TETRA TECH

# TECHNICAL MEMORANDUM

| | |
|---|---|
| ***To:*** | **Nevada Environmental Response Trust** |
| ***Cc:*** | Nevada Division of Environmental Protection<br>United States Environmental Protection Agency |
| ***From:*** | Dana Grady |
| ***Date:*** | August 31, 2021 |
| ***Subject:*** | **Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report** |

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum to summarize Tetra Tech's progress during July 2021 toward successfully implementing the Las Vegas Wash Bioremediation Pilot Study.

## Task Progress Update: July 2021

### Task M19 – Las Vegas Wash Pilot Study

- Current Status
  - *Injections* – The first injection event was completed in December 2020 and included injections into all three pilot study zones (Zones 1, 2, and 3) within the alluvium and/or Upper Muddy Creek formation (UMCf). A summary of the first injection event was provided in the January 2021 monthly progress report. The second injection event was performed from April 12, 2021 to April 21, 2021 and included injections into only the Zone 2 alluvium. Due to slower groundwater flow rates in the UMCf, the next round of injections into Zones 1, 2, and 3 UMCf will likely not occur until fourth quarter 2021. During the second injection event into the Zone 2 alluvium, all injection wells accepted the targeted design quantity of carbon substrate solution and follow-up distribution water. A summary of the second injection event was provided in the April 2021 monthly progress report. The timing of the third injection event, as well as the remediation zones targeted during the third injection event, will be determined based on future effectiveness monitoring results. A layout map and construction details of all injection, monitoring, and extraction wells are provided on Figures 1 through 4 and Table 1.
  - *Effectiveness Monitoring* – Baseline groundwater sampling was completed in the fall of 2020 prior to the first injection event. The monitoring program described in the NDEP-approved Las Vegas Wash Bioremediation Pilot Study Work Plan Addendum (referred to as Work Plan Addendum) was subsequently implemented to evaluate the effectiveness of in-situ bioremediation. As part of this monitoring program, groundwater sampling was conducted on a biweekly basis for the Zone 2 alluvium for the first two months post-injection and followed by a monthly sampling program

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thereafter, which is ongoing. Groundwater sampling for the UMCf and UMCf-coarse grained (UMCf-cg) in Zones 1, 2, and 3 has been conducted monthly over the first four months following the first injection event. In accordance with the Work Plan Addendum, groundwater sampling frequencies in the UMCf and UMCf-cg were reduced to a bi-monthly basis approximately four months after the first injection event (beginning in May 2021) due to the slower groundwater flow rates present in the UMCf. Bi-monthly sampling will continue until the next injection event into the UMCf/UMCf-cg in Zones 1, 2, and 3, at which time monthly sampling will resume.

Available groundwater analytical results from the baseline sampling event and subsequent effectiveness monitoring events performed from December 2020 to June 2021 are provided on Table 2. The June 2021 groundwater results from key cross-gradient and downgradient monitoring wells located within Zones 1, 2, and 3 are summarized below. Groundwater analytical results from the recent sampling event performed July 6, 2021 through July 9, 2021 will be provided in future monthly progress reports as data become available.

- Zone 2 Alluvium:
  - Groundwater samples collected from cross-gradient monitoring wells LVWPS-A2-MW04A/B and LVWPS-A2-MW05A/B, which are located approximately 17 feet from each end of the Zone 2 injection well transect, continue to exhibit perchlorate concentration decreases ranging from 33 percent to greater than 99 percent reduction when compared to baseline concentrations. Noteworthy results include perchlorate concentrations observed in groundwater samples collected from LVWPS-A2-MW04B, which decreased significantly following the second injection event to 120 micrograms per liter (μg/L) in May 2021 and continued to decrease to 46 μg/L in June 2021, which is the lowest concentration measured to date at this location (baseline concentration of 3,400 μg/L). Additionally, groundwater samples collected from LVWPS-A2-MW05B exhibited perchlorate concentrations below the detection limit of 0.31 μg/L during the June 2021 sampling event.
  - Groundwater samples collected from the 14 monitoring wells located approximately 50 to 100 feet downgradient from the injection well transect exhibited an overall average percentage decrease in groundwater perchlorate concentrations (compared to baseline concentrations) of 66 percent during the sixth monthly post-injection sampling event (June 2021). The June 2021 sampling event continued to indicate better overall perchlorate reductions than those observed after the first injection event. Groundwater samples collected from eight of these 14 monitoring wells exhibit perchlorate concentration reductions of greater than 80 percent when compared to baseline.
  - Groundwater samples collected in June 2021 from monitoring wells LVWPS-MW208B and LVWPS-MW223B, which are located approximately 200-250 feet downgradient from the injection well transect, exhibited perchlorate concentration decreases of 64 percent and 87 percent, respectively, when compared to baseline concentrations. In addition, the groundwater sample collected from LVWPS-MW223A during the June 2021 sampling event indicated a decrease from 3,100 μg/L to 1,600 μg/L, representing a reduction of 52 percent from baseline concentrations.
  - Several monitoring wells located farther downgradient and/or cross-gradient of the Zone 2 alluvium injection well transect have indicated moderate reductions in perchlorate concentrations. For example, LVWPS-MW211, which is located 650 feet downgradient, exhibited perchlorate reductions ranging from 40 to 58

percent during the January, March, and June 2021 sampling events. In addition, groundwater samples collected in March and June 2021 from LVWPS-MW209A, which is also approximately 650 feet downgradient, indicated perchlorate reductions ranging from 25 to 36 percent compared to baseline conditions.

- Chlorate results followed a similar pattern to perchlorate results for samples collected in June 2021. Specifically, groundwater samples collected from two of the four cross-gradient monitoring wells continued to show decreases in chlorate concentrations of greater than 99 percent compared to baseline. Groundwater samples collected from 9 of the 18 monitoring wells located between 50 and 250 feet downgradient from the injection well transect exhibited reductions in chlorate concentrations of greater than 80 percent.
- Nitrate concentrations in groundwater were also evaluated because it is often a competing and preferred electron acceptor and carbon substrate consumer. Nitrate concentrations in groundwater samples collected from Zone 2 alluvium monitoring wells averaged 17 milligrams per liter (mg/L) during the baseline sampling event. Groundwater samples collected from cross-gradient and downgradient monitoring wells during the sixth monthly sampling event indicate nitrate concentrations were reduced by an average of 57 percent compared to baseline conditions. During the sixth monthly sampling event, groundwater samples collected from 15 of the 22 cross-gradient or downgradient monitoring wells exhibited nitrate concentrations of less than 10 mg/L. Groundwater samples collected from eight of these 22 monitoring wells exhibited nitrate concentrations less than 1 mg/L.

- Zone 1, 2, and 3 UMCf/UMCf-cg:
  - Zone 1 UMCf – Approximately six months following injections into Zone 1 UMCf, groundwater samples collected from monitoring wells LVWPS-U1-MW08A/B, which are located approximately 25 feet downgradient from the injection well transect, indicated decreases in perchlorate concentrations of 99 and 74 percent when compared to baseline concentrations, respectively. Other notable observations include groundwater samples collected from one monitoring well located 100 feet downgradient from the injection well transect (LVWPS-U1-MW09B), where perchlorate concentrations continued to indicate a significant reduction of 50 percent compared to baseline conditions six months after the injection event. In addition, groundwater samples collected from LVWPS-U1-MW01B June 2021 sampling event indicate that perchlorate, chlorate, and nitrate concentrations are exhibiting a decreasing trend, with concentration decreases of 23 percent, 45 percent, and 49 percent, respectively, when compared to baseline concentrations. In general, nitrate and chlorate concentrations in other monitoring wells followed a similar pattern to perchlorate.
  - Zone 2 UMCf – Approximately six months following injections into Zone 2 UMCf, groundwater samples collected from cross-gradient monitoring wells LVWPS-U2-MW04 and LVWPS-U2-MW05, which are screened in the UMCf and located approximately 12 feet from each end of the Zone 2 injection well transect, continue to indicate perchlorate concentrations less than the sample detection limit in both monitoring wells. Additionally, groundwater samples collected from four of the five monitoring wells located 25 to 50 feet downgradient from the injection well transect exhibited perchlorate concentration decreases of up to 43 percent when compared to baseline concentrations. Lastly, groundwater samples

collected from monitoring well LVWPS-MW223C, which is located approximately 200 feet downgradient from the Zone 2 injection well transect, indicate a perchlorate concentration reduction of approximately 56 percent when compared to baseline, likely indicative of a preferential flow path in this vicinity. Nitrate and chlorate concentrations followed a similar pattern to perchlorate.

- Zone 3 UMCf-cg – Approximately six months following injections into Zone 3 UMCf-cg, groundwater samples collected from three of the six monitoring wells located approximately 25 feet downgradient exhibited a greater than 97 percent reduction in perchlorate concentrations compared to baseline. In addition, groundwater samples collected from monitoring wells LVWPS-U3-MW10A/B, which are located approximately 100 feet downgradient from the Zone 3 injection well transect, both exhibited a greater than 98% reduction in perchlorate, chlorate, and nitrate concentrations compared to baseline. Lastly, groundwater samples collected from LVWPS-U2-MW12B, which is located approximately 150 feet downgradient, continued to indicate decreasing perchlorate, chlorate, and nitrate concentrations six months after injections, with concentration decreases of 83 percent for perchlorate and greater than 69 percent for chlorate and nitrate when compared to baseline conditions. These observations farther downgradient relative to observations in the UMCf in Zones 1 and 2 are likely related to the coarser-grained aquifer matrix in Zone 3 UMCf-cg and faulting in the area.

- Surface water sampling in the Las Vegas Wash was performed prior to injection activities on October 16, 2020 and October 29, 2020. Eight surface water sampling events have since been performed on a monthly basis since December 2020 (including during the December 2020 injections and on a monthly basis after injections through July 2021). Although limited surface water sampling will be periodically conducted downgradient from the study area, reducing perchlorate concentrations in surface water is not an objective of this pilot study. As of the June 2021 surface water sampling event, no significant change in perchlorate concentrations in surface water has been observed. Noteworthy surface water results related to the pilot study will be summarized in future monthly progress reports as warranted.

- *Dye Study* – As part of injection activities, rhodamine WT and fluorescein tracer dyes were injected into the alluvium and UMCf/UMCf-cg, respectively. Analytical results for dye samples collected during baseline activities, injection activities, and the December 2020 through June 2021 effectiveness monitoring events are provided on Table 3. In accordance with the Las Vegas Wash Bioremediation Pilot Study Work Plan Addendum, the final dye sampling event was conducted in June 2021, six months after the first injection event. As a result, the dye study portion of the pilot study program is now complete. A high-level overview of the June 2021 results is summarized below.

  - Zone 2 Alluvium:

    - During the first injection event, rhodamine tracer dye was detected in all four of the Zone 2 alluvium dose response wells. Six months following the injection of tracer dye, rhodamine tracer dye continued to be detected at low concentrations in groundwater samples from one of the dose response wells and charcoal samplers from three of the dose response wells.

    - Cross-gradient monitoring wells LVWPS-A2-MW04A/B and LVWPS-A2-MW05A/B (located approximately 17 feet from the two ends of the Zone 2 injection well transect) had detections of rhodamine dye in groundwater with the field probe during injections. Six months following the injection of tracer dye, low

concentrations of rhodamine dye were still detected in groundwater samples collected from monitoring wells LVWPS-A2-MW05A/B.

- As expected, the high groundwater flow velocity in the alluvium resulted in many downgradient wells observing the presence of dye during active injections or within a few days after injections were completed. Approximately six months after the injection of tracer dye, rhodamine dye was detected in Zone 2 alluvium groundwater samples collected from 10 monitoring wells located 50 to 250 feet downgradient from the injection well transect. Additionally, rhodamine dye was detected in charcoal samplers collected from 18 monitoring wells located 50 to 250 feet downgradient from the injection well transect. Lastly, six months after the injection of tracer dye, rhodamine dye continued to be detected in charcoal samplers collected from wells LVWPS-MW209 and LVWPS-MW210A/B, which are located approximately 625 and 850 feet downgradient, respectively.
- Rhodamine concentrations are decreasing in most monitoring wells at this point, indicating that the peak has already passed, which is expected given the typically high flow velocities in the Zone 2 alluvium and specifically within the paleochannel. Exceptions include some monitoring wells located outside of the paleochannel in areas of lower flow velocity, in which very low dye concentrations have only recently started to appear. These include LVWPS-MW11C, LVWPS-MW15B, and LVWPS-MW16B on the west flank of the paleochannel and LVWPS-MW211 located east of the paleochannel.

- Zone 1, 2, and 3 UMCf/UMCf-cg:
  - Zone 1 UMCf – Six months after the injection of tracer dye was completed in Zone 1 UMCf, fluorescein tracer dye was no longer detected in groundwater samples collected 50 feet upgradient from the injection well transect at wells LVWPS-U1-MW06B and LVWPS-U1-MW07, indicating downgradient migration over time. Dye continued to be detected in charcoal or groundwater samples collected from all four dose response wells and monitoring wells LVWPS-U1-MW08A/B (located 25 feet downgradient). In addition, fluorescein dye continued to be detected in charcoal collected from monitoring well LVWPS-U1-MW02B (located approximately 33 feet downgradient) after being detected for the first time three months after the first injection event.
  - Zone 2 UMCf – Approximately six months after the injection of tracer dye into the Zone 2 UMCf, fluorescein was still detected in the groundwater sample collected from dose response well LVWPS-U2-DR02 and one cross-gradient monitoring well LVWPS-U2-MW05, which is located approximately 12 feet from the injection well transect. Low levels of fluorescein were detected in charcoal at monitoring wells LVWPS-U2-MW12 and LVWPS-U2-MW17, which are located 100 feet downgradient. In addition, low levels of rhodamine were still detected at LVWPS-U2-MW17 from the injections into the Zone 2 alluvium, which likely migrated into the downgradient UMCf monitoring well due to localized downward gradients present within Zone 2. Fluorescein also continued to be detected in charcoal samples from six alluvial monitoring wells downgradient or cross-gradient from the Zone 2 UMCf injection well transect, indicating upflux from the UMCf into the alluvium in the Zone 2 vicinity due to localized upward gradients in Zone 2. These monitoring wells (LVWPS-A2-DR02B, LVWPS-A2-MW04B, LVWPS-A2-MW08C, LVWPS-A2-MW17C, LVWPS-A2-MW12A, and LVWPS-A2-MW13B) have had fluorescein detections in charcoal beginning in December 2020 to

January 2021, which continued across subsequent months. Two monitoring wells (LVWPS-A2-MW08C and LVWPS-A2-MW17C) also had detections of fluorescein in water samples.

- Zone 3 UMCf-cg – Approximately six months after the injection of tracer dye was completed in the Zone 3 UMCf-cg, fluorescein continued to be detected in either charcoal or groundwater samples collected from all dose response wells and four of the six monitoring wells located approximately 25 feet downgradient from the Zone 3 injection well transect. In addition, fluorescein tracer dye continued to be detected in charcoal and/or groundwater samples collected from monitoring wells LVWPS-U3-MW10A/B and LVWPS-MW12A/B, which are located approximately 100 and 150 feet downgradient, respectively.

- Although a detailed analysis of the dye study results will be provided in the final Las Vegas Wash Bioremediation Pilot Study Results Report, a brief discussion of the preliminary findings is provided below. This discussion includes an overview of how the objectives of the dye study were successfully achieved during the pilot study.
  - Assess radius of influence (ROI) of the injections in the alluvium and UMCf –This objective was met through monitoring the nearby cross-gradient monitoring wells (located on either end of the Zone 2 injection well transect) both during and after the first injection event. Results indicated that all cross-gradient monitoring wells in both the alluvium and UMCf observed dye tracer in either field groundwater samples collected during injections and/or charcoal/groundwater samples collected following the injections, which confirms the presence of injectate. Additionally, all cross-gradient monitoring wells observed decreases in groundwater perchlorate concentrations after injection. This confirms that the ROI was equal to, if not larger than, the designed ROI calculated from baseline aquifer data. As a result, based on the injection spacing used in the pilot study was appropriate for the lithology.
  - Estimate effective porosity of the formation near each injection well transect – This objective was accomplished using the dose-response data at the time of injection. In the alluvium, the effective porosity was in the range originally anticipated based on aquifer data collected during the design phase. In the UMCf and UMCf-cg, the effective porosity ranged from approximately 1 to 2 percent, which is less than the original conservative estimate used for distribution water calculations during the design phase. The lower effective porosity result indicated that less distribution water is required and therefore, a field modification was made to decrease the follow-up distribution water volumes, which is beneficial information for future remedy evaluation in the forthcoming Feasibility Study.
  - Evaluate travel times of the injectate/dye – This objective was achieved in the alluvium by monitoring the dye tracer in downgradient wells over the course of six months. In the Zone 2 alluvium, the shortest travel time to the Las Vegas Wash (located approximately 850 feet downgradient) was 67 days, which was an average of 13 feet per day. However, Zone 2 alluvium groundwater velocities calculated using the tracer peaks rather than the leading edge have typically resulted in groundwater velocities ranging from less than 1 foot per day to approximately 3 feet per day. Data from the monitoring wells screened in the UMCf and/or UMCf-cg within Zones 1, 2, and 3 are currently under evaluation.
  - Determine whether water from the UMCf discharges into the alluvium and vice versa – This objective was met by monitoring the alluvium for fluorescein and

monitoring the UMCf for rhodamine. Based on the dye tracer results, groundwater from the UMCf does discharge into the alluvium (upflux), as confirmed by detections of fluorescein downgradient of the Zones 1, 2, and 3 UMCf/UMCf-cg injections. Furthermore, small detections of rhodamine, which was only injected into the alluvium, were present in the underlying Zone 2 UMCf in Zone 2, suggesting that downflux is also occurring.

  - Periodic Aquifer Testing – Slug testing of select monitoring wells within each remediation zone began on June 28, 2021 and concluded on July 9, 2021. Slug testing results will be included in a future monthly progress report after the data are processed and results are available.

- Access and Permitting
  - All access agreements and permits are now in place for all pilot study activities.
- Schedule and Progress Updates
  - The seventh monthly effectiveness monitoring event is scheduled for the week of August 9, 2021 and will include sampling of Zones 1, 2, and 3 alluvium, UMCf, and/or UMCf-cg. As previously noted, the effectiveness monitoring program associated with Zones 1, 2, and 3 UMCf and UMCf-cg transitioned to a bimonthly frequency following the April 2021 sampling event and will continue on a bimonthly basis until the second injection event is performed in the UMCf/UMCf-cg.
  - The third injection event is tentatively planned for the fourth quarter of 2021. The exact timing of the injection event will be determined based on results from the on-going effectiveness monitoring program.
  - Microbial sampling is planned for the third quarter of 2021 prior to the third injection event.
- Health and Safety
  - There were no safety incidents related to Task M19 during July 2021.

# CERTIFICATION

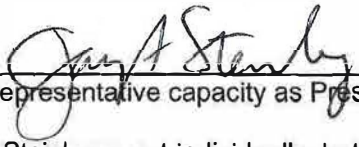
**Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report**

**Nevada Environmental Response Trust Site**
**(Former Tronox LLC Site)**
**Henderson, Nevada**

**Nevada Environmental Response Trust (NERT) Representative Certification**
I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Signature:**  Not Individually, but Solely as President of the Trustee, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Name:** Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Title:** Solely as President and not individually

**Company:** Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Date:** 8/31/21

# CERTIFICATION

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

***Description of Services Provided:*** Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report, Nevada Environmental Response Trust Site, Henderson, Nevada.

August 31, 2021

**David S. Wilson, CEM**
Principal Engineer
Tetra Tech, Inc.

Date

Nevada CEM Certificate Number: 2385
Nevada CEM Expiration Date: September 19, 2022

# Figures

DRAFT

Notes:
1. Monitoring and injection well names are shown without prefix LVWPS.
2. For information on injection well labels see Zone 1-3 figures.

MW216
LNDMW1
MW215A/B
NERT4.51S1
MW219A/B/C
MW214
MW210A/B/C/D/E
MW218A/B/C
MW209/A/B/C
MW211
MW220A/B
MW213
MW-20
MW205B/C
NERT4.71S1
MW207
WMW4.9S
A2-MW16A/B
MW212A/B/C/D
U1-MW03B
MW217A/B/C
A1-MW10/U1-MW10A/B
MW204/B/C
MW203A/B/C
A2-MW15A/B
MW223A/B/C
MW208A/B
A3-MW12/U3-MW12A/B
A3-MW10/U3-MW10A/B
U3-MW05B
A1-MW04/U1-MW04A/B
U1-MW01A/B
A1-MW09/U1-MW09A/B
MW206A/B/C/D/E
U2/A2-MW17A/B/C
U2/A2-MW12A/B
MW221A/B
A3-MW11/U3-MW11A/B/C
A3-MW06/U3-MW06A/B
NERT4.93S
U1-MW08A/B
A2-MW11A/B/C
U2/A2-MW13A/B
U3-MW04B
U3-MW03A/B/C
U1-MW02A/B
EW05
MW222A/B/C
MW202
A1-MW06/U1-MW06A/B
U2/A2-MW08A/B/C
U2/A2-MW14A/B
EW01
EW04
EW03
U2-MW10
U2-MW07
NERT5.11S1
A1-MW07/U1-MW07
U2-MW20
A3-MW08/U3-MW08A/B
EW02
U2-MW19
MW-25
MW201A/B
DBMW-20
A1-MW05/U1-MW05A/B
U2-MW05/A2-MW05A/B
U3-MW13A/B
U2-MW09/A2-MW09A/B
U2-MW04/A2-MW04A/B
A3-MW02/U3-MW02A/B
MW-13
U2-MW03/A2-MW03A/B
U3-MW09
U2-MW18
A3-MW07/U3-MW07A/B
MW225A/B
U2-MW01/A2-MW01A/B
U3-MW01B
U2-MW02/A2-MW02A/B
MW224A/B/C
U2-MW06
MW-18
Henderson
Landfill Site
MW-02
LVWPS-MW226A/B
MW-10
MW-11
MW-12
MW-04
N
0
300
600
Feet

**Legend**
- Existing Monitoring Well
- Extraction Well
- UMCf/UMCf-cg Injection Well
- Alluvial Monitoring Well
- UMCf/UMCf-cg Monitoring Well
- Dose Response Well

Imagery Source: Esri World Map, October 2019.

