00	02/07/20 09:50	
550-137564-4	FS-A-0203-WZ	Air	02/03/20 00:00	02/07/20 09:50	
550-137564-5	FS-A-0204-WZ	Air	02/04/20 00:00	02/07/20 09:50	
550-137564-6	FS-A-0205-WZ	Air	02/05/20 00:00	02/07/20 09:50	

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

**Client Sample ID: FS-A-0205-FB-1**

**Lab Sample ID: 550-137564-1**

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310				0.310	02/11/20 16:42	1	SRA

**Client Sample ID: FS-A-0205-FB-2**

**Lab Sample ID: 550-137564-2**

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310				0.310	02/11/20 16:46	1	SRA

**Client Sample ID: FS-A-0129-WZ**

**Lab Sample ID: 550-137564-3**

Date Collected: 01/29/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 1041.15 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.313	0.000301			0.310	02/11/20 16:49	1	SRA

**Client Sample ID: FS-A-0203-WZ**

**Lab Sample ID: 550-137564-4**

Date Collected: 02/03/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 683.54 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	<0.000454			0.310	02/11/20 16:53	1	SRA

**Client Sample ID: FS-A-0204-WZ**

**Lab Sample ID: 550-137564-5**

Date Collected: 02/04/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 1002.31 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	<0.000309			0.310	02/11/20 16:57	1	SRA

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

**Client Sample ID: FS-A-0205-WZ**

**Lab Sample ID: 550-137564-6**

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 887.32 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	<0.000349		0.310	02/11/20 17:01	1	SRA

# Accreditation/Certification and Definitions Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

## Laboratory: Eurofins TestAmerica, Phoenix

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	154268	10-01-21 *

## Glossary

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

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

# Method Summary

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

Method	Method Description	Protocol	Laboratory
PE-MET-012	NIOSH Method 7300	NIOSH	TAL PHX
Filter Prep	Preparation, IH Filter	NIOSH	TAL PHX

**Protocol References:**

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994 and it's Supplements

**Laboratory References:**

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



**Eurofins TestAmerica, Phoenix**

4625 East Cotton Center Boulevard  
Suite 189  
Phoenix, AZ 85040-4807  
phone 602.437.3340 fax 602.454.9303

137564

**Chain of Custody Record**



ENVIR  
TESTA

Regulatory Program:  DW  NPDES  RCRA  Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins

<b>Client Contact</b>	Shawn Carrier shawn_carrier@westonsolutions.com 808-275-2931	<b>Shawn Carrier</b>	<b>Shawn Carrier</b>	<b>Carlene McCutcheon</b>	<b>FedEx</b>	<b>Date:</b>	<b>COC No.:</b>	<b>of</b>	<b>TALS Project #:</b>	<b>Sampler:</b>	<b>For Lab Use Only:</b>	<b>Job / SDG No.:</b>
Weston Solutions	841 Bishop Street Suite 2301											
Honolulu, Hawaii, 96813												
(xxx) xxx-xxxx	FAX											
Factory Street												
Factory Street												
P O #												

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-grab)	Matrix	# of Cont.	Filtered Sample (Y/N)		Perform MS / MSD (Y/N)	Sample Specific
						Y	N		
FS-A-0205-FB-1	2/5/20	NA	Air-G	Air	1			X	
FS-A-0205-FB-2	2/5/20	NA	G	Air	1			X	Vol: 1041.15
FS-A-0205-0129-WZ	1/29/20	8:40a	G	Air	1			X	Vol: 683.54
FS-A-0203-WZ	2/3/20	5:48	G	Air	1			X	Vol: 1002.31
FS-A-0204-WZ	2/4/20	8:21	G	Air	1			X	Vol: 887.32
FS-A-0205-WZ	2/5/20	15:30	G	Air	1			X	



**FUSIT!**

**Preservation Used:** 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other

**Possible Hazard Identification:** Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

**Special Instructions/QC Requirements & Comments:**

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temp. (°C):	Obs'd:	Corr'd:	Therm ID No.:
Relinquished by: SHAWN CARRIER	Company: WESTON	Date/Time: 02/08/20	Received by:	Company: Am 3	Date/Time: 2/7/20 950
Relinquished by:	Company:	Date/Time: 1:50	Received by:	Company: TAD	Date/Time: 2/7/20 950

