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1ST QUARTER 2015 GROUNDWATER MONITORING REPORT, TIER 2 RISK EVALUATION, SCRENNING-LEVEL ECOLOGICAL RISK ASSESSMENT AND REQUEST FOR SITE CLOSURE FORMER WESTERN FORGE & FLANGE FACILITY 540 CLEVELAND AVENUE ALBANY, CALIFORNIA RO#3009

PREPARED FOR:
Mr. Walter R. Pierce
Western Forge & Flange
687 County Road 2201
Cleveland, Texas 77328

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
1956 Webster Street, Suite 400
Oakland, California 94612

April 17, 2015
Project No. 401823001

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Mr. Walter R. Pierce
Western Forge & Flange
687 County Road 2201
Cleveland, Texas 77328

Subject: 1st Quarter 2015 Groundwater Monitoring Report, Tier 2 Risk Evaluation, Screening-Level Ecological Risk Assessment And Request for Site Closure
Former Western Forge & Flange Facility
540 Cleveland Avenue
Albany, California
RO#3009

Dear Mr. Pierce:

Ninyo & Moore is pleased to present this 1st Quarter 2015; Groundwater Monitoring Report, Screening-Level Ecological Risk Assessment and Request for Site Closure, for the property located at 540 Cleveland Avenue in Albany, California. This report is being submitted in response to Alameda County Environmental Health's "Request for Additional Groundwater Monitoring Event and Tier 2 Risk Analysis; Site Cleanup Program (SCP) Case No. RO0003009 and Geotracker, Global ID # T10000001598; Western Forge & Flange, 540 Cleveland Ave. Albany, CA 94706", dated January 22, 2015.

Should you have any questions regarding this report or need additional information, please contact the undersigned at your convenience.

Sincerely,
NINYO & MOORE

Forrest S. McFarland, PG 7984
Senior Project Environmental Geologist

Kris M. Larson, PG 8059
Principal Environmental Geologist

Jason Grant, PE C64624
Senior Engineer

FSM/KML/vmp

Distribution: (1) Addressee
(1) Mark E. Detterman, ACEH

April 17, 2015
Project No. 401823001

To: Mr. Mark E. Detterman
Alameda County Environmental Health Department
Health Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Perjury Statement
1st Quarter 2015 Groundwater Monitoring Report, Screening-Level Ecological Risk Assessment And Request for Site Closure
Western Forge & Flange
540 Cleveland Avenue
Albany, California 94706

I declare, under penalty of perjury, that the information or recommendations contained in the attached report are true or correct to the best of my knowledge.

Walter R. Pierce
President and CEO
Western Forge & Flange Company

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1. INTRODUCTION

Ninyo & Moore has prepared this 1st Quarter 2015 Groundwater Monitoring Report, Tier 2 Risk Evaluation, Screening-Level Ecological Risk Assessment and Request for Site Closure to document the findings of the groundwater monitoring activities recently performed at the former Western Forge & Flange facility located at 540 Cleveland Avenue, Albany, California (site). The groundwater monitoring activities were performed in general accordance with the guidelines presented in Ninyo & Moore's Revised Data Gap Investigation Report and Corrective Action Plan (CAP), dated May 15, 2013, and CAP Addendum, dated July 22, 2013, which were approved by Alameda County Environmental Health (ACEH) in an e-mail dated October 14, 2013. This report is being submitted in response to ACEH's "Request for Additional Groundwater Monitoring Event and Tier 2 Risk Analysis; Site Cleanup Program (SCP) Case No. RO0003009 and Goetracker, Global ID # T10000001598; Western Forge & Flange, 540 Cleveland Ave. Albany, CA 94706", dated January 22, 2015. As part of the request for site closure, this report and additionally includes a Tier 2 risk evaluation and a screening-level ecological risk assessment (SLERA).

2. SITE BACKGROUND

The following sections describe the location, description, and historical background of the site.

2.1. Site Description

The subject site is located at 540 Cleveland Avenue in Albany, California (Figure 1). The site is located in a commercial/industrial area of Albany between the Interstate 80 and 580 Freeways, and immediately east of a Union Pacific Rail Road (UPRR) right of way (Figure 2). The site is bordered to the north by a heavy industrial property (Albany Steel), to the south by a commercial building (currently occupied by the City of Albany and used as a maintenance yard), and to the east by Cleveland Avenue. The site is approximately 1.0 acre and recently consisted of an approximately 25,000 square-foot building with concrete and asphalt paved areas. Western Forge & Flange manufactured flanges at the site from 1944 until it moved operations to Texas in 2007. The site building and the majority of pavement sur-

faces were demolished and removed in June and July of 2013. Several subsurface concrete pits were also demolished during building demolition activities.

2.2. Site Geology and Hydrology

The site is located within the Coast Range Geologic Province. The San Francisco Bay and Bay margin geology was formed by a series of Mesozoic and Cenozoic aged oceanic crust and volcanic arc terranes accreted to the continent. Uplift also occurred due to transpression along the Hayward Fault Zone during the Cenozoic Era. Bedrock geologic units include Jurassic Coast Range Ophiolite, Late Jurassic-Early Cretaceous Franciscan Complex and Knoxville Formation, and the Late Cretaceous Great Valley Sequence. Late Quaternary deposits consisting of Pleistocene to Holocene alluvial fan deposits overly the bedrock formations within the site area.

The ground surface elevation of the site ranges from approximately 12 to 16 feet above mean sea level (MSL), and ground surface is gently sloped towards the west-southwest. The site sedimentology observed during excavation activities consisted of approximately 2 to 6 feet of fill material over laying native silty clay (Bay Mud) deposits. The margin of the San Francisco Bay historically crossed through the site, with the western portion of the site historically being tidal wetlands. Fill material was observed to be thinner (extending to approximately 2 feet below ground surface [bgs]) in the central portion of the site, and thicker (extending to approximately 6 feet bgs) in the western portion of the site. The upper 1 to 2 feet of fill material was observed to generally consist of brown sand with gravel and clay, and the lower portion of fill was observed to generally consist of dark gray silt with sand and clay. Bricks, concrete rubble, and other debris were observed in areas throughout the fill material.

No natural surface water bodies, including ponds, streams, or other bodies of water, are present on the site. The San Francisco Bay is located approximately 500 feet west of the site. During the soil boring advancement conducted for during previous investigations, shallow groundwater was encountered between 2.5 and 5.5 feet bgs in all but one of the borings.

Groundwater was encountered at 1 foot bgs in one boring in the northwestern portion of the site, which was attributed to a very shallow, perched groundwater zone that has been documented in previous environmental assessments. During excavation activities, groundwater was observed at approximately 4 feet bgs in the south-central portion of the site, and at approximately 6 feet bgs in the western portion of the site. Due to the site's proximity to the San Francisco Bay, tidal fluctuation may affect groundwater depth and flow direction/gradient. The depth and elevation of groundwater measured monitoring wells, and the inferred groundwater flow direction and gradient are described in Section 2.6 below.

2.3. Previous Environmental Assessments and Remedial Action

The site has been the subject of several environmental assessments dating back to 1984. Based on data generated during episodes of site assessment, the site was determined to be impacted with constituents of concern (COCs) including arsenic, chromium, copper, lead, molybdenum, nickel, zinc, polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons as hydraulic oil (TPHho) at elevated concentrations at various locations throughout the site. In order to protect human health and the environment, and allow the site to be redeveloped for future commercial/industrial land use, in 2013 a CAP and CAP Addendum were prepared for the site by Ninyo & Moore. The CAP included an evaluation of remedial alternatives for the site, and excavation and off-site disposal of impacted soil was selected as the appropriate remedial alternative. The CAP was implemented between October 2013 and January 2014, as documented in Ninyo & Moore's Removal Action Completion Report (RACR), dated February 6, 2014, which has been submitted to and approved by ACEH.

Implementation of the CAP included removal of approximately 1,200 cubic yards (1,798 tons) of soil impacted with COCs and replacing the COCs impacted soil with clean imported backfill materials. Approximately 12.5 tons of groundwater impacted with COCs was also removed from the site. Excavation sidewall and bottom confirmation samples were collected and the results indicated that site soil was remediated to meet the requirements presented in the ACEH approved CAP and CAP Addendum. Three groundwater monitoring wells (MW-1

through MW-3) were also installed in the western portion of the site to evaluate post remediation groundwater quality (Figure 2).

An initial groundwater monitoring event was performed on December 5, 2013. A relatively minor concentration of TPHho (below the Cleanup Goal [CG]) was detected in monitoring well MW-1, and TPHho was not detected in monitoring wells MW-2 or MW-3. Only minor concentrations (below CGs) of the PAHs acenaphthene and naphthalene were detected monitoring well MW-1, and no PAHs were detected in monitoring wells MW-2 or MW-3. Concentrations of several metals (cobalt, copper, lead, molybdenum, nickel, and mercury) exceeded CGs. The results of the initial groundwater monitoring event are also documented in the RACR.

2.4. Tier 2 Risk Evaluation

The CGs established in the CAP Addendum for groundwater beneath the site were the San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for sites where groundwater is not a current or potential drinking water resource, dated May 2013. The selection of these CGs were based on results of the Data Gap Investigation, which reported total dissolved solids (TDS) concentrations in several groundwater samples greater than the San Francisco Bay Region Basin Plan (RWQCB, 2007) guidelines of 3,000 milligrams per liter (mg/L) for a potential drinking water resource[1]. However, analytical results from subsequent, post-remediation groundwater monitoring events indicated TDS concentrations ranging from 900 to 2,700 mg/L[2].

[1] State Water Resources Control Board (SWRCB) Resolution No. 88-63, as revised by Resolution No. 2006-0008, also specifies a TDS concentration of 3,000 mg/L as the limit for groundwater to be considered suitable as a potential source of drinking.

[2] The TDS concentration detected in well MW-3 during the 4th Quarter 2014 groundwater monitoring event was 3,100 mg/L, which is the only post-remediation sample exceeding the 3,000 mg/L TDS limit.

ACEH indicated in their January 22, 2015, letter the site's cleanup goals are to be revised to the more recent December 2013 ESLs for sites where groundwater is a "current or potential source of drinking water". ACEH further indicated a Tier 2 risk evaluation can be performed on these revised cleanup goals, with the risk evaluation required to consider aquatic habitat and ecotoxicity. The RWQCB ESL Users Guide, dated December 2013, indicates that areas located north of the Dumbarton Bridge and west of the Richmond-San Rafael Bridge, which is where the site is located, are considered marine ecosystems.

The results of the Tier 2 risk evaluation are presented in Table 1. The Tier 1 CGs shown in this table are the final groundwater screening levels listed in RWQCB ESL Table F-1a, "Groundwater Screening Levels (groundwater is a current or potential drinking water resource)", which are the lowest screening levels established for the following exposure pathpathways: groundwater ceiling value; drinking water; vapor intrusion; and estuary aquatic habitat. The Tier 2 risk evaluation removes the drinking water exposure pathway as shallow groundwater below the site is never anticipated to be relied upon as a source of drinking water, which the site owner will be recording in a deed restriction. Further, no private drinking water supply wells are known to be located in the vicinity of the site and all public drinking water within the City of Albany is supplied by East Bay Municipal Utility District (EBMUD). The Tier 2 risk evaluation additionally removed the ceiling values as these screening levels are associated with drinking water odors and tastes concerns. Lastly, the Tier 2 risk evaluation replaced the estuary aquatic habitat goals with the marine aquatic habitat goals listed in RWQCB ESL Table F-4a "Summary of Selected Aquatic Habitat Goals". The Tier 2 risk evaluation for the site's exposure concerns eliminated the vapor intrusion pathway as this is not a concern for the metal COCs, while the vapor intrusion screening levels for PAHs and TPHho are greater than their respective marine aquatic habitat goals. The final Tier 2 CGs are shown in Table 1, which are all based on the marine aquatic habitat goal.

2.5. Monitoring Well Sampling

On March 10, 2015, groundwater samples were collected from monitoring wells MW-1 through MW-3. The well caps were removed approximately 20 minutes before gauging to

allow the water level to equilibrate, at which time depth to groundwater was measured using a decontaminated water level meter accurate to 0.01 feet. Approximately three casing volumes of groundwater were purged using a peristaltic pump with dedicated tubing for each well prior to sample collection. Groundwater parameters, including pH, temperature, and electrical conductivity were measured during well purging and recorded on groundwater sampling field data sheets (Appendix A). Groundwater samples were collected in the appropriate containers using the peristaltic pump.

As the groundwater samples were not filtered or preserved during collection, the laboratory performed filtering and preservation of samples as necessary prior to analysis. The sample containers were labeled with the sample identification, project location, sampling date/time, and sampler's initials. The sample containers were stored in a cooler containing ice for transport to the analytical laboratory for analysis. Chain-of-custody documentation was completed and accompanied the groundwater samples to the laboratory.

2.5.1. Groundwater Sample Analysis

Groundwater samples were submitted to TestAmerica, a California-certified analytical laboratory located in Pleasanton, California, for analysis of:

- TDS using United States Environmental Protection Agency (USEPA) Method SM 2540C;
- California Title 22 Metals using USEPA Method 6010B/7470A;
- Hexavalent chromium using USEPA Method 7199;
- TPHho using EPA Method 8015M, with silica gel cleanup; and,
- PAHs using EPA Method 8270-SIM.

2.6. Groundwater Depths, Elevations, Flow Direction, and Gradient

The depth to groundwater was measured in site monitoring wells on March 10, 2015. Groundwater depth and elevation data is presented in Table 2 and on Figure 2. The depth to groundwater ranged from 4.90 to 5.21 feet below the top of well casings, or approximately

2.03 to 2.37 feet bgs, as the top of well casings are approximately 3 feet above the ground surface. Based on the surveyed well elevations, the groundwater elevation in the western portion of the site ranged from approximately 10.18 to 10.57 feet above MSL. Based on the groundwater elevations, the groundwater flow direction was inferred to be west, towards the San Francisco Bay, with a gradient of approximately 0.02 feet per foot. However because of the site's proximity to the San Francisco Bay, groundwater elevations and flow direction may be tidally influenced.

2.7. Groundwater Monitoring Analytical Results

Analytical results for groundwater monitoring samples are summarized in Tables 3 and 4, and a copy of the TestAmerica analytical laboratory report is provided in Appendix B. Groundwater sample analytical results are compared to site Tier 2 CGs. Groundwater sample results exceeding Tier 2 CGs are also presented on Figure 2. The following sections summarize the groundwater monitoring sample results.

2.7.1. Total Dissolved Solids

Analytical results for TDS are presented in Table 3. TDS was detected at a concentration of 1,100 mg/L in monitoring well MW-1, 910 mg/L in MW-2, and 1,700 mg/L in MW-3. The 1st Quarter 2015 concentrations are all below the TDS limit established by the RWQCB of 3,000 mg/L for groundwater to be considered a suitable source of drinking water.

2.7.2. California Title 22 Metals

Analytical results for metals are presented in Table 3. Groundwater monitoring results revealed concentrations of only two metals exceeding the Tier 2 CGs, nickel and molybdenum. All other metals were either not detected at concentrations exceeding their respective laboratory reporting limit, or were detected at concentrations below their respective Tier 2 CGs. The metals beryllium, copper, mercury, silver and thallium were all not detect, however, the laboratory reporting limits for these metals are greater than

their respective Tier 2 CG[3]. Groundwater sample analytical results for metals which exceeded CGs are discussed below.

2.7.2.1. Molybdenum

Molybdenum was detected at concentrations exceeding the Tier 2 CG of 0.24 mg/L in the groundwater samples collected from MW-1 (0.90 mg/L) and MW-2 (0.80 mg/L). Molybdenum was not detected in the groundwater sample collected from MW-3 at a concentration exceeding the laboratory reporting limit of 0.010 mg/L. Although molybdenum has been consistently detected in the groundwater samples collected from monitoring wells MW-1 and MW-2 at concentrations exceeding its Tier 2 CG, it has never exceeded the Tier 2 CG in the groundwater samples collected from the site's furthest downgradient monitoring well, MW-3.

2.7.2.2. Nickel

Nickel was detected at concentrations exceeding the Tier 2 CG of 0.0082 mg/L in the groundwater samples collected from MW-1 (0.025 mg/L), MW-2 (0.025 mg/L) and MW-3 (0.018 mg/L). Although nickel has been consistently detected in the groundwater samples collected from all three monitoring wells at concentrations exceeding its Tier 2 CG, the detected concentrations appear to be declining over time since implementing the site's remedial action.

2.7.3. TPHho

Analytical results for TPHho are presented in Table 4. TPHho was not detected at concentrations exceeding laboratory reporting limits in any of the three groundwater samples collected from monitoring wells MW-1, MW-2 and MW-3. The laboratory re-

[3] The laboratory reporting limits listed in Table 2 were the lowest limits achievable by TestAmerica for each respective metal.

porting limits for all three samples were less than the Tier 2 CG of 640 mg/L[4]. Given these results, it appears the increase in TPHho concentrations observed in the groundwater samples collected during the 4th Quarter 2014 may have resulted from not prepar-preparing these samples using silica-gel cleanup.[5]

2.7.4. PAHs

Analytical results for PAHs are presented in Table 4. These results indicate a naphthalene concentration of 34 micrograms per liter (µg/L) in the groundwater sample collected from monitoring well MW-1, which does not exceed the Tier 2 CG of 62 µg/L. Naphthalene was not detected in either of the groundwater samples collected from monitoring wells MW-2 and MW-3 at concentrations exceeding the respective laboratory reporting limits of 0.10 µg/L and 0.11 µg/L. The following PAHs were additionally detected in the groundwater sample collected from monitoring well MW-1, all at concentrations less than their respective Tier 2 CGs: acenapthene (3.2 µg/L), anthracene (0.14 µg/L), fluorene (1.1 µg/L), and phrenanthene (0.85 µg/L). No other PAHs were detected at concentrations exceeding laboratory reporting limits in the collected groundwater monitoring well samples.

3. SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

Ninyo & Moore conducted a SLERA to evaluate whether chemicals remaining in groundwater beneath the site could pose a threat to ecological receptors at the San Francisco Bay. This assessment was performed by Dr. Heriberto Robles, a certified Diplomate of the American Board of Toxicology (DABT). The SLERA included:

- Developing an Ecological Conceptual Site Model (ECSM), which identified complete exposure pathways and exposure point concentrations (EPCs) for chemicals of potential

[4] The Tier 2 CG for TPHho references the ESLs established by the RWQCB for "TPH diesel".