C:\USERS\ELLYN.SWENSON\LVW MONITORING WELL INSTALLATION FIGURES\BL04 GROUNDWATER CONTOURS\ZONECOVERVIEW_11102020.MXD

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**NEVADA ENVIRONMENTAL RESPONSE TRUST**

LAS VEGAS WASH BIOREMEDIATION PILOT STUDY
HENDERSON, NEVADA

# LAS VEGAS WASH BIOREMEDIATION PILOT STUDY LAYOUT

| | |
|---|---|
| Project No.: | 117-7502019 |
| Date: | NOVEMBER 10, 2020 |
| Designed By: | ES |

Figure No.
**1**

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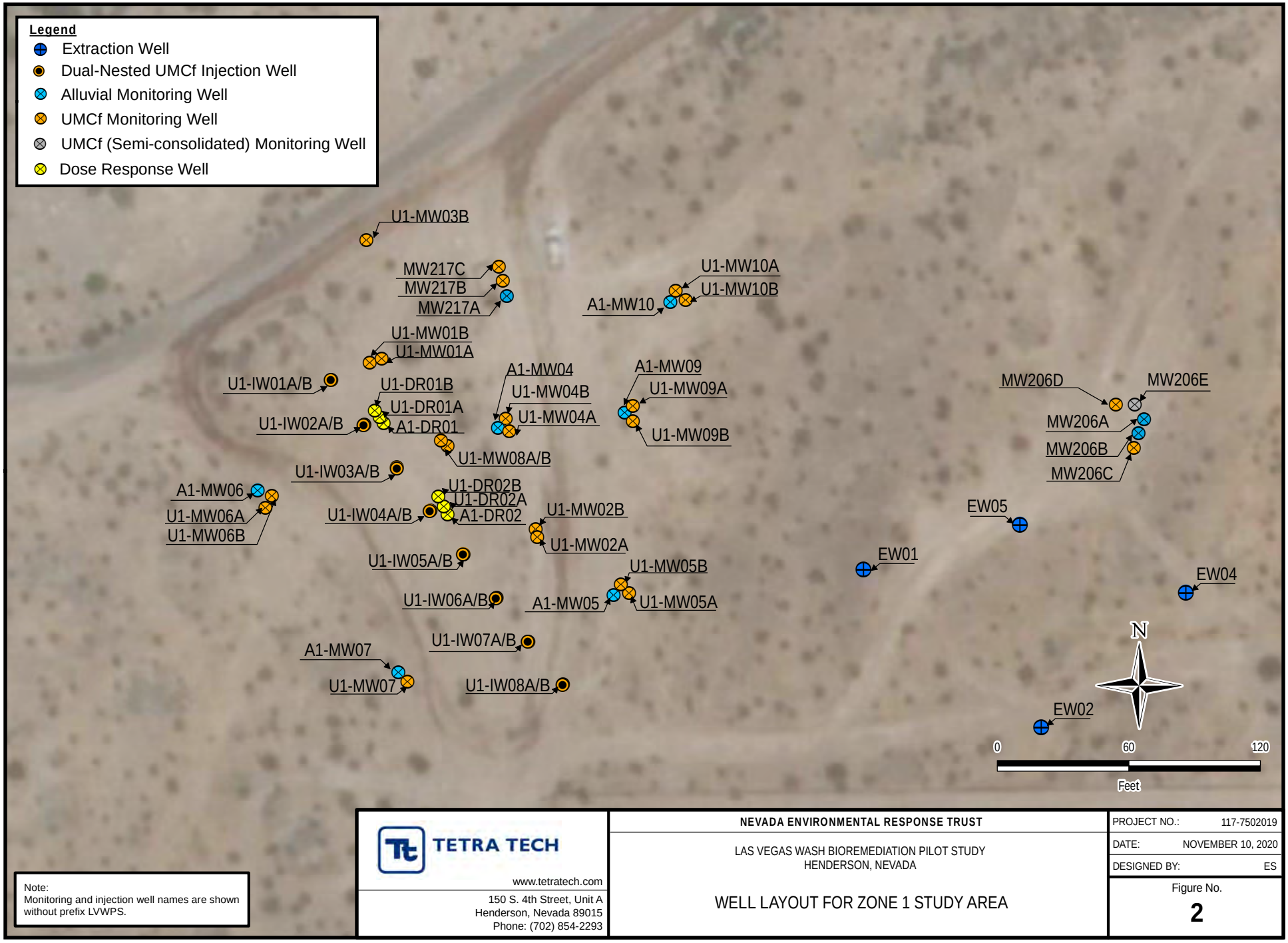


Note:
Monitoring and injection well names are shown without prefix LVWPS.

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NEVADA ENVIRONMENTAL RESPONSE TRUST

LAS VEGAS WASH BIOREMEDIATION PILOT STUDY
HENDERSON, NEVADA

WELL LAYOUT FOR ZONE 1 STUDY AREA

| | |
|---|---|
| PROJECT NO.: | 117-7502019 |
| DATE: | NOVEMBER 10, 2020 |
| DESIGNED BY: | ES |

Figure No.
**2**

C:\Users\ELLYN.SWENSON\LVW Monitoring Well Installation Figures\BL04 Groundwater Contours\Zone1_UMCfContours_1110.mxd

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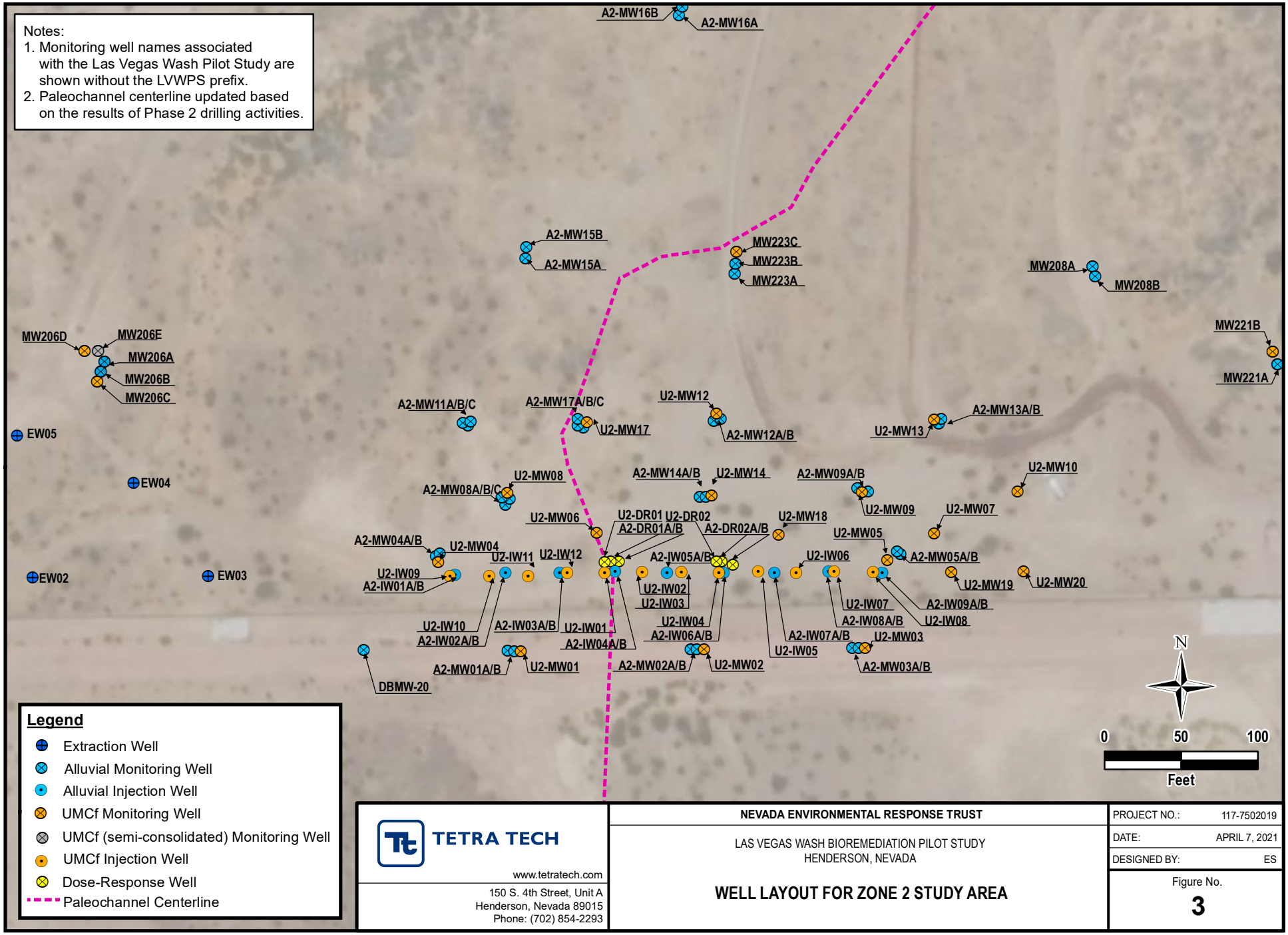


C:\Users\JENNIFER.JACOBS\Desktop\Zone2_FieldSurveyLocations.mxd


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**NEVADA ENVIRONMENTAL RESPONSE TRUST**

LAS VEGAS WASH BIOREMEDIATION PILOT STUDY
HENDERSON, NEVADA

## WELL LAYOUT FOR ZONE 2 STUDY AREA

| | |
|---|---|
| PROJECT NO.: | 117-7502019 |
| DATE: | APRIL 7, 2021 |
| DESIGNED BY: | ES |

Figure No.
**3**

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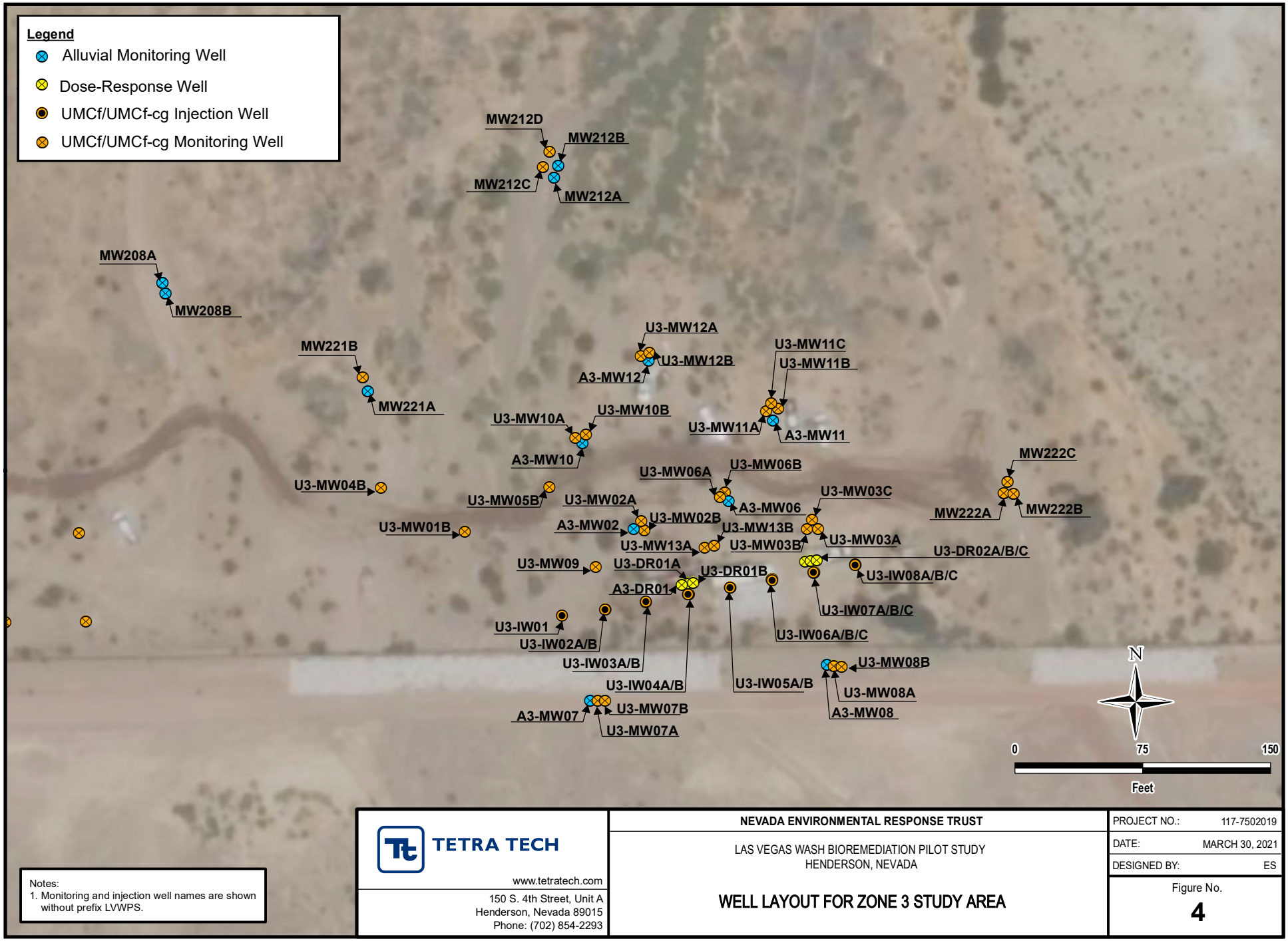


Notes:
1. Monitoring and injection well names are shown without prefix LVWPS.


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HENDERSON, NEVADA

# WELL LAYOUT FOR ZONE 3 STUDY AREA

| | |
|---|---|
| PROJECT NO.: | 117-7502019 |
| DATE: | MARCH 30, 2021 |
| DESIGNED BY: | ES |

Figure No.
**4**

C:\Users\steven.henning\Desktop\NERTM19\Zone3_Contours_UMCf_1021.mxd

# Tables

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**Table 1**
**Phase 2 Well Construction Details**
Las Vegas Wash Bioremediation Pilot Study

| Well ID | Screened Lithology | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Depth to Water[1] | Construction Type | Construction Material | Slot Size | Filter Pack Gradation | Borehole Diameter | Borehole Total Depth | Well Diameter | Nominal Screen Length | Well Total Depth | Bottom of Screen | Top of Screen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | feet amsl | feet amsl | feet bTOC | | | inches | | inches | feet bgs | inches | feet | feet bgs | feet bgs | feet bgs |
| **Zone 1 Study Area** | | | | | | | | | | | | | | | | | |
| LVWPS-A1-DR01 | Alluvium | 26735024.80 | 838207.19 | 1524.18 | 1523.98 | 29.38 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 83.5 | 2 | 20 | 83 | 82.5 | 62.8 |
| LVWPS-A1-DR02 | Alluvium | 26734983.35 | 838236.38 | 1524.57 | 1524.20 | 29.54 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 79.0 | 2 | 20 | 78.5 | 78 | 58.3 |
| LVWPS-A1-MW04 | Alluvium | 26735022.91 | 838259.32 | 1529.32 | 1529.30 | 34.87 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 92.5 | 2 | 20 | 89.5 | 89 | 69.3 |
| LVWPS-A1-MW05 | Alluvium | 26734946.32 | 838312.17 | 1530.88 | 1530.55 | 36.10 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 95.0 | 2 | 20 | 89.5 | 89 | 69.3 |
| LVWPS-A1-MW06 | Alluvium | 26734994.26 | 838149.70 | 1523.90 | 1523.76 | 28.80 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 85.0 | 2 | 20 | 79.5 | 79 | 59.3 |
| LVWPS-A1-MW07 | Alluvium | 26734911.17 | 838213.86 | 1525.06 | 1524.99 | 30.15 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 80.0 | 2 | 20 | 78.5 | 78 | 58.3 |
| LVWPS-A1-MW09 | Alluvium | 26735029.71 | 838317.19 | 1529.61 | 1529.43 | 35.62 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 107.0 | 2 | 20 | 106 | 105.5 | 85.8 |
| LVWPS-A1-MW10 | Alluvium | 26735080.18 | 838337.96 | 1527.26 | 1527.07 | 33.55 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 91.5 | 2 | 20 | 91 | 90.5 | 70.8 |
| LVWPS-U1-DR01A | UMCf | 26735027.64 | 838205.37 | 1524.09 | 1524.00 | 29.15 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 116.5 | 2 | 25 | 115.5 | 115 | 90.3 |
| LVWPS-U1-DR01B | UMCf | 26735030.53 | 838203.16 | 1524.07 | 1523.94 | 28.89 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 152.5 | 2 | 30 | 151.5 | 151 | 121.3 |
| LVWPS-U1-DR02A | UMCf | 26734986.83 | 838234.68 | 1524.02 | 1523.92 | 29.15 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 117.5 | 2 | 30 | 117 | 116.5 | 86.8 |
| LVWPS-U1-DR02B | UMCf | 26734991.38 | 838232.08 | 1523.92 | 1523.71 | 28.63 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 153.5 | 2 | 30 | 153 | 152.5 | 122.8 |
| LVWPS-U1-IW01A | UMCf | 26735044.59 | 838183.29 | 1523.67 | 1523.72 | 28.91 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 155.0 | 2 | 25 | 114 | 113.5 | 88.8 |
| LVWPS-U1-IW01B | UMCf | 26735044.44 | 838182.98 | 1523.67 | 1523.65 | 28.76 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 145.5 | 145 | 120.3 |
| LVWPS-U1-IW02A | UMCf | 26735024.11 | 838198.37 | 1524.46 | 1524.39 | 29.41 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 155.0 | 2 | 25 | 115.5 | 115 | 90.3 |
| LVWPS-U1-IW02B | UMCf | 26735023.96 | 838198.03 | 1524.46 | 1524.43 | 29.42 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 30 | 151.5 | 151 | 121.3 |
| LVWPS-U1-IW03A | UMCf | 26735004.66 | 838213.18 | 1523.88 | 1523.55 | 28.59 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 155.0 | 2 | 25 | 119 | 118.5 | 93.8 |
| LVWPS-U1-IW03B | UMCf | 26735004.34 | 838213.12 | 1523.88 | 1523.53 | 28.40 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 150.5 | 150 | 125.3 |
| LVWPS-U1-IW04A | UMCf | 26734984.96 | 838228.48 | 1523.90 | 1523.65 | 28.89 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 155.0 | 2 | 30 | 117 | 116.5 | 86.8 |
| LVWPS-U1-IW04B | UMCf | 26734984.86 | 838228.18 | 1523.90 | 1523.59 | 28.49 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 30 | 153 | 152.5 | 122.8 |
| LVWPS-U1-IW05A | UMCf | 26734965.08 | 838243.71 | 1524.36 | 1524.25 | 29.45 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 155.0 | 2 | 25 | 114 | 113.5 | 88.8 |
| LVWPS-U1-IW05B | UMCf | 26734965.09 | 838243.38 | 1524.36 | 1524.23 | 29.21 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 145.5 | 145 | 120.3 |
| LVWPS-U1-IW06A | UMCf | 26734945.21 | 838258.76 | 1524.91 | 1525.12 | 30.40 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 157.5 | 2 | 25 | 113 | 112.5 | 87.8 |
| LVWPS-U1-IW06B | UMCf | 26734945.02 | 838258.36 | 1524.91 | 1525.07 | 30.06 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 30 | 149.5 | 149 | 119.3 |
| LVWPS-U1-IW07A | UMCf | 26734925.20 | 838273.28 | 1529.08 | 1528.30 | 33.50 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 160.0 | 2 | 25 | 121 | 120.5 | 95.8 |
| LVWPS-U1-IW07B | UMCf | 26734925.28 | 838272.95 | 1529.08 | 1528.66 | 33.46 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 152.5 | 152 | 127.3 |
| LVWPS-U1-IW08A | UMCf | 26734905.81 | 838289.00 | 1529.69 | 1530.71 | 35.85 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 170.0 | 2 | 30 | 125.5 | 125 | 95.3 |
| LVWPS-U1-IW08B | UMCf | 26734905.38 | 838288.84 | 1529.69 | 1530.83 | 35.70 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 157 | 156.5 | 131.8 |
| LVWPS-U1-MW01A | UMCf | 26735054.25 | 838206.27 | 1526.30 | 1526.15 | 31.60 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 116.0 | 2 | 25 | 115.5 | 115 | 90.3 |
| LVWPS-U1-MW01B | UMCf | 26735052.48 | 838200.84 | 1525.78 | 1525.85 | 30.95 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 157.5 | 4 | 20 | 153.5 | 153 | 133.5 |
| LVWPS-U1-MW02A | UMCf | 26734972.90 | 838277.36 | 1529.90 | 1529.61 | 35.00 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 25 | 119.5 | 119 | 94.3 |
| LVWPS-U1-MW02B | UMCf | 26734976.53 | 838276.51 | 1529.75 | 1529.63 | 34.81 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 165.0 | 4 | 25 | 162 | 161.5 | 136.9 |
| LVWPS-U1-MW03B | UMCf | 26735108.31 | 838199.29 | 1527.13 | 1527.06 | 32.32 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 165.0 | 4 | 20 | 154.5 | 154 | 134.5 |
| LVWPS-U1-MW04A | UMCf | 26735021.39 | 838264.46 | 1529.55 | 1529.35 | 34.82 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 126.5 | 2 | 25 | 124.5 | 124 | 99.3 |
| LVWPS-U1-MW04B | UMCf | 26735026.82 | 838262.94 | 1529.47 | 1529.33 | 34.59 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 175.0 | 4 | 25 | 165 | 164.5 | 139.9 |
| LVWPS-U1-MW05A | UMCf | 26734947.22 | 838319.22 | 1530.32 | 1529.93 | 35.52 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 122.0 | 2 | 25 | 121 | 120.5 | 95.8 |
| LVWPS-U1-MW05B | UMCf | 26734951.22 | 838315.42 | 1530.45 | 1530.30 | 35.40 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 172.5 | 4 | 25 | 162 | 161.5 | 136.9 |
| LVWPS-U1-MW06A | UMCf | 26734986.21 | 838153.16 | 1523.81 | 1523.70 | 28.56 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 106.5 | 2 | 20 | 105.5 | 105 | 85.3 |
| LVWPS-U1-MW06B | UMCf | 26734991.82 | 838156.18 | 1524.09 | 1523.73 | 28.51 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 143.0 | 2 | 25 | 134.5 | 134 | 109.3 |
| LVWPS-U1-MW07 | UMCf | 26734907.19 | 838218.01 | 1525.17 | 1524.96 | 30.16 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 140.0 | 2 | 25 | 111.5 | 111 | 86.3 |
| LVWPS-U1-MW08A | UMCf | 26735014.52 | 838236.36 | 1524.11 | 1523.97 | 29.20 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 25 | 119 | 118.5 | 93.8 |
| LVWPS-U1-MW08B | UMCf | 26735017.13 | 838233.33 | 1523.84 | 1523.74 | 28.75 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 151.0 | 2 | 25 | 150.5 | 150 | 125.3 |
| LVWPS-U1-MW09A | UMCf | 26735032.96 | 838320.87 | 1529.36 | 1529.11 | 35.12 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 126.0 | 2 | 10 | 125.5 | 125 | 115.3 |
| LVWPS-U1-MW09B | UMCf | 26735025.78 | 838320.98 | 1529.37 | 1529.08 | 34.62 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 156.0 | 2 | 25 | 155.5 | 155 | 130.3 |
| LVWPS-U1-MW10A | UMCf | 26735085.42 | 838340.44 | 1527.11 | 1527.02 | 33.20 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 125.0 | 2 | 25 | 124.5 | 124 | 99.3 |
| LVWPS-U1-MW10B | UMCf | 26735081.08 | 838344.98 | 1527.40 | 1527.21 | 32.98 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 160.0 | 2 | 25 | 155.5 | 155 | 130.3 |
| **Zone 2 Study Area** | | | | | | | | | | | | | | | | | |
| LVWPS-A2-DR01A | Alluvium | 26734896.39 | 838889.65 | 1524.78 | 1524.77 | 31.90 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 72.0 | 2 | 35 | 71.5 | 71 | 36.3 |
| LVWPS-A2-DR01B | Alluvium | 26734896.42 | 838884.23 | 1524.80 | 1524.57 | 31.75 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 113.0 | 2 | 35 | 112.5 | 112 | 77.3 |
| LVWPS-A2-DR02A | Alluvium | 26734894.17 | 838964.08 | 1524.91 | 1524.65 | 32.00 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 52.5 | 2 | 15 | 52 | 51.5 | 36.8 |
| LVWPS-A2-DR02B | Alluvium | 26734896.56 | 838956.61 | 1524.91 | 1524.90 | 32.09 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 78.5 | 2 | 20 | 78 | 77.5 | 57.8 |
| LVWPS-A2-IW01A | Alluvium | 26734887.97 | 838782.98 | 1530.17 | 1529.79 | 36.44 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 105.0 | 2 | 25 | 66.5 | 66 | 41.3 |
| LVWPS-A2-IW01B | Alluvium | 26734888.00 | 838782.65 | 1530.17 | 1529.78 | 36.64 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 25 | 98 | 97.5 | 72.8 |
| LVWPS-A2-IW02A | Alluvium | 26734888.97 | 838815.84 | 1529.49 | 1529.01 | 35.88 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 110.0 | 2 | 30 | 69 | 68.5 | 38.8 |
| LVWPS-A2-IW02B | Alluvium | 26734889.05 | 838815.49 | 1529.49 | 1529.03 | 36.22 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 25 | 100.5 | 100 | 75.3 |
| LVWPS-A2-IW03A | Alluvium | 26734888.88 | 838851.00 | 1527.28 | 1526.93 | 33.94 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 115.0 | 2 | 30 | 67.5 | 67 | 37.3 |
| LVWPS-A2-IW03B | Alluvium | 26734889.18 | 838850.83 | 1527.28 | 1526.93 | 33.94 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 30 | 104 | 103.5 | 73.8 |