# Sample Login Acknowledgement

## Job 550-137564-1

<b>Client Job Description:</b> Factory Street <b>Purchase Order #:</b> 0102649 <b>Work Order #:</b> <b>Project Manager:</b> Carlene McCutcheon <b>Job Due Date:</b> 2/10/2020 <b>Job TAT:</b> 1 Day RUSH <b>Max Deliverable Level:</b> I  <b>Earliest Deliverable Due:</b> 2/10/2020	<b>Report To:</b> Weston Solutions, Inc. Shawn Carrier 841 Bishop Street Suite 2301 Honolulu, HI 96813  <b>Bill To:</b> Weston Solutions, Inc. Accounts Payable - Hawaii / Califo 841 Bishop Street Suite 2301 Honolulu, HI 96813
--	---

## Login 550-137564

<b>Sample Receipt:</b> 2/7/2020 9:50:00 AM	<b>Number of Coolers:</b> 1
<b>Method of Delivery:</b> FedEx Priority Overnight	<b>Cooler Temperature(s) (C°):</b>

Lab Sample # Method	Client Sample ID Method Description / Work Location	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
<b>550-137564-1</b> NIOSH7300	<b>FS-A-0205-FB-1</b> Lead / In-Lab	<b>2/5/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet
<b>550-137564-2</b> NIOSH7300	<b>FS-A-0205-FB-2</b> Lead / In-Lab	<b>2/5/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet
<b>550-137564-3</b> NIOSH7300	<b>FS-A-0129-WZ</b> Lead / In-Lab	<b>1/29/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet
<b>550-137564-4</b> NIOSH7300	<b>FS-A-0203-WZ</b> Lead / In-Lab	<b>2/3/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet
<b>550-137564-5</b> NIOSH7300	<b>FS-A-0204-WZ</b> Lead / In-Lab	<b>2/4/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet
<b>550-137564-6</b> NIOSH7300	<b>FS-A-0205-WZ</b> Lead / In-Lab	<b>2/5/2020 12:00:00 AM</b>	<b>Air</b>	Total	Wet

\* Method on-hold

\*\* Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

## FACTORY STREET LEAD REMOVAL DATA VALIDATION REPORT

**Date:** August 24, 2020

**Laboratory:** Eurofins TestAmerica, Phoenix, AZ

**Laboratory Job Numbers:** 550-136699-1, 550-136700-1, 550-136790-1, 550-136820-1,  
550-136831-1, 550-136874-1, 550-136943-1, and 550-137564-1

**Data Validation Performed By:** Tara Johnson, Weston Solutions, Inc. (WESTON) Superfund  
Technical Assessment and Response Team (START)

**Data Validation Reviewed By:** Kelly Luck, WESTON START

**Weston Work Order #:** 20905.012.005.0003.00

This data validation report has been prepared by WESTON START under the START V U.S. Environmental Protection Agency (EPA) Region 9 contract. This report documents the data validation for 47 air samples collected for the Factory Street Lead Removal site that were analyzed for the following parameter and National Institute for Occupational Safety and Health (NIOSH) Method.

- Total Lead by NIOSH Method 7300

Level II data packages were received from TestAmerica Laboratories, Inc., Phoenix, AZ. The data validation was performed and was conducted in general accordance with the EPA “Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review” dated January 2017. The Attachment contains results summary sheets with any hand-written qualifiers applied during data validation.

This report was revised August 24, 2020 to correct field duplication QC criteria and remove the mis-applied qualifier for field duplication.

### LEAD by NIOSH METHOD 7300

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
FS-A-0120-SW	550-136699-1	Air	1/20/20	1/23/20	1/24/20
FS-A-0120-WZ	550-136699-2	Air	1/20/20	1/23/20	1/24/20
FS-A-0120-NW	550-136699-3	Air	1/20/20	1/23/20	1/24/20
FS-A-0120-NE	550-136699-4	Air	1/20/20	1/23/20	1/24/20
FS-A-0120-SE	550-136699-5	Air	1/20/20	1/23/20	1/24/20
FS-A-0121-FB1	550-136699-6	Air	1/21/20	1/23/20	1/24/20
FS-A-0121-FB2	550-136699-7	Air	1/21/20	1/23/20	1/24/20
FS-A-0121-NE	550-136700-1	Air	1/21/20	1/23/20	1/24/20
FS-A-0121-NW	550-136700-2	Air	1/21/20	1/23/20	1/24/20
FS-A-0121-SE	550-136700-3	Air	1/21/20	1/23/20	1/24/20
FS-A-0121-SW	550-136700-4	Air	1/21/20	1/23/20	1/24/20