[5] Silica-gel cleanup removes naturally occurring hydrocarbons eluding in the TPHho carbon range.

ecological concern (COPECs). The ECSM concluded groundwater discharge to surface water as the only complete exposure pathway for site's COPECs. The EPCs referenced in the SLERA were the maximum post-remediation groundwater concentrations detected in the site's monitoring wells (i.e., not the current groundwater concentrations detected in the 1st Quarter 2015 monitoring event).

- Conducting a risk characterization, which compared COPECs against screening level values (SLVs) and calculated associated hazard quotients (HQs). The SLVs selected were the marine aquatic habitat goals as established in the RWQCB ESL Table F-4a[6]. The COPECs exceeding SLVs resulted in HQs greater than 1.0, which included the following chemicals: copper; lead; mercury; molybdenum; nickel and vanadium.

- Conducting chemical fate and transport modeling for the six COPECs with HQs greater than 1. The objective of this modeling was to determine the downgradient groundwater migration timeframe and maximum groundwater concentration of each chemical at the groundwater-surface water interface for the nearby San Francisco Bay. HQs were recalculated for this models output, and the resulting HQs were all less than 1.0.

The results of the SLERA are provided in Appendix C. The SLERA concluded adverse chronic effects to aquatic organisms resulting from the downgradient migration of the site's groundwater to the San Francisco Bay are unlikely under the current exposure scenario.

4. REQUEST FOR CLOSURE

Ninyo & Moore's submitted ACEH our *4th Quarter 2014 Groundwater Monitoring Report and Request for Site Closure*, dated December 4, 2014. ACEH reviewed this report and provided their January 22, 2015 response letter, which required the performance of the 1st Quarter 2015 groundwater monitoring event and the preparation of a Tier 2 Risk Evaluation, both of which are documented in this report. ACEH's letter also indicated concerns with the increased TPHho concentrations detected in the 4th quarter 2014 groundwater samples collected from monitoring wells MW-1 and MW-2, and dissolved molybdenum concentrations detected in the site's groundwater monitoring well network. Ninyo & Moore additionally performed a SLERA to evaluate whether offsite migration of the site's COC may pose a downgradient threat to the San

[6] These SLVs are also the Tier 2 CGs.

Francisco Bay. Given the results obtained during the 1st Quarter 2015 groundwater monitoring event and the additional evaluations performed on the site's groundwater monitoring results, Ninyo & Moore believes ACEH should grant the request for closure based on the following findings:

- The Tier 2 Risk Evaluation presented in Section 2.4 provides CGs established for the marine aquatic habitat. The post-remediation groundwater monitoring data has indicated exceedances of the Tier 2 CGs for select metals, with only molybdenum and nickel exceeding their respective Tier 2 CG in the groundwater samples collected during the 1st Quarter 2015.

- Although molybdenum concentrations detected in the groundwater samples collected from monitoring wells MW-1 and MW-2 have consistently exceeded the Tier 2 CG, the molybdenum Tier 2 CG has never been exceeded in the groundwater samples collected from monitoring well MW-3 (i.e., the furthest downgradient monitoring well). Therefore, no offsite impacts are expected due to the onsite groundwater molybdenum concentrations.

- ACEH indicated in their letter the molybdenum concentrations in monitoring well MW-2 have consistently increased, with the groundwater samples collected in the 4th Quarter 2014 contained the highest recorded concentration in this well. In addition, ACEH noted the molybdenum concentrations detected in the groundwater sample collected from monitoring well MW-3 increased during the past two quarterly events (i.e., 3rd Quarter 2014 and 4th Quarter 2014). The results obtained from the groundwater samples collected from monitoring wells MW-2 and MW-3 during the 1st Quarter 2015 indicated a decrease in the molybdenum concentration, thereby eliminating this increasing trend.

- ACEH indicated in their letter TPHho concentrations in the groundwater samples collected from monitoring wells MW-1 and MW-2 increased during the 4th Quarter 2014 groundwater monitoring event, and were the highest TPHho concentrations recorded for each monitoring well. Ninyo & Moore notes that the laboratory analysis for TPHho during the 4th Quarter 2014 did not include preparation of the groundwater samples using silica-gel cleanup, as had been performed for the previous quarterly monitoring events. The groundwater samples collected during the 1st Quarter 2015 monitoring event were prepared with silica-gel cleanup, with the results indicated TPHho not detected at concentrations exceeding the laboratory reporting limit. Therefore, the increased TPHho concentrations observed in the 4th Quarter 2014 groundwater samples were likely due to naturally occurring hydrocarbons eluding in the TPHho carbon range.

- The SLERA presented in Section 3 identified COPECs that could potentially migrate downgradient from the site and discharge to the San Francisco Bay. The results of this SLERA concluded that even though onsite groundwater concentrations of a few select metals may exceed the Tier 2 CGs, the resulting downgradient concentrations would not be at levels that would pose a risk to this ecological receptor.

5. CONCLUSIONS AND RECOMMENDATIONS

This report presents the results of the 1st Quarter 2015 groundwater monitoring event. Based on the findings of the site's post-remediation groundwater monitoring activities, residual impacts from dissolved metals, TPHho and PAHs in groundwater do not pose a significant threat to human health or the environmental. Five quarterly post-remediation groundwater monitoring events have been conducted at the site, with the results of the current 1st Quarter 2015 monitoring event indicating exceedances of the Tier 2 CGs for only two metals, molybdenum and nickel. Ninyo & Moore performed a SLERA to evaluate whether the onsite groundwater concentrations exceeding CGs could pose a threat to ecological receptors at the San Francisco Bay. The results of this SLERA concluded groundwater migrating downgradient from the site would not present adverse chronic effects to the San Francisco Bay ecosystem.

Based on the site's post-remediation groundwater monitoring results, Ninyo & Moore recommends that groundwater monitoring at the site be discontinued and ACEH consider the site for case closure. Following completion of a public notice and comment period for the proposed case closure, monitoring wells MW-1 through MW-3 would be destroyed in accordance with state and local guidelines. In addition, the site owner will implement a deed restriction for this site prohibiting the use of the site's groundwater as a source of drinking. Following the submittal of a report to ACEH documenting the monitoring well destruction activities, ACEH should consider granting the request for closure and providing a No Further Action determination for the site.

6. LIMITATIONS

The environmental services described in this report have been conducted in general accordance with current regulatory guidelines and the standard-of-care exercised by environmental consultants performing similar work in the project area. No other warranty, expressed or implied, is made regarding the professional opinions presented in this report. Variations in site conditions may exist and conditions not observed or described in this report may be encountered during subsequent activities. Please also note that this study did not include an evaluation of geotechnical conditions or potential geologic hazards.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this report, are based on limited subsurface assessment and chemical analysis. Further assessment of potential adverse environmental impacts from past on-site and/or nearby use of hazardous materials may be accomplished by a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area(s) evaluated; however, conditions can vary significantly between sampling locations. Variations in soil and/or groundwater conditions will exist beyond the points explored in this evaluation.

The environmental interpretations and opinions contained in this report are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site. The testing and analyses have been conducted by an independent laboratory which is accredited by the EPA or certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis. Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results.

Our conclusions and recommendations are based on an analysis of the observed site conditions. It should be understood that the conditions of a site could change with time as a result of natural processes or human activities at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the WF&F. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the WF&F is undertaken at said parties' sole risk.

7. REFERENCES

California Regional Water Quality Control Board, San Francisco Bay Region, 2007 Water Quality Control Plan, dated January 18.

Ninyo & Moore, 2013, Revised Data Gap Investigation Report and Corrective Action Plan, Western Forge and Flange, 540 Cleveland Avenue, Albany, California, dated May 15.

Ninyo & Moore, 2013, Corrective Action Plan Addendum, Western Forge and Flange, 540 Cleveland Avenue, Albany, California, dated July 22.

Ninyo & Moore, 2014, Removal Action Completion Report, 540 Cleveland Avenue, Albany, California, dated February 6.

San Francisco Bay Regional Water Quality Control Board (RWQCB), 2013, Environmental Screening Levels, dated December.

TABLE 1. TIER 2 CLEANUP GOALS

COC	Tier 1 CG [a] (µg/L)	Basis	Tier 2 CG [b] (µg/L)	Basis
Antimony	6.0	Drinking Water	500	Marine Aquatic Habitat Goal
Arsenic	10	Drinking Water	36	Marine Aquatic Habitat Goal
Barium	1,000	Drinking Water	1,000	Marine Aquatic Habitat Goal
Beryllium	0.53	Estuary Aquatic Habitat Goal	0.53	Marine Aquatic Habitat Goal
Cadmium	0.25	Estuary Aquatic Habitat Goal	9.30	Marine Aquatic Habitat Goal
Total Chromium	50	Drinking Water	180	Marine Aquatic Habitat Goal
Hexavalent Chromium	0.02	Drinking Water	50	Marine Aquatic Habitat Goal
Cobalt	3.0	Estuary Aquatic Habitat Goal	3.0	Marine Aquatic Habitat Goal
Copper	3.1	Estuary Aquatic Habitat Goal	3.1	Marine Aquatic Habitat Goal
Lead	2.5	Estuary Aquatic Habitat Goal	8.1	Marine Aquatic Habitat Goal
Mercury	0.025	Aquatic Habitat Goal	0.025	Marine Aquatic Habitat Goal
Molybdenum	78	Drinking Water	240	Marine Aquatic Habitat Goal
Nickel	8.2	Estuary Aquatic Habitat Goal	8.2	Marine Aquatic Habitat Goal
Selenium	5.0	Estuary Aquatic Habitat Goal	71	Marine Aquatic Habitat Goal
Silver	0.19	Estuary Aquatic Habitat Goal	0.19	Marine Aquatic Habitat Goal
Thallium	2.0	Drinking Water	4.0	Marine Aquatic Habitat Goal
Vanadium	19	Estuary Aquatic Habitat Goal	19	Marine Aquatic Habitat Goal
Zinc	81	Estuary Aquatic Habitat Goal	81	Marine Aquatic Habitat Goal
Acenaphthene	20	Ceiling Value	40	Marine Aquatic Habitat Goal
Acenaphthylene	30	Estuary Aquatic Habitat Goal	30	Marine Aquatic Habitat Goal
Anthracene	0.73	Estuary Aquatic Habitat Goal	0.73	Marine Aquatic Habitat Goal
Benzo[a]anthracene	0.027	Estuary Aquatic Habitat Goal	0.027	Marine Aquatic Habitat Goal
Benzo[a]pyrene	0.014	Estuary Aquatic Habitat Goal	0.014	Marine Aquatic Habitat Goal
Benzo[b]flouranthene	0.056	Drinking Water	0.056	Marine Aquatic Habitat Goal
Benzo[g,h,i]perylene	0.10	Estuary Aquatic Habitat Goal	0.10	Marine Aquatic Habitat Goal
Benzo[k]fluoranthene	0.056	Drinking Water	3.7	Marine Aquatic Habitat Goal
Chrysene	0.35	Estuary Aquatic Habitat Goal	0.35	Marine Aquatic Habitat Goal
Dibenz(a,h)anthracene	0.016	Drinking Water	7.5	Marine Aquatic Habitat Goal
Fluoranthene	8.0	Estuary Aquatic Habitat Goal	8.0	Marine Aquatic Habitat Goal
Fluorene	3.9	Estuary Aquatic Habitat Goal	30	Marine Aquatic Habitat Goal
Indeno[1,2,3-cd]pyrene	0.056	Drinking Water	0.056	Marine Aquatic Habitat Goal
Naphthalene	6.1	Drinking Water	62	Marine Aquatic Habitat Goal
Phenanthrene	4.6	Estuary Aquatic Habitat Goal	4.6	Marine Aquatic Habitat Goal
Pyrene	2.0	Estuary Aquatic Habitat Goal	2.0	Marine Aquatic Habitat Goal
TPHho [c]	100	Ceiling Value	640	Marine Aquatic Habitat Goal

Notes:
CG = Cleanup Goal
µg/L = micrograms per liter
a = Tier 1 CGs obtained from the San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs), dated December 2013, Table F-1a
b = Tier 2 CGs obtained from the RWQCB ESLs, dated December 2013, Table F-4a
c = references "TPH diesel" ESL
CG = Cleanup Goal
µg/L = micrograms per liter

TABLE 2 - GROUNDWATER DEPTH AND ELEVATION DATA

Monitoring Well ID	TOC Elevation (ft msl)	Ground Surface Elevation (ft msl)	Measurement Date	Depth to Groundwater (ft btoc)	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft msl)
MW-1	15.76	12.92	12/03/13	7.62	4.78	8.14
			12/05/13	7.59	4.75	8.17
			03/24/14	5.25	2.41	10.51
			09/09/14	6.81	3.97	8.95
			11/12/14	6.85	4.01	8.91
			03/10/15	5.21	2.37	10.55
MW-2	15.47	12.60	12/03/13	7.31	4.44	8.16
			12/05/13	7.28	4.41	8.19
			03/24/14	4.95	2.08	10.52
			09/09/14	6.50	3.63	8.97
			11/12/14	6.54	3.67	8.93
			03/10/15	4.90	2.03	10.57
MW-3	15.17	12.34	12/03/13	5.47	2.64	9.70
			12/05/13	5.79	2.96	9.38
			03/24/14	4.75	1.92	10.42
			09/09/14	6.95	4.12	8.22
			11/12/14	6.58	3.75	8.59
			03/10/15	4.99	2.16	10.18

Notes:
TOC = top of casing
ft btoc= feet below top of casing
ft msl = feet above mean sea level
ft bgs = feet below ground surface

TABLE 3 - ANALYTICAL RESULTS FOR CALIFORNIA TITLE 22 METALS AND TOTAL DISSOLVED SOLIDS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury	Total Dissolved Solids
		Groundwater Sample Results (mg/L)																		
MW-1	12/05/13	<0.010	0.017	0.074	<0.0020	<0.0020	<0.010	<0.010*	<0.0020	**0.021**	**0.0094**	**0.99**	**0.033**	<0.020	<0.0050	<0.010	0.018	<0.020	**0.00022**	1,400
	03/24/14	<0.010	0.018	0.032	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	**0.037**	**0.019**	**0.67**	**0.043**	<0.020	<0.0050	<0.010	**0.022**	<0.020	<0.00020	1,100
	09/09/14	<0.010	0.017	<0.0050	<0.0020	<0.0050	<0.010	<0.0005	<0.0050	**0.0079**	**0.019**	**0.86**	**0.039**	0.031	<0.0050	<0.010	<0.0050	<0.020	<0.00020	1,100
	11/12/14	<0.010	0.015	0.011	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	**0.0081**	**0.88**	**0.035**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	1,100
	03/10/15	<0.010	0.013	<0.050	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	**0.90**	**0.025**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	1,100
MW-2	12/05/13	<0.010	0.011	0.11	<0.0020	<0.0020	<0.010	<0.010*	**0.0056**	**0.020**	<0.0050	**0.58**	**0.037**	<0.020	<0.0050	<0.010	0.012	0.047	**0.00027**	1,800
	03/24/14	<0.010	<0.010	0.036	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	**0.55**	**0.018**	<0.020	<0.0050	<0.010	0.015	<0.020	<0.00020	1,100
	09/09/14	<0.010	0.011	0.019	<0.0020	<0.0050	<0.010	<0.0005	<0.0050	**0.064**	**0.0099**	**0.88**	**0.025**	<0.010	<0.0050	<0.010	0.0054	<0.020	<0.00020	900
	11/12/14	<0.010	<0.010	0.021	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	**0.0055**	**0.98**	**0.024**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	960
	03/10/15	<0.010	0.011	<0.050	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	**0.80**	**0.025**	<0.020	<0.0050	<0.010	0.015	<0.020	<0.00020	910
MW-3	12/05/13	<0.010	<0.010	0.15	<0.0020	<0.0020	<0.010	<0.010*	0.0028	<0.020	**0.0099**	<0.010	**0.030**	<0.020	<0.0050	<0.010	<0.010	0.047	**0.00021**	1,800
	03/24/14	<0.010	0.014	0.04	<0.0020	<0.0020	<0.010	<0.0005	0.0023	<0.020	<0.0050	<0.010	**0.019**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	1,200
	09/09/14	<0.010	0.019	0.19	<0.0020	<0.0020	<0.010	<0.0005	<0.0050	<0.0050	<0.0050	0.014	**0.029**	0.029	<0.0050	<0.010	<0.010	<0.020	<0.00020	2,700
	11/12/14	<0.010	0.011	0.31	<0.0020	<0.0020	<0.010	<0.0005	0.0026	<0.020	<0.0050	0.018	**0.025**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	3,100
	03/10/15	<0.010	<0.010	0.22	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	<0.010	**0.018**	<0.020	<0.0050	<0.010	<0.010	0.054	<0.00020	1,700
	Tier 2 CG (mg/L)	0.50	0.36	1.0	0.00053	0.0093	0.18	0.050	0.0030	0.0031	0.0081	0.24	0.0082	0.071	0.00019	0.0040	0.019	0.081	0.000025	NA

Notes:
Metals analyzed by USEPA Methods 6010B, 7470A (mercury), and 7199 (hexavalent chromium)
* indicates samples analyzed for hexavalent chromium by USEPA Method 7196A
Total Dissolved Solids analyzed by USEPA Method SM 2540C
Tier 2 CG = Tier 2 Cleanup Goal; see Table 1
<x = not detected at a concentration greater than laboratory reporting limit of x
mg/L= milligrams per liter
NA = not applicable
Bold indicates concentration exceeds Tier 2 CG

TABLE 4 - ANALYTICAL RESULTS FOR TPHho AND PAHs

Sample ID	Date Collected	TPHho	PAHs															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]flouranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
		Analytical Results (µg/L)																
MW-1	12/05/13	230	0.28	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.99	<0.10	<0.10
	03/24/14	<100	0.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.26	<0.10	5.2	0.24	<0.10
	09/09/14	<300	2.20	<0.09	0.3	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.7	<0.09	38	0.7	<0.09
	11/12/14	470 [a]	3.8	0.11	0.32	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.14	1.8	<0.11	30	1.9	<0.11
	03/10/15	<100	3.2	<0.11	0.14	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	1.1	<0.11	34	0.85	<0.11
MW-2	12/05/13	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	03/24/14	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10
	09/09/14	<300	0.1	<0.09	0.1	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.1	<0.09	0.3	0.2	<0.09
	11/12/14	630 [a]	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.17	<0.11	<0.11
	03/10/15	<110	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-3	12/05/13	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	03/24/14	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	09/09/14	<300	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
	11/12/14	<110 [a]	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	03/10/15	<110	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
Tier 2 CG (µg/L)		640	40	30	0.73	0.027	0.014	0.056	0.10	3.7	0.35	7.5	8.0	30	0.056	62	4.6	2.0

Notes:
PAHs = polycyclic aromatic hydrocarbons analyzed by USEPA Method 8270 SIM
TPHho = total petroleum hydrocarbons as hydraulic oil analyzed by USEPA Method 8015B; samples prepared with silica-gel cleanup (unless noted otherwise)
a = TPHho analysis did not include silica-gel cleanup
Tier 2 CG = Tier 2 Cleanup Goal; see Table 1
<x = not detected at a concentration greater than laboratory reporting limit of x
µg/L= micrograms per liter
Bold indicates concentration exceeds Tier 2 CG

REFERENCE: METRO AREAS OF ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO, AND SANTA CLARA COUNTIES, THOMAS GUIDE, 2008.