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**Table 1**
**Phase 2 Well Construction Details**
Las Vegas Wash Bioremediation Pilot Study

| Well ID | Screened Lithology | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Depth to Water[1] | Construction Type | Construction Material | Slot Size | Filter Pack Gradation | Borehole Diameter | Borehole Total Depth | Well Diameter | Nominal Screen Length | Well Total Depth | Bottom of Screen | Top of Screen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | feet amsl | feet amsl | feet bTOC | | | inches | | inches | feet bgs | inches | feet | feet bgs | feet bgs | feet bgs |
| LVWPS-A2-IW04A | Alluvium | 26734889.81 | 838887.08 | 1524.70 | 1524.57 | 31.70 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 115.0 | 2 | 35 | 71.5 | 71 | 36.3 |
| LVWPS-A2-IW04B | Alluvium | 26734890.02 | 838886.74 | 1524.70 | 1524.61 | 31.80 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 35 | 112.5 | 112 | 77.3 |
| LVWPS-A2-IW05A | Alluvium | 26734889.15 | 838921.04 | 1524.89 | 1524.86 | 32.05 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 105.0 | 2 | 25 | 63 | 62.5 | 37.8 |
| LVWPS-A2-IW05B | Alluvium | 26734889.30 | 838920.74 | 1524.89 | 1524.83 | 31.94 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 25 | 94 | 93.5 | 68.8 |
| LVWPS-A2-IW06A | Alluvium | 26734888.81 | 838957.92 | 1524.94 | 1524.91 | 32.20 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 80.0 | 2 | 15 | 52 | 51.5 | 36.8 |
| LVWPS-A2-IW06B | Alluvium | 26734888.84 | 838957.55 | 1524.94 | 1524.89 | 32.10 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 20 | 78 | 77.5 | 57.8 |
| LVWPS-A2-IW07A | Alluvium | 26734889.27 | 838991.11 | 1524.39 | 1524.31 | 31.57 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 85.0 | 2 | 15 | 50.5 | 50 | 35.3 |
| LVWPS-A2-IW07B | Alluvium | 26734889.32 | 838990.81 | 1524.39 | 1524.34 | 31.57 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 20 | 76.5 | 76 | 56.3 |
| LVWPS-A2-IW08A | Alluvium | 26734889.80 | 839026.35 | 1524.85 | 1524.74 | 32.10 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 90.0 | 2 | 20 | 56 | 55.5 | 35.8 |
| LVWPS-A2-IW08B | Alluvium | 26734889.91 | 839026.04 | 1524.85 | 1524.80 | 32.15 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 20 | 82 | 81.5 | 61.8 |
| LVWPS-A2-IW09A | Alluvium | 26734889.16 | 839061.18 | 1525.33 | 1525.37 | 32.68 | Dual-Nested | Schedule 40 PVC | 0.020 | #3 | 10 | 85.0 | 2 | 15 | 52 | 51.5 | 36.8 |
| LVWPS-A2-IW09B | Alluvium | 26734889.14 | 839060.89 | 1525.33 | 1525.37 | 32.69 | | Schedule 40 PVC | 0.020 | #3 | | | 2 | 15 | 74 | 73.5 | 58.8 |
| LVWPS-A2-MW01A | Alluvium | 26734838.04 | 838817.08 | 1526.61 | 1526.29 | 33.07 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 61 | 2 | 20 | 60.5 | 60 | 40.3 |
| LVWPS-A2-MW01B | Alluvium | 26734837.91 | 838821.64 | 1526.61 | 1526.16 | 33.09 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 91 | 2 | 20 | 90.5 | 90 | 70.3 |
| LVWPS-A2-MW02A | Alluvium | 26734839.33 | 838936.61 | 1527.83 | 1527.49 | 34.66 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 61 | 2 | 20 | 60.5 | 60 | 40.3 |
| LVWPS-A2-MW02B | Alluvium | 26734839.33 | 838940.48 | 1527.88 | 1527.62 | 34.55 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 91 | 2 | 20 | 90.5 | 90 | 70.3 |
| LVWPS-A2-MW03A | Alluvium | 26734839.87 | 839041.77 | 1528.00 | 1527.72 | 34.95 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 60 | 2 | 20 | 58.5 | 58 | 38.3 |
| LVWPS-A2-MW03B | Alluvium | 26734839.96 | 839046.05 | 1528.02 | 1527.68 | 34.90 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 85 | 2 | 20 | 84.5 | 84 | 64.3 |
| LVWPS-A2-MW04A | Alluvium | 26734900.17 | 838770.49 | 1527.54 | 1527.55 | 34.24 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 64.5 | 2 | 20 | 64 | 63.5 | 43.8 |
| LVWPS-A2-MW04B | Alluvium | 26734901.60 | 838772.88 | 1528.17 | 1527.86 | 34.91 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 96.0 | 2 | 20 | 95.5 | 95 | 75.3 |
| LVWPS-A2-MW05A | Alluvium | 26734901.04 | 839073.31 | 1524.49 | 1524.18 | 31.50 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 53.0 | 2 | 15 | 52 | 51.5 | 36.8 |
| LVWPS-A2-MW05B | Alluvium | 26734903.12 | 839070.97 | 1524.49 | 1524.29 | 31.68 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 75.0 | 2 | 15 | 74 | 73.5 | 58.8 |
| LVWPS-A2-MW08A | Alluvium | 26734933.48 | 838815.75 | 1529.44 | 1529.35 | 36.36 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 56.0 | 2 | 15 | 55.5 | 55 | 40.3 |
| LVWPS-A2-MW08B | Alluvium | 26734937.17 | 838818.51 | 1529.20 | 1528.84 | 35.90 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 81.3 | 2 | 20 | 80 | 79.5 | 59.8 |
| LVWPS-A2-MW08C | Alluvium | 26734938.06 | 838813.32 | 1529.24 | 1528.93 | 36.25 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 110.0 | 2 | 20 | 106.5 | 106 | 86.3 |
| LVWPS-A2-MW09A | Alluvium | 26734942.12 | 839052.25 | 1523.77 | 1523.56 | 30.91 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 56.0 | 2 | 20 | 55 | 54.5 | 34.8 |
| LVWPS-A2-MW09B | Alluvium | 26734943.95 | 839045.22 | 1523.85 | 1523.67 | 31.31 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 85.0 | 2 | 20 | 79 | 78.5 | 58.8 |
| LVWPS-A2-MW11A | Alluvium | 26734984.76 | 838791.31 | 1528.05 | 1528.00 | 35.10 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 61.5 | 2 | 20 | 60.5 | 60 | 40.3 |
| LVWPS-A2-MW11B | Alluvium | 26734986.77 | 838787.83 | 1528.01 | 1527.79 | 35.06 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 86.0 | 2 | 20 | 85.5 | 85 | 65.3 |
| LVWPS-A2-MW11C | Alluvium | 26734987.49 | 838793.00 | 1528.09 | 1527.81 | 35.36 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 114.0 | 2 | 20 | 110.5 | 110 | 90.3 |
| LVWPS-A2-MW12A | Alluvium | 26734988.20 | 838951.66 | 1523.08 | 1522.85 | 30.24 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 46.0 | 2 | 10 | 45 | 44.5 | 34.9 |
| LVWPS-A2-MW12B | Alluvium | 26734989.46 | 838955.96 | 1523.15 | 1522.94 | 30.48 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 75.0 | 2 | 20 | 69.5 | 69 | 49.3 |
| LVWPS-A2-MW13A | Alluvium | 26734986.06 | 839098.37 | 1523.62 | 1523.23 | 31.00 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 62.0 | 2 | 20 | 61.5 | 61 | 41.3 |
| LVWPS-A2-MW13B | Alluvium | 26734989.09 | 839099.95 | 1523.60 | 1523.40 | 31.44 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 90.0 | 2 | 20 | 86.6 | 86.1 | 66.4 |
| LVWPS-A2-MW14A | Alluvium | 26734938.41 | 838942.48 | 1524.15 | 1523.84 | 31.16 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 51.5 | 2 | 15 | 51 | 50.5 | 35.8 |
| LVWPS-A2-MW14B | Alluvium | 26734938.74 | 838946.20 | 1524.51 | 1524.32 | 31.70 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 80.0 | 2 | 20 | 75 | 74.5 | 54.8 |
| LVWPS-A2-MW15A | Alluvium | 26735094.04 | 838828.85 | 1521.20 | 1520.95 | 28.70 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 61.0 | 2 | 20 | 60 | 59.5 | 39.8 |
| LVWPS-A2-MW15B | Alluvium | 26735101.30 | 838829.49 | 1521.68 | 1521.37 | 29.34 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 110.0 | 2 | 20 | 90.5 | 90 | 70.3 |
| LVWPS-A2-MW16A | Alluvium | 26735252.27 | 838928.69 | 1520.47 | 1520.73 | 29.34 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 56.0 | 2 | 20 | 56 | 55.5 | 35.8 |
| LVWPS-A2-MW16B | Alluvium | 26735258.00 | 838931.03 | 1520.25 | 1520.51 | 29.21 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 90.0 | 2 | 20 | 80.5 | 80 | 60.3 |
| LVWPS-A2-MW17A | Alluvium | 26734983.57 | 838866.47 | 1526.43 | 1526.35 | 33.65 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 61.5 | 2 | 20 | 60.5 | 60 | 40.3 |
| LVWPS-A2-MW17B | Alluvium | 26734985.17 | 838863.03 | 1526.25 | 1526.26 | 33.65 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 86.0 | 2 | 20 | 85.5 | 85 | 65.3 |
| LVWPS-A2-MW17C | Alluvium | 26734989.37 | 838862.92 | 1526.03 | 1525.81 | 33.86 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 115.5 | 2 | 20 | 110.5 | 110 | 90.3 |
| LVWPS-U2-DR01 | UMCf | 26734896.14 | 838880.43 | 1524.84 | 1524.74 | 32.06 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 142.0 | 2 | 20 | 141.5 | 141 | 121.3 |
| LVWPS-U2-DR02 | UMCf | 26734896.48 | 838953.23 | 1524.85 | 1524.76 | 32.25 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 109.5 | 2 | 25 | 109 | 108.5 | 83.8 |
| LVWPS-U2-IW01 | UMCf | 26734889.36 | 838880.42 | 1524.71 | 1524.63 | 32.09 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 155.0 | 2 | 20 | 141.5 | 141 | 121.2 |
| LVWPS-U2-IW02 | UMCf | 26734889.50 | 838905.01 | 1525.09 | 1525.07 | 32.55 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 145.0 | 2 | 25 | 141.5 | 141 | 116.2 |

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**Table 1**
**Phase 2 Well Construction Details**
Las Vegas Wash Bioremediation Pilot Study

| Well ID | Screened Lithology | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Depth to Water[1] | Construction Type | Construction Material | Slot Size | Filter Pack Gradation | Borehole Diameter | Borehole Total Depth | Well Diameter | Nominal Screen Length | Well Total Depth | Bottom of Screen | Top of Screen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | feet amsl | feet amsl | feet bTOC | | | inches | | inches | feet bgs | inches | feet | feet bgs | feet bgs | feet bgs |
| LVWPS-U2-IW03 | UMCf | 26734889.40 | 838930.38 | 1524.99 | 1524.91 | 32.25 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 125.0 | 2 | 25 | 124.5 | 124 | 99.2 |
| LVWPS-U2-IW04 | UMCf | 26734888.87 | 838954.79 | 1524.89 | 1524.84 | 32.10 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 145.0 | 2 | 25 | 109 | 108.5 | 83.7 |
| LVWPS-U2-IW05 | UMCf | 26734889.80 | 838980.34 | 1524.54 | 1524.54 | 32.80 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 30 | 118 | 117.5 | 87.7 |
| LVWPS-U2-IW06 | UMCf | 26734889.08 | 839005.30 | 1524.82 | 1524.70 | 32.52 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 15 | 104.5 | 104 | 89.2 |
| LVWPS-U2-IW07 | UMCf | 26734889.76 | 839029.85 | 1524.95 | 1524.98 | 32.40 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 15 | 106.5 | 106 | 91.2 |
| LVWPS-U2-IW08 | UMCf | 26734889.41 | 839055.50 | 1525.34 | 1525.29 | 32.72 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 25 | 109 | 108.5 | 83.7 |
| LVWPS-U2-IW09 | UMCf | 26734886.72 | 838779.73 | 1529.53 | 1529.26 | 36.22 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 130.0 | 2 | 25 | 128.5 | 128 | 103.2 |
| LVWPS-U2-IW10 | UMCf | 26734887.07 | 838805.16 | 1529.51 | 1529.59 | 36.72 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 135.0 | 2 | 20 | 129.5 | 129 | 109.3 |
| LVWPS-U2-IW11 | UMCf | 26734886.91 | 838830.51 | 1528.30 | 1528.02 | 35.26 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 135.0 | 2 | 25 | 134.2 | 133.7 | 108.9 |
| LVWPS-U2-IW12 | UMCf | 26734889.28 | 838856.13 | 1526.66 | 1526.14 | 33.53 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 139.0 | 2 | 25 | 138 | 137.5 | 112.8 |
| LVWPS-U2-MW01 | UMCf | 26734837.77 | 838825.83 | 1526.69 | 1526.40 | 33.42 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 125 | 2 | 20 | 117.5 | 117 | 97.3 |
| LVWPS-U2-MW02 | UMCf | 26734839.36 | 838945.11 | 1527.94 | 1527.68 | 35.20 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 126 | 2 | 25 | 125.5 | 125 | 100.3 |
| LVWPS-U2-MW03 | UMCf | 26734839.69 | 839050.30 | 1527.99 | 1527.66 | 34.91 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115 | 2 | 20 | 110.5 | 110 | 90.3 |
| LVWPS-U2-MW04 | UMCf | 26734895.79 | 838771.90 | 1528.66 | 1528.35 | 35.35 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 130.0 | 2 | 25 | 128.5 | 128 | 103.2 |
| LVWPS-U2-MW05 | UMCf | 26734897.24 | 839064.72 | 1524.94 | 1524.76 | 32.20 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 110.0 | 2 | 25 | 108.5 | 108 | 83.2 |
| LVWPS-U2-MW06 | UMCf | 26734914.99 | 838875.13 | 1525.48 | 1524.89 | 32.40 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 142.5 | 2 | 20 | 142 | 141.5 | 121.8 |
| LVWPS-U2-MW07 | UMCf | 26734914.74 | 839095.07 | 1524.53 | 1524.37 | 31.82 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 20 | 108.5 | 108 | 88.2 |
| LVWPS-U2-MW08 | UMCf | 26734941.29 | 838816.82 | 1529.11 | 1528.75 | 36.21 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 135.0 | 2 | 20 | 133.5 | 133 | 113.2 |
| LVWPS-U2-MW09 | UMCf | 26734941.56 | 839048.32 | 1523.83 | 1523.62 | 31.61 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 20 | 105.2 | 104.7 | 84.9 |
| LVWPS-U2-MW10 | UMCf | 26734942.01 | 839149.60 | 1525.67 | 1525.57 | 34.12 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 20 | 110.5 | 110 | 90.2 |
| LVWPS-U2-MW12 | UMCf | 26734992.74 | 838953.32 | 1523.09 | 1522.89 | 31.20 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 110.0 | 2 | 25 | 108.5 | 108 | 83.2 |
| LVWPS-U2-MW13 | UMCf | 26734988.97 | 839095.12 | 1523.52 | 1523.42 | 31.89 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 120.0 | 2 | 15 | 110 | 109.5 | 94.7 |
| LVWPS-U2-MW14 | UMCf | 26734939.25 | 838950.26 | 1524.77 | 1524.30 | 32.70 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 110.0 | 2 | 25 | 108.5 | 108 | 83.2 |
| LVWPS-U2-MW17 | UMCf | 26734987.32 | 838868.87 | 1526.17 | 1525.88 | 34.19 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 137.7 | 2 | 20 | 137 | 136.5 | 117 |
| LVWPS-U2-MW18 | UMCf | 26734914.05 | 838993.79 | 1524.16 | 1524.09 | 32.53 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 114.0 | 2 | 25 | 113.5 | 113 | 88.3 |
| LVWPS-U2-MW19 | UMCf | 26734889.37 | 839106.34 | 1525.18 | 1525.07 | 32.71 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 20 | 111.5 | 111 | 91.2 |
| LVWPS-U2-MW20 | UMCf | 26734889.93 | 839153.61 | 1525.44 | 1525.24 | 32.98 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 20 | 108.5 | 108 | 88.2 |
| LVWPS-BH01 | --- | 26734872.28 | 838780.13 | 1530.46 | --- | --- | Soil Boring | --- | --- | --- | 6 | 105.0 | --- | --- | --- | --- | --- |
| **Zone 3 Study Area** | | | | | | | | | | | | | | | | | |
| LVWPS-A3-DR01 | Alluvium | 26734911.52 | 839503.33 | 1522.87 | 1522.71 | 30.41 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 76.5 | 2 | 20 | 76 | 75.5 | 55.8 |
| LVWPS-A3-MW02 | Alluvium | 26734944.12 | 839475.20 | 1522.61 | 1522.39 | 30.30 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 85.0 | 2 | 20 | 73 | 72.5 | 52.8 |
| LVWPS-A3-MW06 | Alluvium | 26734960.45 | 839530.77 | 1522.32 | 1521.99 | 30.03 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 76.0 | 2 | 20 | 75.5 | 75 | 55.3 |
| LVWPS-A3-MW07 | Alluvium | 26734843.39 | 839449.63 | 1525.17 | 1525.06 | 32.48 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 75 | 2 | 20 | 75 | 74.5 | 54.8 |
| LVWPS-A3-MW08 | Alluvium | 26734864.46 | 839588.62 | 1525.58 | 1525.30 | 32.90 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 110 | 2 | 20 | 105 | 104.5 | 84.8 |
| LVWPS-A3-MW10 | Alluvium | 26734994.40 | 839445.10 | 1521.78 | 1521.72 | 30.06 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 77.0 | 2 | 20 | 76.5 | 76 | 56.3 |
| LVWPS-A3-MW11 | Alluvium | 26735007.80 | 839556.93 | 1521.33 | 1521.36 | 29.41 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 80.0 | 2 | 20 | 74 | 73.5 | 53.8 |
| LVWPS-A3-MW12 | Alluvium | 26735042.88 | 839483.87 | 1520.86 | 1520.75 | 29.13 | Single | Schedule 40 PVC | 0.020 | #3 | 6 | 80.0 | 2 | 20 | 79.5 | 79 | 59.3 |
| LVWPS-U3-DR01A | UMCf-cg | 26734912.10 | 839506.61 | 1522.95 | 1522.72 | 30.55 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 124.5 | 2 | 30 | 123.5 | 123 | 93.3 |
| LVWPS-U3-DR01B | UMCf-cg | 26734912.55 | 839510.18 | 1522.84 | 1522.69 | 30.71 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 160.0 | 2 | 30 | 159.5 | 159 | 129.3 |
| LVWPS-U3-DR02A | UMCf-cg | 26734924.88 | 839575.78 | 1523.27 | 1523.13 | 30.96 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 112.5 | 2 | 25 | 111.5 | 111 | 86.3 |
| LVWPS-U3-DR02B | UMCf-cg | 26734925.39 | 839579.10 | 1523.15 | 1522.98 | 31.05 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 144.0 | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-DR02C | UMCf-cg | 26734925.79 | 839582.56 | 1523.10 | 1522.90 | 31.03 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 175.0 | 2 | 25 | 174.5 | 174 | 149.3 |
| LVWPS-U3-IW01 | UMCf-cg | 26734893.19 | 839433.14 | 1522.95 | 1525.61 | 34.12 | Single | Schedule 40 PVC | 0.010 | #2/16 | 10 | 118.0 | 2 | 35 | 115.5 | 115 | 80.2 |
| LVWPS-U3-IW02A | UMCf-cg | 26734896.96 | 839458.60 | 1522.81 | 1524.20 | 33.32 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 128.0 | 2 | 20 | 99.5 | 99 | 79.3 |
| LVWPS-U3-IW02B | UMCf-cg | 26734896.77 | 839458.31 | 1522.81 | 1524.22 | 32.78 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 20 | 125 | 124.5 | 104.8 |
| LVWPS-U3-IW03A | UMCf-cg | 26734901.01 | 839482.33 | 1522.92 | 1524.25 | 32.31 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 144.0 | 2 | 25 | 103 | 102.5 | 77.8 |
| LVWPS-U3-IW03B | UMCf-cg | 26734901.38 | 839482.28 | 1522.92 | 1524.33 | 32.61 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 30 | 139.5 | 139 | 109.3 |
| LVWPS-U3-IW04A | UMCf-cg | 26734905.65 | 839507.50 | 1523.09 | 1522.80 | 30.46 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 160.0 | 2 | 30 | 123.5 | 123 | 93.3 |
| LVWPS-U3-IW04B | UMCf-cg | 26734905.89 | 839507.21 | 1523.09 | 1522.81 | 30.87 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 30 | 159.5 | 159 | 129.3 |
| LVWPS-U3-IW05A | UMCf-cg | 26734909.80 | 839531.81 | 1522.62 | 1522.80 | 31.46 | Dual-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 175.0 | 2 | 35 | 126.5 | 126 | 91.3 |
| LVWPS-U3-IW05B | UMCf-cg | 26734909.78 | 839531.47 | 1522.62 | 1522.80 | 30.58 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 35 | 168 | 167.5 | 132.8 |
| LVWPS-U3-IW06A | UMCf-cg | 26734914.65 | 839556.40 | 1522.79 | 1522.83 | 30.52 | Triple-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 175.0 | 2 | 25 | 111.5 | 111 | 86.3 |
| LVWPS-U3-IW06B | UMCf-cg | 26734914.56 | 839556.00 | 1522.79 | 1522.89 | 30.68 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-IW06C | UMCf-cg | 26734914.32 | 839556.27 | 1522.79 | 1522.85 | 31.02 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 174.5 | 174 | 149.3 |
| LVWPS-U3-IW07A | UMCf-cg | 26734918.75 | 839580.97 | 1523.32 | 1523.03 | 30.80 | Triple-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 175.0 | 2 | 25 | 111.5 | 111 | 86.3 |
| LVWPS-U3-IW07B | UMCf-cg | 26734918.38 | 839580.95 | 1523.32 | 1523.03 | 31.02 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-IW07C | UMCf-cg | 26734918.60 | 839580.61 | 1523.32 | 1523.03 | 31.02 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 174.5 | 174 | 149.3 |
| LVWPS-U3-IW08A | UMCf-cg | 26734923.35 | 839605.13 | 1523.23 | 1523.11 | 30.87 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 111.5 | 111 | 86.3 |