Data Validation Report – August 24, 2020

Factory Street Lead Removal

Laboratory: Eurofins TestAmerica, Phoenix, AZ

Laboratory Job Numbers: 550-136699-1, 550-136700-1, 550-136790-1, 550-136820-1, 550-136831-1, 550-136874-1, 550-136943-1, and 550-137564-1

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
FS-A-0121-W2	550-136700-5	Air	1/21/20	1/23/20	1/24/20
FS-A-0122-W2	550-136790-1	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-SE	550-136790-2	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-SW	550-136790-3	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-NE	550-136790-4	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-NW	550-136790-5	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-NW-D	550-136790-6	Air	1/22/20	1/24/20	1/27/20
FS-A-0122-SE-D	550-136790-7	Air	1/22/20	1/24/20	1/27/20
FS-A-0123-SE	550-136820-1	Air	1/23/20	1/27/20	1/27/20
FS-A-0123-SW	550-136820-2	Air	1/23/20	1/27/20	1/27/20
FS-A-0123-NW	550-136820-3	Air	1/23/20	1/27/20	1/27/20
FS-A-0123-NE	550-136820-4	Air	1/23/20	1/27/20	1/27/20
FS-A-0123-SE-D	550-136820-5	Air	1/23/20	1/27/20	1/27/20
FS-A-0123-WZ	550-136820-6	Air	1/23/20	1/27/20	1/27/20
FS-A-0124-SW	550-136831-1	Air	1/24/20	1/28/20	1/28/20
FS-A-0124-SE	550-136831-2	Air	1/24/20	1/28/20	1/28/20
FS-A-0124-NW	550-136831-3	Air	1/24/20	1/28/20	1/28/20
FS-A-0124-NE	550-136831-4	Air	1/24/20	1/28/20	1/28/20
FS-A-0124-INZ	550-136831-5	Air	1/24/20	1/28/20	1/28/20
FS-A-0125-IW2	550-136874-1	Air	1/25/20	1/28/20	1/30/20
FS-A-0125-SE	550-136874-2	Air	1/25/20	1/28/20	1/30/20
FS-A-0125-SW	550-136874-3	Air	1/25/20	1/28/20	1/30/20
FS-A-0125-NW	550-136874-4	Air	1/25/20	1/28/20	1/30/20
FS-A-0125-NE	550-136874-5	Air	1/25/20	1/28/20	1/30/20
FS-A-0127-SW	550-136943-1	Air	1/27/20	1/29/20	1/30/20
FS-A-0127-SE	550-136943-2	Air	1/27/20	1/29/20	1/30/20
FS-A-0127-SE-D	550-136943-3	Air	1/27/20	1/29/20	1/30/20
FS-A-0127-NW	550-136943-4	Air	1/27/20	1/29/20	1/30/20
FS-A-0127-NE	550-136943-5	Air	1/27/20	1/29/20	1/30/20
FS-A-0127-INZ	550-136943-6	Air	1/27/20	1/29/20	1/30/20
FS-A-0205-FB-1	550-137564-1	Air	2/5/20	2/10/20	2/11/20
FS-A-0205-FB-2	550-137564-2	Air	2/5/20	2/10/20	2/11/20
FS-A-0129-WZ	550-137564-3	Air	1/29/20	2/10/20	2/11/20
FS-A-0203-WZ	550-137564-4	Air	2/3/20	2/10/20	2/11/20
FS-A-0204-WZ	550-137564-5	Air	2/4/20	2/10/20	2/11/20
FS-A-0205-WZ	550-137564-6	Air	2/5/20	2/10/20	2/11/20

**1. Data Verification Check**

A data verification and completeness check was performed in accordance with the Stage 1 and 2A verification checks outlined in the EPA “Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use” dated January 13, 2009. For the lead analyses, all analytical data package items were received from the laboratory and the analyses requested were performed.

**2. Holding Times**

The samples were analyzed within the recommended holding time limit of 180 days from sample collection.

**3. Blanks**

Seven method blanks were analyzed with the sample sets, at the correct frequency. Lead was detected in four of the blanks above the reporting limit (RL; 0.0250 µg/sample), as detailed in the table below. The detected amount (background) was subtracted from all associated sample results, including quality control (QC) samples, as specified in the method; therefore, no qualification of data is needed.