N

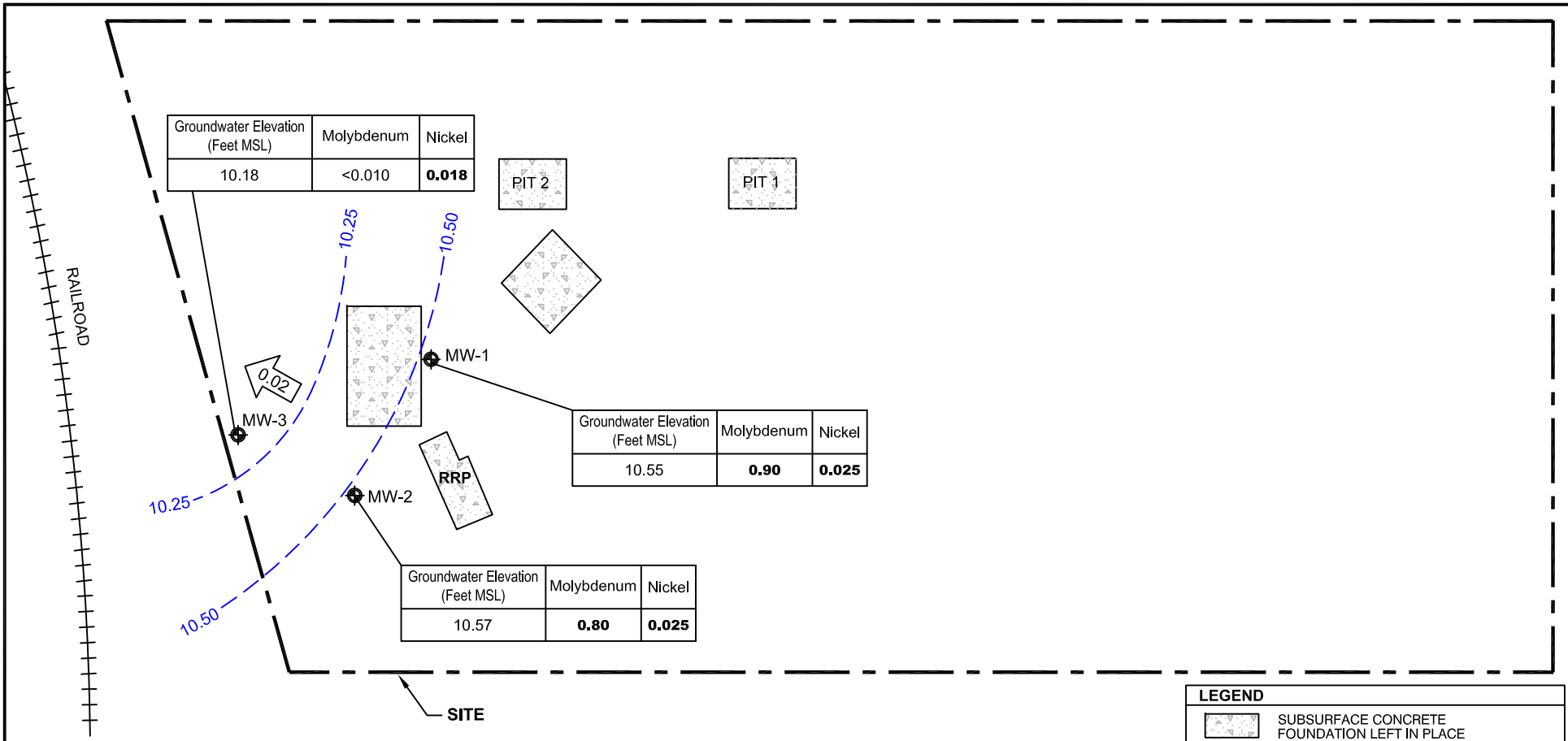
SCALE IN FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	SITE LOCATION	FIGURE
PROJECT NO. 401823001 / DATE 4/15	WESTERN FORGE & FLANGE 540 CLEVELAND AVENUE ALBANY, CALIFORNIA	1

401823001-SL.dwg, Apr 17, 2015, 8:28am,snguyen



LEGEND

	SUBSURFACE CONCRETE FOUNDATION LEFT IN PLACE
MW-3	MONITORING WELL
RRP	RING ROLLING PIT
0.02	GROUNDWATER FLOW DIRECTION AND GRADIENT IN FEET PER FOOT
10.50	GROUNDWATER EQUIPOTENTIAL LINE ELEVATION IN FEET MSL
TPHho	TOTAL PETROLEUM HYDROCARBONS AS HYDRAULIC OIL
MSL	ABOVE MEAN SEA LEVEL
ESLs	ENVIRONMENTAL SCREENING LEVELS
<	INDICATES NOT DETECTED, BELOW LABORATORY REPORTING LIMIT
BOLD	INDICATES CONCENTRATION EXCEEDING CLEANUP GOALS

ANALYTICAL RESULTS, CLEANUP GOALS, AND ESLs IN MILLIGRAMS PER LITER

	Molybdenum	Nickel
Tier 2 Cleanup Goals	0.24	0.0082

N

SCALE IN FEET

0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: MASTER LAYOUT FIGURE, CDMS, 1998, REV. 2008, NINYO & MOORE MEASUREMENTS OCTOBER 2011.

Ninyo & Moore

GROUNDWATER GRADIENT AND ANALYTICAL RESULTS FOR CONSTITUENTS EXCEEDING CLEANUP GOALS OR DRINKING WATER ESLs - MARCH 10, 2015

PROJECT NO.	DATE
401823001	4/15

WESTERN FORGE & FLANGE
540 CLEVELAND AVENUE
ALBANY, CALIFORNIA

FIGURE

2

401823001-FIG2.dwg, Apr 17, 2015, 8:27am snguyen

APPENDIX A
FIELD DATA SHEETS

MW-1

Ninyo & Moore

GROUNDWATER SAMPLING FIELD DATA SHEET

Project Name: WF&F

Site: WF&F

Project No.: 461923001

Monitoring Well ID: MW-1

Date: 2/10/15 Sampler: TM

Weather: Cloudy

Vapor Monitoring Results (ppmv): BZ= WH= 0.4

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ Other

Casing Material: ☒ SCH 40-PVC ☐ Other: S. Steel

Total Depth (ft-TOC): 12.95

Depth to Water (ft-TOC): 5.21

Floating Immiscible Layer Observed?: No

Floating Immiscible Layer Thickness (feet):

Water Column Height (feet): 7.74 x 2" = 0.16, 4"=0.65, 6" = 1.47 gal/ft = 0.16 x 3 = 3.71 gal Min. Purge Volume (gallons)

Water Level Measurement Equip.: Solinst Water Level Indicator

Purging Method/Equipment: Peristaltic Pump

Pump Lines/Bailer Ropes-New or Cleaned?: New

Temp./pH Meter: OAKTON 10 Series

Conductivity Meter:

Cleaned: yes

Cleaned: yes

Calibration (date/time): 2/9/15

Calibration (date/time): 2/9/15

Comments:

pH STND.	FIELD pH	FIELD TEMP. (°C)
4.0		
7.0		

TIME	Purge Vol.(Gal)	Totalizer Reading (Gal)	TEMP. (°C)	ORP	DO (%)	pH	COND. (µS/cm)	COMMENTS (color, turbidity, odor, sheen, etc.):
~~1110~~	~~1~~		~~16.6~~			~~10.91~~	~~1211~~	Clear yellow; SL
1118	1		16.9			10.91	1211	Clear yellow; SL
1124	2		15.8			11.10	1198	" "
1130	3		15.8			11.19	1158	" "
1132	3.75		15.9			11.21	1130	" "

Total Volume Purged (gallon): 3.75

Time Finished Purging: 1132

Sampling Method/Equipment: Peristaltic/ Geo Pump

Bailer Rope-New or Cleaned?: —

Sample Time: 1145

Sample ID: MW-1

Replicate ID (if appl.) —

Laboratory: Testamerica

Comments: open well 0805

PARAMETER	USEPA METHOD	CONTAINERS/VOLUME/ TYPE (Voa/Glass/Plastic)	PRES.
TDS	SM 2540C	500 ml Poly	—
Hex Chrom	7199	250 ml Poly	Lab Filter
Title 22 Metals	6010B	250 ml Poly	" "
SVOCs	8270C	2x 1L Amber	—
	SIM	—	—
TPH-HO	8015B	2x 1L Amber	—

Sample Time 1145

MW-2

Ninyo & Moore

GROUNDWATER SAMPLING FIELD DATA SHEET

Project Name:

Site: WF&F
Project No.: 401923.001
Monitoring Well ID: MW-2

Date: 3/10/15 Sampler: MM
Weather: cloudy
Vapor Monitoring Results (ppmv): BZ= WH= 0.3

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ Other
Casing Material: ☒ SCH 40-PVC ☐ Other: S. Steel
Total Depth (ft-TOC): 12.43
Depth to Water (ft-TOC): 4.90
Floating Immiscible Layer Observed?: NO
Floating Immiscible Layer Thickness (feet):

Water Column Height (feet): 7.53 x (2" = 0.16, 4"=0.65, 6" = 1.47) gal/ft = 0.16 x 3 = 3.61 Min. Purge Volume (gallons)

Water Level Measurement Equip.: Solinst Water Level Indicator
Purging Method/Equipment: peristaltic Pump
Pump Lines/Bailer Ropes-New or Cleaned?: New
Temp./pH Meter: OAKTON 10 Series
Conductivity Meter:
Cleaned: yes
Cleaned: yes
Calibration (date/time): 3/9/15
Calibration (date/time):

Comments:

pH STND.	FIELD pH	FIELD TEMP. (°C)
4.0		
7.0		

TIME	Purge Vol.(Gal)	Totalizer Reading (Gal)	TEMP. (°C)	ORP	DO (%)	pH	COND. (µS/cm)	COMMENTS (color, turbidity, odor, sheen, etc.):
1020	1		15.7			7.35	965	clear, yellow, sl
1025	2		15.6			7.55	911	" "
1030	3		15.6			7.59	876	" "
1033	3.75		15.6			8.01	842	" "

Total Volume Purged (gallon): 3.75
Time Finished Purging: 1033

Sampling Method/Equipment: peristaltic Pump
Geo pump

Bailer Rope-New or Cleaned?: —
Sample Time: 1050
Sample ID: MW-2
Replicate ID (if appl.)

Laboratory: Test America

Comments: Open well 0805

PARAMETER	USEPA METHOD	CONTAINERS/VOLUME/ TYPE (Voa/Glass/Plastic)	PRES.

Sample Time 1050

MW-3

Ninyo & Moore

GROUNDWATER SAMPLING FIELD DATA SHEET

Project Name:

Site: WF+F

Project No.: 401823001

Monitoring Well ID: MW-3

Date: 3/10/15 Sampler: FM

Weather: Cloudy

Vapor Monitoring Results (ppmv): BZ= WH= 0.2

Casing Diameter: [X] 2" [ ] 4" [ ] 6" [ ] Other

Casing Material: [X] SCH 40-PVC [ ] Other: S. Steel

Total Depth (ft-TOC): 13.80

Depth to Water (ft-TOC): 4.99

Floating Immiscible Layer Observed?: NO

Floating Immiscible Layer Thickness (feet):

Water Column Height (feet): 8.81 x (2" = 0.16, 4"=0.65, 6" = 1.47) gal/ft = 0.16 x 3 = 4.22 Min. Purge Volume (gallons)

Water Level Measurement Equip.: *Solinst Water Level Indicator*

Purging Method/Equipment: peristaltic pump

Pump Lines/Bailer Ropes-New or Cleaned?: New

Cleaned: yes

Cleaned: yes

Temp./pH Meter: OAKTON 10 Series

Conductivity Meter:

Calibration (date/time): 3/9/15

Calibration (date/time): 3/9/15

Comments:

pH STND.	FIELD pH	FIELD TEMP. (°C)
4.0		
7.0		

TIME	Purge Vol.(Gal)	Totalizer Reading (Gal)	TEMP. (°C)	ORP	DO (%)	pH	COND. (µS/cm)	COMMENTS (color, turbidity, odor, sheen, etc.):
0920	1		15.6			6.91	1524	Clear yellowish
0925	2		15.1			6.84	1556	Clear V Lt Yellow
0931	3		15.9			6.89	1559	Clear
0936	4		15.9			6.93	1554	Clear
0939	4.25		15.9			6.93	1554	Clear Lt Yellow

Total Volume Purged (gallon): 4.25 Time Finished Purging: 0939

Sampling Method/Equipment:

Bailer Rope-New or Cleaned?:

Sample Time: 0950

Sample ID: MW-3

Replicate ID (if appl.)

Laboratory: Test America

Comments: OPEN WELL 0805

PARAMETER	USEPA METHOD	CONTAINERS/VOLUME/ TYPE (Voa/Glass/Plastic)	PRES.

Sampled 0950

APPENDIX B

LABORATORY ANALYTICAL REPORT

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-63432-1
Client Project/Site: Western Forge & Flange

For:
Ninyo & Moore
1956 Webster Street
Suite 400
Oakland, California 94612

Attn: Mr. Kris Larsen

Authorized for release by:
3/17/2015 5:03:42 PM
Afsaneh Salimpour, Senior Project Manager
afsaneh.salimpour@testamericainc.com

Designee for

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

Table of Contents

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

Job ID: 720-63432-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-63432-1

Comments
No additional comments.

Receipt
The samples were received on 3/10/2015 5:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

Except:

PNA/PAH 8270-SIM (SVOC is also written in the same box), logged for PNA-SIM the same as previous submissions submitted for this project.

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

GC Semi VOA
Method(s) 8015B: The Diesel Range Organics (DRO) concentration reported for the following sample(s) is due to the presence of discrete peaks: MW-1 (720-63432-1).

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

Metals
Method(s) 7470A: The following samples requested dissolved metals and were not filtered in the field: MW-1 (720-63432-1), MW-2 (720-63432-2), MW-3 (720-63432-3). These samples were filtered and preserved upon receipt to the laboratory. Ref# 177429

Method(s) 3005A: The following samples requested dissolved metals and were not filtered in the field: MW-1 (720-63432-1), MW-2 (720-63432-2), MW-3 (720-63432-3). These samples were filtered and preserved upon receipt to the laboratory; ref #: 177429

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

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

Organic Prep

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

Detection Summary

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-1 — Lab Sample ID: 720-63432-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	34		0.21		ug/L	2		8270C SIM	Total/NA
Acenaphthene	3.2		0.11		ug/L	1		8270C SIM	Total/NA
Fluorene	1.1		0.11		ug/L	1		8270C SIM	Total/NA
Phenanthrene	0.85		0.11		ug/L	1		8270C SIM	Total/NA
Anthracene	0.14		0.11		ug/L	1		8270C SIM	Total/NA
Arsenic	0.013		0.010		mg/L	1		6010B	Dissolved
Molybdenum	0.90		0.010		mg/L	1		6010B	Dissolved
Nickel	0.025		0.010		mg/L	1		6010B	Dissolved
Total Dissolved Solids	1100		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2 — Lab Sample ID: 720-63432-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.011		0.010		mg/L	1		6010B	Dissolved
Molybdenum	0.80		0.010		mg/L	1		6010B	Dissolved
Nickel	0.025		0.010		mg/L	1		6010B	Dissolved
Vanadium	0.015		0.010		mg/L	1		6010B	Dissolved
Total Dissolved Solids	910		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 720-63432-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.22		0.050		mg/L	1		6010B	Dissolved
Nickel	0.018		0.010		mg/L	1		6010B	Dissolved
Zinc	0.054		0.020		mg/L	1		6010B	Dissolved
Total Dissolved Solids	1700		13		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1

Date Collected: 03/10/15 11:45
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-1

Matrix: Water

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**34**		0.21		ug/L		03/13/15 13:36	03/16/15 21:52	2
Acenaphthene	**3.2**		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Acenaphthylene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Fluorene	**1.1**		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Phenanthrene	**0.85**		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Anthracene	**0.14**		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Benzo[a]anthracene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Chrysene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Benzo[a]pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Benzo[b]fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Benzo[k]fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Benzo[g,h,i]perylene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Indeno[1,2,3-cd]pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1
Dibenz(a,h)anthracene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 18:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*40*		*29 - 120*	*03/13/15 13:36*	*03/14/15 18:19*	*1*
2-Fluorobiphenyl	*48*		*29 - 120*	*03/13/15 13:36*	*03/16/15 21:52*	*2*
Terphenyl-d14	*55*		*45 - 120*	*03/13/15 13:36*	*03/14/15 18:19*	*1*
Terphenyl-d14	*71*		*45 - 120*	*03/13/15 13:36*	*03/16/15 21:52*	*2*

Method: 8015B - Diesel Range Organics (DRO) (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TPH-Hydraulic Oil Range (C19-C36)	ND		100		ug/L		03/16/15 10:09	03/16/15 18:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Capric Acid (Surr)	*0*		*0 - 5*	*03/16/15 10:09*	*03/16/15 18:13*	*1*
p-Terphenyl	*91*		*31 - 150*	*03/16/15 10:09*	*03/16/15 18:13*	*1*

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Arsenic	**0.013**		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Barium	ND		0.050		mg/L		03/12/15 16:17	03/16/15 23:29	1
Beryllium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:29	1
Cadmium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:29	1
Chromium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Cobalt	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:29	1
Copper	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:29	1
Lead	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:29	1
Molybdenum	**0.90**		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Nickel	**0.025**		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Selenium	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:29	1
Silver	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:29	1
Thallium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Vanadium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:29	1
Zinc	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:29	1

Client Sample Results

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-1
Date Collected: 03/10/15 11:45
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-1
Matrix: Water