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**Table 1**
**Phase 2 Well Construction Details**
Las Vegas Wash Bioremediation Pilot Study

| Well ID | Screened Lithology | Northing | Easting | Ground Surface Elevation | Top of Casing Elevation | Depth to Water[1] | Construction Type | Construction Material | Slot Size | Filter Pack Gradation | Borehole Diameter | Borehole Total Depth | Well Diameter | Nominal Screen Length | Well Total Depth | Bottom of Screen | Top of Screen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | feet amsl | feet amsl | feet bTOC | | | inches | | inches | feet bgs | inches | feet | feet bgs | feet bgs | feet bgs |
| LVWPS-U3-IW08B | UMCf-cg | 26734923.06 | 839605.34 | 1523.23 | 1523.09 | 31.08 | Triple-Nested | Schedule 40 PVC | 0.010 | #2/16 | 10 | 175.0 | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-IW08C | UMCf-cg | 26734923.00 | 839604.97 | 1523.23 | 1523.10 | 31.05 | | Schedule 40 PVC | 0.010 | #2/16 | | | 2 | 25 | 174.5 | 174 | 149.3 |
| LVWPS-U3-MW01B | UMCf-cg | 26734942.69 | 839376.18 | 1522.54 | 1522.41 | 30.90 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 107.5 | 4 | 20 | 103.8 | 103.3 | 83.8 |
| LVWPS-U3-MW02A | UMCf-cg | 26734948.75 | 839479.60 | 1522.40 | 1522.13 | 30.42 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 98.5 | 2 | 15 | 97.5 | 97 | 82.3 |
| LVWPS-U3-MW02B | UMCf-cg | 26734943.22 | 839481.31 | 1522.50 | 1522.21 | 30.76 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 130.0 | 4 | 20 | 123 | 122.5 | 103 |
| LVWPS-U3-MW03A | UMCf-cg | 26734944.17 | 839583.42 | 1522.80 | 1522.68 | 30.60 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 112.5 | 2 | 25 | 111.5 | 111 | 86.3 |
| LVWPS-U3-MW03B | UMCf-cg | 26734944.11 | 839576.72 | 1522.86 | 1522.49 | 30.68 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 179.0 | 4 | 25 | 176.2 | 175.7 | 151.1 |
| LVWPS-U3-MW03C | UMCf-cg | 26734949.67 | 839579.79 | 1522.47 | 1522.21 | 30.32 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 143.5 | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-MW04B | UMCf-cg | 26734968.11 | 839326.96 | 1522.25 | 1521.92 | 30.36 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 102.5 | 4 | 20 | 98.2 | 97.7 | 78.2 |
| LVWPS-U3-MW05B | UMCf-cg | 26734968.70 | 839425.48 | 1522.17 | 1521.98 | 30.50 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 112.5 | 4 | 20 | 105.2 | 104.7 | 85.2 |
| LVWPS-U3-MW06A | UMCf-cg | 26734962.99 | 839525.84 | 1522.04 | 1521.91 | 30.10 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 116.5 | 2 | 25 | 115.5 | 115 | 90.3 |
| LVWPS-U3-MW06B | UMCf-cg | 26734965.59 | 839528.63 | 1522.18 | 1521.92 | 30.20 | Single | Schedule 80 PVC | 0.010 | #2/16 | 8 | 152.5 | 4 | 25 | 150.4 | 149.9 | 125.3 |
| LVWPS-U3-MW07A | UMCf-cg | 26734843.54 | 839454.21 | 1525.21 | 1524.95 | 32.40 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 100 | 2 | 15 | 98 | 97.5 | 82.8 |
| LVWPS-U3-MW07B | UMCf-cg | 26734843.26 | 839458.27 | 1525.26 | 1524.93 | 32.87 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 126 | 2 | 20 | 125 | 124.5 | 104.8 |
| LVWPS-U3-MW08A | UMCf-cg | 26734863.82 | 839592.64 | 1525.64 | 1525.45 | 33.40 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 145 | 2 | 25 | 143 | 142.5 | 117.8 |
| LVWPS-U3-MW08B | UMCf-cg | 26734863.16 | 839597.03 | 1525.70 | 1525.28 | 33.21 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 175 | 2 | 25 | 174.5 | 174 | 149.3 |
| LVWPS-U3-MW09 | UMCf-cg | 26734922.06 | 839452.86 | 1522.74 | 1525.38 | 34.00 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 115.0 | 2 | 25 | 108 | 107.5 | 82.8 |
| LVWPS-U3-MW10A | UMCf-cg | 26734997.78 | 839440.95 | 1521.78 | 1521.47 | 30.09 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 97.0 | 2 | 10 | 95.5 | 95 | 85.3 |
| LVWPS-U3-MW10B | UMCf-cg | 26734999.52 | 839447.11 | 1521.68 | 1521.55 | 30.14 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 130.0 | 2 | 20 | 121.5 | 121 | 101.3 |
| LVWPS-U3-MW11A | UMCf-cg | 26735013.48 | 839552.91 | 1521.42 | 1521.39 | 29.79 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 107.5 | 2 | 20 | 106.5 | 106 | 86.3 |
| LVWPS-U3-MW11B | UMCf-cg | 26735014.90 | 839559.83 | 1521.28 | 1521.35 | 29.91 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 138.0 | 2 | 25 | 137.5 | 137 | 112.3 |
| LVWPS-U3-MW11C | UMCf-cg | 26735017.93 | 839555.86 | 1521.33 | 1521.20 | 29.83 | Single | Schedule 80 PVC | 0.010 | #2/16 | 6 | 170.0 | 2 | 20 | 163.4 | 163 | 143.3 |
| LVWPS-U3-MW12A | UMCf-cg | 26735045.73 | 839479.41 | 1521.01 | 1520.83 | 29.40 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 109.5 | 2 | 20 | 108.5 | 108 | 88.3 |
| LVWPS-U3-MW12B | UMCf-cg | 26735047.74 | 839484.29 | 1520.91 | 1520.74 | 29.36 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 140.0 | 2 | 25 | 138.5 | 138 | 113.3 |
| LVWPS-U3-MW13A | UMCf-cg | 26734933.25 | 839516.75 | 1522.40 | 1522.24 | 30.21 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 122.5 | 2 | 25 | 121.5 | 121 | 96.3 |
| LVWPS-U3-MW13B | UMCf-cg | 26734934.09 | 839522.37 | 1522.01 | 1521.91 | 30.00 | Single | Schedule 40 PVC | 0.010 | #2/16 | 6 | 155.0 | 2 | 15 | 148 | 147.5 | 132.8 |
| **Extraction Wells** | | | | | | | | | | | | | | | | | |
| LVWPS-EW01 | Alluvium | 26734957.94 | 838426.21 | 1530.03 | 1529.74 | 35.74 | Single | Schedule 40 PVC with Stainless Steel Wire Wrap Screen | 0.020 | 12-20 | 10 | 95.0 | 6 | 40 | 85 | 84.5 | 44.8 |
| LVWPS-EW02 | Alluvium | 26734885.98 | 838507.29 | 1523.66 | 1523.25 | 29.20 | Single | Schedule 40 PVC with Stainless Steel Wire Wrap Screen | 0.020 | 12-20 | 10 | 61.0 | 6 | 30 | 58.5 | 58 | 28.3 |
| LVWPS-EW03 | Alluvium | 26734886.94 | 838621.90 | 1523.14 | 1522.70 | 28.95 | Single | Schedule 40 PVC with Stainless Steel Wire Wrap Screen | 0.020 | 12-20 | 10 | 81.0 | 6 | 30 | 70.5 | 70 | 40.3 |
| LVWPS-EW04 | Alluvium | 26734947.54 | 838573.33 | 1522.40 | 1521.92 | 28.20 | Single | Schedule 40 PVC with Stainless Steel Wire Wrap Screen | 0.020 | 12-20 | 10 | 47.0 | 6 | 20 | 46.5 | 46 | 26.3 |
| LVWPS-EW05 | Alluvium | 26734978.54 | 838497.51 | 1529.76 | 1529.42 | 35.60 | Single | Schedule 40 PVC with Stainless Steel Wire Wrap Screen | 0.020 | 12-20 | 10 | 81.0 | 6 | 30 | 80.5 | 80 | 50.3 |

Notes
amsl - above mean sea level
bgs - below ground surface
bTOC - below top of casing
PVC - polyvinyl chloride
UMCf - Upper Muddy Creek formation
UMCf-cg - Upper Muddy Creek formation - coarse grained facies
UMCf/Horse Springs- Alternating layers of UMCf, semi-consolidated UMCf, and reworked Horse Springs formation.
UMCf (Semi-Cons) - Semi-consolidated Upper Muddy Creek formation
--- Not Applicable
1. Depth to water measurements collected in October 2020.
2. Well names including IW indicate an injection well. Well names including DR indicate a dose response well. Well names including MW indicate a monitoring well. Well names including EW indicate an extraction well.