<b>Data package</b>	<b>Lead level in blank (µg/sample)</b>
550-136699-1, 550136700-1	0.04680
550-136790-1	0.02898
550-136874-1	0.1425
550-136943-1	0.05888

In addition, the field blanks, FS-A-0121-FB1, FS-A-0121-FB2, FS-A-0205-FB-1, and FS-A-0205-FB-2, were free of lead contamination above the RL.

**4. Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) Results**

Seven LCS/LCSD pairs were analyzed with the sample sets, at the correct frequency, and recoveries and relative percent differences were within QC limits of 80-120% and ≤20%.

**5. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results**

MS/MSD analysis was not required.

**6. Field Duplicate Results**

The sample set included four field duplicate pairs:

- FS-A-0122-NW and FS-A-0122-NW-D;
- FS-A-0122-SE and FS-A-0122-SE-D;
- FS-A-0123-SE and FS-A-0123-SE-D; and
- FS-A-0127-SE and FS-A-0127-SE-D.

The QC criteria for field duplication are RPD ≤50% for concentrations greater than five times the RL, and absolute difference between results less than the RL for sample concentrations less

Data Validation Report – August 24, 2020

Factory Street Lead Removal

Laboratory: Eurofins TestAmerica, Phoenix, AZ

Laboratory Job Numbers: 550-136699-1, 550-136700-1, 550-136790-1, 550-136820-1, 550-136831-1, 550-136874-1, 550-136943-1, and 550-137564-1

than five times the RL. The field duplication QC criteria were met for the lead analyses for all field duplicate pairs.

## 7. **Overall Assessment**

In addition to the qualifiers discussed above, the data validator applied “U” qualifiers to sample results reported by the laboratory as <RL.

The total lead data are acceptable for use as qualified based on the information received.

**ATTACHMENT**

**EUROFINS TESTAMERICA  
RESULTS SUMMARY WITH QUALIFIERS**

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

**Client Sample ID: FS-A-0120-SW**

**Lab Sample ID: 550-136699-1**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 308.99 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0399	0.000129			0.0250	01/24/20 10:47	1	ARE

**Client Sample ID: FS-A-0120-WZ**

**Lab Sample ID: 550-136699-2**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 174.81 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0636	0.000364			0.0250	01/24/20 10:49	1	ARE

**Client Sample ID: FS-A-0120-NW**

**Lab Sample ID: 550-136699-3**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 289.45 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000864			0.0250	01/24/20 10:51	1	ARE

**Client Sample ID: FS-A-0120-NE**

**Lab Sample ID: 550-136699-4**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 309.38 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000808			0.0250	01/24/20 10:53	1	ARE

**Client Sample ID: FS-A-0120-SE**

**Lab Sample ID: 550-136699-5**

Date Collected: 01/20/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 325.8 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000767			0.0250	01/24/20 10:54	1	ARE

TJ 5/5/20

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136699-1

Client Sample ID: FS-A-0121-FB1

Lab Sample ID: 550-136699-6

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result	Result	Qualifier	RL	Analyzed	Dil Fac	Analyst
	ug/Sample			ug/Sample			
Lead	<0.0250	u		0.0250	01/24/20 10:56	1	ARE

Client Sample ID: FS-A-0121-FB2

Lab Sample ID: 550-136699-7

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result	Result	Qualifier	RL	Analyzed	Dil Fac	Analyst
	ug/Sample			ug/Sample			
Lead	<0.0250	u		0.0250	01/24/20 10:58	1	ARE

TBJ 5/5/20

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136700-1

**Client Sample ID: FS-A-0121-NE**

**Lab Sample ID: 550-136700-1**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1061.65 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0576	0.0000543		0.0250	01/24/20 11:03	1	ARE

**Client Sample ID: FS-A-0121-NW**

**Lab Sample ID: 550-136700-2**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1043.67 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0362	0.0000347		0.0250	01/24/20 11:05	1	ARE

**Client Sample ID: FS-A-0121-SE**

**Lab Sample ID: 550-136700-3**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1062.1 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.354	0.000333		0.0250	01/24/20 11:07	1	ARE

**Client Sample ID: FS-A-0121-SW**

**Lab Sample ID: 550-136700-4**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 1046.23 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0325	0.0000310		0.0250	01/24/20 11:09	1	ARE