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		03/12/15 08:57	03/12/15 13:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		10		mg/L			03/12/15 12:12	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			03/10/15 20:44	1

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-2
Date Collected: 03/10/15 10:50
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-2
Matrix: Water

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Acenaphthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Acenaphthylene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Fluorene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Phenanthrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Benzo[a]anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Chrysene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Benzo[a]pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Benzo[b]fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Benzo[k]fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Benzo[g,h,i]perylene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Indeno[1,2,3-cd]pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1
Dibenz(a,h)anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*40*		*29 - 120*	*03/13/15 13:36*	*03/14/15 18:42*	*1*
Terphenyl-d14	*55*		*45 - 120*	*03/13/15 13:36*	*03/14/15 18:42*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TPH-Hydraulic Oil Range (C19-C36)	ND		110		ug/L		03/16/15 10:09	03/16/15 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Capric Acid (Surr)	*0*		*0 - 5*	*03/16/15 10:09*	*03/16/15 18:42*	*1*
p-Terphenyl	*88*		*31 - 150*	*03/16/15 10:09*	*03/16/15 18:42*	*1*

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Arsenic	**0.011**		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Barium	ND		0.050		mg/L		03/12/15 16:17	03/16/15 23:34	1
Beryllium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:34	1
Cadmium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:34	1
Chromium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Cobalt	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:34	1
Copper	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:34	1
Lead	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:34	1
Molybdenum	**0.80**		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Nickel	**0.025**		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Selenium	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:34	1
Silver	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:34	1
Thallium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Vanadium	**0.015**		0.010		mg/L		03/12/15 16:17	03/16/15 23:34	1
Zinc	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:34	1

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-2
Date Collected: 03/10/15 10:50
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-2
Matrix: Water

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		03/12/15 08:57	03/12/15 13:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		10		mg/L			03/12/15 12:14	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			03/10/15 20:56	1

Client Sample ID: MW-3
Date Collected: 03/10/15 09:50
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-3
Matrix: Water

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Acenaphthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Acenaphthylene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Fluorene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Phenanthrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Anthracene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Benzo[a]anthracene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Chrysene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Benzo[a]pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Benzo[b]fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Benzo[k]fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Benzo[g,h,i]perylene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Indeno[1,2,3-cd]pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Fluoranthene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Pyrene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1
Dibenz(a,h)anthracene	ND		0.11		ug/L		03/13/15 13:36	03/14/15 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*47*		*29 - 120*	*03/13/15 13:36*	*03/14/15 19:05*	*1*
Terphenyl-d14	*58*		*45 - 120*	*03/13/15 13:36*	*03/14/15 19:05*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TPH-Hydraulic Oil Range (C19-C36)	ND		110		ug/L		03/16/15 10:09	03/16/15 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Capric Acid (Surr)	*0*		*0 - 5*	*03/16/15 10:09*	*03/16/15 19:11*	*1*
p-Terphenyl	*94*		*31 - 150*	*03/16/15 10:09*	*03/16/15 19:11*	*1*

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Arsenic	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Barium	**0.22**		0.050		mg/L		03/12/15 16:17	03/16/15 23:39	1
Beryllium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:39	1
Cadmium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:39	1
Chromium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Cobalt	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:39	1
Copper	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:39	1
Lead	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:39	1
Molybdenum	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Nickel	**0.018**		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Selenium	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:39	1
Silver	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:39	1
Thallium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Vanadium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:39	1
Zinc	**0.054**		0.020		mg/L		03/12/15 16:17	03/16/15 23:39	1

Client Sample Results

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-3
Date Collected: 03/10/15 09:50
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-3
Matrix: Water

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		03/12/15 08:57	03/12/15 13:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1700		13		mg/L			03/12/15 12:18	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			03/10/15 21:08	1

Surrogate Summary

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Method: 8270C SIM - PAHs by GCMS (SIM)

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

		Percent Surrogate Recovery (Acceptance Limits)											
		FBP	TPH										
Lab Sample ID	Client Sample ID	(29-120)	(45-120)										
720-63432-1	MW-1	40	55										
720-63432-1	MW-1	48	71										
720-63432-2	MW-2	40	55										
720-63432-3	MW-3	47	58										
LCS 720-177591/2-A	Lab Control Sample	46	64										
LCSD 720-177591/3-A	Lab Control Sample Dup	48	62										
MB 720-177591/1-A	Method Blank	46	64										

Surrogate Legend

FBP = 2-Fluorobiphenyl

TPH = Terphenyl-d14

Method: 8015B - Diesel Range Organics (DRO) (GC)

Matrix: Water **Prep Type: Silica Gel Cleanup**

		Percent Surrogate Recovery (Acceptance Limits)											
		NDA1	PTP1										
Lab Sample ID	Client Sample ID	(0-5)	(31-150)										
720-63432-1	MW-1	0	91										
720-63432-2	MW-2	0	88										
720-63432-3	MW-3	0	94										
LCS 720-177655/2-A	Lab Control Sample		90										
LCSD 720-177655/3-A	Lab Control Sample Dup		87										
MB 720-177655/1-A	Method Blank	0	88										

Surrogate Legend

NDA = Capric Acid (Surr)

PTP = p-Terphenyl

Method: 8270C SIM - PAHs by GCMS (SIM)

Lab Sample ID: MB 720-177591/1-A
Matrix: Water
Analysis Batch: 177635

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177591

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Acenaphthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Acenaphthylene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Fluorene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Phenanthrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Benzo[a]anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Chrysene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Benzo[a]pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Benzo[b]fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Benzo[k]fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Benzo[g,h,i]perylene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Indeno[1,2,3-cd]pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Fluoranthene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Pyrene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1
Dibenz(a,h)anthracene	ND		0.10		ug/L		03/13/15 13:36	03/14/15 13:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*46*		*29 - 120*	*03/13/15 13:36*	*03/14/15 13:42*	*1*
Terphenyl-d14	*64*		*45 - 120*	*03/13/15 13:36*	*03/14/15 13:42*	*1*

Lab Sample ID: LCS 720-177591/2-A
Matrix: Water
Analysis Batch: 177635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177591

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	10.0	4.42		ug/L		44	19 - 120
Acenaphthene	10.0	4.33		ug/L		43	24 - 120
Acenaphthylene	10.0	4.74		ug/L		47	24 - 120
Fluorene	10.0	4.81		ug/L		48	27 - 120
Phenanthrene	10.0	4.75		ug/L		47	31 - 120
Anthracene	10.0	5.01		ug/L		50	44 - 120
Benzo[a]anthracene	10.0	6.27		ug/L		63	48 - 120
Chrysene	10.0	6.27		ug/L		63	47 - 120
Benzo[a]pyrene	10.0	5.79		ug/L		58	43 - 120
Benzo[b]fluoranthene	10.0	6.06		ug/L		61	42 - 120
Benzo[k]fluoranthene	10.0	5.95		ug/L		59	42 - 120
Benzo[g,h,i]perylene	10.0	5.51		ug/L		55	35 - 120
Indeno[1,2,3-cd]pyrene	10.0	5.45		ug/L		54	36 - 120
Fluoranthene	10.0	5.73		ug/L		57	43 - 120
Pyrene	10.0	6.03		ug/L		60	47 - 120
Dibenz(a,h)anthracene	10.0	5.50		ug/L		55	33 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*46*		*29 - 120*
Terphenyl-d14	*64*		*45 - 120*

Method: 8270C SIM - PAHs by GCMS (SIM) (Continued)

Lab Sample ID: LCSD 720-177591/3-A
Matrix: Water
Analysis Batch: 177635

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177591

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			10.0	4.56		ug/L		46	19 - 120	3	35
Acenaphthene			10.0	4.53		ug/L		45	24 - 120	4	35
Acenaphthylene			10.0	4.91		ug/L		49	24 - 120	4	35
Fluorene			10.0	5.03		ug/L		50	27 - 120	4	35
Phenanthrene			10.0	4.90		ug/L		49	31 - 120	3	35
Anthracene			10.0	5.01		ug/L		50	44 - 120	0	35
Benzo[a]anthracene			10.0	6.03		ug/L		60	48 - 120	4	35
Chrysene			10.0	5.84		ug/L		58	47 - 120	7	35
Benzo[a]pyrene			10.0	5.44		ug/L		54	43 - 120	6	35
Benzo[b]fluoranthene			10.0	6.02		ug/L		60	42 - 120	1	35
Benzo[k]fluoranthene			10.0	5.31		ug/L		53	42 - 120	11	35
Benzo[g,h,i]perylene			10.0	5.07		ug/L		51	35 - 120	8	35
Indeno[1,2,3-cd]pyrene			10.0	5.00		ug/L		50	36 - 120	9	35
Fluoranthene			10.0	5.58		ug/L		56	43 - 120	3	35
Pyrene			10.0	6.00		ug/L		60	47 - 120	1	35
Dibenz(a,h)anthracene			10.0	5.05		ug/L		50	33 - 120	8	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl	*48*		*29 - 120*
Terphenyl-d14	*62*		*45 - 120*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 720-177655/1-A
Matrix: Water
Analysis Batch: 177658

Client Sample ID: Method Blank
Prep Type: Silica Gel Cleanup
Prep Batch: 177655

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TPH-Hydraulic Oil Range (C19-C36)	ND		99		ug/L		03/16/15 10:09	03/16/15 21:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Capric Acid (Surr)	*0*		*0 - 5*	*03/16/15 10:09*	*03/16/15 21:08*	*1*
p-Terphenyl	*88*		*31 - 150*	*03/16/15 10:09*	*03/16/15 21:08*	*1*

Lab Sample ID: LCS 720-177655/2-A
Matrix: Water
Analysis Batch: 177658

Client Sample ID: Lab Control Sample
Prep Type: Silica Gel Cleanup
Prep Batch: 177655

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics [C10-C28]			2500	1270		ug/L		51	32 - 119		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
p-Terphenyl	*90*		*31 - 150*

Method: 8015B - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCSD 720-177655/3-A
Matrix: Water
Analysis Batch: 177658

Client Sample ID: Lab Control Sample Dup
Prep Type: Silica Gel Cleanup
Prep Batch: 177655

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]			2500	1340		ug/L		54	32 - 119	5	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
p-Terphenyl	*87*		*31 - 150*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-177525/1-A
Matrix: Water
Analysis Batch: 177743

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 177525

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Arsenic	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Barium	ND		0.050		mg/L		03/12/15 16:17	03/16/15 22:13	1
Beryllium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 22:13	1
Cadmium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 22:13	1
Chromium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Cobalt	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 22:13	1
Copper	ND		0.020		mg/L		03/12/15 16:17	03/16/15 22:13	1
Lead	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 22:13	1
Molybdenum	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Nickel	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Selenium	ND		0.020		mg/L		03/12/15 16:17	03/16/15 22:13	1
Silver	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 22:13	1
Thallium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Vanadium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 22:13	1
Zinc	ND		0.020		mg/L		03/12/15 16:17	03/16/15 22:13	1

Lab Sample ID: LCS 720-177525/2-A
Matrix: Water
Analysis Batch: 177743

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 177525

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.922		mg/L		92	80 - 120
Arsenic	1.00	0.960		mg/L		96	80 - 120
Barium	1.00	0.890		mg/L		89	80 - 120
Beryllium	1.00	0.949		mg/L		95	80 - 120
Cadmium	1.00	0.940		mg/L		94	80 - 120
Chromium	1.00	0.949		mg/L		95	80 - 120
Cobalt	1.00	0.980		mg/L		98	80 - 120
Copper	1.00	0.938		mg/L		94	80 - 120
Lead	1.00	0.971		mg/L		97	80 - 120
Molybdenum	1.00	0.957		mg/L		96	80 - 120
Nickel	1.00	0.958		mg/L		96	80 - 120
Selenium	1.00	0.964		mg/L		96	80 - 120
Silver	0.500	0.462		mg/L		92	80 - 120

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 720-177525/2-A
Matrix: Water
Analysis Batch: 177743

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 177525

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	1.00	0.961		mg/L		96	80 - 120
Vanadium	1.00	0.954		mg/L		95	80 - 120
Zinc	1.00	0.986		mg/L		99	80 - 120

Lab Sample ID: LCSD 720-177525/3-A
Matrix: Water
Analysis Batch: 177743

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 177525

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.00	0.943		mg/L		94	80 - 120	2	20
Arsenic	1.00	0.982		mg/L		98	80 - 120	2	20
Barium	1.00	0.904		mg/L		90	80 - 120	2	20
Beryllium	1.00	0.968		mg/L		97	80 - 120	2	20
Cadmium	1.00	0.958		mg/L		96	80 - 120	2	20
Chromium	1.00	0.965		mg/L		96	80 - 120	2	20
Cobalt	1.00	1.00		mg/L		100	80 - 120	2	20
Copper	1.00	0.956		mg/L		96	80 - 120	2	20
Lead	1.00	0.991		mg/L		99	80 - 120	2	20
Molybdenum	1.00	0.978		mg/L		98	80 - 120	2	20
Nickel	1.00	0.976		mg/L		98	80 - 120	2	20
Selenium	1.00	0.991		mg/L		99	80 - 120	3	20
Silver	0.500	0.470		mg/L		94	80 - 120	2	20
Thallium	1.00	0.979		mg/L		98	80 - 120	2	20
Vanadium	1.00	0.974		mg/L		97	80 - 120	2	20
Zinc	1.00	1.01		mg/L		101	80 - 120	2	20

Lab Sample ID: MB 720-177429/1-C
Matrix: Water
Analysis Batch: 177743

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 177525

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Arsenic	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Barium	ND		0.050		mg/L		03/12/15 16:17	03/16/15 23:23	1
Beryllium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:23	1
Cadmium	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:23	1
Chromium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Cobalt	ND		0.0020		mg/L		03/12/15 16:17	03/16/15 23:23	1
Copper	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:23	1
Lead	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:23	1
Molybdenum	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Nickel	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Selenium	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:23	1
Silver	ND		0.0050		mg/L		03/12/15 16:17	03/16/15 23:23	1
Thallium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Vanadium	ND		0.010		mg/L		03/12/15 16:17	03/16/15 23:23	1
Zinc	ND		0.020		mg/L		03/12/15 16:17	03/16/15 23:23	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 720-177475/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 177510 — **Prep Batch: 177475**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		03/12/15 08:57	03/12/15 13:09	1

Lab Sample ID: LCS 720-177475/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 177510 — **Prep Batch: 177475**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0100	0.00966		mg/L		97	85 - 115

Lab Sample ID: LCSD 720-177475/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 177510 — **Prep Batch: 177475**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0100	0.00942		mg/L		94	85 - 115	3	20

Lab Sample ID: MB 720-177429/1-B — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 177510 — **Prep Batch: 177475**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		03/12/15 08:57	03/12/15 13:42	1

Method: 7199 - Chromium, Hexavalent (IC)

Lab Sample ID: MB 720-177426/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 177357

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			03/10/15 16:25	1

Lab Sample ID: LCS 720-177426/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 177357

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	2.00	2.09		ug/L		104	90 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-279395/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 279395

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10		mg/L			03/12/15 12:10	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 500-279395/2
Matrix: Water
Analysis Batch: 279395

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	250	296		mg/L		118	80 - 120

Lab Sample ID: 720-63432-2 MS
Matrix: Water
Analysis Batch: 279395

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	910		250	1140		mg/L		94	75 - 125

Lab Sample ID: 720-63432-2 DU
Matrix: Water
Analysis Batch: 279395

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	910		866		mg/L		5	5

GC/MS Semi VOA

Prep Batch: 177591

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Total/NA	Water	3510C	
720-63432-2	MW-2	Total/NA	Water	3510C	
720-63432-3	MW-3	Total/NA	Water	3510C	
LCS 720-177591/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 720-177591/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 720-177591/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 177635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Total/NA	Water	8270C SIM	177591
720-63432-2	MW-2	Total/NA	Water	8270C SIM	177591
720-63432-3	MW-3	Total/NA	Water	8270C SIM	177591
LCS 720-177591/2-A	Lab Control Sample	Total/NA	Water	8270C SIM	177591
LCSD 720-177591/3-A	Lab Control Sample Dup	Total/NA	Water	8270C SIM	177591
MB 720-177591/1-A	Method Blank	Total/NA	Water	8270C SIM	177591

Analysis Batch: 177726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Total/NA	Water	8270C SIM	177591

GC Semi VOA

Prep Batch: 177655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Silica Gel Cleanup	Water	3510C SGC	
720-63432-2	MW-2	Silica Gel Cleanup	Water	3510C SGC	
720-63432-3	MW-3	Silica Gel Cleanup	Water	3510C SGC	
LCS 720-177655/2-A	Lab Control Sample	Silica Gel Cleanup	Water	3510C SGC	
LCSD 720-177655/3-A	Lab Control Sample Dup	Silica Gel Cleanup	Water	3510C SGC	
MB 720-177655/1-A	Method Blank	Silica Gel Cleanup	Water	3510C SGC	

Analysis Batch: 177658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Silica Gel Cleanup	Water	8015B	177655
720-63432-2	MW-2	Silica Gel Cleanup	Water	8015B	177655
720-63432-3	MW-3	Silica Gel Cleanup	Water	8015B	177655
LCS 720-177655/2-A	Lab Control Sample	Silica Gel Cleanup	Water	8015B	177655
LCSD 720-177655/3-A	Lab Control Sample Dup	Silica Gel Cleanup	Water	8015B	177655
MB 720-177655/1-A	Method Blank	Silica Gel Cleanup	Water	8015B	177655

Metals

Filtration Batch: 177429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	FILTRATION	
720-63432-2	MW-2	Dissolved	Water	FILTRATION	
720-63432-3	MW-3	Dissolved	Water	FILTRATION	
MB 720-177429/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 720-177429/1-C	Method Blank	Dissolved	Water	FILTRATION	

Metals (Continued)

Prep Batch: 177475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	7470A	177429
720-63432-2	MW-2	Dissolved	Water	7470A	177429
720-63432-3	MW-3	Dissolved	Water	7470A	177429
LCS 720-177475/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 720-177475/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	
MB 720-177429/1-B	Method Blank	Dissolved	Water	7470A	177429
MB 720-177475/1-A	Method Blank	Total/NA	Water	7470A	

Analysis Batch: 177510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	7470A	177475
720-63432-2	MW-2	Dissolved	Water	7470A	177475
720-63432-3	MW-3	Dissolved	Water	7470A	177475
LCS 720-177475/2-A	Lab Control Sample	Total/NA	Water	7470A	177475
LCSD 720-177475/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	177475
MB 720-177429/1-B	Method Blank	Dissolved	Water	7470A	177475
MB 720-177475/1-A	Method Blank	Total/NA	Water	7470A	177475