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| **Zone 1** | | | | | | | | | | | | | |
| LVWPS-A1-MW06 | 9/29/2020 | N | BL04 | Upgradient | -60 | Qal | 59.3 - 79.0 | 1,900 | 9,000 | 13 | 1,300 | 1.4 | 1.16 |
| LVWPS-A1-MW06 | 1/14/2021 | N | EM02 | Upgradient | -60 | Qal | 59.3 - 79.0 | 3,200 J | 11,000 | 15 | 1,500 | 1.5 | 1.38 |
| LVWPS-A1-MW06 | 1/14/2021 | FD | EM02 | Upgradient | -60 | Qal | 59.3 - 79.0 | 2,300 J | 11,000 | 15 | 1,600 | 1.4 | ---- |
| LVWPS-A1-MW06 | 2/9/2021 | N | EM04 | Upgradient | -60 | Qal | 59.3 - 79.0 | 2,300 | 11,000 | 15 | 1,500 | 1.5 J- | 1.07 |
| LVWPS-A1-MW06 | 2/9/2021 | FD | EM04 | Upgradient | -60 | Qal | 59.3 - 79.0 | 2,300 | 11,000 | 15 | 1,500 | 1.3 J- | ---- |
| LVWPS-A1-MW06 | 3/9/2021 | N | EM05 | Upgradient | -60 | Qal | 59.3 - 79.0 | 2,300 | 11,000 | 15 | 1,600 | 1.4 | 1.22 |
| LVWPS-A1-MW06 | 3/9/2021 | FD | EM05 | Upgradient | -60 | Qal | 59.3 - 79.0 | 2,400 | 11,000 | 15 | 1,600 | 1.5 | ---- |
| LVWPS-A1-MW06 | 4/9/2021 | N | EM06 | Upgradient | -60 | Qal | 59.3 - 79.0 | 1,900 | 13,000 | 14 | 1,400 | 1.4 | 1.40 |
| LVWPS-A1-MW06 | 4/9/2021 | FD | EM06 | Upgradient | -60 | Qal | 59.3 - 79.0 | 1,900 | 11,000 | 14 | 1,400 | 1.5 | ---- |
| LVWPS-A1-MW06 | 6/9/2021 | N | EM08 | Upgradient | -60 | Qal | 59.3 - 79.0 | 1,900 | 9,700 | 15 | 1,300 | 1.4 | 0.85 |
| LVWPS-A1-MW06 | 6/9/2021 | FD | EM08 | Upgradient | -60 | Qal | 59.3 - 79.0 | 1,900 | 9,900 | 15 | 1,700 | 1.3 | ---- |
| LVWPS-A1-MW07 | 9/30/2020 | N | BL04 | Upgradient | -60 | Qal | 58.3 - 78.0 | 2,900 | 16,000 | 19 | 1,900 | 1.6 | 1.43 |
| LVWPS-A1-MW07 | 1/14/2021 | N | EM02 | Upgradient | -60 | Qal | 58.3 - 78.0 | 3,200 | 17,000 | 20 | 2,200 | 1.6 | 1.22 |
| LVWPS-A1-MW07 | 2/10/2021 | N | EM04 | Upgradient | -60 | Qal | 58.3 - 78.0 | 3,400 | 17,000 | 19 | 2,200 | 1.6 | 1.08 |
| LVWPS-A1-MW07 | 3/9/2021 | N | EM05 | Upgradient | -60 | Qal | 58.3 - 78.0 | 3,400 | 17,000 | 20 | 2,200 | 1.5 | 1.21 |
| LVWPS-A1-MW07 | 4/7/2021 | N | EM06 | Upgradient | -60 | Qal | 58.3 - 78.0 | 3,100 | 17,000 | 18 | 2,000 | 1.4 J+ | 1.25 |
| LVWPS-A1-MW07 | 6/9/2021 | N | EM08 | Upgradient | -60 | Qal | 58.3 - 78.0 | 3,200 | 20,000 | 18 | 2,700 | 1.4 | 1.01 |
| LVWPS-U1-MW06A | 9/29/2020 | N | BL04 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,100 | 3,300 | 11 | 970 | 1.5 | 0.98 |
| LVWPS-U1-MW06A | 1/14/2021 | N | EM02 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,300 | 3,300 | 9.0 | 1,100 | 2.0 | 0.84 |
| LVWPS-U1-MW06A | 2/9/2021 | N | EM04 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,300 | 3,000 | 10 | 990 | 1.4 J- | 0.52 |
| LVWPS-U1-MW06A | 3/10/2021 | N | EM05 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,400 | 3,100 | 10 | 1,100 | 1.5 | 0.70 |
| LVWPS-U1-MW06A | 4/12/2021 | N | EM06 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,300 | 3,100 | 11 J- | 970 | 1.9 J | 0.83 |
| LVWPS-U1-MW06A | 6/9/2021 | N | EM08 | Upgradient | -60 | UMCf | 85.3 - 105.0 | 1,300 | 3,600 | 11 | 960 | 1.4 | 0.38 |
| LVWPS-U1-MW06B | 9/29/2020 | N | BL04 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 1,700 | 3,800 | 11 | 1,000 | 1.7 | 1.03 |
| LVWPS-U1-MW06B | 1/12/2021 | N | EM02 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 21 | 8.7 J | 0.17 J | 1,100 | 12 | 0.27 |
| LVWPS-U1-MW06B | 2/10/2021 | N | EM04 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 1,000 | 1,400 | 2.0 | 1,100 | 1.9 | 0.74 |
| LVWPS-U1-MW06B | 3/10/2021 | N | EM05 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 1,300 | 2,300 | 4.4 | 1,200 | 1.8 J | 0.38 |
| LVWPS-U1-MW06B | 4/8/2021 | N | EM06 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 1,200 | 2,600 | 6.4 | 1,000 | 2.0 | 1.05 |
| LVWPS-U1-MW06B | 6/9/2021 | N | EM08 | Upgradient | -60 | UMCf | 109.3 - 134.0 | 1,400 | 3,100 | 8.2 | 1,000 | 1.7 J | 0.72 |
| LVWPS-U1-MW07 | 9/30/2020 | N | BL04 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 4,100 | 7,700 | 5.6 | 2,000 | 0.84 | 3.78 |
| LVWPS-U1-MW07 | 1/14/2021 | N | EM02 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 430 | 110 | <0.014 | 1,700 | 210 | 0.73 |
| LVWPS-U1-MW07 | 2/10/2021 | N | EM04 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 370 | 180 | 0.081 | 1,600 | 180 | 0.38 |
| LVWPS-U1-MW07 | 3/12/2021 | N | EM05 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 1,300 | 2,000 | 0.42 | 1,800 | 19 J+ | 0.32 |
| LVWPS-U1-MW07 | 4/7/2021 | N | EM06 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 2,500 | 2,600 | 0.41 | 2,000 | 16 J+ | 0.40 |
| LVWPS-U1-MW07 | 6/10/2021 | N | EM08 | Upgradient | -60 | UMCf | 86.3 - 111.0 | 4,000 | 3,300 | 1.9 | 1,700 | 3.9 | 0.04 |
| LVWPS-U1-IW01A | 9/29/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 88.8 - 113.5 | 9,700 | 18,000 | 14 | ---- | ---- | 0.86 |
| LVWPS-U1-IW01B | 9/29/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 120.3 - 145.0 | 7,800 | 13,000 | 13 | ---- | ---- | 0.80 |
| LVWPS-U1-IW02A | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 90.3 - 115.0 | 2,200 | 5,000 | 11 | ---- | ---- | 0.68 |
| LVWPS-U1-IW02B | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 121.3 - 151.0 | 3,400 | 6,900 | 9.8 | ---- | ---- | 1.82 |
| LVWPS-U1-IW03A | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 93.8 - 118.5 | 2,500 | 5,200 | 13 | ---- | ---- | 0.68 |
| LVWPS-U1-IW03B | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 125.3 - 150.0 | 1,400 | 3,900 | 10 | ---- | ---- | 2.18 |
| LVWPS-U1-IW04A | 9/28/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 86.8 - 116.5 | 3,500 | 6,600 | 12 | ---- | ---- | 0.53 |
| LVWPS-U1-IW04A | 9/28/2020 | FD | BL04 | Injection Well Transect | 0 | UMCf | 86.8 - 116.5 | 3,500 | 6,600 | 12 | ---- | ---- | ---- |
| LVWPS-U1-IW04B | 9/28/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 122.8 - 152.5 | 3,400 | 4,800 | 11 | ---- | ---- | 2.37 |
| LVWPS-U1-IW05A | 9/29/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 88.8 - 113.5 | 2,100 | 4,300 | 10 | ---- | ---- | 0.51 |
| LVWPS-U1-IW05B | 9/29/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 120.3 - 145.0 | 2,500 | 5,100 | 11 | ---- | ---- | 1.34 |
| LVWPS-U1-IW06A | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 87.8 - 112.5 | 2,400 | 3,600 | 8.5 | ---- | ---- | 1.60 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U1-IW06B | 9/30/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 119.3 - 149.0 | 2,500 | 3,900 | 10 | ---- | ---- | 2.07 |
| LVWPS-U1-IW07A | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 95.8 - 120.5 | 3,100 | 4,500 | 9.5 | ---- | ---- | 3.39 |
| LVWPS-U1-IW07B | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 127.3 - 152.0 | 4,300 | 4,900 | 9.5 | ---- | ---- | 2.21 |
| LVWPS-U1-IW08A | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 95.3 - 125.0 | 4,000 | 7,500 | 9.7 | ---- | ---- | 1.60 |
| LVWPS-U1-IW08B | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 131.8 - 156.5 | 4,900 | 6,700 | 11 | ---- | ---- | 1.92 |
| LVWPS-U1-MW01A | 9/28/2020 | N | BL04 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 6,100 | 11,000 | 14 | 1,600 | 1.0 | 1.98 |
| LVWPS-U1-MW01A | 1/14/2021 | N | EM02 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 6,900 | 11,000 | 12 | 1,600 | 1.2 J | 2.08 |
| LVWPS-U1-MW01A | 2/10/2021 | N | EM04 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 7,800 | 11,000 | 13 | 1,600 | 1.5 | 1.93 |
| LVWPS-U1-MW01A | 3/11/2021 | N | EM05 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 6,500 | 10,000 | 13 | 1,500 | 1.4 J | 5.27 |
| LVWPS-U1-MW01A | 4/8/2021 | N | EM06 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 6,900 | 12,000 | 13 | 1,600 | 1.5 J | 1.83 |
| LVWPS-U1-MW01A | 6/10/2021 | N | EM08 | Downgradient | 22 | UMCf | 90.3 - 115.0 | 7,000 | 11,000 | 13 | 1,500 | 1.4 J | 2.44 |
| LVWPS-U1-MW01B | 9/28/2020 | N | BL04 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 7,100 | 12,000 | 13 | 1,800 | 1.2 J- | 1.72 |
| LVWPS-U1-MW01B | 1/14/2021 | N | EM02 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 510 | 1,100 | 1.5 | 360 | 2.1 | 1.58 |
| LVWPS-U1-MW01B | 2/10/2021 | N | EM04 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 8,200 | 13,000 | 12 | 1,900 | 1.0 | 0.63 |
| LVWPS-U1-MW01B | 3/11/2021 | N | EM05 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 8,900 | 12,000 | 10 | 1,800 | 1.2 | 0.69 |
| LVWPS-U1-MW01B | 4/7/2021 | N | EM06 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 6,200 | 9,800 | 8.9 | 1,900 | 1.2 J+ | 1.25 |
| LVWPS-U1-MW01B | 6/10/2021 | N | EM08 | Downgradient | 22 | UMCf | 133.5 - 153.0 | 5,500 | 6,600 J+ | 6.6 | 1,800 | 1.2 | 0.85 |
| LVWPS-U1-MW08A | 9/30/2020 | N | BL04 | Downgradient | 25 | UMCf | 93.8 - 118.5 | 4,700 | 7,300 | 13 | 1,500 | 1.7 | 2.21 |
| LVWPS-U1-MW08A | 1/12/2021 | N | EM02 | Downgradient | 25 | UMCf | 93.8 - 118.5 | <0.31 | <10 | <0.14 | 990 | 300 | 0.33 |
| LVWPS-U1-MW08A | 2/9/2021 | N | EM04 | Downgradient | 25 | UMCf | 93.8 - 118.5 | <0.31 | <10 | <0.014 | 700 | 420 J- | 1.21 |
| LVWPS-U1-MW08A | 3/11/2021 | N | EM05 | Downgradient | 25 | UMCf | 93.8 - 118.5 | <0.31 | <10 | <0.014 | 410 | 180 | 0.30 |
| LVWPS-U1-MW08A | 4/8/2021 | N | EM06 | Downgradient | 25 | UMCf | 93.8 - 118.5 | 310 | 24 J | 0.038 J | 460 | 40 | 0.45 |
| LVWPS-U1-MW08A | 6/9/2021 | N | EM08 | Downgradient | 25 | UMCf | 93.8 - 118.5 | 50 | <24 | <0.014 | 480 | 8.5 | 0.12 |
| LVWPS-U1-MW08B | 9/30/2020 | N | BL04 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 2,800 | 5,500 | 10 | 1,400 | 1.3 | 3.10 |
| LVWPS-U1-MW08B | 1/11/2021 | N | EM02 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 3.9 | <10 | <0.014 | 1,100 | 230 | 0.23 |
| LVWPS-U1-MW08B | 1/11/2021 | FD | EM02 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 3.8 | <10 | 0.014 R | 1,400 | 220 | ---- |
| LVWPS-U1-MW08B | 2/9/2021 | N | EM04 | Downgradient | 25 | UMCf | 125.3 - 150.0 | <0.31 | <10 | <0.014 | 1,100 | 270 J- | 0.41 |
| LVWPS-U1-MW08B | 2/9/2021 | FD | EM04 | Downgradient | 25 | UMCf | 125.3 - 150.0 | <0.31 | <10 | <0.014 | 1,100 | 300 J- | ---- |
| LVWPS-U1-MW08B | 3/10/2021 | N | EM05 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 54 | 35 J | 0.047 J | 1,000 | 100 | 0.39 |
| LVWPS-U1-MW08B | 3/10/2021 | FD | EM05 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 43 | 35 J | 0.060 | 1,000 | 98 | ---- |
| LVWPS-U1-MW08B | 4/9/2021 | N | EM06 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 700 | 400 | 0.76 | 1,100 | 55 | 0.44 |
| LVWPS-U1-MW08B | 4/9/2021 | FD | EM06 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 640 | 400 | 0.92 | 1,100 | 46 | ---- |
| LVWPS-U1-MW08B | 6/9/2021 | N | EM08 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 740 | 770 | 2.4 | 1,400 | 10 | 0.30 |
| LVWPS-U1-MW08B | 6/9/2021 | FD | EM08 | Downgradient | 25 | UMCf | 125.3 - 150.0 | 790 | 790 | 2.2 | 1,200 | 9.4 | ---- |
| LVWPS-U1-MW02A | 9/29/2020 | N | BL04 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 4,200 | 7,600 | 12 | 1,600 | 1.2 | 4.60 |
| LVWPS-U1-MW02A | 1/14/2021 | N | EM02 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 5,400 | 8,400 | 12 | 1,700 | 1.3 J | 0.9 |
| LVWPS-U1-MW02A | 2/11/2021 | N | EM04 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 5,600 | 8,500 | 12 | 1,700 | 1.1 | 0.72 |
| LVWPS-U1-MW02A | 3/11/2021 | N | EM05 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 5,400 | 8,300 | 12 | 1,700 | 1.4 J | 1.54 |
| LVWPS-U1-MW02A | 4/8/2021 | N | EM06 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 5,100 | 8,600 | 12 | 1,700 | 1.1 | 1.29 |
| LVWPS-U1-MW02A | 6/10/2021 | N | EM08 | Downgradient | 32.5 | UMCf | 94.3 - 119.0 | 5,400 | 9,600 | 12 | 1,700 | 1.3 J | 1.99 |
| LVWPS-U1-MW02B | 10/7/2020 | N | BL04 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,400 | 4,100 | 11 | 8,300 | 1.1 | 2.35 |
| LVWPS-U1-MW02B | 1/14/2021 | N | EM02 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,300 | 3,500 | 6.5 | 1,700 | 1.6 | 0.88 |
| LVWPS-U1-MW02B | 2/11/2021 | N | EM04 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,100 | 2,900 | 5.9 J- | 1,700 | 1.5 | 0.77 |
| LVWPS-U1-MW02B | 3/11/2021 | N | EM05 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,900 | 4,500 | 8.0 | 1,700 | 1.3 | 0.75 |
| LVWPS-U1-MW02B | 4/6/2021 | N | EM06 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,800 | 4,700 | 9.4 | 1,600 | 1.2 J+ | 1.04 |
| LVWPS-U1-MW02B | 6/11/2021 | N | EM08 | Downgradient | 32.5 | UMCf | 136.9 - 161.5 | 2,400 | 4,200 | 8.0 | 1,500 | 1.3 J+ | 1.33 |
| LVWPS-A1-MW04 | 9/30/2020 | N | BL04 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,000 | 12,000 | 15 | 1,600 | 1.5 | 2.26 |
| LVWPS-A1-MW04 | 1/13/2021 | N | EM02 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,400 | 15,000 | 17 | 1,700 | 1.5 | 1.38 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A1-MW04 | 1/13/2021 | FD | EM02 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,800 | 15,000 | 17 | 1,700 | 1.4 | ---- |
| LVWPS-A1-MW04 | 2/9/2021 | N | EM04 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,000 | 15,000 | 17 | 1,800 | 1.4 J- | 1.35 |
| LVWPS-A1-MW04 | 2/9/2021 | FD | EM04 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,000 | 15,000 | 17 | 1,800 | 1.4 J- | ---- |
| LVWPS-A1-MW04 | 3/9/2021 | N | EM05 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,000 | 16,000 | 16 | 1,900 | 1.5 | 0.74 |
| LVWPS-A1-MW04 | 3/9/2021 | FD | EM05 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,900 | 15,000 | 16 | 2,000 | 1.5 | ---- |
| LVWPS-A1-MW04 | 4/7/2021 | N | EM06 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,700 | 14,000 | 16 | 1,700 | 1.4 J+ | 0.75 |
| LVWPS-A1-MW04 | 4/7/2021 | FD | EM06 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,700 | 18,000 | 16 | 1,700 | 1.5 J+ | ---- |
| LVWPS-A1-MW04 | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,500 | 11,000 | 15 | 1,800 | 1.3 J+ | 1.20 |
| LVWPS-A1-MW04 | 6/8/2021 | FD | EM08 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,700 | 11,000 | 15 | 1,600 | 1.4 J+ | ---- |
| LVWPS-A1-MW05 | 9/30/2020 | N | BL04 | Downgradient | 50 | Qal | 69.3 - 89.0 | 2,900 | 16,000 | 19 | 2,000 | 1.6 | 2.90 |
| LVWPS-A1-MW05 | 1/15/2021 | N | EM02 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,300 | 17,000 | 21 | 2,200 | 1.6 | 1.54 |
| LVWPS-A1-MW05 | 2/10/2021 | N | EM04 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,600 | 18,000 | 20 | 2,200 | 1.7 | 1.20 |
| LVWPS-A1-MW05 | 3/10/2021 | N | EM05 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,400 | 16,000 | 20 | 2,000 | 1.5 | 2.03 |
| LVWPS-A1-MW05 | 4/8/2021 | N | EM06 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,200 | 17,000 | 20 | 2,100 | 1.5 | 1.79 |
| LVWPS-A1-MW05 | 6/9/2021 | N | EM08 | Downgradient | 50 | Qal | 69.3 - 89.0 | 3,400 | 15,000 | 20 | 2,000 | 2.5 | 1.57 |
| LVWPS-U1-MW04A | 9/30/2020 | N | BL04 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 4,500 | 9,100 | 13 | 1,600 | 1.0 | 0.84 |
| LVWPS-U1-MW04A | 1/13/2021 | N | EM02 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 6,400 | 10,000 | 13 | 1,600 | 1.3 J | 1.15 |
| LVWPS-U1-MW04A | 2/10/2021 | N | EM04 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 6,500 | 11,000 | 13 | 1,700 | 1.0 | 1.96 |
| LVWPS-U1-MW04A | 3/9/2021 | N | EM05 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 6,000 | 8,900 | 11 | 1,700 | 1.3 J | 0.84 |
| LVWPS-U1-MW04A | 4/7/2021 | N | EM06 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 6,200 | 12,000 | 12 | 1,700 | 1.3 J | 0.90 |
| LVWPS-U1-MW04A | 6/8/2021 | N | EM08 | Downgradient | 50 | UMCf | 99.3 - 124.0 | 6,200 | 10,000 | 12 | 1,700 | 1.2 J | 1.22 |
| LVWPS-U1-MW04B | 10/1/2020 | N | BL04 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 4,200 | 9,200 | 13 | 1,700 | 2.1 | 1.75 |
| LVWPS-U1-MW04B | 1/13/2021 | N | EM02 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 5,300 | 10,000 | 13 | 1,700 | 1.8 | 0.46 |
| LVWPS-U1-MW04B | 2/9/2021 | N | EM04 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 4,900 | 9,700 | 14 | 1,700 | 1.7 J- | 0.68 |
| LVWPS-U1-MW04B | 3/9/2021 | N | EM05 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 6,000 | 9,500 | 14 | 1,800 | 1.8 J | 0.83 |
| LVWPS-U1-MW04B | 4/9/2021 | N | EM06 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 5,600 | 9,400 | 14 | 1,700 | 1.2 | 1.33 |
| LVWPS-U1-MW04B | 6/8/2021 | N | EM08 | Downgradient | 50 | UMCf | 139.9 - 164.5 | 6,200 | 8,400 | 14 | 1,700 | 1.2 J+ | 1.59 |
| LVWPS-U1-MW05A | 9/29/2020 | N | BL04 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 10,000 | 15,000 | 14 | 1,900 | 1.0 | 2.23 |
| LVWPS-U1-MW05A | 1/18/2021 | N | EM02 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 8,900 | 15,000 | 14 | 2,100 | <2.1 | 1.11 |
| LVWPS-U1-MW05A | 2/10/2021 | N | EM04 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 10,000 | 15,000 | 14 | 2,100 | 1.1 | 0.89 |
| LVWPS-U1-MW05A | 3/10/2021 | N | EM05 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 8,300 | 14,000 | 13 | 1,800 | 1.6 J | 3.61 |
| LVWPS-U1-MW05A | 4/8/2021 | N | EM06 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 8,500 | 15,000 | 14 | 2,000 | 1.2 J | 2.03 |
| LVWPS-U1-MW05A | 6/9/2021 | N | EM08 | Downgradient | 50 | UMCf | 95.8 - 120.5 | 8,800 | 15,000 | 14 | 1,900 | 1.1 J | 1.53 |
| LVWPS-U1-MW05B | 9/29/2020 | N | BL04 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 5,100 | 8,800 | 13 | 1,800 | 1.2 | 1.71 |
| LVWPS-U1-MW05B | 1/13/2021 | N | EM02 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 9,800 | 14,000 | 13 | 1,800 | 1.1 | 0.5 |
| LVWPS-U1-MW05B | 2/10/2021 | N | EM04 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 12,000 | 19,000 | 15 | 2,200 | 1.2 | 0.90 |
| LVWPS-U1-MW05B | 3/9/2021 | N | EM05 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 9,600 | 15,000 | 14 | 2,100 | 1.0 | 0.92 |
| LVWPS-U1-MW05B | 4/7/2021 | N | EM06 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 11,000 | 18,000 | 14 | 2,000 | 1.1 J+ | 1.31 |
| LVWPS-U1-MW05B | 6/11/2021 | N | EM08 | Downgradient | 50 | UMCf | 136.9 - 161.5 | 11,000 | 19,000 | 15 | 1,900 | 1.1 J+ | 1.24 |
| LVWPS-A1-MW09 | 9/30/2020 | N | BL04 | Downgradient | 100 | Qal | 85.8 - 105.5 | 2,700 | 15,000 | 16 | 1,600 | 1.6 | 1.17 |
| LVWPS-A1-MW09 | 1/13/2021 | N | EM02 | Downgradient | 100 | Qal | 85.8 - 105.5 | 2,500 | 14,000 | 13 | 1,800 | 4.2 | 1.06 |
| LVWPS-A1-MW09 | 2/11/2021 | N | EM04 | Downgradient | 100 | Qal | 85.8 - 105.5 | 3,100 | 14,000 | 15 J- | 2,000 | 1.6 | 0.66 |
| LVWPS-A1-MW09 | 3/11/2021 | N | EM05 | Downgradient | 100 | Qal | 85.8 - 105.5 | 3,200 | 16,000 | 18 | 1,900 | 1.5 | 1.83 |
| LVWPS-A1-MW09 | 4/8/2021 | N | EM06 | Downgradient | 100 | Qal | 85.8 - 105.5 | 2,700 | 14,000 | 16 | 1,800 | 1.6 | 0.65 |
| LVWPS-A1-MW09 | 6/11/2021 | N | EM08 | Downgradient | 100 | Qal | 85.8 - 105.5 | 2,600 | 9,900 | 16 | 1,700 | 1.5 J+ | 1.38 |
| LVWPS-MW217A | 9/30/2020 | N | BL04 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,200 | 11,000 | 15 | 1,500 | 1.4 | 2.60 |
| LVWPS-MW217A | 1/12/2021 | N | EM02 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,600 | 14,000 | 17 | 1,800 | 1.5 | 1.75 |
| LVWPS-MW217A | 2/9/2021 | N | EM04 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,700 | 14,000 | 17 | 1,300 | 1.5 J- | 2.21 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-MW217A | 3/12/2021 | N | EM05 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,800 | 15,000 | 17 | 1,600 | 1.6 J+ | 1.31 |
| LVWPS-MW217A | 4/8/2021 | N | EM06 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,500 | 13,000 | 17 | 1,600 | 1.4 | 1.55 |
| LVWPS-MW217A | 6/9/2021 | N | EM08 | Downgradient | 100 | Qal | 51.3 - 71.0 | 2,300 | 11,000 | 16 | 1,500 | 1.4 | 1.25 |
| LVWPS-MW217B | 9/30/2020 | N | BL04 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 7,300 | 14,000 | 15 | 1,600 | 1.0 | 2.53 |
| LVWPS-MW217B | 1/13/2021 | N | EM02 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 9,500 | 14,000 | 15 | 1,700 | 1.3 J | 1.03 |
| LVWPS-MW217B | 2/10/2021 | N | EM04 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 8,600 | 14,000 | 15 | 1,800 | 1.1 | 1.12 |
| LVWPS-MW217B | 3/10/2021 | N | EM05 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 9,400 | 13,000 | 14 | 1,800 | 1.2 J | 1.19 |