**Client Sample ID: FS-A-0121-W2**

**Lab Sample ID: 550-136700-5**

Date Collected: 01/21/20 00:00

Matrix: Air

Date Received: 01/23/20 09:35

Sample Air Volume: 500.25 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.303	0.000605		0.0250	01/24/20 11:11	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

**Client Sample ID: FS-A-0122-W2**

**Lab Sample ID: 550-136790-1**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 811.49 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0543	0.0000669		0.0250	01/27/20 10:20	1	ARE

**Client Sample ID: FS-A-0122-SE**

**Lab Sample ID: 550-136790-2**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1041.63 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.481	0.000462		0.0250	01/27/20 10:22	1	ARE

**Client Sample ID: FS-A-0122-SW**

**Lab Sample ID: 550-136790-3**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1051.28 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0436	0.0000415		0.0250	01/27/20 10:24	1	ARE

**Client Sample ID: FS-A-0122-NE**

**Lab Sample ID: 550-136790-4**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1064.33 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0449	0.0000421		0.0250	01/27/20 10:26	1	ARE

**Client Sample ID: FS-A-0122-NW**

**Lab Sample ID: 550-136790-5**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 1030.73 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0637	0.0000618		0.0250	01/27/20 10:28	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136790-1

**Client Sample ID: FS-A-0122-NW-D**

**Lab Sample ID: 550-136790-6**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 948.75 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0616	0.000649		0.0250	01/27/20 10:29	1	ARE

**Client Sample ID: FS-A-0122-SE-D**

**Lab Sample ID: 550-136790-7**

Date Collected: 01/22/20 00:00

Matrix: Air

Date Received: 01/24/20 09:30

Sample Air Volume: 978.43 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.507	0.000518		0.0250	01/27/20 10:31	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

Client Sample ID: FS-A-0123-SE

Lab Sample ID: 550-136820-1

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 987.77 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.392	0.000397		0.0250	01/27/20 10:47	1	ARE

Client Sample ID: FS-A-0123-SW

Lab Sample ID: 550-136820-2

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 989.01 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.210	0.000212		0.0250	01/27/20 10:53	1	ARE

Client Sample ID: FS-A-0123-NW

Lab Sample ID: 550-136820-3

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 987.05 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.257	0.000260		0.0250	01/27/20 10:55	1	ARE

Client Sample ID: FS-A-0123-NE

Lab Sample ID: 550-136820-4

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 1015.96 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.812	0.000799		0.0250	01/27/20 10:56	1	ARE

Client Sample ID: FS-A-0123-SE-D

Lab Sample ID: 550-136820-5

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 1051.28 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.274	0.000261		0.0250	01/27/20 10:58	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136820-1

**Client Sample ID: FS-A-0123-WZ**

**Lab Sample ID: 550-136820-6**

Date Collected: 01/23/20 00:00

Matrix: Air

Date Received: 01/25/20 09:15

Sample Air Volume: 783.04 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.568	0.000726		0.0250	01/27/20 11:00	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136831-1

**Client Sample ID: FS-A-0124-SW**

**Lab Sample ID: 550-136831-1**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1001.85 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.476	0.000475		0.0250	01/28/20 11:27	1	ARE

**Client Sample ID: FS-A-0124-SE**

**Lab Sample ID: 550-136831-2**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1019.62 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.182	0.000178		0.0250	01/28/20 11:29	1	ARE

**Client Sample ID: FS-A-0124-NW**

**Lab Sample ID: 550-136831-3**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1005.09 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.143	0.000142		0.0250	01/28/20 11:31	1	ARE

**Client Sample ID: FS-A-0124-NE**

**Lab Sample ID: 550-136831-4**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1020.06 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.148	0.000145		0.0250	01/28/20 11:33	1	ARE

**Client Sample ID: FS-A-0124-INZ**

**Lab Sample ID: 550-136831-5**

Date Collected: 01/24/20 00:00

Matrix: Air

Date Received: 01/27/20 10:20

Sample Air Volume: 1035.81 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

**Method: PE-MET-012 - NIOSH Method 7300**

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.842	0.000813		0.0250	01/28/20 11:34	1	ARE

# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136874-1

**Client Sample ID: FS-A-0125-IW2**

**Lab Sample ID: 550-136874-1**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 961.32 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result		Result	Qualifier	RL		Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample	Analyzed		
Lead	0.207	0.000215			0.0250	01/30/20 08:36	1	ARE