Prep Batch: 177525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	3005A	177429
720-63432-2	MW-2	Dissolved	Water	3005A	177429
720-63432-3	MW-3	Dissolved	Water	3005A	177429
LCS 720-177525/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 720-177525/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 720-177429/1-C	Method Blank	Dissolved	Water	3005A	177429
MB 720-177525/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 177743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	6010B	177525
720-63432-2	MW-2	Dissolved	Water	6010B	177525
720-63432-3	MW-3	Dissolved	Water	6010B	177525
LCS 720-177525/2-A	Lab Control Sample	Total Recoverable	Water	6010B	177525
LCSD 720-177525/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010B	177525
MB 720-177429/1-C	Method Blank	Dissolved	Water	6010B	177525
MB 720-177525/1-A	Method Blank	Total Recoverable	Water	6010B	177525

General Chemistry

Analysis Batch: 177357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	7199	177426
720-63432-2	MW-2	Dissolved	Water	7199	177426
720-63432-3	MW-3	Dissolved	Water	7199	177426
LCS 720-177426/2-A	Lab Control Sample	Dissolved	Water	7199	177426
MB 720-177426/1-A	Method Blank	Dissolved	Water	7199	177426

General Chemistry (Continued)

Filtration Batch: 177426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Dissolved	Water	FILTRATION	
720-63432-2	MW-2	Dissolved	Water	FILTRATION	
720-63432-3	MW-3	Dissolved	Water	FILTRATION	
LCS 720-177426/2-A	Lab Control Sample	Dissolved	Water	FILTRATION	
MB 720-177426/1-A	Method Blank	Dissolved	Water	FILTRATION	

Analysis Batch: 279395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-63432-1	MW-1	Total/NA	Water	SM 2540C	
720-63432-2	MW-2	Total/NA	Water	SM 2540C	
720-63432-2 DU	MW-2	Total/NA	Water	SM 2540C	
720-63432-2 MS	MW-2	Total/NA	Water	SM 2540C	
720-63432-3	MW-3	Total/NA	Water	SM 2540C	
LCS 500-279395/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 500-279395/1	Method Blank	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-1

Lab Sample ID: 720-63432-1

Date Collected: 03/10/15 11:45

Matrix: Water

Date Received: 03/10/15 17:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			177591	03/13/15 13:36	NVP	TAL PLS
Total/NA	Analysis	8270C SIM		1	177635	03/14/15 18:19	MQL	TAL PLS
Total/NA	Prep	3510C			177591	03/13/15 13:36	NVP	TAL PLS
Total/NA	Analysis	8270C SIM		2	177726	03/16/15 21:52	MQL	TAL PLS
Silica Gel Cleanup	Prep	3510C SGC			177655	03/16/15 10:09	CJG	TAL PLS
Silica Gel Cleanup	Analysis	8015B		1	177658	03/16/15 18:13	JXL	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	3005A			177525	03/12/15 16:17	ASB	TAL PLS
Dissolved	Analysis	6010B		1	177743	03/16/15 23:29	SLK	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	7470A			177475	03/12/15 08:57	ECT	TAL PLS
Dissolved	Analysis	7470A		1	177510	03/12/15 13:44	EFH	TAL PLS
Dissolved	Filtration	FILTRATION			177426	03/10/15 18:35	EYT	TAL PLS
Dissolved	Analysis	7199		1	177357	03/10/15 20:44	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	279395	03/12/15 12:12	MTB	TAL CHI

Client Sample ID: MW-2

Lab Sample ID: 720-63432-2

Date Collected: 03/10/15 10:50

Matrix: Water

Date Received: 03/10/15 17:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			177591	03/13/15 13:36	NVP	TAL PLS
Total/NA	Analysis	8270C SIM		1	177635	03/14/15 18:42	MQL	TAL PLS
Silica Gel Cleanup	Prep	3510C SGC			177655	03/16/15 10:09	CJG	TAL PLS
Silica Gel Cleanup	Analysis	8015B		1	177658	03/16/15 18:42	JXL	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	3005A			177525	03/12/15 16:17	ASB	TAL PLS
Dissolved	Analysis	6010B		1	177743	03/16/15 23:34	SLK	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	7470A			177475	03/12/15 08:57	ECT	TAL PLS
Dissolved	Analysis	7470A		1	177510	03/12/15 13:47	EFH	TAL PLS
Dissolved	Filtration	FILTRATION			177426	03/10/15 18:35	EYT	TAL PLS
Dissolved	Analysis	7199		1	177357	03/10/15 20:56	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	279395	03/12/15 12:14	MTB	TAL CHI

Client Sample ID: MW-3

Lab Sample ID: 720-63432-3

Date Collected: 03/10/15 09:50

Matrix: Water

Date Received: 03/10/15 17:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			177591	03/13/15 13:36	NVP	TAL PLS
Total/NA	Analysis	8270C SIM		1	177635	03/14/15 19:05	MQL	TAL PLS
Silica Gel Cleanup	Prep	3510C SGC			177655	03/16/15 10:09	CJG	TAL PLS

Lab Chronicle

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Client Sample ID: MW-3

Date Collected: 03/10/15 09:50
Date Received: 03/10/15 17:55

Lab Sample ID: 720-63432-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Silica Gel Cleanup	Analysis	8015B		1	177658	03/16/15 19:11	JXL	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	3005A			177525	03/12/15 16:17	ASB	TAL PLS
Dissolved	Analysis	6010B		1	177743	03/16/15 23:39	SLK	TAL PLS
Dissolved	Filtration	FILTRATION			177429	03/11/15 13:36	ECT	TAL PLS
Dissolved	Prep	7470A			177475	03/12/15 08:57	ECT	TAL PLS
Dissolved	Analysis	7470A		1	177510	03/12/15 13:49	EFH	TAL PLS
Dissolved	Filtration	FILTRATION			177426	03/10/15 18:35	EYT	TAL PLS
Dissolved	Analysis	7199		1	177357	03/10/15 21:08	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	279395	03/12/15 12:18	MTB	TAL CHI

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Laboratory: TestAmerica Pleasanton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Laboratory: TestAmerica Chicago

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	03-31-15 *
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Method	Method Description	Protocol	Laboratory
8270C SIM	PAHs by GCMS (SIM)	SW846	TAL PLS
8015B	Diesel Range Organics (DRO) (GC)	SW846	TAL PLS
6010B	Metals (ICP)	SW846	TAL PLS
7470A	Mercury (CVAA)	SW846	TAL PLS
7199	Chromium, Hexavalent (IC)	SW846	TAL PLS
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CHI

Protocol References:

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

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Ninyo & Moore
Project/Site: Western Forge & Flange

TestAmerica Job ID: 720-63432-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-63432-1	MW-1	Water	03/10/15 11:45	03/10/15 17:55
720-63432-2	MW-2	Water	03/10/15 10:50	03/10/15 17:55
720-63432-3	MW-3	Water	03/10/15 09:50	03/10/15 17:55

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

720-63432

TESTAMERICA Pleasanton Chain of Custody
1220 Quarry Lane • Pleasanton CA 94566-4756
Phone: (925) 484-1919 • Fax: (925) 600-3002

Reference #: 159783

Date 3/10/15 Page 1 of 1

3/17/2015

Report To

Attn: Forrest McFarland
Company: Ninyo & Moore
Address: 1956 Webster St, Oakland
Email: fmcfarland@ninyoandmoore.com
Bill To: 401823001
Sampled By: FM
Attn:
Phone: 510-343-3000

Analysis Request

Sample ID	Date	Time	Matrix	Preserv	Volatile Organics GC/MS (VOCs) ☐ EPA 8260B	HVOCs by ☐ EPA 8260B	EPA 8260B: ☐ Gas ☐ BTEX ☐ 5 Oxygenates ☐ DCA, EDB ☐ Ethanol	TEPH EPA 8015B ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☒ Other TPH Hydraulic Oil	SemiVolatile Organics GC/MS ☐ EPA 8270C	PNA/PAH's by ☐ 8270C ☒ 8270C SIM	Oil and Grease (EPA 1664/9071) ☐ Petroleum ☐ Total	Pesticides ☐ EPA 8081 PCBs ☐ EPA 8082	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☒ 6010B ☐ 200.7 ☐ Lead ☐ LUFT ☐ RCRA ☐ Other Title 22 metals	Metals: ☐ 6020 ☐ 200.8 (ICP-MS):	☐ W.E.T (STLC) ☐ W.E.T (DI) ☐ TCLP	Hex. Chrom by ☐ EPA 7196 ☐ or EPA 7199	pH ☐ 9040 ☐ SM4500	☐ Spec. Cond. ☐ Alkalinity ☐ TSS ☐ SS ☐ TDS	Anions: ☐ Cl ☐ SO_4 ☐ NO_3 ☐ F ☐ Br ☐ NO_2 ☐ PO_4	☐ Perchlorate by EPA 314.0	COD ☐ EPA 410.4 ☐ SM5220D ☐ Turbidity	By 7199 Hexavalent Chromium	TDS by SM2540C	Number of Containers
MW-1	3/10/15	1145	W	-				X		X			X									X	X	7
MW-2	3/10/15	1050	W	-				X		X			X									X	X	7
MW-3	3/10/15	0950	W	-				X		X			X									X	X	7
													LAB									LAB		
													TO									TO		
													Filter									Filter		

720-63432 Chain of Custody

* Note: TPH as TPH Hydraulic Oil with Silica Gel Cleanup

Project Info.

Project Name/ #: Western Forge & Flange
PO#:

Sample Receipt

of Containers: 7x3 = 21
Head Space:
Temp: 1.3°C

Credit Card Y/N: If yes, please call with payment information ASAP

TAT	10 Day	5 Day	4 Day	3 Day	2 Day	1 Day	Other: STD

Report: ☐ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ EDF
Special Instructions / Comments: ☐ Global ID
LAB TO Filter for T-22 Metals and Hex Chrome

See Terms and Conditions on reverse

1) Relinquished by:	2) Relinquished by:	3) Relinquished by:
Signature / Time	Signature / Time: 1755	Signature / Time
Printed Name / Date: Forrest McFarland 1610	Printed Name / Date: 3-10-15	Printed Name / Date
Company: Ninyo & Moore 3/10/15	Company: UPTRA-EX	Company

1) Received by:	2) Received by:	3) Received by:
Signature / Time: 1600	Signature / Time: 1755	Signature / Time
Printed Name / Date: 3-10-15	Printed Name / Date: 3-10-15	Printed Name / Date
Company: UPTRA-EX	Company	Company

Rev.10/2012

Login Sample Receipt Checklist

Client: Ninyo & Moore

Job Number: 720-63432-1

Login Number: 63432

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Bullock, Tracy

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

Login Sample Receipt Checklist

Client: Ninyo & Moore

Job Number: 720-63432-1

Login Number: 63432
List Number: 2
Creator: Lunt, Jeff T

List Source: TestAmerica Chicago
List Creation: 03/12/15 11:31 AM

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

APPENDIX C

SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

APPENDIX C

SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

FORMER WESTERN FORGE & FLANGE FACILITY
540 CLEVELAND AVENUE, ALBANY, CALIFORNIA

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1.0 INTRODUCTION

This evaluation has been prepared in response to a request from the Alameda County Environmental Health Care Services Agency (ACEH) in a letter dated January 22, 2015. The ACEH requested Western Forge & Flange (WF&F) evaluate whether chemicals remaining in groundwater under their Albany, California, site could pose a threat to ecological receptors at the San Francisco Bay. The WF&F site is located at 540 Cleveland Avenue in Albany, California, which is approximately 425 feet west of the San Francisco Bay.

This report presents a screening-level evaluation of the potential for site-related chemicals (Tables C1 and C2) to migrate in groundwater and impact ecological receptors at the San Francisco Bay. The evaluation was conducted using a weight-of-evidence approach similar to that proposed by the United States Environmental Protection Agency (USEPA) in its draft final guidance on groundwater/surface water interaction (USEPA 2002). Because of the environmental setting of this site, the evaluation is presented within the framework of the California Department of Toxic Substances Control's (DTSC) Ecological Risk Assessment guidance (https://www.dtsc.ca.gov/AssessingRisk/eco.cfm). In essence, this risk evaluation is comprised of a screening-level ecological risk assessment (SLERA), which provides a conservative estimate of potential ecological risks and compensates for uncertainty by incorporating numerous conservative assumptions.

A SLERA, as defined by the DTSC, is a qualitative and/or quantitative appraisal of the potential effects an impacted site might have on plants and animals other than people and domesticated species (DTSC 1996). This report describes the tasks performed to conduct a screening-level evaluation of the potential adverse effects the WF&F site may have on ecological receptors at the San Francisco Bay.

1.1 Scope of Work

The draft final USEPA (2002) groundwater-surface water interaction guidance promotes a weight-of-evidence approach for the assessment of migration of contaminated groundwater. This approach is based on physical/chemical properties, mixing with surface water, and screening against water quality criteria or other aquatic benchmarks.

Based on USEPA (2002) groundwater-surface water interaction guidance, three questions are important for the WF&F site:

1. Does contaminated groundwater discharge into the San Francisco Bay?
2. Is this discharge significant?
3. Is current or expected discharge acceptable?

The objective of the risk evaluation presented in this report is to answer these three questions and propose a path forward for the site. A response to these questions is obtained by comparing the maximum expected chemical concentrations, at the site and at the groundwater/surface water interface, to screening level values (SLV) for surface water. SLVs are concentrations deemed to pose no significant risk to ecological receptors and thus considered acceptable to the California State Water Resources Quality Control Board (SWRCB) and the ACEH. As recommended by the ACEH in its January 22, 2015 letter, the SLVs selected for this evaluation are the aquatic habitat goals and ecotoxicity screening levels published by the San Francisco Regional Water Quality Control Board (RWQCB) in its Environmental Screening Level (ESL) tables, dated December 2013.

2.0 CONSTITUENTS OF POTENTIAL CONCERN SELECTION

A review of the most recent (post-remediation) groundwater monitoring data compiled by Ninyo & Moore (i.e., Fourth Quarter 2013 through First Quarter 2015) was conducted to determine constituents of potential ecological concern (COPEC) and representative exposure concentrations for this evaluation. Because this is a screening level assessment, all constituents detected (Tables C1 and C2) were retained as COPEC. Because of the site-remediation activities, only the most recent analytical results were used in the evaluation. Maximum residual groundwater concentrations (Tables C1 and C2) were chosen from this time period and conservatively represent current site conditions. The COPC identified were:

- Total petroleum hydrocarbons as hydraulic oil (TPHho)
- Polycyclic aromatic hydrocarbons (PAHs)
    - Acenaphthene
    - Acenaphthylene
    - Anthracene
    - Fluoranthene
    - Fluorene
    - Naphthalene
    - Phenanthrene
- Arsenic
- Barium
- Copper
- Lead
- Mercury
- Molybdenum
- Nickel
- Selenium
- Vanadium
- Zinc

3.0 EXPOSURE ASSESSMENT

The Exposure Assessment section of the SLERA evaluates the potential for chemicals detected at the site to migrate to locations where ecological receptors may be exposed. The potential chemical sources, release mechanisms, exposure media and potential receptors evaluated in this SLERA are presented in the Ecological Conceptual Site Model (ECSM) developed for the site (see Figure C1). The ECSM integrates the exposure pathways judged to be potentially complete with the potentially exposed ecological receptors to focus the ecological assessment on critical ecological components and functions. The ECSM also identifies complete exposure pathways that might exist at the site (a complete exposure pathway is one in which the chemical can be traced or expected to travel from the source to a receptor).

An exposure pathway is considered complete when all four of the following elements are present:

- A site-related source of a chemical;
- A mechanism of release of the chemical from the source to the environment;
- A mechanism of transport of the chemical to the receptor exposure point; and
- A route by which the receptor is exposed to the chemical.

A quantitative exposure analysis was performed in the SLERA for the potentially complete exposure pathways identified for ecological receptors. Only potentially complete and significant pathways were considered relevant in the SLERA, as there can be no effects without exposure.

3.1 Potential Exposure Pathways

A complete exposure pathway is "one in which the chemical can be traced or expected to travel from the source to a receptor that can be affected by the chemicals" (USEPA 2001). Therefore, a chemical, its release and migration from the source, a receptor, and the mechanisms of toxicity of that chemical must be demonstrated before a complete exposure pathway can be identified. The potential exposure pathway for this assessment is direct contact with aquatic organisms in the San Francisco Bay.

The site is located in an area zoned for industrial use and surrounded by freeways and railroad tracks. Therefore, there are no ecological habitats at the site and there are no ecological receptors exposed at the site.

Impacted groundwater at the site is inaccessible to ecological receptors and is considered a medium of exposure only after it exits the ground and discharges to the surface. For purposes of this evaluation, groundwater and groundwater discharge to surface water exposure pathways is the only exposure pathway considered to be complete for site-related chemicals (Figure C1).

The ECSM (Figure C1) illustrates the potential chemical exposure scenarios relevant to ecological receptors and depicts site-specific transport pathways. Available site information and professional judgment were used to determine the completeness and importance of these pathways. In the ECSM, the importance of each exposure route is represented by a red circle for potentially complete and significant pathways, by a hollow circle for complete, but minor pathways, and by the letters "IC" for incomplete pathways.

3.2 Description of Potentially Exposed Receptors

The identification of the categories of receptors most likely to be exposed helps focus the SLERA. Potentially exposed receptors are designated based on the available aquatic habitat associated with the San Francisco Bay. Aquatic organisms could be exposed to constituents in surface water from impacted groundwater discharge to the San Francisco Bay. The only exposure pathway identified was the direct uptake and contact with waters of the San Francisco Bay.

3.3 Exposure Point Concentrations

The exposure point concentration (EPC) is the concentration of a chemical in a specific environmental medium at the point of contact with a receptor. For example, the EPC for ecological receptors in contact with soil (i.e., plants and invertebrates) is estimated as a

function of the COPEC concentration measured in soil. Receptors at the lower levels of the food web, such as primary producers and consumers could feasibly be exposed to the maximum concentrations of COPECs. Therefore, maximum residual COPEC concentrations (Tables C1 and C2) were initially used as EPCs. Then, for those chemicals deemed to have the potential to impact the San Francisco Bay, the EPCs at the groundwater-surface water interface were estimated using chemical fate and transport modeling (Section 6.0).