| LVWPS-MW217B | 4/8/2021 | N | EM06 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 8,100 | 17,000 | 14 | 1,700 | 1.1 J | 1.61 |
| LVWPS-MW217B | 6/9/2021 | N | EM08 | Downgradient | 100 | UMCf | 100.3 - 120.0 | 6,600 | 14,000 | 15 | 1,700 | 1.3 J | 1.40 |
| LVWPS-MW217C | 10/5/2020 | N | BL04 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,200 | 10,000 | 12 | 1,600 | 1.5 | 2.53 |
| LVWPS-MW217C | 1/13/2021 | N | EM02 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 7,100 | 11,000 | 12 | 1,700 | 1.8 J | 1.02 |
| LVWPS-MW217C | 1/13/2021 | FD | EM02 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 7,500 | 10,000 | 12 | 1,700 | 1.8 J | ---- |
| LVWPS-MW217C | 2/10/2021 | N | EM04 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,700 | 11,000 | 12 | 1,700 | 1.7 | 1.19 |
| LVWPS-MW217C | 2/10/2021 | FD | EM04 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,700 | 11,000 | 12 | 1,700 | 1.6 | ---- |
| LVWPS-MW217C | 3/10/2021 | N | EM05 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 7,200 | 10,000 | 11 | 1,800 | 1.4 | 1.13 |
| LVWPS-MW217C | 3/10/2021 | FD | EM05 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 7,300 | 10,000 | 13 | 1,800 | 1.5 | ---- |
| LVWPS-MW217C | 4/9/2021 | N | EM06 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,300 | 14,000 | 12 | 1,600 | 1.4 | 1.83 |
| LVWPS-MW217C | 4/9/2021 | FD | EM06 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,300 | 13,000 | 12 | 1,700 | 1.6 | ---- |
| LVWPS-MW217C | 6/14/2021 | N | EM08 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,300 | 8,000 | 13 | 1,700 | 1.5 | 1.10 |
| LVWPS-MW217C | 6/14/2021 | FD | EM08 | Downgradient | 100 | UMCf | 155.5 - 175.0 | 6,200 | 7,600 | 13 | 1,700 | 1.5 | ---- |
| LVWPS-U1-MW09A | 9/30/2020 | N | BL04 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 7,500 | 12,000 | 13 | 1,900 | 1.8 | 1.62 |
| LVWPS-U1-MW09A | 1/13/2021 | N | EM02 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 8,600 | 13,000 | 12 | 1,900 | 0.88 | 0.75 |
| LVWPS-U1-MW09A | 2/10/2021 | N | EM04 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 7,800 | 12,000 | 12 | 2,000 | 1.1 | 1.08 |
| LVWPS-U1-MW09A | 3/11/2021 | N | EM05 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 9,100 | 12,000 | 12 | 2,100 | 0.95 | 0.99 |
| LVWPS-U1-MW09A | 4/8/2021 | N | EM06 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 7,400 | 16,000 | 13 | 1,900 | 0.91 | 1.74 |
| LVWPS-U1-MW09A | 6/10/2021 | N | EM08 | Downgradient | 100 | UMCf | 115.3 - 125.0 | 7,600 | 8,200 | 13 | 1,900 | 0.94 | 1.20 |
| LVWPS-U1-MW09B | 9/30/2020 | N | BL04 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 6,400 | 11,000 | 9.6 | 1,900 | 0.89 | 1.80 |
| LVWPS-U1-MW09B | 1/13/2021 | N | EM02 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 3,800 | 5,900 | 12 | 1,700 | <2.1 | 0.74 |
| LVWPS-U1-MW09B | 2/10/2021 | N | EM04 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 3,500 | 5,700 | 11 | 1,700 | 1.2 | 0.60 |
| LVWPS-U1-MW09B | 3/11/2021 | N | EM05 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 4,200 | 5,300 | 10 | 2,300 | 1.4 J | 0.89 |
| LVWPS-U1-MW09B | 4/8/2021 | N | EM06 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 3,100 | 6,300 | 11 | 1,700 | 1.2 J | 1.19 |
| LVWPS-U1-MW09B | 6/10/2021 | N | EM08 | Downgradient | 100 | UMCf | 130.3 - 155.0 | 3,200 | 5,400 | 10 | 1,500 | 1.4 J | 0.87 |
| LVWPS-A1-MW10 | 10/1/2020 | N | BL04 | Downgradient | 150 | Qal | 70.8 - 90.5 | 4,400 J- | 14,000 | 16 | 1,600 | 1.4 | 1.13 |
| LVWPS-A1-MW10 | 10/1/2020 | FD | BL04 | Downgradient | 150 | Qal | 70.8 - 90.5 | 3,700 | 14,000 | 16 | 1,700 | 1.5 | ---- |
| LVWPS-A1-MW10 | 1/13/2021 | N | EM02 | Downgradient | 150 | Qal | 70.8 - 90.5 | 3,100 | 16,000 | 17 | 1,800 | 1.5 | 1.11 |
| LVWPS-A1-MW10 | 2/8/2021 | N | EM04 | Downgradient | 150 | Qal | 70.8 - 90.5 | 3,600 | 16,000 | 17 | 1,800 | 1.5 J- | 0.60 |
| LVWPS-A1-MW10 | 3/9/2021 | N | EM05 | Downgradient | 150 | Qal | 70.8 - 90.5 | 3,000 | 16,000 | 17 | 2,000 | 1.4 | 0.77 |
| LVWPS-A1-MW10 | 4/7/2021 | N | EM06 | Downgradient | 150 | Qal | 70.8 - 90.5 | 2,700 | 14,000 | 16 | 1,700 | 1.4 J+ | 0.62 |
| LVWPS-A1-MW10 | 6/8/2021 | N | EM08 | Downgradient | 150 | Qal | 70.8 - 90.5 | 2,900 | 10,000 | 16 | 1,600 | 1.4 J | 0.60 |
| LVWPS-U1-MW10A | 10/2/2020 | N | BL04 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 9,200 | 16,000 | 9.9 | 2,000 | 0.55 | 3.77 |
| LVWPS-U1-MW10A | 1/13/2021 | N | EM02 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 13,000 J | 17,000 | 10 | 2,000 | 1.2 J | 3.28 |
| LVWPS-U1-MW10A | 2/9/2021 | N | EM04 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 10,000 | 16,000 | 9.8 | 2,000 | 0.46 J | 5.98 |
| LVWPS-U1-MW10A | 3/9/2021 | N | EM05 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 12,000 | 17,000 | 10 | 2,100 | 0.49 J | 3.70 |
| LVWPS-U1-MW10A | 4/7/2021 | N | EM06 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 10,000 | 17,000 | 9.9 | 2,000 | <1.0 | 3.92 |
| LVWPS-U1-MW10A | 6/9/2021 | N | EM08 | Downgradient | 150 | UMCf | 99.3 - 124.0 | 11,000 | 9,600 | 9.6 | 1,900 | <1.0 | 3.33 |
| LVWPS-U1-MW10B | 10/2/2020 | N | BL04 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 4,600 | 5,100 | 3.8 | 1,800 | 0.53 | 1.68 |
| LVWPS-U1-MW10B | 1/12/2021 | N | EM02 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 4,600 | 5,500 | 4.6 | 1,900 | <1.3 | 1.37 |
| LVWPS-U1-MW10B | 2/9/2021 | N | EM04 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 2,900 | 6,800 | 4.0 | 1,900 | <1.0 UJ | 2.00 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U1-MW10B | 3/9/2021 | N | EM05 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 3,900 | 5,700 | 4.1 | 2,000 | <1.0 | 2.27 |
| LVWPS-U1-MW10B | 4/7/2021 | N | EM06 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 3,700 | 5,700 | 4.2 | 1,900 | <1.0 | 2.00 |
| LVWPS-U1-MW10B | 6/8/2021 | N | EM08 | Downgradient | 150 | UMCf | 130.3 - 155.0 | 3,500 | 5,200 | 4.0 | 2,000 | <1.0 | 1.67 |
| LVWPS-MW204 | 9/28/2020 | N | BL04 | Cross Gradient | N/A | Qal | 50.3 - 70.0 | 1,600 | 10,000 | 14 | 1,300 | 1.4 | 1.84 |
| LVWPS-MW204 | 9/28/2020 | FD | BL04 | Cross Gradient | N/A | Qal | 50.3 - 70.0 | 1,600 | 10,000 | 14 | 1,300 | 1.3 | ---- |
| LVWPS-MW204B | 9/28/2020 | N | BL04 | Cross Gradient | N/A | UMCf | 101.5 - 121.2 | 12,000 | 22,000 | 15 | 1,800 | 0.75 | 2.92 |
| LVWPS-U1-MW03B | 9/29/2020 | N | BL04 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 4,300 | 7,800 | 14 | 1,400 | 1.5 | 6.71 |
| LVWPS-U1-MW03B | 1/14/2021 | N | EM02 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 5,500 | 8,900 | 13 | 1,400 | 1.2 | 0.69 |
| LVWPS-U1-MW03B | 2/11/2021 | N | EM04 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 5,500 | 8,500 | 14 J- | 1,400 | 1.2 | 1.13 |
| LVWPS-U1-MW03B | 3/11/2021 | N | EM05 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 6,300 | 9,700 | 13 | 1,500 | 1.3 | 1.21 |
| LVWPS-U1-MW03B | 4/9/2021 | N | EM06 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 5,100 | 8,600 | 13 | 1,400 | 1.2 | 2.54 |
| LVWPS-U1-MW03B | 6/10/2021 | N | EM08 | Cross Gradient | N/A | UMCf | 134.5 - 154.0 | 5,200 | 5,800 | 14 | 1,400 | 1.0 | 1.35 |
| **Zone 2** | | | | | | | | | | | | | |
| LVWPS-MW224A | 10/7/2020 | N | BL04 | Far Upgradient | -225 | Qal | 55.3 - 75.0 | 2,300 | 2,900 | 11 | 2,000 | 0.90 | 6.09 |
| LVWPS-MW224A | 12/23/2020 | N | EM01 | Far Upgradient | -225 | Qal | 55.3 - 75.0 | 2,700 | 2,800 | 11 | 2,200 | 1.4 J | 6.34 |
| LVWPS-MW224A | 1/29/2021 | N | EM03 | Far Upgradient | -225 | Qal | 55.3 - 75.0 | 1,900 | 3,000 | 9.9 | 1,900 | 1.5 J | 5.75 |
| LVWPS-MW224A | 3/11/2021 | N | EM05 | Far Upgradient | -225 | Qal | 55.3 - 75.0 | 2,000 | 3,700 | 9.6 | 2,200 | 0.87 | 6.39 |
| LVWPS-MW224A | 6/15/2021 | N | EM08 | Far Upgradient | -225 | Qal | 55.3 - 75.0 | 2,000 | 3,000 J+ | 13 | 2,100 | 1.2 | 5.79 |
| LVWPS-A2-MW01A | 10/8/2020 | N | BL04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,900 | 5,500 | 20 | 2,200 | 1.8 | 4.48 |
| LVWPS-A2-MW01A | 10/8/2020 | FD | BL04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,900 | 5,600 | 19 | 2,200 | 1.8 | ---- |
| LVWPS-A2-MW01A | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,600 | 5,100 | 19 | 2,200 | 2.1 | 3.69 |
| LVWPS-A2-MW01A | 1/13/2021 | N | EM02 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,700 | 6,300 | 19 | 2,100 | 1.9 | 3.75 |
| LVWPS-A2-MW01A | 1/25/2021 | N | EM03 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,900 | 5,100 | 18 | 2,100 | 1.9 J+ | 3.46 |
| LVWPS-A2-MW01A | 2/10/2021 | N | EM04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,800 | 4,900 | 19 | 2,000 | 2.0 | 3.68 |
| LVWPS-A2-MW01A | 3/10/2021 | N | EM05 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,100 | 5,200 | 20 | 2,100 | 1.9 | 3.70 |
| LVWPS-A2-MW01A | 4/7/2021 | N | EM06 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,200 | 5,100 | 20 | 2,200 | 2.4 J+ | 4.01 |
| LVWPS-A2-MW01A | 5/6/2021 | N | EM07 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,900 | 5,100 J | 21 | 2,300 | 1.7 J- | 3.34 |
| LVWPS-A2-MW01A | 6/9/2021 | N | EM08 | Upgradient | -50 | Qal | 40.3 - 60.0 | 2,700 | 4,800 | 19 | 2,100 | 1.7 | 0.70 |
| LVWPS-A2-MW01B | 10/8/2020 | N | BL04 | Upgradient | -50 | Qal | 70.3 - 90.0 | 3,100 | 5,200 | 18 | 2,100 | 1.7 | 4.49 |
| LVWPS-A2-MW01B | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 70.3 - 90.0 | 3,000 | 5,000 | 18 | 2,200 | 1.7 | 4.16 |
| LVWPS-A2-MW01B | 1/13/2021 | N | EM02 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,800 | 6,700 | 18 | 2,200 | 2.1 | 3.97 |
| LVWPS-A2-MW01B | 1/25/2021 | N | EM03 | Upgradient | -50 | Qal | 70.3 - 90.0 | 3,200 | 5,200 | 18 | 2,100 | 2.4 J+ | 3.44 |
| LVWPS-A2-MW01B | 2/10/2021 | N | EM04 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,800 | 4,800 | 19 | 2,300 | 1.8 | 4.13 |
| LVWPS-A2-MW01B | 3/10/2021 | N | EM05 | Upgradient | -50 | Qal | 70.3 - 90.0 | 3,400 | 5,000 | 20 | 2,100 | 1.8 | 4.43 |
| LVWPS-A2-MW01B | 4/7/2021 | N | EM06 | Upgradient | -50 | Qal | 70.3 - 90.0 | 4,200 | 5,100 | 19 | 2,300 | 1.7 J+ | 4.33 |
| LVWPS-A2-MW01B | 5/6/2021 | N | EM07 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,800 | 5,000 | 22 | 2,200 | 1.7 | 1.26 |
| LVWPS-A2-MW01B | 6/9/2021 | N | EM08 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,800 | 5,200 | 20 | 2,200 | 1.7 | 0.40 |
| LVWPS-A2-MW02A | 10/8/2020 | N | BL04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,700 | 6,500 | 18 | 2,600 | 1.3 | 4.19 |
| LVWPS-A2-MW02A | 10/8/2020 | FD | BL04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,800 | 6,600 | 18 | 2,600 | 1.3 | ---- |
| LVWPS-A2-MW02A | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,800 | 8,100 | 18 | 2,700 | 1.2 | 5.28 |
| LVWPS-A2-MW02A | 1/12/2021 | N | EM02 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,900 | 6,300 | 18 | 2,600 | 1.2 | 4.46 |
| LVWPS-A2-MW02A | 1/25/2021 | N | EM03 | Upgradient | -50 | Qal | 40.3 - 60.0 | 4,200 | 7,100 | 20 | 2,500 | 1.3 J+ | 3.93 |
| LVWPS-A2-MW02A | 2/9/2021 | N | EM04 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,900 | 6,200 | 17 | 1,900 | 1.2 J- | 4.61 |
| LVWPS-A2-MW02A | 3/9/2021 | N | EM05 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,700 | 6,100 | 17 | 2,800 | 1.4 | 3.99 |
| LVWPS-A2-MW02A | 4/7/2021 | N | EM06 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,700 | 5,700 | 17 | 2,600 | 1.5 J+ | 4.05 |
| LVWPS-A2-MW02A | 5/5/2021 | N | EM07 | Upgradient | -50 | Qal | 40.3 - 60.0 | 4,200 | 5,200 | 17 | 3,000 | 1.2 | 4.44 |
| LVWPS-A2-MW02A | 6/11/2021 | N | EM08 | Upgradient | -50 | Qal | 40.3 - 60.0 | 3,600 | 4,200 | 17 | 2,600 | 1.5 J+ | 3.74 |
| LVWPS-A2-MW02B | 10/8/2020 | N | BL04 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,300 | 3,900 | 14 | 2,100 | 1.2 | 5.81 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW02B | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,200 | 4,900 | 15 | 2,300 | 1.3 | 5.57 |
| LVWPS-A2-MW02B | 1/13/2021 | N | EM02 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,100 | 3,600 | 14 | 2,100 | 1.2 | 5.79 |
| LVWPS-A2-MW02B | 1/25/2021 | N | EM03 | Upgradient | -50 | Qal | 70.3 - 90.0 | 3,700 | 4,000 | 13 | 2,000 | 1.3 J+ | 5.11 |
| LVWPS-A2-MW02B | 2/10/2021 | N | EM04 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,300 | 3,900 | 15 | 2,200 | 1.3 | 5.77 |
| LVWPS-A2-MW02B | 3/10/2021 | N | EM05 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,500 | 3,800 | 16 | 2,300 | 1.4 | 5.43 |
| LVWPS-A2-MW02B | 4/9/2021 | N | EM06 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,200 | 4,100 | 16 | 2,600 | 1.4 | 5.78 |
| LVWPS-A2-MW02B | 5/5/2021 | N | EM07 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,400 | 3,700 | 15 | 2,200 | 1.3 | 6.27 |
| LVWPS-A2-MW02B | 6/8/2021 | N | EM08 | Upgradient | -50 | Qal | 70.3 - 90.0 | 2,100 | 3,000 | 16 | 2,200 | 1.2 J+ | 5.38 |
| LVWPS-A2-MW03A | 10/9/2020 | N | BL04 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,300 | 2,000 | 9.2 | 1,800 | 0.63 | 6.82 |
| LVWPS-A2-MW03A | 10/9/2020 | FD | BL04 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,300 | 2,000 | 9.1 | 1,800 | 0.70 | ---- |
| LVWPS-A2-MW03A | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,100 | 7,500 | 7.3 | 1,700 | 0.47 J | 6.86 |
| LVWPS-A2-MW03A | 1/14/2021 | N | EM02 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,100 | 1,600 | 7.8 | 1,900 | 0.54 | 7.34 |
| LVWPS-A2-MW03A | 1/25/2021 | N | EM03 | Upgradient | -50 | Qal | 38.3 - 58.0 | 2,500 | 3,300 | 9.2 | 1,800 | 0.77 J+ | 5.88 |
| LVWPS-A2-MW03A | 2/10/2021 | N | EM04 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,200 | 1,600 | 8.3 | 1,900 | 0.52 | 7.08 |
| LVWPS-A2-MW03A | 3/10/2021 | N | EM05 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,300 | 1,500 | 8.1 | 1,900 | 0.49 J | 6.92 |
| LVWPS-A2-MW03A | 4/5/2021 | N | EM06 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,300 | 1,700 | 8.5 | 1,800 | 0.60 | 6.80 |
| LVWPS-A2-MW03A | 5/5/2021 | N | EM07 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,400 | 1,900 | 8.3 | 1,900 | 0.60 | 7.00 |
| LVWPS-A2-MW03A | 6/9/2021 | N | EM08 | Upgradient | -50 | Qal | 38.3 - 58.0 | 1,500 | 1,900 | 8.4 | 1,800 | 1.3 | 3.00 |
| LVWPS-A2-MW03B | 10/9/2020 | N | BL04 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,000 | 3,700 | 12 | 2,000 | 0.92 | 6.21 |
| LVWPS-A2-MW03B | 12/23/2020 | N | EM01 | Upgradient | -50 | Qal | 64.3 - 84.0 | 3,600 | 3,500 | 12 | 2,100 | 0.87 J- | 5.56 |
| LVWPS-A2-MW03B | 1/14/2021 | N | EM02 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,100 | 3,600 | 12 | 2,100 | 0.96 | 6.03 |
| LVWPS-A2-MW03B | 1/26/2021 | N | EM03 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,300 | 3,400 | 9.8 | 1,900 | 1.0 J+ | 5.24 |
| LVWPS-A2-MW03B | 2/10/2021 | N | EM04 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,200 | 3,500 | 13 | 2,200 | 1.0 | 5.86 |
| LVWPS-A2-MW03B | 3/10/2021 | N | EM05 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,300 | 3,500 | 13 | 2,200 | 1.1 | 5.40 |
| LVWPS-A2-MW03B | 4/6/2021 | N | EM06 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,200 | 3,600 | 16 | 2,100 | 1.0 J+ | 5.50 |
| LVWPS-A2-MW03B | 5/5/2021 | N | EM07 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,300 | 3,800 | 14 | 2,200 | 1.1 | 5.70 |
| LVWPS-A2-MW03B | 6/9/2021 | N | EM08 | Upgradient | -50 | Qal | 64.3 - 84.0 | 2,400 | 4,000 | 15 | 2,100 | 1.1 | 5.46 |
| LVWPS-U2-MW01 | 10/8/2020 | N | BL04 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 360 | 450 | 0.89 | 2,500 | 0.36 J | 1.63 |
| LVWPS-U2-MW01 | 1/14/2021 | N | EM02 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 85 | 93 J | 0.11 | 2,600 | <1.0 | 2.76 |
| LVWPS-U2-MW01 | 2/10/2021 | N | EM04 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 200 | 260 | 0.98 | 2,500 | 0.46 J | 1.94 |
| LVWPS-U2-MW01 | 3/10/2021 | N | EM05 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 26 | <10 | <0.014 | 2,100 | 2.2 | 0.43 |
| LVWPS-U2-MW01 | 4/7/2021 | N | EM06 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 250 | 330 J+ | 0.51 J+ | 2,400 | 0.26 J | 1.55 |
| LVWPS-U2-MW01 | 6/9/2021 | N | EM08 | Upgradient | -50 | UMCf | 97.3 - 117.0 | 160 | 210 | 0.28 | 2,400 | <1.0 | 1.83 |
| LVWPS-U2-MW02 | 10/8/2020 | N | BL04 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 5,200 | 8,300 | 6.2 | 1,800 | 0.64 | 8.10 |
| LVWPS-U2-MW02 | 1/12/2021 | N | EM02 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 7,100 | 9,600 | 9.1 | 1,900 | <1.3 | 2.13 |
| LVWPS-U2-MW02 | 2/9/2021 | N | EM04 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 5,600 | 13,000 | 7.7 | 1,800 | <1.0 UJ | 2.93 |
| LVWPS-U2-MW02 | 3/9/2021 | N | EM05 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 6,600 | 10,000 | 7.0 | 1,900 | <1.0 | 3.38 |
| LVWPS-U2-MW02 | 4/5/2021 | N | EM06 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 6,500 | 11,000 | 7.2 | 1,800 | 0.42 J | 3.23 |
| LVWPS-U2-MW02 | 6/8/2021 | N | EM08 | Upgradient | -50 | UMCf | 100.3 - 125.0 | 6,400 | 10,000 | 7.9 | 1,900 | <1.0 | 3.74 |
| LVWPS-U2-MW03 | 10/9/2020 | N | BL04 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 2,100 | 3,400 | 11 | 2,000 | 0.98 | 3.53 |
| LVWPS-U2-MW03 | 1/14/2021 | N | EM02 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 1,800 | 3,300 | 12 | 2,100 | 1.4 J | 3.53 |
| LVWPS-U2-MW03 | 2/10/2021 | N | EM04 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 2,200 | 3,500 | 13 | 2,100 | 1.2 | 5.49 |
| LVWPS-U2-MW03 | 3/10/2021 | N | EM05 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 2,200 | 3,400 | 13 | 2,200 | 1.3 J | 5.02 |
| LVWPS-U2-MW03 | 4/6/2021 | N | EM06 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 2,200 | 3,800 | 16 | 2,100 | 1.7 J | 5.14 |
| LVWPS-U2-MW03 | 6/9/2021 | N | EM08 | Upgradient | -50 | UMCf | 90.3 - 110.0 | 2,500 | 3,900 | 16 | 2,200 | 1.5 J | 4.99 |
| LVWPS-A2-IW01A | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 41.3 - 66.0 | 3,300 | 5,100 | 19 | ---- | ---- | 4.10 |
| LVWPS-A2-IW01A | 10/1/2020 | FD | BL04 | Injection Well Transect | 0 | Qal | 41.3 - 66.0 | 3,300 | 5,000 | 19 | ---- | ---- | ---- |
| LVWPS-A2-IW01B | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 72.8 - 97.5 | 2,300 | 5,400 | 20 | ---- | ---- | 4.23 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-IW02A | 10/1/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 38.8 - 68.5 | 2,900 | 5,200 | 18 | ---- | ---- | 4.29 |
| LVWPS-A2-IW02B | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 75.3 - 100.0 | 3,800 | 6,100 | 20 | ---- | ---- | 4.44 |
| LVWPS-A2-IW03A | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 37.3 - 67.0 | 3,300 | 5,400 | 20 | ---- | ---- | 4.44 |
| LVWPS-A2-IW03B | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 73.8 - 103.5 | 3,400 | 5,500 | 18 | ---- | ---- | 4.30 |
| LVWPS-A2-IW03B | 10/2/2020 | FD | BL04 | Injection Well Transect | 0 | Qal | 73.8 - 103.5 | 2,700 | 5,400 | 18 | ---- | ---- | ---- |
| LVWPS-A2-IW04A | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 36.3 - 71.0 | 2,700 | 5,600 | 20 | ---- | ---- | 4.43 |
| LVWPS-A2-IW04B | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 77.3 - 112.0 | 3,200 | 5,000 | 18 | ---- | ---- | 5.05 |
| LVWPS-A2-IW05A | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 37.8 - 62.5 | 4,800 | 6,200 | 19 | ---- | ---- | 4.44 |
| LVWPS-A2-IW05B | 10/2/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 68.8 - 93.5 | 4,400 | 5,300 | 19 | ---- | ---- | 4.47 |
| LVWPS-A2-IW06A | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 36.8 - 51.5 | 3,700 | 5,900 | 18 | ---- | ---- | 5.36 |
| LVWPS-A2-IW06B | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 57.8 - 77.5 | 4,600 | 4,900 | 18 | ---- | ---- | 4.75 |
| LVWPS-A2-IW07A | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 35.3 - 50.0 | 3,100 | 5,500 | 21 | ---- | ---- | 4.76 |
| LVWPS-A2-IW07A | 10/5/2020 | FD | BL04 | Injection Well Transect | 0 | Qal | 35.3 - 50.0 | 2,800 | 5,600 | 20 | ---- | ---- | ---- |
| LVWPS-A2-IW07B | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 56.3 - 76.0 | 2,700 | 4,500 | 16 | ---- | ---- | 5.14 |
| LVWPS-A2-IW08A | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 35.8 - 55.5 | 3,500 | 4,800 | 20 | ---- | ---- | 4.79 |