**Client Sample ID: FS-A-0125-SE**

**Lab Sample ID: 550-136874-2**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 942.15 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result		Result	Qualifier	RL		Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample	Analyzed		
Lead	<0.0250 <b>M</b>	<0.000265 <b>M</b>			0.0250	01/30/20 08:38	1	ARE

**Client Sample ID: FS-A-0125-SW**

**Lab Sample ID: 550-136874-3**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 947.27 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result		Result	Qualifier	RL		Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample	Analyzed		
Lead	0.221	0.000233			0.0250	01/30/20 08:39	1	ARE

**Client Sample ID: FS-A-0125-NW**

**Lab Sample ID: 550-136874-4**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 953.89 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result		Result	Qualifier	RL		Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample	Analyzed		
Lead	0.137	0.000143			0.0250	01/30/20 08:41	1	ARE

**Client Sample ID: FS-A-0125-NE**

**Lab Sample ID: 550-136874-5**

Date Collected: 01/25/20 00:00

Matrix: Air

Date Received: 01/28/20 09:30

Sample Air Volume: 940.80 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result		Result	Qualifier	RL		Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample	Analyzed		
Lead	<0.0250 <b>M</b>	<0.0000266 <b>M</b>			0.0250	01/30/20 08:43	1	ARE

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# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

## Client Sample ID: FS-A-0127-SW

Lab Sample ID: 550-136943-1

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Sample Air Volume: 979.73 L

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.373	0.000381		0.0250	01/30/20 09:21	1	ARE

## Client Sample ID: FS-A-0127-SE

Lab Sample ID: 550-136943-2

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Sample Air Volume: 1011.80 L

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000247	U	0.0250	01/30/20 09:23	1	ARE

## Client Sample ID: FS-A-0127-SE-D

Lab Sample ID: 550-136943-3

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Sample Air Volume: 1012.10 L

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0300	0.0000296		0.0250	01/30/20 09:24	1	ARE

## Client Sample ID: FS-A-0127-NW

Lab Sample ID: 550-136943-4

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Sample Air Volume: 987.30 L

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.0874	0.0000885		0.0250	01/30/20 09:26	1	ARE

## Client Sample ID: FS-A-0127-NE

Lab Sample ID: 550-136943-5

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Sample Air Volume: 1004.62 L

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250	<0.0000249	U	0.0250	01/30/20 09:28	1	ARE

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# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-136943-1

Client Sample ID: FS-A-0127-INZ

Lab Sample ID: 550-136943-6

Date Collected: 01/27/20 00:00

Matrix: Air

Date Received: 01/29/20 09:50

Sample Air Volume: 1056.09 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.0250 <i>u</i>	<0.0000237 <i>u</i>		0.0250	01/30/20 09:30	1	ARE

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# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

## Client Sample ID: FS-A-0205-FB-1

Lab Sample ID: 550-137564-1

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	u			0.310	02/11/20 16:42	1	SRA

## Client Sample ID: FS-A-0205-FB-2

Lab Sample ID: 550-137564-2

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 0 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	u			0.310	02/11/20 16:46	1	SRA

## Client Sample ID: FS-A-0129-WZ

Lab Sample ID: 550-137564-3

Date Collected: 01/29/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 1041.15 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	0.313	0.000301			0.310	02/11/20 16:49	1	SRA

## Client Sample ID: FS-A-0203-WZ

Lab Sample ID: 550-137564-4

Date Collected: 02/03/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 683.54 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	<0.000454	u		0.310	02/11/20 16:53	1	SRA

## Client Sample ID: FS-A-0204-WZ

Lab Sample ID: 550-137564-5

Date Collected: 02/04/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 1002.31 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

### Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Lead	<0.310	<0.000309	u		0.310	02/11/20 16:57	1	SRA

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# Client Sample Results

Client: Weston Solutions, Inc.  
Project/Site: Factory Street

Job ID: 550-137564-1  
SDG: Factory Street

Client Sample ID: FS-A-0205-WZ

Lab Sample ID: 550-137564-6

Date Collected: 02/05/20 00:00

Matrix: Air

Date Received: 02/07/20 09:50

Sample Air Volume: 887.32 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: PE-MET-012 - NIOSH Method 7300

Analyte	Result	Result	Result	Qualifier	RL	Analyzed	Dil Fac	Analyst
	ug/Sample	mg/m3			ug/Sample			
Lead	<0.310 <i>u</i>	<0.000349 <i>u</i>			0.310	02/11/20 17:01	1	SRA

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