3.4 Assessment and Measurement Endpoints

An assessment endpoint can be defined as the environmental attributes considered being critical to the function of the biological community or population and are the ultimate focus of the ecological risk assessment. A measurement endpoint can be defined as the measurable observable change that is used to evaluate the effects of the chemicals of concern on the selected assessment endpoints.

An assessment endpoint is a characteristic of an ecological component (e.g., increased plant mortality, animal reproductive or developmental impairment) that may be affected by exposure to a COPEC. In some cases, measurement endpoints for various compounds may have already been determined in the laboratory and may be used to estimate the degree of impact at the site. For example, USEPA Ambient Water Quality Criteria are generally based on the lowest observed adverse effect level of the most sensitive species.

A literature review of the potential ecotoxicity of COPECs revealed significant effects on survival, development and reproduction of aquatic organisms. The SLVs utilized in this assessment were developed to be protective of these ecological effects.

4.0 MECHANISMS OF ECOTOXICITY

Assessment endpoints are the explicit expression of the ecological values to be protected (USEPA 1997). The selection of assessment endpoints depends on knowledge of the receiving environment, knowledge about the constituents released (including their toxicological properties and the relevant concentrations) and understanding of the values that will drive risk management decisions (Suter et al. 1995). Consistent with USEPA (1997) guidance, two elements are required to define an assessment endpoint: the specific valued ecological entity and the characteristic about the entity that is important to protect.

USEPA guidance provides that Superfund remedial actions should be designed not to protect organisms on an individual basis, but to protect local populations and communities of biota (USEPA 1997). Thus, the first management principle for conducting an ecological risk assessment is to provide a basis for selecting a response action "that will result in the recovery and/or maintenance of healthy local populations/communities of ecological receptors that are or should be present at or near the site" (USEPA 1999). The USEPA (1999) guidance also notes, as an exception to this rule, that threatened and endangered species may be evaluated on an individual basis. In concept, this approach is justified on the basis that, given the stressed nature of a threatened and endangered population, effects on individuals could impact the local population. Therefore, the assessment endpoint for this site is sustainability of populations of aquatic organisms at the San Francisco Bay.

Because direct measurement of assessment endpoints is often difficult or infeasible, surrogate endpoints called measurement endpoints are used to provide the information necessary to evaluate whether the values associated with the assessment endpoint are being protected. A measurement endpoint is defined as a measurable ecological characteristic and/or response to a stressor (USEPA 1999). Predictions of the likelihood for adverse effects, if any, for the COPCs will be based on comparison of maximum residual groundwater concentrations with aquatic chronic SLVs (i.e., hazard quotient [HQ] method, exposure divided by SLV) (USEPA 1997). These comparisons will serve as the measurement endpoints for this SLERA. SLVs are chemical

concentrations in environmental media below which there is negligible risk to receptors exposed to those media (Simon 2000).

SLVs are generally based on effects such as mortality and reproductive impairment, and are assumed to be widely applicable to sites around the United States for screening purposes (USEPA 1997). For most chemicals and receptors, the data available to generate SLVs are limited and related to effects on individual organisms, rather than subpopulations or communities. Given these limitations, conservative assumptions are used to ensure that the SLVs are protective. The documents that present the SLVs caution users to recognize that such screening values do not constitute remediation goals, as they are sometimes based on highly conservative exposure assumptions and/or receptors that may not be applicable to a particular site. As such, their robustness and biological association with the assessment endpoint may be limited.

The screening-level ecological effects evaluation involves the identification of SLVs for each detected constituent. One of the limitations in conducting SLERAs is the lack of robust ecotoxicity data. Although SLVs are available from a variety of sources, no individual set of screening values is applicable to the variety of systems encountered in the natural environment. However, conservative SLVs provide a starting point for the SLERA, in that they may provide an indication of the worst-case measure of the potential for adverse impacts.

As recommended by the ACEH in its January 22, 2015 letter, the SLVs selected for this evaluation are the aquatic habitat goals and ecotoxicity screening levels published by the San Francisco Water Quality Control Board in its ESL tables, specifically Table F-4a Summary of Aquatic Habitat Goals.

Although it is appropriate to screen groundwater concentrations against surface water quality screening levels, this is conservative because dilution and attenuation is expected during COPEC migration in and upon discharge of groundwater to surface water. Because of this dilution and attenuation, NOAA Screening Quick Reference Tables (SQuiRT) (NOAA 1999) and USEPA

groundwater-surface water guidance (USEPA 2002) use 10 times the applicable water quality screening level for screening purposes. The 10 times "rule of thumb" is a practical screening policy used to determine sites that have significant constituent discharge. The rule of thumb is intended to account for sorption, dispersion, dilution, and biotic and abiotic transformation which are responsible for constituent attenuation in groundwater.

However, to retain a conservative nature for this screening level assessment, water quality screening levels were used as reported which accounts for no attenuation from groundwater to the surface water discharge point.

For this SLERA, the Marine Aquatic Habitat Goals (RWQCB, 2013) were selected as conservative SLV. It should be noted that there are ranges of SLVs that are available from a variety of other regulatory and scientific sources.

5.0 RISK CHARACTERIZATION

At this step of the SLERA, the potential adverse effects of exposure to chemical stressors on ecological receptors are evaluated. The relationship between the degree of exposure and ecological effects was assessed based on available field measurements and eco-toxicological literature.

The screening-level exposure assessment involves identifying exposure estimates, completing risk calculations, and evaluating uncertainties (USEPA 1997; Simon 2000). These form lines of evidence to support the conclusion of the SLERA.

Exposure estimates for the SLERA were the maximum post-remediation residual groundwater concentrations from all monitor wells at the site. This conservative approach is appropriate for a screening-level effort.

Risk calculations in this SLERA were performed by simply comparing the exposure estimates (i.e., the maximum residual concentrations) with the conservative SLVs. This comparison is a

highly conservative surrogate for the assessment endpoints, which are the sustainability of populations of aquatic organisms and communities.

5.1 Hazard Quotient Evaluation

Potential risks to ecological receptors at the San Francisco Bay were quantitatively evaluated by calculating hazard quotients (HQs). The HQ provides a mathematically derived index that expresses the relationship between the predicted EPC and a representative "safe" concentration. If the HQ is larger than 1.0, that is, exposure is greater than the SLV, the potential for adverse effects to local ecological receptors has to be considered in greater detail. If, on the other hand, the HQ is lower than 1.0, then adverse effects are not expected. The magnitude of the HQ provides a general indication of the potential for ecological risk for a chemical if a reasonable level of confidence exists in the estimated EPC and the corresponding medium- and receptor-specific SLV.

The equation used to calculate HQs is presented below:

$$HQ = \frac{EPC}{SLV}$$

Where:

HQ = Hazard Quotient for a specific chemical and receptor (unitless)
EPC = Exposure point concentration (ug of chemical per liter of water; ug/L)
SLV = Screening level value which representing a safe exposure concentration for the represented ecological receptor (units consistent with EPC).

HQs were calculated first using the maximum residual groundwater concentrations as the EPCs and the Marine Aquatic Habitat Goal (RWQCB, 2013) as the SLV. Then, for those chemicals deemed to have the potential to impact the San Francisco Bay, the EPCs used to calculate the HQs were the maximum estimated chemical concentrations at the San Francisco Bay groundwater-surface water interface.

HQs obtained from the maximum residual groundwater chemical concentrations on site are designated here as HQs at the site (HQ_{site}). HQs obtained from the estimated maximum chemical concentrations at the San Francisco Bay groundwater/surface water interface are designated here as HQs at the San Francisco Bay (HQ_{SFB}).

Table C3 presents the estimated HQ_{site} for all COPECs. The only COPEC with estimated HQ_{site} higher than 1.0 were, copper, lead, mercury, molybdenum, nickel and vanadium. These results indicate that of all the anthropogenic chemicals remaining in groundwater under the site, only the six chemicals listed above are at a concentration that could pose a threat to ecological receptors at the San Francisco Bay. It should be noted that these results assume that these six metal elements could be carried by groundwater flow into the San Francisco Bay and that the concentrations of the metals in surface water at the San Francisco Bay will be the same as the residual groundwater concentrations at the site.

6.0 CHEMICAL FATE AND TRANSPORT MODELING

Results of the evaluation presented above indicate that copper, lead, mercury, molybdenum, nickel and vanadium remaining in groundwater at the site could present a threat to ecological receptors at the San Francisco Bay, if and only if, those chemicals are able to migrate and emerge at the San Francisco Bay.

Given that groundwater at the site typically trends towards the west-southwest towards San Francisco Bay it was then necessary to evaluate whether the six metal elements listed above could migrate and enter the San Francisco Bay.

The potential for site-related chemicals to migrate and impact the San Francisco Bay was modeled using the Analytical, Transient One-, Two-, and Three-Dimensional (AT123D) model. The AT123D model is an analytical groundwater transport model that computes the chemical spatial and temporal concentration distribution in an aquifer system. The AT123D model predicts the transient spread of a contaminant plume through a groundwater aquifer. The fate and transport processes accounted for in AT123D are advection, dispersion, adsorption, and decay.

AT123D estimates all the above components on a monthly basis for the duration of the simulation time.

The AT123D model was used here to estimate the dissolved concentration of copper, lead, mercury, molybdenum, nickel and vanadium in three dimensions in groundwater resulting from a mass release over the source area. The AT123D model was set to calculate migration assuming an instantaneous initial release equal to the maximum residual groundwater concentration at the site (Table C1).

The AT123D model assumes that the aquifer is a homogeneous and isotropic aquifer with groundwater flowing almost horizontally towards the selected point of compliance. When describing points at which the chemical enters the aquifer or points at which concentrations are to be estimated, AT123D uses a triple-axis system. Groundwater flow and chemical spread occur primarily in the direction of the x-axis. The y-axis describes the width of the release source or the plume in the horizontal or the transverse direction. The depth of the chemical plume from the surface of the aquifer is described using the z-axis.

6.1 AT123D Input and Output Data

Input data consists of three types: simulation parameters, source configurations, and soil and chemical properties. For this evaluation, the area of the release was assumed to be an area of 30 feet (9.14 meters) by 60 feet (18.29 meters) located at the center of the site.

It is known that the parallel flow direction is toward the northwest, and the distance from the site to the San Francisco Bay (toward the northwest) is approximately 900 feet (274.32 meters). It is also known that perpendicular flow direction is toward the southwest and the distance between the source area and the Bay is approximately 425 feet (129.54 meters). In an effort to present a conservative estimate, it was assumed groundwater flows at the site towards the San Francisco Bay and that the nearest groundwater/surface water interface is at 425 feet (129.54 meters) from the site. Default soil and chemical properties used in

the models were taken from the default parameters included in the commercial AT123D model package (Environmental Software Consultants, 2014).

AT123D output data contains the model input and predicted concentrations at a user-specified set of positions (X, Y and Z coordinates) for specified output times. For the WFF site the model was set to run for 600 years. Chemicals estimated to take more than 600 years to reach the point of compliance are deemed to be essentially immobile at the site. The concentration tables report dissolved chemical in micrograms per liter (µg/L). In the output file, the maximum estimated concentration at the groundwater-surface water interface is reported along with the time estimated for the chemicals to migrate from the source to the point of compliance.

The estimated maximum chemical concentrations and estimated travel time for each chemical are presented below.

Chemical	**Years to Surface at the San Francisco Bay Groundwater-Surface Water Interface**	**Maximum Concentration at the Groundwater-Surface Water Interface (µg/L)**
Copper	453.25	2.84
Lead	More than 600	0.00
Mercury	596.25	0.012
Molybdenum	264.75	47.00
Nickel	599.75	1.45
Vanadium	More than 600	0.00

Notes:
µg/L = Micrograms per liter

AT123D model printouts for the six metals modeled are presented in Appendix A. According to AT123D model, lead and vanadium are essentially trapped by soils at the site and are not allowed to migrate down with groundwater flow. Also according to the model, mercury and nickel will migrate very slowly and will take almost 600 years to reach the San

Francisco Bay. Since the models were run only for 600 years, the maximum concentration at the San Francisco Bay groundwater-surface water interface estimated to occur after 600 years of migration is reported in the above table.

The estimated chemical concentrations at the San Francisco Bay groundwater-surface water interface were used along with the Marine Aquatic Habitat Goal (RWQCB 2013) as the SLV to calculate the HQ_{SFB}.

Table C4 presents the estimated HQ_{SFB} for the six metal elements included in the modeling. All the estimated HQs for each respective metal at the San Francisco Bay are below 1.0. The cumulative HQ_{SFB} totals 1.78, which does exceed 1.0. However, mercury has not been detected in any of the site's groundwater monitoring wells at concentrations exceeding laboratory reporting limits in the previous four quarterly sampling events, and copper has not been detected in any of the site's groundwater monitoring wells at concentrations exceeding laboratory reporting limits in the previous two quarterly sampling events nor has coper ever been detected in the groundwater samples collected from MW-3, the furthest downgradient monitoring well, at concentrations exceeding laboratory reporting limits. Removing these two metals' HQ_{SFB} reduces the total cumulative HQ_{SFB} to 0.38, which is below 1.0. These results indicate that none of the chemicals detected in groundwater under the WFF site pose a threat to ecological receptors at the San Francisco Bay.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The SLERA presented in this report evaluated the potential health threat posed by the presence of anthropogenic chemicals remaining in groundwater under the site to ecological receptors at the San Francisco Bay.

After weighing all relevant parameters specific to the site, it is concluded that it is extremely unlikely that San Francisco Bay waters will be impacted by site-related chemicals. It should be noted that the risk evaluation for most of the chemicals conservatively does not account for dilution and attenuation which are expected to occur during chemical migration in groundwater.

Furthermore, results of the fate and transport modeling conducted for copper, lead, mercury, molybdenum, nickel and vanadium indicate that these six metal elements are essentially trapped by soils at the site and are not allowed to migrate down with groundwater flow in significant quantities. Based on these results, it can be concluded that anthropogenic chemicals remaining in groundwater under the site do not pose a threat to ecological receptors at the San Francisco Bay.

The ecological risk assessment process culminates in a risk management decision point. This decision point represents a critical step in the process where results are presented and risk management decision-making occurs. The SLERA for the site provide adequate information to conclude that adverse chronic effects to aquatic organisms are unlikely under a current exposure scenario. Therefore, no further ecological evaluation of the surface water at San Francisco Bay is warranted at this time.

SLERAs are designed to provide estimates of the risks that may exist for ecological receptors and incorporates uncertainty in a precautionary manner. Uncertainty is "the imperfect knowledge concerning the present or future state of the system under consideration; a component of risk resulting from imperfect knowledge of the degree of hazard or of its spatial and temporal distribution" (USEPA 1997). Uncertainties that may lead to either an overestimate or underestimate of risk are associated with each stage of risk assessment. Because the SLERA is intended to provide a precautionary approach to evaluating risks to ecological receptors, the majority of the SLERA uncertainties tend toward an overestimate of risk.

It should be noted that the SLERA was based on site-specific data as well as conservative (health-protective) assumptions, estimates, models, and parameters. Therefore, the results are not absolute estimates of health risks at the site but are health-protective estimates.

Based on the findings of previous site assessments, the results of site remediation and post remediation groundwater monitoring; and the results of this SLERA, Ninyo & Moore recommends that groundwater monitoring at the site be discontinued and ACEH consider the site for regulatory closure.

8.0 UNCERTAINTY ANALYSIS

Risk assessment provides a systematic means for organizing, analyzing, and presenting information on the nature and magnitude of potential risks to public health associated with chemical exposures. Despite the advanced state of the current risk assessment methodology, uncertainties and limitations are inherent in the risk assessment process. This section discusses the following sources of uncertainties and limitations associated with this SLERA:

- Data
- Receptor exposure assessment
- Toxicological assessment
- Risk characterization

To overcome uncertainties in the estimation of potential ecological health risks, conservative assumptions were used in every step of the process (exposure assumptions, toxicity assessment and risk characterization) so as not to underestimate risks. Because multiple conservative assumptions were used, the overall results of this SLERA are more likely to overestimate than to underestimate the actual health threat posed by the site.

The primary sources of uncertainty for this SLERA can be attributed to assumptions concerning the exposure assessment, and toxicological extrapolations. The exposure assessment for this SLERA was based on actual groundwater monitoring data and the assumption that impacted groundwater will reach San Francisco Bay. Therefore, it is not likely that exposure concentrations were underestimated.

Toxicity in surface water is affected by the bioavailability of each COPEC. Therefore, site-specific toxicity may be manifested at lower or higher concentrations than in laboratory studies. However, the SLVs were derived using conservative assumptions so that application to a variety of sites would be possible and that some type of ranking of contaminated sites based on their potential toxicity would be possible. Species-specific variation in sensitivity of receptors to COPCs cannot usually be accounted for with literature-derived values. Thus, ecological risks may be under- or overestimated due to uncertainty associated with the toxicological data utilized

in this SLERA. However, risk estimates utilized conservative inputs so that risks are likely overestimated and not underestimated.

This SLERA has been prepared in a manner consistent with that generally used in the consulting community and agency guidance at the time it was prepared, using recently collected data and the current available risk assessment methodology.

9.0 LIMITATIONS

The environmental services described in this report have been conducted in general accordance with current regulatory guidelines and the standard-of-care exercised by environmental consultants performing similar work in the project area. No other warranty, expressed or implied, is made regarding the professional opinions presented in this report. Variations in site conditions may exist and conditions not observed or described in this report may be encountered during subsequent activities. Please also note that this study did not include an evaluation of risks and hazards to human receptors at the site or its vicinity.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this report, are based on limited subsurface assessment and chemical analysis. Further assessment of potential adverse environmental impacts from past on-site and/or nearby use of hazardous materials may be accomplished by a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area(s) evaluated; however, conditions can vary significantly between sampling locations. Variations in soil and/or groundwater conditions will exist beyond the points explored in this evaluation.

The environmental interpretations and opinions contained in this report are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site. The testing and analyses have been conducted by an independent laboratory which is accredited by the EPA or certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis. Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results.

Our conclusions and recommendations are based on an analysis of the observed site conditions. It should be understood that the conditions of a site could change with time as a result of natural processes or human activities at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the WF&F. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the WF&F is undertaken at said parties' sole risk.