| LVWPS-A2-IW08B | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 61.8 - 81.5 | 2,100 | 3,600 | 13 | ---- | ---- | 5.54 |
| LVWPS-A2-IW09A | 10/5/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 36.8 - 51.5 | 2,000 | 3,000 | 13 | ---- | ---- | 5.36 |
| LVWPS-A2-IW09B | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | Qal | 58.8 - 73.5 | 1,500 | 2,300 | 9.1 | ---- | ---- | 6.22 |
| LVWPS-U2-IW01 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 121.2 - 141.0 | 8,100 | 12,000 | 9.0 | ---- | ---- | 3.48 |
| LVWPS-U2-IW01 | 10/8/2020 | FD | BL04 | Injection Well Transect | 0 | UMCf | 121.2 - 141.0 | 6,900 | 11,000 | 8.6 | ---- | ---- | ---- |
| LVWPS-U2-IW02 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 116.2 - 141.0 | 8,100 | 12,000 | 8.7 | ---- | ---- | 3.80 |
| LVWPS-U2-IW03 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 99.2 - 124.0 | 7,100 | 11,000 | 12 | ---- | ---- | 2.66 |
| LVWPS-U2-IW04 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 83.7 - 108.5 | 3,900 | 6,500 | 19 | ---- | ---- | 4.10 |
| LVWPS-U2-IW05 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 87.7 - 117.5 | 8,500 | 14,000 | 12 | ---- | ---- | 4.95 |
| LVWPS-U2-IW06 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 89.2 - 104.0 | 10,000 | 17,000 | 14 | ---- | ---- | 3.46 |
| LVWPS-U2-IW07 | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 91.2 - 106.0 | 6,000 | 8,700 | 5.7 | ---- | ---- | 1.85 |
| LVWPS-U2-IW08 | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 83.7 - 108.5 | 12,000 | 20,000 | 17 | ---- | ---- | 5.08 |
| LVWPS-U2-IW09 | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 103.2 - 128.0 | 35 | 63 J | 0.11 | ---- | ---- | 2.85 |
| LVWPS-U2-IW10 | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 109.3 - 129.0 | 400 | 150 | <0.014 | ---- | ---- | 3.48 |
| LVWPS-U2-IW11 | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 108.9 - 133.7 | 1,400 | 2,400 | 2.6 | ---- | ---- | 3.31 |
| LVWPS-U2-IW12 | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf | 112.8 - 137.5 | 5,900 | 8,300 | 11 | ---- | ---- | 4.65 |
| LVWPS-U2-MW04 | 10/6/2020 | N | BL04 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | 160 | 260 | 0.27 | 3,000 | 0.27 J | 0.93 |
| LVWPS-U2-MW04 | 1/11/2021 | N | EM02 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | 2.0 | <10 | <0.014 | 2,900 | 9.5 | 0.49 |
| LVWPS-U2-MW04 | 2/8/2021 | N | EM04 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | <1.6 | <10 | <0.014 | 2,800 | 38 | 1.56 |
| LVWPS-U2-MW04 | 3/8/2021 | N | EM05 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | <0.31 | <10 | <0.014 | 3,700 | 56 | 0.81 |
| LVWPS-U2-MW04 | 4/5/2021 | N | EM06 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | <0.31 | <10 | <0.014 | 2,900 | 1.7 | 0.80 |
| LVWPS-U2-MW04 | 6/7/2021 | N | EM08 | Cross Gradient | 12 | UMCf | 103.2 - 128.0 | <0.31 | <24 | <0.014 | 2,900 | 0.69 | 0.50 |
| LVWPS-U2-MW05 | 10/5/2020 | N | BL04 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | 9,300 | 15,000 | 8.4 | 1,300 | 0.41 J | 4.35 |
| LVWPS-U2-MW05 | 1/13/2021 | N | EM02 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | 2.7 | <10 | <0.014 | 1,100 | 1,100 | 0.24 |
| LVWPS-U2-MW05 | 2/10/2021 | N | EM04 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | <0.31 UJ | <10 | <0.014 | 810 | 910 | 0.51 |
| LVWPS-U2-MW05 | 3/10/2021 | N | EM05 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | <0.31 | <10 | 0.016 J | 420 | 1,000 | 1.22 |
| LVWPS-U2-MW05 | 4/7/2021 | N | EM06 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | <0.31 | <10 | <0.014 | 300 | 960 | 0.20 |
| LVWPS-U2-MW05 | 6/15/2021 | N | EM08 | Cross Gradient | 12 | UMCf | 83.2 - 108.0 | <0.31 | <24 | <0.014 | 23 | 840 | 0.44 |
| LVWPS-A2-MW04A | 10/2/2020 | N | BL04 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 4,100 J | 5,300 | 19 | 2,100 | 1.7 | 5.60 |
| LVWPS-A2-MW04A | 10/2/2020 | FD | BL04 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,900 J | 5,200 | 19 | 2,100 | 1.7 | ---- |
| LVWPS-A2-MW04A | 12/22/2020 | N | EM01 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,600 | 5,100 | 19 | 2,100 | 2.2 J | 3.79 |
| LVWPS-A2-MW04A | 12/22/2020 | FD | EM01 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,600 | 5,100 | 19 | 2,100 | 1.8 | ---- |
| LVWPS-A2-MW04A | 1/12/2021 | N | EM02 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,700 | 4,900 | 20 | 2,200 | 1.9 | 3.84 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW04A | 1/12/2021 | FD | EM02 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,700 | 4,900 | 19 | 2,200 | 2.1 | ---- |
| LVWPS-A2-MW04A | 1/26/2021 | N | EM03 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,800 | 4,900 | 19 | 1,900 | 2.0 J+ | 3.67 |
| LVWPS-A2-MW04A | 1/26/2021 | FD | EM03 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,700 | 4,900 | 19 | 1,900 | 1.8 J+ | ---- |
| LVWPS-A2-MW04A | 2/9/2021 | N | EM04 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,100 | 7,200 | 21 | 1,900 | 3.4 J- | 4.44 |
| LVWPS-A2-MW04A | 2/9/2021 | FD | EM04 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,200 | 7,100 | 21 | 1,800 | 2.4 J- | ---- |
| LVWPS-A2-MW04A | 3/9/2021 | N | EM05 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,900 | 5,400 | 19 | 2,300 | 1.9 | 4.00 |
| LVWPS-A2-MW04A | 3/9/2021 | FD | EM05 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,800 | 5,200 | 19 | 2,200 | 2.0 | ---- |
| LVWPS-A2-MW04A | 4/6/2021 | N | EM06 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,600 | 5,000 | 22 | 2,100 | 2.0 J+ | 4.48 |
| LVWPS-A2-MW04A | 4/6/2021 | FD | EM06 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,600 | 5,000 | 21 | 2,100 | 2.1 J+ | ---- |
| LVWPS-A2-MW04A | 5/3/2021 | N | EM07 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,500 | 3,900 | 13 | 2,500 | 2.4 | 1.30 |
| LVWPS-A2-MW04A | 5/3/2021 | FD | EM07 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,800 | 4,000 | 14 | 2,200 | 2.3 | ---- |
| LVWPS-A2-MW04A | 6/8/2021 | N | EM08 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,100 | 2,700 | 16 | 2,100 | 5.2 | 2.35 |
| LVWPS-A2-MW04A | 6/8/2021 | FD | EM08 | Cross Gradient | 17 | Qal | 43.8 - 63.5 | 2,100 | 3,000 | 16 | 2,100 | 5.2 | ---- |
| LVWPS-A2-MW04B | 10/2/2020 | N | BL04 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 3,400 | 7,300 | 22 | 2,200 | 1.7 | 3.65 |
| LVWPS-A2-MW04B | 12/22/2020 | N | EM01 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 2,800 | 7,300 | 13 | 2,100 | 23 | 0.49 |
| LVWPS-A2-MW04B | 1/12/2021 | N | EM02 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 700 | 1,300 | 3.0 | 2,300 | 52 | 0.66 |
| LVWPS-A2-MW04B | 1/26/2021 | N | EM03 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 1,100 | 2,400 | 3.7 | 1,900 | 34 | 0.46 |
| LVWPS-A2-MW04B | 2/9/2021 | N | EM04 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 650 | 1,800 | 3.5 | 2,000 | 51 J- | 4.06 |
| LVWPS-A2-MW04B | 3/9/2021 | N | EM05 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 1,200 | 1,700 | 4.0 | 2,100 | 34 | 0.29 |
| LVWPS-A2-MW04B | 4/6/2021 | N | EM06 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 870 | 1,700 | 4.4 | 2,000 | 7.0 J+ | 0.40 |
| LVWPS-A2-MW04B | 5/3/2021 | N | EM07 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 120 | <9.8 | 0.042 J | 1,900 | 150 | 0.26 |
| LVWPS-A2-MW04B | 6/8/2021 | N | EM08 | Cross Gradient | 17 | Qal | 75.3 - 95.0 | 46 | 49 J | 0.018 J | 1,400 | 7.7 | 0.05 |
| LVWPS-A2-MW05A | 10/5/2020 | N | BL04 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 2,400 | 3,900 | 14 | 2,200 | 1.1 | 6.22 |
| LVWPS-A2-MW05A | 12/22/2020 | N | EM01 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 310 | 73 | 0.91 | 2,200 | 170 | 0.91 |
| LVWPS-A2-MW05A | 1/13/2021 | N | EM02 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 330 | 190 | 1.5 | 2,000 | 50 | 0.28 |
| LVWPS-A2-MW05A | 1/26/2021 | N | EM03 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 720 | 460 | 1.8 | 1,600 | 120 | 0.44 |
| LVWPS-A2-MW05A | 2/9/2021 | N | EM04 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 1,900 | 2,500 | 7.4 | 2,000 | 9.8 J- | 3.20 |
| LVWPS-A2-MW05A | 3/10/2021 | N | EM05 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 1,200 | 1,200 | 5.2 J+ | 1,700 | 22 | 1.70 |
| LVWPS-A2-MW05A | 4/7/2021 | N | EM06 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 1,500 | 1,400 | 8.1 | 2,100 | 4.1 J+ | 1.04 |
| LVWPS-A2-MW05A | 5/4/2021 | N | EM07 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 940 | 870 | 4.0 | 1,800 | 140 | 0.30 |
| LVWPS-A2-MW05A | 6/9/2021 | N | EM08 | Cross Gradient | 17 | Qal | 36.8 - 51.5 | 1,600 | 2,100 | 8.5 | 2,200 | 7.1 | 0.45 |
| LVWPS-A2-MW05B | 10/5/2020 | N | BL04 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 1,900 | 2,300 | 8.7 | 2,000 | 0.66 | 7.24 |
| LVWPS-A2-MW05B | 12/22/2020 | N | EM01 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 2.9 | <4.0 | <0.014 | 1,800 | 170 J- | 0.35 |
| LVWPS-A2-MW05B | 12/22/2020 | FD | EM01 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 2.9 | <4.0 | 0.026 J | 2,000 | 170 | ---- |
| LVWPS-A2-MW05B | 1/13/2021 | N | EM02 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 1,400 | 150 | 0.29 |
| LVWPS-A2-MW05B | 1/13/2021 | FD | EM02 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 1,400 | 150 | ---- |
| LVWPS-A2-MW05B | 1/26/2021 | N | EM03 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 860 | 220 | 0.45 |
| LVWPS-A2-MW05B | 2/9/2021 | N | EM04 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 590 | 160 J- | 0.26 |
| LVWPS-A2-MW05B | 2/9/2021 | FD | EM04 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 610 | 140 J- | ---- |
| LVWPS-A2-MW05B | 3/10/2021 | N | EM05 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 270 | 280 J | 1.25 |
| LVWPS-A2-MW05B | 3/10/2021 | FD | EM05 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <10 | <0.014 | 270 | 170 J | ---- |
| LVWPS-A2-MW05B | 4/7/2021 | N | EM06 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 1.3 | <10 | <0.014 | 470 | 170 | 0.41 |
| LVWPS-A2-MW05B | 4/7/2021 | FD | EM06 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 1.3 | <10 | <0.014 | 450 | 170 | ---- |
| LVWPS-A2-MW05B | 5/4/2021 | N | EM07 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 3.0 | 38 J | <0.014 | 1,200 | 1,800 | 0.25 |
| LVWPS-A2-MW05B | 5/4/2021 | FD | EM07 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | 3.1 | <4.9 | <0.014 | 1,200 | 1,500 | ---- |
| LVWPS-A2-MW05B | 6/9/2021 | N | EM08 | Cross Gradient | 17 | Qal | 58.8 - 73.5 | <0.31 | <9.8 | <0.014 | 1.4 J | 590 J- | 0.38 |
| LVWPS-U2-MW06 | 10/1/2020 | N | BL04 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 4,100 | 7,300 | 9.5 | 1,900 | 0.94 | 2.79 |
| LVWPS-U2-MW06 | 1/11/2021 | N | EM02 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 4,200 | 5,700 | 7.0 | 2,000 | <1.3 | 1.01 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U2-MW06 | 2/8/2021 | N | EM04 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 3,900 | 5,500 | 8.0 | 2,000 | 1.3 J | 1.45 |
| LVWPS-U2-MW06 | 3/9/2021 | N | EM05 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 3,700 | 5,200 | 7.7 | 2,200 | 1.2 J | 2.12 |
| LVWPS-U2-MW06 | 4/6/2021 | N | EM06 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 3,700 | 5,500 | 10 | 2,000 | 1.4 J | 1.53 |
| LVWPS-U2-MW06 | 6/7/2021 | N | EM08 | Downgradient | 25 | UMCf | 121.8 - 141.5 | 7,900 | 5,500 | 11 | 2,200 | 1.1 J | 1.48 |
| LVWPS-U2-MW18 | 10/5/2020 | N | BL04 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 8,400 | 10,000 | 18 | 2,200 | 1.3 | 4.49 |
| LVWPS-U2-MW18 | 1/11/2021 | N | EM02 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 5,800 | 8,800 | 18 | 2,400 | 1.8 J | 2.83 |
| LVWPS-U2-MW18 | 2/8/2021 | N | EM04 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 6,000 | 8,800 | 18 | 2,000 | <2.6 UJ | 4.08 |
| LVWPS-U2-MW18 | 3/9/2021 | N | EM05 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 5,100 | 9,500 | 17 | 2,400 | 1.8 | 3.15 |
| LVWPS-U2-MW18 | 4/5/2021 | N | EM06 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 4,800 | 8,100 | 17 | 2,200 | 2.4 | 2.12 |
| LVWPS-U2-MW18 | 6/8/2021 | N | EM08 | Downgradient | 25 | UMCf | 88.3 - 113.0 | 4,800 | 6,700 | 15 | 2,200 | 2.0 | 2.17 |
| LVWPS-A2-MW08A | 9/30/2020 | N | BL04 | Downgradient | 50 | Qal | 40.3 - 55.0 | 2,700 | 2,100 | 20 | 2,100 | 1.9 J+ | 5.27 |
| LVWPS-A2-MW08A | 12/23/2020 | N | EM01 | Downgradient | 50 | Qal | 40.3 - 55.0 | 1,400 | 2,000 | 4.7 | 2,100 | 7.4 | 0.91 |
| LVWPS-A2-MW08A | 1/15/2021 | N | EM02 | Downgradient | 50 | Qal | 40.3 - 55.0 | 750 | 1,300 | 3.2 | 2,200 | 25 | 1.84 |
| LVWPS-A2-MW08A | 1/26/2021 | N | EM03 | Downgradient | 50 | Qal | 40.3 - 55.0 | 1,100 | 1,800 | 6.1 | 1,800 | 6.5 | 0.86 |
| LVWPS-A2-MW08A | 2/10/2021 | N | EM04 | Downgradient | 50 | Qal | 40.3 - 55.0 | 1,800 | 3,400 | 11 | 2,000 | 2.7 | 0.61 |
| LVWPS-A2-MW08A | 3/10/2021 | N | EM05 | Downgradient | 50 | Qal | 40.3 - 55.0 | 2,000 | 3,200 | 13 | 2,100 | 2.3 | 0.83 |
| LVWPS-A2-MW08A | 4/6/2021 | N | EM06 | Downgradient | 50 | Qal | 40.3 - 55.0 | 2,000 | 4,300 | 16 | 2,000 | 2.1 J+ | 1.97 |
| LVWPS-A2-MW08A | 5/3/2021 | N | EM07 | Downgradient | 50 | Qal | 40.3 - 55.0 | 21 J- | 79 J | 0.016 J | 1,800 | 65 | 0.24 |
| LVWPS-A2-MW08A | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 40.3 - 55.0 | 200 | 200 | 0.60 | 1,400 | 3.1 | 0.08 |
| LVWPS-A2-MW08B | 10/1/2020 | N | BL04 | Downgradient | 50 | Qal | 59.8 - 79.5 | 3,800 | 6,000 | 21 | 2,000 | 1.8 | 5.25 |
| LVWPS-A2-MW08B | 12/23/2020 | N | EM01 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,400 | 4,900 | 18 | 2,000 | 2.4 | 1.45 |
| LVWPS-A2-MW08B | 1/15/2021 | N | EM02 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,100 | 4,400 | 15 | 2,100 | 2.2 | 1.76 |
| LVWPS-A2-MW08B | 1/26/2021 | N | EM03 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,500 | 4,600 | 16 | 1,900 | 2.4 J+ | 1.54 |
| LVWPS-A2-MW08B | 2/10/2021 | N | EM04 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,600 | 4,700 | 20 | 2,200 | 2.3 | 1.96 |
| LVWPS-A2-MW08B | 3/10/2021 | N | EM05 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,800 | 4,900 | 19 | 2,300 | 2.1 | 2.18 |
| LVWPS-A2-MW08B | 4/9/2021 | N | EM06 | Downgradient | 50 | Qal | 59.8 - 79.5 | 2,600 | 5,600 | 22 | 2,200 | 1.9 | 3.78 |
| LVWPS-A2-MW08B | 5/3/2021 | N | EM07 | Downgradient | 50 | Qal | 59.8 - 79.5 | 25 | <49 | 0.042 J | 1,900 | 140 | 0.24 |
| LVWPS-A2-MW08B | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 59.8 - 79.5 | 240 | 140 | 0.83 | 1,700 | 18 | 0.05 |
| LVWPS-A2-MW08C | 10/1/2020 | N | BL04 | Downgradient | 50 | Qal | 86.3 - 106.0 | 4,100 | 7,200 | 21 | 2,200 | 1.7 | 4.92 |
| LVWPS-A2-MW08C | 12/23/2020 | N | EM01 | Downgradient | 50 | Qal | 86.3 - 106.0 | 110 | <10 | <0.014 | 2,400 | 210 | 0.81 |
| LVWPS-A2-MW08C | 1/15/2021 | N | EM02 | Downgradient | 50 | Qal | 86.3 - 106.0 | <0.31 | <10 | <0.014 | 2,100 | 130 | 0.35 |
| LVWPS-A2-MW08C | 1/28/2021 | N | EM03 | Downgradient | 50 | Qal | 86.3 - 106.0 | <3.1 | <10 | <0.014 | 1,400 | 91 | 0.42 |
| LVWPS-A2-MW08C | 2/10/2021 | N | EM04 | Downgradient | 50 | Qal | 86.3 - 106.0 | 140 | 39 J | <0.014 | 1,500 | 100 | 0.29 |
| LVWPS-A2-MW08C | 3/10/2021 | N | EM05 | Downgradient | 50 | Qal | 86.3 - 106.0 | 130 | <10 | <0.014 | 1,300 | 53 | 0.23 |
| LVWPS-A2-MW08C | 4/9/2021 | N | EM06 | Downgradient | 50 | Qal | 86.3 - 106.0 | 310 | 140 | 0.18 | 1,800 | 3.6 | 0.43 |
| LVWPS-A2-MW08C | 5/4/2021 | N | EM07 | Downgradient | 50 | Qal | 86.3 - 106.0 | 230 | 210 | 0.53 | 2,100 | 13 | 0.27 |
| LVWPS-A2-MW08C | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 86.3 - 106.0 | 420 | 320 | 1.2 | 1,900 | 3.1 | 0.01 |
| LVWPS-A2-MW09A | 10/9/2020 | N | BL04 | Downgradient | 50 | Qal | 34.8 - 54.5 | 3,400 | 5,500 | 17 | 2,500 | 1.4 | 5.63 |
| LVWPS-A2-MW09A | 12/22/2020 | N | EM01 | Downgradient | 50 | Qal | 34.8 - 54.5 | 1,900 | 2,300 | 8.3 J- | 2,000 | 1.7 J | 4.92 |
| LVWPS-A2-MW09A | 1/11/2021 | N | EM02 | Downgradient | 50 | Qal | 34.8 - 54.5 | 3,000 | 3,200 | 12 | 2,400 | 1.5 | 2.82 |
| LVWPS-A2-MW09A | 1/11/2021 | FD | EM02 | Downgradient | 50 | Qal | 34.8 - 54.5 | 3,200 | 3,400 | 12 | 2,500 | 1.6 | ---- |
| LVWPS-A2-MW09A | 1/26/2021 | N | EM03 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,200 | 2,700 | 8.7 | 2,400 | 2.1 J+ | 1.94 |
| LVWPS-A2-MW09A | 2/8/2021 | N | EM04 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,100 | 3,000 | 11 | 2,300 | 1.4 | 4.10 |
| LVWPS-A2-MW09A | 2/8/2021 | FD | EM04 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,200 | 3,100 | 11 | 2,300 | 1.5 | ---- |
| LVWPS-A2-MW09A | 3/8/2021 | N | EM05 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,300 | 3,400 | 13 | 2,100 | 1.4 | 2.09 |
| LVWPS-A2-MW09A | 3/8/2021 | FD | EM05 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,300 | 3,300 | 11 | 2,200 | 1.5 | ---- |
| LVWPS-A2-MW09A | 4/5/2021 | N | EM06 | Downgradient | 50 | Qal | 34.8 - 54.5 | 1,000 | 3,200 | 11 | 2,300 | 1.5 | 2.30 |
| LVWPS-A2-MW09A | 4/5/2021 | FD | EM06 | Downgradient | 50 | Qal | 34.8 - 54.5 | 1,000 | 3,200 | 11 | 2,300 | 1.7 | ---- |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW09A | 5/4/2021 | N | EM07 | Downgradient | 50 | Qal | 34.8 - 54.5 | 1,700 | 2,500 | 12 | 2,300 | 2.3 | 2.64 |
| LVWPS-A2-MW09A | 5/4/2021 | FD | EM07 | Downgradient | 50 | Qal | 34.8 - 54.5 | 1,800 | 2,100 | 11 | 2,300 | 2.4 | ---- |
| LVWPS-A2-MW09A | 6/7/2021 | N | EM08 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,100 | 3,100 | 14 | 2,300 | 1.4 | 0.52 |
| LVWPS-A2-MW09A | 6/7/2021 | FD | EM08 | Downgradient | 50 | Qal | 34.8 - 54.5 | 2,100 | 3,000 | 13 | 2,200 | 1.4 | ---- |
| LVWPS-A2-MW09B | 10/9/2020 | N | BL04 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,600 | 2,100 | 8.8 | 2,000 | 0.60 | 7.44 |
| LVWPS-A2-MW09B | 12/22/2020 | N | EM01 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,500 | 1,600 | 5.5 | 1,800 | 0.69 | 3.74 |
| LVWPS-A2-MW09B | 1/14/2021 | N | EM02 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,300 | 1,700 | 6.1 | 1,900 | 0.59 | 3.90 |
| LVWPS-A2-MW09B | 1/27/2021 | N | EM03 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,500 | 1,600 | 6.5 | 1,700 | 0.64 | 3.54 |
| LVWPS-A2-MW09B | 2/8/2021 | N | EM04 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,500 | 1,800 | 7.2 | 1,800 | 0.71 | 4.12 |
| LVWPS-A2-MW09B | 3/8/2021 | N | EM05 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,400 | 1,800 | 7.2 | 1,700 | 0.63 | 6.42 |
| LVWPS-A2-MW09B | 4/5/2021 | N | EM06 | Downgradient | 50 | Qal | 58.8 - 78.5 | 720 | 2,000 | 8.5 | 1,900 | 0.64 | 6.05 |
| LVWPS-A2-MW09B | 5/4/2021 | N | EM07 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,100 | 1,300 | 5.2 | 2,000 | 1.4 | 1.62 |
| LVWPS-A2-MW09B | 6/7/2021 | N | EM08 | Downgradient | 50 | Qal | 58.8 - 78.5 | 1,600 | 2,000 | 8.1 | 2,100 | 0.79 | 0.26 |
| LVWPS-A2-MW14A | 10/6/2020 | N | BL04 | Downgradient | 50 | Qal | 35.8 - 50.5 | 2,600 | 5,400 | 19 | 2,200 | 1.7 | 5.77 |
| LVWPS-A2-MW14A | 10/6/2020 | FD | BL04 | Downgradient | 50 | Qal | 35.8 - 50.5 | 2,700 | 5,100 | 19 | 2,200 | 1.7 | ---- |
| LVWPS-A2-MW14A | 12/22/2020 | N | EM01 | Downgradient | 50 | Qal | 35.8 - 50.5 | 130 | 240 | 0.58 J- | 2,300 | 28 | 0.33 |
| LVWPS-A2-MW14A | 12/22/2020 | FD | EM01 | Downgradient | 50 | Qal | 35.8 - 50.5 | 140 | 210 | 0.58 J- | 2,200 | 29 | ---- |
| LVWPS-A2-MW14A | 1/13/2021 | N | EM02 | Downgradient | 50 | Qal | 35.8 - 50.5 | 200 | 250 | 0.57 | 1,900 | 31 | 0.69 |
| LVWPS-A2-MW14A | 1/13/2021 | FD | EM02 | Downgradient | 50 | Qal | 35.8 - 50.5 | 210 | 220 | 0.59 | 1,900 | 32 | ---- |
| LVWPS-A2-MW14A | 1/28/2021 | N | EM03 | Downgradient | 50 | Qal | 35.8 - 50.5 | 50 | 65 J | 0.24 | 950 | 59 | 1.02 |
| LVWPS-A2-MW14A | 1/28/2021 | FD | EM03 | Downgradient | 50 | Qal | 35.8 - 50.5 | 59 | 52 J | 0.25 | 960 | 61 | ---- |
| LVWPS-A2-MW14A | 2/9/2021 | N | EM04 | Downgradient | 50 | Qal | 35.8 - 50.5 | 23 | <10 | 0.053 | 890 | 41 J- | 0.72 |
| LVWPS-A2-MW14A | 2/9/2021 | FD | EM04 | Downgradient | 50 | Qal | 35.8 - 50.5 | 23 | <10 | 0.038 J | 890 | 41 J- | ---- |
| LVWPS-A2-MW14A | 3/9/2021 | N | EM05 | Downgradient | 50 | Qal | 35.8 - 50.5 | 13 | 12 J | <0.014 | 920 | 49 | 0.27 |