10.0 REFERENCES

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TABLE C1 - ANALYTICAL RESULTS FOR METALS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thalium	Vanadium	Zinc	Mercury
		Groundwater Sample Results (mg/L)																	
MW-1	12/05/13	<0.010	0.017	0.074	<0.0020	<0.0020	<0.010	<0.010*	<0.0020	0.021	0.0094	0.99	0.033	<0.020	<0.0050	<0.010	0.018	<0.020	0.00022
	03/24/14	<0.010	0.018	0.032	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	0.037	0.019	0.67	0.043	<0.020	<0.0050	<0.010	0.022	<0.020	<0.00020
	09/09/14	<0.010	0.017	<0.0050	<0.0020	<0.0050	<0.010	<0.0005	<0.0050	0.0079	0.019	0.86	0.039	0.031	<0.0050	<0.010	<0.0050	<0.020	<0.00020
	11/12/14	<0.010	0.015	0.011	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	0.0081	0.88	0.035	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020
	03/10/15	<0.010	0.013	<0.050	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	0.90	0.025	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020
MW-2	12/05/13	<0.010	0.011	0.11	<0.0020	<0.0020	<0.010	<0.010*	0.0056	0.020	<0.0050	0.58	0.037	<0.020	<0.0050	<0.010	0.012	0.047	0.00027
	03/24/14	<0.010	<0.010	0.036	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	0.55	0.018	<0.020	<0.0050	<0.010	0.015	<0.020	<0.00020
	09/09/14	<0.010	0.011	0.019	<0.0020	<0.0050	<0.010	<0.0005	<0.0050	0.064	0.0099	0.88	0.025	<0.010	<0.0050	<0.010	0.0054	<0.020	<0.00020
	11/12/14	<0.010	<0.010	0.021	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	0.0055	0.98	0.024	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020
	03/10/15	<0.010	0.011	<0.050	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	0.80	0.025	<0.020	<0.0050	<0.010	0.015	<0.020	<0.00020
MW-3	12/05/13	<0.010	<0.010	0.15	<0.0020	<0.0020	<0.010	<0.010*	0.0028	<0.020	0.0099	<0.010	0.030	<0.020	<0.0050	<0.010	<0.010	0.047	0.00021
	03/24/14	<0.010	0.014	0.04	<0.0020	<0.0020	<0.010	<0.0005	0.0023	<0.020	<0.0050	<0.010	0.019	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020
	09/09/14	<0.010	0.019	0.19	<0.0020	<0.0020	<0.010	<0.0005	<0.0050	<0.0050	<0.0050	0.014	0.029	0.029	<0.0050	<0.010	<0.010	<0.020	<0.00020
	11/12/14	<0.010	0.011	0.31	<0.0020	<0.0020	<0.010	<0.0005	0.0026	<0.020	<0.0050	0.018	0.025	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020
	03/10/15	<0.010	<0.010	0.22	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	<0.010	0.018	<0.020	<0.0050	<0.010	<0.010	0.054	<0.00020
Maximum Concentration		**<0.010**	**0.019**	**0.31**	**<0.0020**	**<0.0020**	**<0.010**	**<0.0005**	**0.0056**	**0.064**	**0.019**	**0.99**	**0.043**	**0.031**	**<0.0050**	**<0.010**	**0.022**	**0.054**	**0.00027**

Notes

Metals analyzed by USEPA Methods 6010B, 7470A (mercury), and 7199 (hexavalent chromium)

* indicates samples analyzed for hexavalent chromium by EPA Method 7196A

<x = not detected at a concentration greater than laboratory reporting limit of x

mg/L= milligrams per liter

TABLE C2 - ANALYTICAL RESULTS FOR TPH AND PAHs

Sample ID	Date Collected	TPHho	PAHs															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]flouranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
		Analytical Results (µg/L)																
MW-1	12/05/13	230	0.28	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.99	<0.10	<0.10
	03/24/14	<100	0.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.26	<0.10	5.2	0.24	<0.10
	09/09/14	<300	2.20	<0.09	0.3	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.7	<0.09	38	0.7	<0.09
	11/12/14	470 [a]	3.8	0.11	0.32	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.14	1.8	<0.11	30	1.9	<0.11
	03/10/15	<100	3.2	<0.11	0.14	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	1.1	<0.11	34	0.85	<0.11
MW-2	12/05/13	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	03/24/14	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10
	09/09/14	<300	0.1	<0.09	0.1	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.1	<0.09	0.3	0.2	<0.09
	11/12/14	630 [a]	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.17	<0.11	<0.11
	03/10/15	<110	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-3	12/05/13	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	03/24/14	<100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	09/09/14	<300	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
	11/12/14	<110 [a]	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	03/10/15	<110	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
Maximum Concentration		**630**	**3.8**	**0.11**	**0.32**	**<0.11**	**<0.11**	**<0.11**	**<0.11**	**<0.11**	**<0.11**	**<0.11**	**0.14**	**1.8**	**<0.11**	**38**	**1.9**	**<0.11**

Notes
PAHs = polycyclic aromatic hydrocarbons analyzed by USEPA Method 8270 SIM
TPHho = total petroleum hydrocarbons as hydraulic oil analyzed by USEPA Method 8015B; samples prepared with silica-gel cleanup (unless noted otherwise)
a = TPHho analysis did not include silica-gel cleanup
<x = not detected at a concentration greater than laboratory reporting limit of x
µg/L = micrograms per Liter

TABLE C3 - CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN AND ESTIMATED HAZARD QUOTIENTS AT THE SITE

Chemical	Maximum Residual Site Groundwater Concentration (µg/L)	Screening Level Value (SLV) (µg/L)	Ecological Hazard Quotient at the Site* (unitless)
Metals			
Arsenic	19	36	5.3E-01
Barium	310	1000	3.1E-01
Copper	64	3.1	2.1E+01
Lead	19	8.1	2.3E+00
Mercury	2.7	0.025	1.1E+02
Molybdenum	990	240	4.1E+00
Nickel	43	8.2	5.2E+00
Selenium	31	71	4.4E-01
Vanadium	22	19	1.2E+00
Zinc	54	81	6.7E-01
PAHs			
Acenaphthene	3.8	40	9.5E-02
Acenapthylene	0.11	30	3.7E-03
Anthracene	0.32	0.73	4.4E-01
Fluoranthene	0.14	8	1.8E-02
Fluorene	1.8	30	6.0E-02
Naphthalene	38	62	6.1E-01
Phenanthrene	1.9	4.6	4.1E-01
TPH			
TPH as hydraulic oil	630	640	9.8E-01

Notes:

* Value assumes ecological receptors are exposed to groundwater at the site.

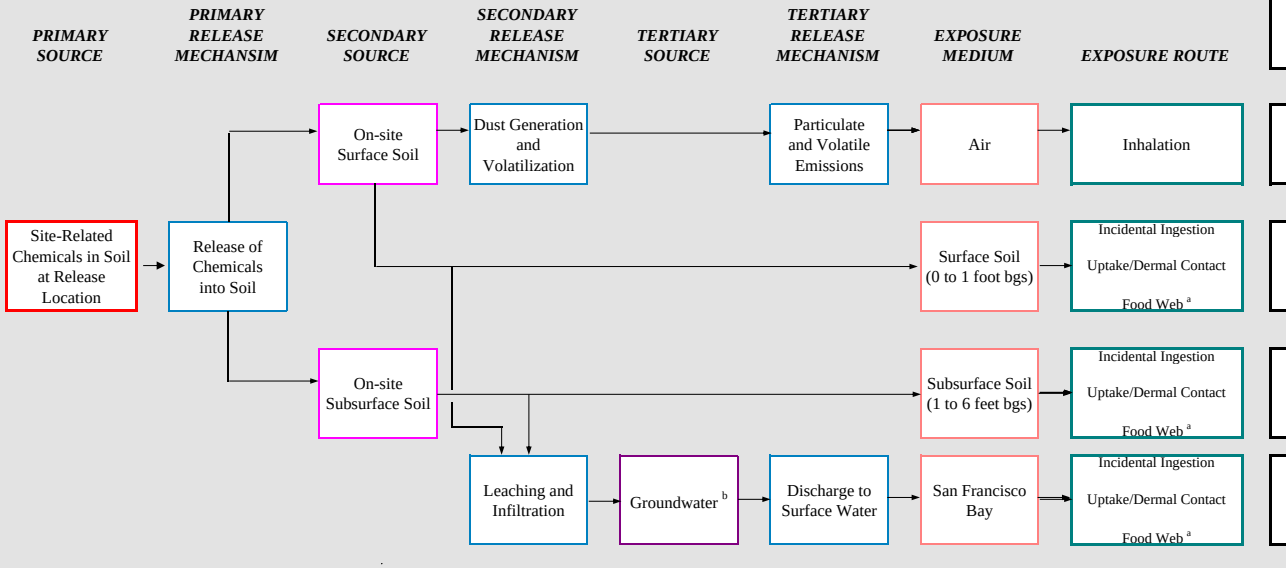
µg/L = micrograms per Liter

SLV Source: Marine Aquatic Habitat Goal from Table F-4a of RWQCB Environmental Screening Level (ESL) Tables, December 2013

TABLE C4 - ESTIMATED HAZARD QUOTIENTS AT THE SAN FRANCISCO BAY

Chemical	Maximum Estimated Concentration at the Groundwater/Surface Water Interface (µg/L)	Screening Level Value (SLV) (µg/L)	Ecological Hazard Quotient at the San Francisco Bay (unitless)
Metals			
Copper	2.84	3.1	9.2E-01
Lead	0.00	8.1	0.0E+00
Mercury	0.012	0.025	4.8E-01
Molybdenum	47	240	2.0E-01
Nickel	1.45	8.2	1.8E-01
Vanadium	0.00	19	0.0E+00

Notes:
µg/L = micrograms per Liter
SLV Source: Marine Aquatic Habitat Goal from Table F-4a of RWQCB Environmental Screening Level (ESL) Tables, December 2013



POTENTIAL ECOLOGICAL RECEPTORS									
Terrestrial Plants	Soil Invertebrates	Herbivorous Small Mammals	Carnivorous and Omnivorous Small Mammals	Predatory Large Mammals	Herbivorous and Omnivorous Birds	Raptors	Reptiles and Amphibians	Benthic Invertebrates	Aquatic Organisms
NA	NA	IC	IC	IC	IC	IC	IC	NA	NA
IC	IC	IC	IC	IC	IC	IC	IC	NA	NA
IC	IC	IC	IC	IC	IC	IC	IC	NA	NA
IC	IC	IC	IC	IC	IC	IC	IC	NA	NA
IC	IC	IC	IC	IC	IC	IC	IC	NA	NA
IC	IC	IC	IC	IC	IC	IC	IC	NA	NA
NA	NA	NA	NA	NA	NA	NA	●	●	●
NA	NA	NA	NA	NA	NA	NA	●	●	●
NA	NA	NA	NA	NA	NA	NA	●	●	●

Legend:
● Potentially complete pathway
○ Minor or insignificant pathway
IC Incomplete pathway
NA Not an applicable pathway for the particular receptor.

[a] Food web exposure occurs when upper trophic levels consume dietary items that have accumulated site-related chemicals.

[b] Groundwater is only a medium of concern for ecological receptors if it has the potential to discharge to a surface water body.

Ecological Conceptual Site Model

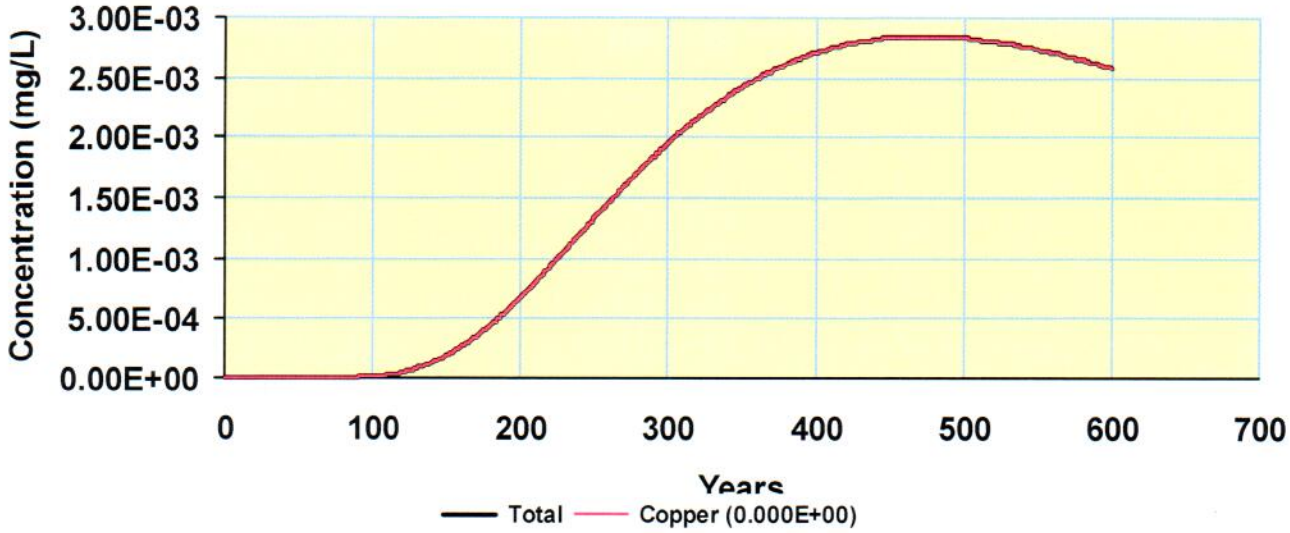
Figure C1

ATTACHMENT A

AT123D Model Printouts

San Francisco Bay

Western Forge & Flange



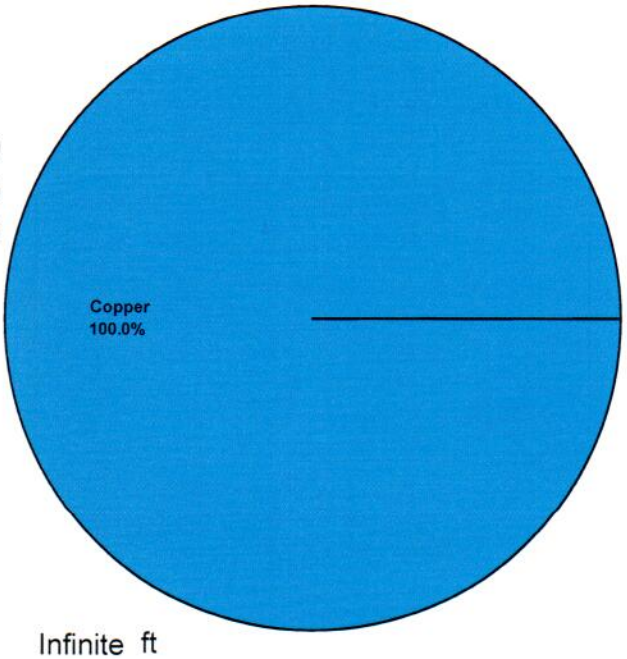
Maximum Concentration: 2.840E-03 mg/L

Year of Maximum Concentration: 453.25

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

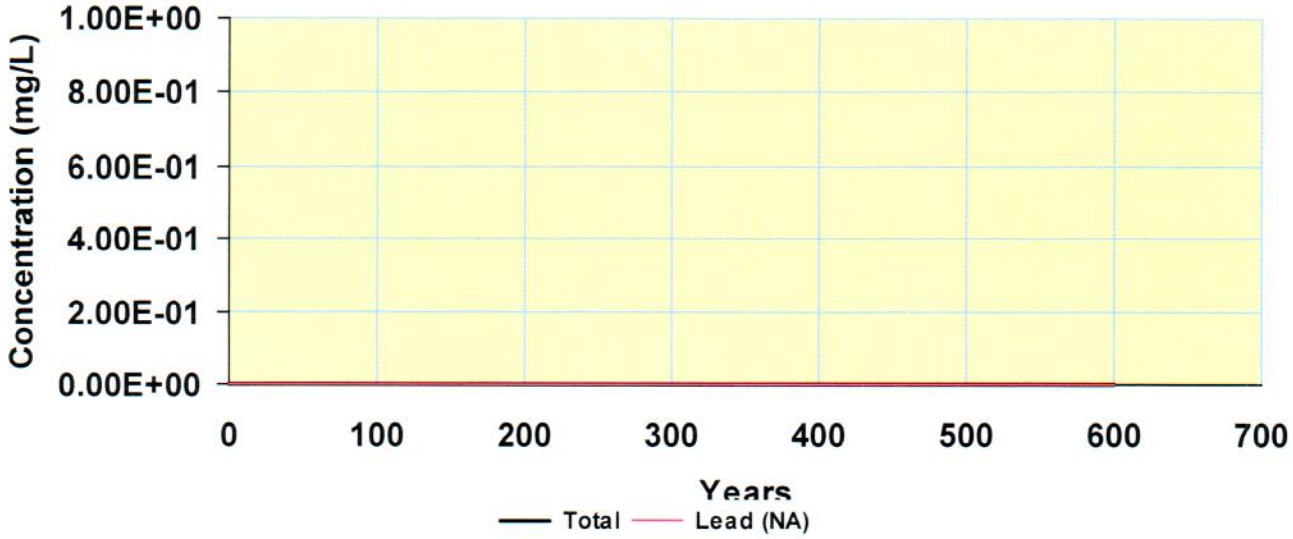
Dispersivities	Meters	Feet
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02



Aquifer Width:	Infinite	m	Infinite	ft	
Aquifer Depth:	Infinite	m	Infinite	ft	
Retardation Factor:			2.390E+02		
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3	
Molecular Diffusion:	0.000E+00	m2/hr	0.000E+00	cm2/sec	
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day	
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec	
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)	
Kd:	3.500E-02	m3/kg	3.500E+01	(ug/g)(ug/ml)	
Retarded Darcy Velocity:			1.205E-05	m/hr	3.347E-05 cm/sec
Retarded Longitudinal Disp. Coefficient:			1.205E-04	m2/hr	3.347E-04 cm2/sec
Retarded Lateral Dispersion Coefficient:			2.410E-05	m2/hr	6.694E-05 cm2/sec
Retarded Vertical Dispersion Coefficient:			1.398E-07	m2/hr	3.883E-07 cm2/sec

San Francisco Bay

Western Forge & Flange



Maximum Concentration: 0.000E+00 mg/L

Year of Maximum Concentration: 0.00

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

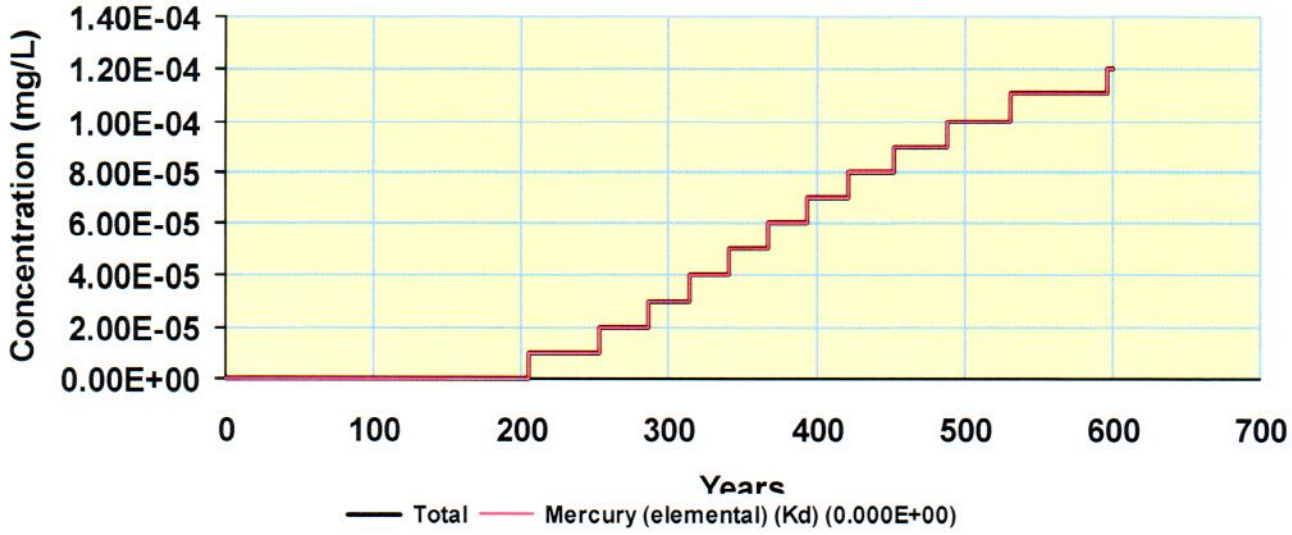
Dispersivities	**Meters**	**Feet**
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02

Lead
0.0%

Aquifer Width:	Infinite	m	Infinite	ft	
Aquifer Depth:	Infinite	m	Infinite	ft	
Retardation Factor:			6.121E+03		
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3	
Molecular Diffusion:	0.000E+00	m2/hr	0.000E+00	cm2/sec	
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day	
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec	
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)	
Kd:	9.000E-01	m3/kg	9.000E+02	(ug/g)(ug/ml)	
Retarded Darcy Velocity:			4.705E-07	m/hr	1.306E-06 cm/sec
Retarded Longitudinal Disp. Coefficient:			4.705E-06	m2/hr	1.306E-05 cm2/sec
Retarded Lateral Dispersion Coefficient:			9.410E-07	m2/hr	2.613E-06 cm2/sec
Retarded Vertical Dispersion Coefficient:			5.458E-09	m2/hr	1.516E-08 cm2/sec

San Francisco Bay

Western Forge & Flange



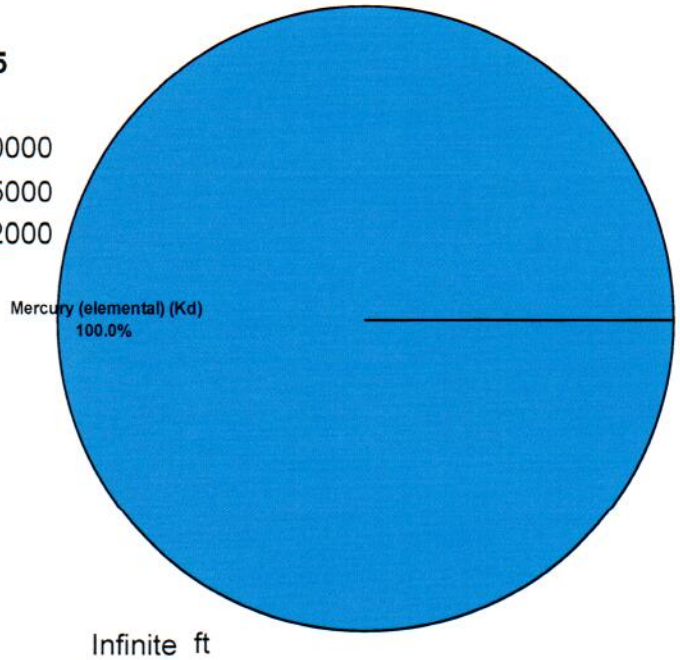
Maximum Concentration: 1.200E-04 mg/L

Year of Maximum Concentration: 596.25

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

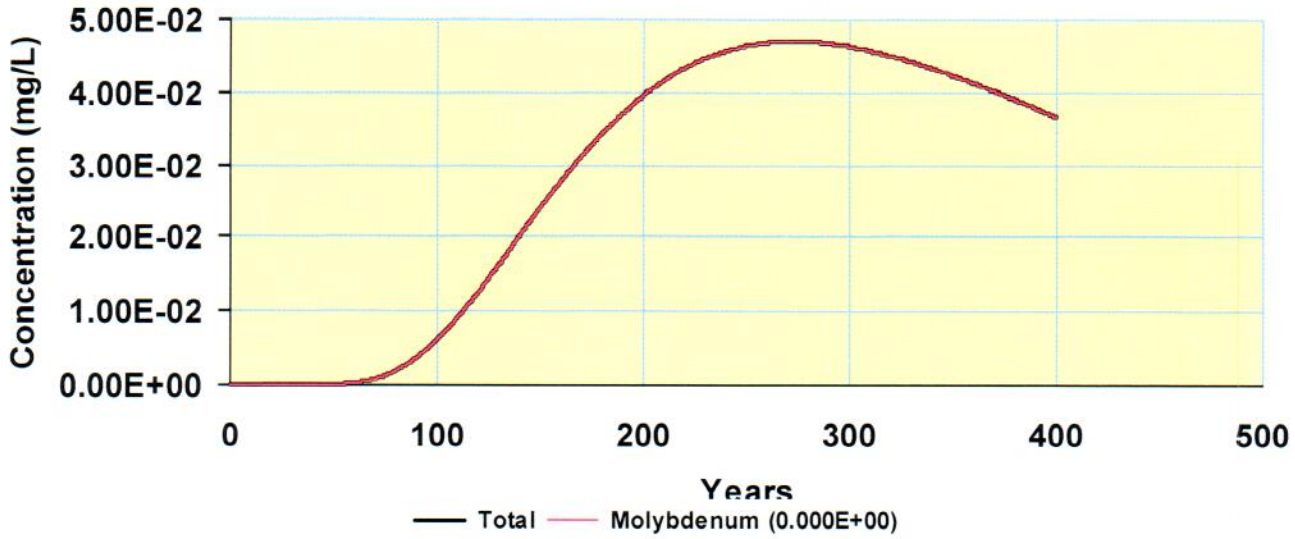
Dispersivities	Meters	Feet
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02



Aquifer Width:	Infinite	m	Infinite	ft
Aquifer Depth:	Infinite	m	Infinite	ft
Retardation Factor:			3.546E+02	
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3
Molecular Diffusion:	2.268E-06	m2/hr	6.300E-06	cm2/sec
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)
Kd:	5.200E-02	m3/kg	5.200E+01	(ug/g)(ug/ml)
Retarded Darcy Velocity:			8.122E-06 m/hr	2.256E-05 cm/sec
Retarded Longitudinal Disp. Coefficient:			8.124E-05 m2/hr	2.256E-04 cm2/sec
Retarded Lateral Dispersion Coefficient:			1.627E-05 m2/hr	4.519E-05 cm2/sec
Retarded Vertical Dispersion Coefficient:			1.198E-07 m2/hr	3.327E-07 cm2/sec

SF Bay

Western Forge & Flange



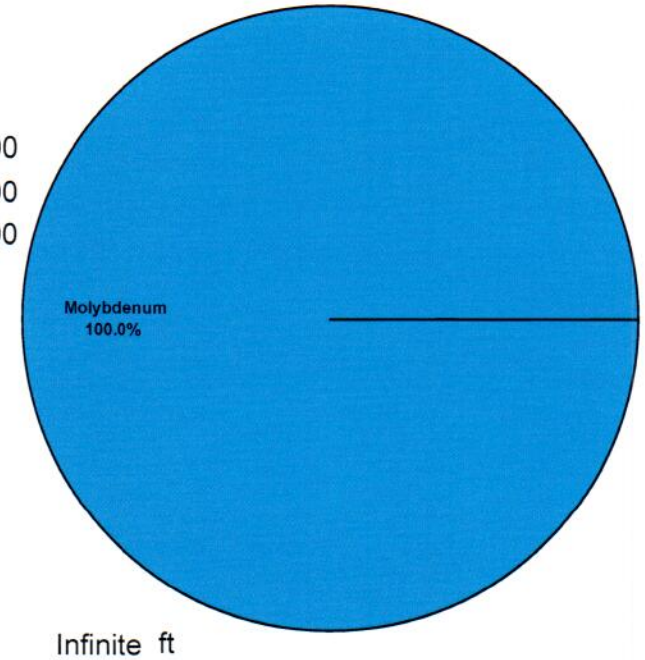
Maximum Concentration: 4.700E-02 mg/L

Year of Maximum Concentration: 264.75

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

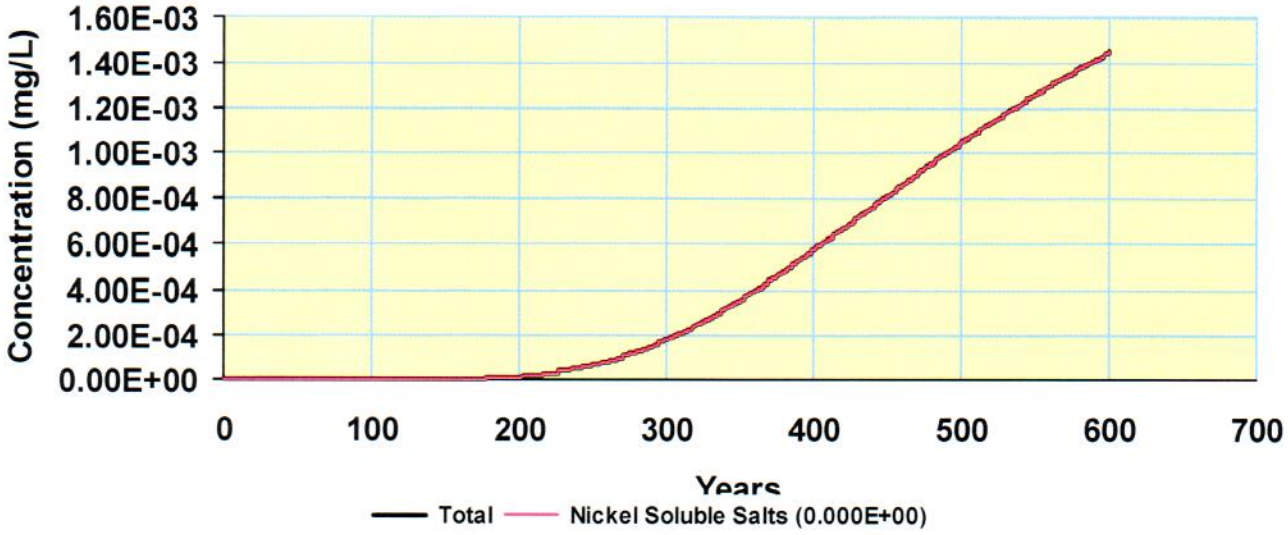
Dispersivities	Meters	Feet
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02



Aquifer Width:	Infinite	m	Infinite	ft
Aquifer Depth:	Infinite	m	Infinite	ft
Retardation Factor:			1.370E+02	
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3
Molecular Diffusion:	0.000E+00	m2/hr	0.000E+00	cm2/sec
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)
Kd:	2.000E-02	m3/kg	2.000E+01	(ug/g)(ug/ml)
Retarded Darcy Velocity:			2.102E-05 m/hr	5.838E-05 cm/sec
Retarded Longitudinal Disp. Coefficient:			2.102E-04 m2/hr	5.838E-04 cm2/sec
Retarded Lateral Dispersion Coefficient:			4.204E-05 m2/hr	1.167E-04 cm2/sec
Retarded Vertical Dispersion Coefficient:			2.439E-07 m2/hr	6.775E-07 cm2/sec

SF Bay

Western Forge & Flange



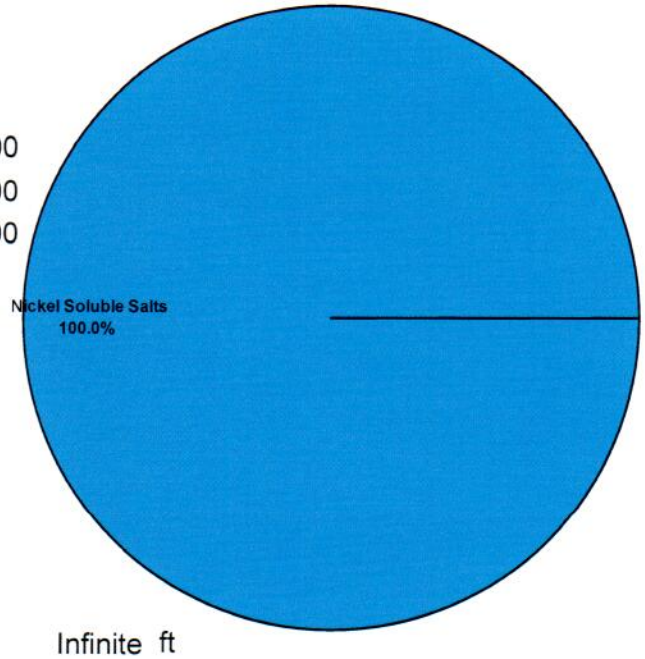
Maximum Concentration: 1.450E-03 mg/L

Year of Maximum Concentration: 599.75

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

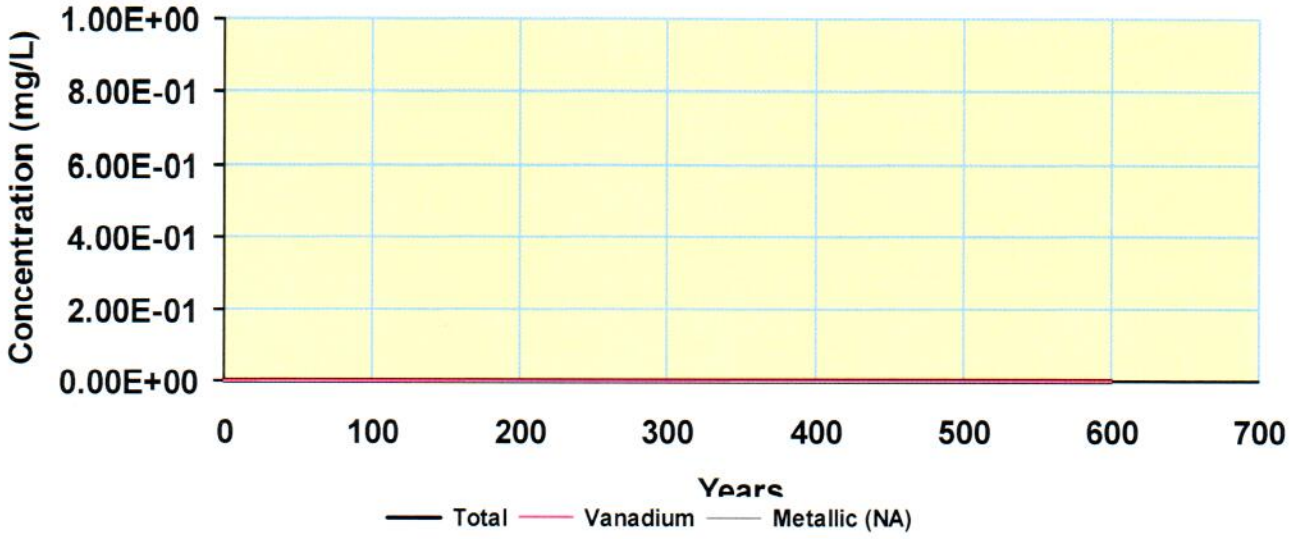
Dispersivities	Meters	Feet
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02



Aquifer Width:	Infinite	m	Infinite	ft
Aquifer Depth:	Infinite	m	Infinite	ft
Retardation Factor:			4.430E+02	
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3
Molecular Diffusion:	0.000E+00	m2/hr	0.000E+00	cm2/sec
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)
Kd:	6.500E-02	m3/kg	6.500E+01	(ug/g)(ug/ml)
Retarded Darcy Velocity:			6.501E-06 m/hr	1.805E-05 cm/sec
Retarded Longitudinal Disp. Coefficient:			6.501E-05 m2/hr	1.805E-04 cm2/sec
Retarded Lateral Dispersion Coefficient:			1.300E-05 m2/hr	3.611E-05 cm2/sec
Retarded Vertical Dispersion Coefficient:			7.541E-08 m2/hr	2.094E-07 cm2/sec

San Franciso Bay

Western Forge & Flange



Maximum Concentration: 0.000E+00 mg/L

Year of Maximum Concentration: 0.00

Input Parameters

Organic Carbon Content (percent):	0.50000
Effective Porosity:	0.25000
Hydraulic Gradient (m/m):	0.02000

Dispersivities	**Meters**	**Feet**
Longitudinal:	1.000E+01	3.280E+01
Lateral:	2.000E+00	6.561E+00
Vertical:	1.160E-02	3.805E-02

Aquifer Width:	Infinite	m	Infinite	ft	
Aquifer Depth:	Infinite	m	Infinite	ft	
Retardation Factor:			6.801E+03		
Soil Bulk Density:	1.700E+03	kg/m3	1.700E+00	g/cm3	
Molecular Diffusion:	0.000E+00	m2/hr	0.000E+00	cm2/sec	
Decay Coefficient:	0.000E+00	1/hr	0.000E+00	1/day	
Hydraulic Conductivity:	3.600E-02	m/hr	1.000E-03	cm/sec	
Carbon Adsorption Coeff:			0.0000E+0	(ug/g)(ug/ml)	
Kd:	1.000E+00	m3/kg	1.000E+03	(ug/g)(ug/ml)	
Retarded Darcy Velocity:			4.235E-07	m/hr	1.176E-06 cm/sec
Retarded Longitudinal Disp. Coefficient:			4.235E-06	m2/hr	1.176E-05 cm2/sec
Retarded Lateral Dispersion Coefficient:			8.469E-07	m2/hr	2.352E-06 cm2/sec
Retarded Vertical Dispersion Coefficient:			4.912E-09	m2/hr	1.364E-08 cm2/sec