| LVWPS-A2-MW14A | 3/9/2021 | FD | EM05 | Downgradient | 50 | Qal | 35.8 - 50.5 | 13 | 32 J | <0.014 | 910 | 50 | ---- |
| LVWPS-A2-MW14A | 4/6/2021 | N | EM06 | Downgradient | 50 | Qal | 35.8 - 50.5 | 67 | 96 J | 0.32 J+ | 1,100 | 4.2 J+ | 0.36 |
| LVWPS-A2-MW14A | 4/6/2021 | FD | EM06 | Downgradient | 50 | Qal | 35.8 - 50.5 | 68 | 99 J | 0.30 J+ | 1,100 | 4.0 J+ | ---- |
| LVWPS-A2-MW14A | 5/3/2021 | N | EM07 | Downgradient | 50 | Qal | 35.8 - 50.5 | 58 | 42 J | 0.047 J | 800 J- | 230 | 0.31 |
| LVWPS-A2-MW14A | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 35.8 - 50.5 | 62 | 85 J | 0.18 | 140 J+ | 6.1 | 0.19 |
| LVWPS-A2-MW14A | 6/8/2021 | FD | EM08 | Downgradient | 50 | Qal | 35.8 - 50.5 | 62 | 91 J | 0.20 | 140 J+ | 5.5 | ---- |
| LVWPS-A2-MW14B | 10/6/2020 | N | BL04 | Downgradient | 50 | Qal | 54.8 - 74.5 | 2,800 | 5,400 | 18 | 2,300 | 1.6 | 5.42 |
| LVWPS-A2-MW14B | 12/22/2020 | N | EM01 | Downgradient | 50 | Qal | 54.8 - 74.5 | 1,700 | 2,800 | 7.9 | 2,400 | 7.4 | 0.28 |
| LVWPS-A2-MW14B | 1/13/2021 | N | EM02 | Downgradient | 50 | Qal | 54.8 - 74.5 | 1,800 | 3,800 | 10 | 2,300 | 3.1 | 0.70 |
| LVWPS-A2-MW14B | 1/25/2021 | N | EM03 | Downgradient | 50 | Qal | 54.8 - 74.5 | 2,400 | 3,000 | 8.6 | 2,100 | 2.2 J+ | 0.98 |
| LVWPS-A2-MW14B | 2/9/2021 | N | EM04 | Downgradient | 50 | Qal | 54.8 - 74.5 | 1,400 | 2,600 | 9.5 | 2,000 | 6.2 J- | 0.73 |
| LVWPS-A2-MW14B | 3/10/2021 | N | EM05 | Downgradient | 50 | Qal | 54.8 - 74.5 | 2,200 | 3,700 | 13 | 2,100 | 2.1 | 1.41 |
| LVWPS-A2-MW14B | 4/6/2021 | N | EM06 | Downgradient | 50 | Qal | 54.8 - 74.5 | 2,200 | 4,000 | 15 | 2,300 | 2.1 J+ | 0.91 |
| LVWPS-A2-MW14B | 5/3/2021 | N | EM07 | Downgradient | 50 | Qal | 54.8 - 74.5 | 1,600 | 1,800 | 4.7 | 3,200 | 4.3 | 0.31 |
| LVWPS-A2-MW14B | 6/8/2021 | N | EM08 | Downgradient | 50 | Qal | 54.8 - 74.5 | 1,700 | 1,900 | 12 | 2,200 | 2.1 J+ | 0.32 |
| LVWPS-U2-MW08 | 10/1/2020 | N | BL04 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 4,600 | 8,100 | 17 | 2,100 | 1.5 | 2.63 |
| LVWPS-U2-MW08 | 1/11/2021 | N | EM02 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 3,100 | 9,400 | 9.1 | 1,900 | <0.26 | 0.54 |
| LVWPS-U2-MW08 | 2/8/2021 | N | EM04 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 3,400 | 9,200 | 9.8 | 1,800 | 1.1 J | 1.84 |
| LVWPS-U2-MW08 | 3/8/2021 | N | EM05 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 4,600 | 14,000 | 10 | 1,500 | 0.50 J- | 1.99 |
| LVWPS-U2-MW08 | 4/5/2021 | N | EM06 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 5,000 | 10,000 | 11 | 1,800 | 0.51 | 1.95 |
| LVWPS-U2-MW08 | 6/7/2021 | N | EM08 | Downgradient | 50 | UMCf | 113.2 - 133.0 | 490 J- | 9,000 | 11 | 1,800 | <1.0 | 2.63 |
| LVWPS-U2-MW09 | 10/9/2020 | N | BL04 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 12,000 | 18,000 | 17 | 2,200 | 1.1 | 2.06 |
| LVWPS-U2-MW09 | 1/18/2021 | N | EM02 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 9,800 | 15,000 | 17 | 2,300 | 1.4 J | 2.21 |
| LVWPS-U2-MW09 | 2/8/2021 | N | EM04 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 10,000 | 15,000 | 16 | 1,900 | 2.6 J | 3.42 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U2-MW09 | 3/8/2021 | N | EM05 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 8,900 | 16,000 | 17 | 2,000 | 1.1 | 3.36 |
| LVWPS-U2-MW09 | 4/5/2021 | N | EM06 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 2,000 | 11,000 | 17 | 1,900 | 1.5 | 2.69 |
| LVWPS-U2-MW09 | 6/7/2021 | N | EM08 | Downgradient | 50 | UMCf | 84.9 - 104.7 | 9,600 | 17,000 | 3.7 | 2,300 | 1.2 J | 2.69 |
| LVWPS-U2-MW14 | 10/6/2020 | N | BL04 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 11,000 | 360 | 17 | 2,000 | 0.78 | 5.18 |
| LVWPS-U2-MW14 | 1/13/2021 | N | EM02 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 9,600 | 20,000 | 8.9 | 1,900 | 1.4 J | 0.82 |
| LVWPS-U2-MW14 | 2/9/2021 | N | EM04 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 7,300 | 12,000 | 13 | 1,900 | 2.1 J- | 1.49 |
| LVWPS-U2-MW14 | 3/10/2021 | N | EM05 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 9,200 | 11,000 | 11 | 1,800 | 1.1 | 1.26 |
| LVWPS-U2-MW14 | 4/6/2021 | N | EM06 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 9,300 | 13,000 | 15 | 1,900 | 1.2 J+ | 0.95 |
| LVWPS-U2-MW14 | 6/9/2021 | N | EM08 | Downgradient | 50 | UMCf | 83.2 - 108.0 | 10,000 | 18,000 | 15 | 1,900 | 0.89 | 1.89 |
| LVWPS-A2-MW11A | 10/2/2020 | N | BL04 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 3,100 | 5,300 | 19 | 2,100 | 1.7 | 4.72 |
| LVWPS-A2-MW11A | 10/2/2020 | FD | BL04 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 3,100 | 5,100 | 19 | 2,100 | 1.7 | ---- |
| LVWPS-A2-MW11A | 12/23/2020 | N | EM01 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,900 | 5,000 | 19 | 2,100 | 2.0 | 3.75 |
| LVWPS-A2-MW11A | 1/13/2021 | N | EM02 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,500 | 5,600 | 19 | 2,100 | 1.9 | 3.37 |
| LVWPS-A2-MW11A | 1/27/2021 | N | EM03 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,200 | 4,700 | 5.2 | 1,900 | 1.9 | 3.34 |
| LVWPS-A2-MW11A | 2/9/2021 | N | EM04 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,700 | 4,700 | 21 | 2,000 J- | 1.7 J- | 5.05 |
| LVWPS-A2-MW11A | 3/9/2021 | N | EM05 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,800 | 4,900 | 21 | 2,300 | 1.8 | 4.31 |
| LVWPS-A2-MW11A | 4/6/2021 | N | EM06 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,800 | 5,200 | 22 | 2,200 | 1.8 J+ | 4.46 |
| LVWPS-A2-MW11A | 5/4/2021 | N | EM07 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,800 | 5,200 | 22 | 2,300 | 1.7 J- | 4.75 |
| LVWPS-A2-MW11A | 6/8/2021 | N | EM08 | Cross/Downgradient | 100 | Qal | 40.3 - 60.0 | 2,700 | 4,300 J+ | 20 | 4,400 | 1.7 J- | 5.21 |
| LVWPS-A2-MW11B | 10/2/2020 | N | BL04 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 2,900 | 7,200 | 21 | 2,100 | 1.7 | 4.18 |
| LVWPS-A2-MW11B | 12/23/2020 | N | EM01 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 2,600 | 6,100 | 22 | 2,100 | 2.3 J | 7.73 |
| LVWPS-A2-MW11B | 1/13/2021 | N | EM02 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 2,600 | 6,500 | 22 | 2,100 | 2.2 | 7.13 |
| LVWPS-A2-MW11B | 1/27/2021 | N | EM03 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 3,300 | 6,900 | 23 | 1,900 | 1.9 | 3.35 |
| LVWPS-A2-MW11B | 2/8/2021 | N | EM04 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 3,200 | 8,000 | 23 | 2,000 | 1.8 | 8.67 |
| LVWPS-A2-MW11B | 3/9/2021 | N | EM05 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 3,000 | 6,600 | 23 | 2,100 | 1.8 | 6.28 |
| LVWPS-A2-MW11B | 4/6/2021 | N | EM06 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 2,800 | 7,800 | 24 | 2,100 | 1.8 J+ | 4.14 |
| LVWPS-A2-MW11B | 5/3/2021 | N | EM07 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 2,900 | 7,400 | 22 | 2,200 | 1.7 | 4.24 E |
| LVWPS-A2-MW11B | 6/8/2021 | N | EM08 | Cross/Downgradient | 100 | Qal | 65.3 - 85.0 | 3,000 | 6,200 | 24 | 2,100 | 1.6 | 4.14 |
| LVWPS-A2-MW11C | 10/2/2020 | N | BL04 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,500 | 11,000 | 23 | 2,100 | 1.6 | 3.91 |
| LVWPS-A2-MW11C | 12/23/2020 | N | EM01 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,000 | 9,800 | 23 | 2,100 | <0.26 | 3.43 |
| LVWPS-A2-MW11C | 1/14/2021 | N | EM02 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 2,900 | 9,900 | 23 | 2,300 | 1.7 | 3.14 |
| LVWPS-A2-MW11C | 1/27/2021 | N | EM03 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,500 | 11,000 | 24 | 2,000 | 2.2 | 2.67 |
| LVWPS-A2-MW11C | 2/9/2021 | N | EM04 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,200 | 11,000 | 24 | 1,900 | 1.6 J- | 6.27 |
| LVWPS-A2-MW11C | 3/10/2021 | N | EM05 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,000 | 11,000 | 24 | 2,100 | 2.0 | 3.91 |
| LVWPS-A2-MW11C | 4/6/2021 | N | EM06 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 2,700 | 12,000 | 25 | 2,200 | 2.5 J | 3.53 |
| LVWPS-A2-MW11C | 5/4/2021 | N | EM07 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,300 | 13,000 | 24 | 2,200 | 1.5 | 5.43 |
| LVWPS-A2-MW11C | 6/8/2021 | N | EM08 | Cross/Downgradient | 100 | Qal | 90.3 - 110.0 | 3,400 | 7,800 | 24 J- | 2,200 | 1.7 J | 3.41 |
| LVWPS-A2-MW12A | 10/6/2020 | N | BL04 | Downgradient | 100 | Qal | 34.9 - 44.5 | 4,400 | 5,300 | 18 | 2,100 | 1.7 | 4.83 |
| LVWPS-A2-MW12A | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 34.9 - 44.5 | 32 | 50 J | <0.014 | 2,500 | 120 | 0.56 |
| LVWPS-A2-MW12A | 12/22/2020 | FD | EM01 | Downgradient | 100 | Qal | 34.9 - 44.5 | 40 | 48 J | <0.014 | 2,400 | 120 | ---- |
| LVWPS-A2-MW12A | 1/11/2021 | N | EM02 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <4.0 | <0.014 | 2,100 | 92 | 0.74 |
| LVWPS-A2-MW12A | 1/27/2021 | N | EM03 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <10 | <0.014 | 200 | 8.0 | 0.45 |
| LVWPS-A2-MW12A | 2/8/2021 | N | EM04 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <10 | 0.023 J | 14 | 33 | 1.34 |
| LVWPS-A2-MW12A | 3/8/2021 | N | EM05 | Downgradient | 100 | Qal | 34.9 - 44.5 | 0.47 J | <10 | <0.014 | 290 | 4.0 | 0.18 |
| LVWPS-A2-MW12A | 4/5/2021 | N | EM06 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <10 | <0.014 | 650 | 3.4 | 0.70 |
| LVWPS-A2-MW12A | 5/5/2021 | N | EM07 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <24 | <0.014 | 2.6 | 140 | 0.40 |
| LVWPS-A2-MW12A | 5/5/2021 | FD | EM07 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <24 | <0.014 | 3.0 | 140 | ---- |
| LVWPS-A2-MW12A | 6/7/2021 | N | EM08 | Downgradient | 100 | Qal | 34.9 - 44.5 | <0.31 | <24 | <0.014 | 23 | 6.0 | 0.64 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW12B | 10/7/2020 | N | BL04 | Downgradient | 100 | Qal | 49.3 - 69.0 | 4,000 | 5,600 | 19 | 2,300 | 1.6 | 4.82 |
| LVWPS-A2-MW12B | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 49.3 - 69.0 | 12 | <10 | <0.014 | 2,100 | 45 | 0.53 |
| LVWPS-A2-MW12B | 1/12/2021 | N | EM02 | Downgradient | 100 | Qal | 49.3 - 69.0 | 170 | 130 | 0.036 J | 2,300 | 11 | 0.68 |
| LVWPS-A2-MW12B | 1/27/2021 | N | EM03 | Downgradient | 100 | Qal | 49.3 - 69.0 | 220 | 140 | <0.014 | 1,900 | 2.8 | 0.57 |
| LVWPS-A2-MW12B | 1/27/2021 | FD | EM03 | Downgradient | 100 | Qal | 49.3 - 69.0 | 220 | 150 | <0.014 | 2,000 | 2.9 | ---- |
| LVWPS-A2-MW12B | 2/8/2021 | N | EM04 | Downgradient | 100 | Qal | 49.3 - 69.0 | 20 | 28 J | <0.014 | 2,100 | 2.8 | 1.31 |
| LVWPS-A2-MW12B | 3/8/2021 | N | EM05 | Downgradient | 100 | Qal | 49.3 - 69.0 | 340 | 490 | 1.1 | 1,900 | 2.4 | 0.23 |
| LVWPS-A2-MW12B | 4/5/2021 | N | EM06 | Downgradient | 100 | Qal | 49.3 - 69.0 | 1,200 | 1,700 | 4.6 | 2,100 | 2.7 | 0.75 |
| LVWPS-A2-MW12B | 5/5/2021 | N | EM07 | Downgradient | 100 | Qal | 49.3 - 69.0 | 40 | 54 J | <0.014 | 2,000 | 14 J- | 0.36 |
| LVWPS-A2-MW12B | 6/7/2021 | N | EM08 | Downgradient | 100 | Qal | 49.3 - 69.0 | 510 | 460 | 0.78 | 2,000 | 2.3 | 0.55 |
| LVWPS-A2-MW13A | 10/1/2020 | N | BL04 | Downgradient | 100 | Qal | 41.3 - 61.0 | 1,200 | 2,100 | 10 | 1,800 | 0.76 | 6.60 |
| LVWPS-A2-MW13A | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 41.3 - 61.0 | 1,100 | 1,300 | 7.3 | 1,900 | 1.4 | 6.32 |
| LVWPS-A2-MW13A | 1/11/2021 | N | EM02 | Downgradient | 100 | Qal | 41.3 - 61.0 | 1,100 | 1,100 | 5.9 | 2,300 | 1.7 | 0.85 |
| LVWPS-A2-MW13A | 1/27/2021 | N | EM03 | Downgradient | 100 | Qal | 41.3 - 61.0 | 1,700 | 1,900 | 8.9 | 2,000 | 1.6 | 1.12 |
| LVWPS-A2-MW13A | 2/10/2021 | N | EM04 | Downgradient | 100 | Qal | 41.3 - 61.0 | 2,000 | 2,300 | 12 | 2,000 | 1.4 | 1.87 |
| LVWPS-A2-MW13A | 3/11/2021 | N | EM05 | Downgradient | 100 | Qal | 41.3 - 61.0 | 1,400 | 1,900 | 8.5 | 1,900 | 1.1 J | 4.82 |
| LVWPS-A2-MW13A | 4/7/2021 | N | EM06 | Downgradient | 100 | Qal | 41.3 - 61.0 | 2,000 | 2,900 | 14 | 2,300 | 1.3 J+ | 1.89 |
| LVWPS-A2-MW13A | 5/4/2021 | N | EM07 | Downgradient | 100 | Qal | 41.3 - 61.0 | 69 | 90 J | 0.29 | 2,200 | 84 | 1.46 |
| LVWPS-A2-MW13A | 6/9/2021 | N | EM08 | Downgradient | 100 | Qal | 41.3 - 61.0 | 490 | 650 | 2.9 | 2,300 | 1.7 | 0.47 |
| LVWPS-A2-MW13B | 10/1/2020 | N | BL04 | Downgradient | 100 | Qal | 66.4 - 86.1 | 2,200 | 4,300 | 15 | 2,200 | 1.2 | 5.76 |
| LVWPS-A2-MW13B | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 66.4 - 86.1 | 610 | 830 | 3.5 | 2,200 | 32 | 2.43 |
| LVWPS-A2-MW13B | 1/12/2021 | N | EM02 | Downgradient | 100 | Qal | 66.4 - 86.1 | 38 | 58 J | 0.11 J | 2,100 | 21 | 0.49 |
| LVWPS-A2-MW13B | 1/27/2021 | N | EM03 | Downgradient | 100 | Qal | 66.4 - 86.1 | 52 | 26 J | 0.71 | 1,700 | 9.6 | 0.44 |
| LVWPS-A2-MW13B | 2/10/2021 | N | EM04 | Downgradient | 100 | Qal | 66.4 - 86.1 | 170 | 240 | 0.76 | 1,600 | 3.6 | 0.85 |
| LVWPS-A2-MW13B | 3/11/2021 | N | EM05 | Downgradient | 100 | Qal | 66.4 - 86.1 | 520 | 380 | 3.3 | 1,800 | 1.8 | 1.19 |
| LVWPS-A2-MW13B | 4/7/2021 | N | EM06 | Downgradient | 100 | Qal | 66.4 - 86.1 | 230 | 170 J+ | 0.58 J+ | 2,000 | 1.9 J+ | 0.90 |
| LVWPS-A2-MW13B | 5/4/2021 | N | EM07 | Downgradient | 100 | Qal | 66.4 - 86.1 | 65 | 86 J | 0.13 J+ | 1,400 | 4.5 | 0.94 |
| LVWPS-A2-MW13B | 6/10/2021 | N | EM08 | Downgradient | 100 | Qal | 66.4 - 86.1 | 120 | 91 J | 0.34 | 1,700 | 2.0 | 0.44 |
| LVWPS-A2-MW17A | 10/1/2020 | N | BL04 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,500 | 5,300 | 19 | 2,100 | 1.7 | 4.90 |
| LVWPS-A2-MW17A | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,100 | 2,100 | 6.4 | 2,200 | 2.8 | 0.37 |
| LVWPS-A2-MW17A | 1/11/2021 | N | EM02 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,100 | 3,000 | 8.7 | 2,200 | 2.0 | 0.67 |
| LVWPS-A2-MW17A | 1/26/2021 | N | EM03 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,700 | 3,700 | 14 | 1,900 | 2.4 J+ | 1.77 E |
| LVWPS-A2-MW17A | 2/8/2021 | N | EM04 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,400 | 3,600 | 13 | 2,000 | 1.9 | 1.18 |
| LVWPS-A2-MW17A | 3/8/2021 | N | EM05 | Downgradient | 100 | Qal | 40.3 - 60.0 | 1,900 | 3,500 | 14 | 1,900 | 2.0 | 3.86 |
| LVWPS-A2-MW17A | 4/5/2021 | N | EM06 | Downgradient | 100 | Qal | 40.3 - 60.0 | 2,400 | 4,400 | 18 | 2,100 | 2.0 | 1.84 |
| LVWPS-A2-MW17A | 5/3/2021 | N | EM07 | Downgradient | 100 | Qal | 40.3 - 60.0 | 1,800 | 2,400 | 8.4 | 2,200 | 4.1 | 1.40 E |
| LVWPS-A2-MW17A | 6/7/2021 | N | EM08 | Downgradient | 100 | Qal | 40.3 - 60.0 | 1,800 | 2,800 | 12 | 1,800 | 1.8 | 1.48 |
| LVWPS-A2-MW17B | 10/1/2020 | N | BL04 | Downgradient | 100 | Qal | 65.3 - 85.0 | 2,700 | 5,700 | 21 | 2,100 | 1.7 | 4.83 |
| LVWPS-A2-MW17B | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 65.3 - 85.0 | 560 | 350 | 1.2 | 2,200 | 7.6 | 0.37 |
| LVWPS-A2-MW17B | 1/11/2021 | N | EM02 | Downgradient | 100 | Qal | 65.3 - 85.0 | 790 | 1,200 | 3.2 | 2,200 | 6.8 | 0.26 |
| LVWPS-A2-MW17B | 1/26/2021 | N | EM03 | Downgradient | 100 | Qal | 65.3 - 85.0 | 870 | 1,300 | 3.3 | 1,700 | 4.5 | 7.06 E |
| LVWPS-A2-MW17B | 2/8/2021 | N | EM04 | Downgradient | 100 | Qal | 65.3 - 85.0 | 1,100 | 1,400 | 4.5 | 1,800 | 3.5 | 4.10 |
| LVWPS-A2-MW17B | 3/8/2021 | N | EM05 | Downgradient | 100 | Qal | 65.3 - 85.0 | 530 | 560 | 3.1 | 1,700 | 3.2 | 3.35 |
| LVWPS-A2-MW17B | 4/5/2021 | N | EM06 | Downgradient | 100 | Qal | 65.3 - 85.0 | 1,600 | 2,900 | 13 | 2,100 | 2.4 | 1.01 |
| LVWPS-A2-MW17B | 5/3/2021 | N | EM07 | Downgradient | 100 | Qal | 65.3 - 85.0 | 1,200 | 1,900 | 4.9 | 1,900 | 10 | 1.30 E |
| LVWPS-A2-MW17B | 6/7/2021 | N | EM08 | Downgradient | 100 | Qal | 65.3 - 85.0 | 2,100 | 5,600 | 16 | 2,000 | 1.9 | 1.02 |
| LVWPS-A2-MW17C | 10/1/2020 | N | BL04 | Downgradient | 100 | Qal | 90.3 - 110.0 | 2,200 | 3,700 | 14 | 2,100 | 1.1 | 5.67 |
| LVWPS-A2-MW17C | 12/22/2020 | N | EM01 | Downgradient | 100 | Qal | 90.3 - 110.0 | 2,000 | 1,700 | 4.3 | 1,900 | 4.8 | 2.30 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW17C | 1/11/2021 | N | EM02 | Downgradient | 100 | Qal | 90.3 - 110.0 | 660 | 920 | 2.6 | 2,100 | 3.6 | 0.91 |
| LVWPS-A2-MW17C | 1/26/2021 | N | EM03 | Downgradient | 100 | Qal | 90.3 - 110.0 | 720 | 1,000 | 2.5 | 1,800 | 2.9 | 3.80 E |
| LVWPS-A2-MW17C | 2/8/2021 | N | EM04 | Downgradient | 100 | Qal | 90.3 - 110.0 | 570 | 760 | 2.1 | 1,200 | 62 | 3.93 |
| LVWPS-A2-MW17C | 3/8/2021 | N | EM05 | Downgradient | 100 | Qal | 90.3 - 110.0 | 1,300 | 2,100 | 6.7 | 1,700 | 1.4 | 7.18 |
| LVWPS-A2-MW17C | 4/5/2021 | N | EM06 | Downgradient | 100 | Qal | 90.3 - 110.0 | 920 | 970 | 4.8 | 1,800 | 3.0 | 0.34 |
| LVWPS-A2-MW17C | 5/3/2021 | N | EM07 | Downgradient | 100 | Qal | 90.3 - 110.0 | 370 | 440 | 1.1 | 1,500 | 4.7 | 2.22 E |
| LVWPS-A2-MW17C | 6/8/2021 | N | EM08 | Downgradient | 100 | Qal | 90.3 - 110.0 | 440 | 690 | 2.8 | 1,500 | 2.7 | 1.35 |
| LVWPS-U2-MW12 | 10/7/2020 | N | BL04 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 8,800 | 12,000 | 18 | 2,000 | 1.1 | 4.13 |
| LVWPS-U2-MW12 | 1/12/2021 | N | EM02 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 7,000 | 11,000 | 16 | 1,900 | 1.4 J | 3.9 |
| LVWPS-U2-MW12 | 2/8/2021 | N | EM04 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 7,500 | 11,000 | 15 | 2,000 | 1.0 J- | 3.80 |
| LVWPS-U2-MW12 | 3/8/2021 | N | EM05 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 6,100 | 14,000 | 13 | 1,900 | 1.1 | 2.73 |
| LVWPS-U2-MW12 | 4/7/2021 | N | EM06 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 6,200 | 11,000 | 15 | 2,000 | 1.4 J+ | 3.05 |
| LVWPS-U2-MW12 | 6/7/2021 | N | EM08 | Downgradient | 100 | UMCf | 83.2 - 108.0 | 6,700 | 11,000 | 15 | 2,100 | 1.0 | 2.70 |
| LVWPS-U2-MW17 | 10/1/2020 | N | BL04 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 4,500 | 10,000 | 11 | 1,700 | 0.66 | 2.28 |
| LVWPS-U2-MW17 | 1/12/2021 | N | EM02 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 1,800 | 800 | <0.14 | 2,200 | 6.1 | 0.64 |
| LVWPS-U2-MW17 | 1/12/2021 | FD | EM02 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 2,100 | 810 | 0.036 J | 2,200 | 6.6 | ---- |
| LVWPS-U2-MW17 | 2/8/2021 | N | EM04 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 2,000 | 3,900 | 3.9 | 2,000 | 2.0 | 2.19 |
| LVWPS-U2-MW17 | 2/8/2021 | FD | EM04 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 2,200 | 3,800 | 3.9 | 2,000 | 1.9 J | ---- |
| LVWPS-U2-MW17 | 3/9/2021 | N | EM05 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 3,400 | 6,500 | 6.2 | 2,100 | 2.0 | 2.52 |
| LVWPS-U2-MW17 | 3/9/2021 | FD | EM05 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 3,400 | 6,600 | 6.6 | 2,100 | 2.0 | ---- |
| LVWPS-U2-MW17 | 4/6/2021 | N | EM06 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 3,700 | 7,600 | 9.6 | 2,000 | 1.9 J | 1.51 |
| LVWPS-U2-MW17 | 4/6/2021 | FD | EM06 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 3,700 | 7,600 | 9.7 | 2,100 | 2.2 J+ | ---- |
| LVWPS-U2-MW17 | 6/9/2021 | N | EM08 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 4,100 | 6,300 | 12 | 2,000 | 1.8 J | 2.12 |
| LVWPS-U2-MW17 | 6/9/2021 | FD | EM08 | Downgradient | 100 | UMCf | 117.0 - 136.5 | 3,900 | 4,700 | 12 | 2,000 | 2.1 | ---- |
| LVWPS-A2-MW15A | 10/7/2020 | N | BL04 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 3,400 | 5,100 | 20 | 2,100 | 1.7 | 4.55 |
| LVWPS-A2-MW15A | 12/21/2020 | N | EM01 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 3,000 | 5,100 | 19 | 2,000 | 1.9 | 4.42 |
| LVWPS-A2-MW15A | 1/11/2021 | N | EM02 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,800 | 5,400 | 19 | 2,200 | 1.9 | 3.70 |
| LVWPS-A2-MW15A | 1/25/2021 | N | EM03 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,900 | 5,000 | 18 | 2,000 | 2.0 J+ | 3.59 |
| LVWPS-A2-MW15A | 2/9/2021 | N | EM04 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,200 | 4,800 | 20 | 1,900 | 2.0 J- | 4.64 |
| LVWPS-A2-MW15A | 3/9/2021 | N | EM05 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,800 | 4,900 | 21 | 2,000 | 1.9 | 4.17 |
| LVWPS-A2-MW15A | 4/6/2021 | N | EM06 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,600 | 5,100 | 21 | 2,100 | 2.5 J+ | 3.99 |
| LVWPS-A2-MW15A | 5/4/2021 | N | EM07 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,700 | 5,000 | 20 | 2,200 | 1.8 | 5.52 |
| LVWPS-A2-MW15A | 6/11/2021 | N | EM08 | Cross/Downgradient | 200 | Qal | 39.8 - 59.5 | 2,500 | 4,000 | 21 | 2,000 | 1.9 J+ | 4.48 |
| LVWPS-A2-MW15B | 10/8/2020 | N | BL04 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,200 | 9,000 | 22 | 2,300 | 1.7 | 3.90 |
| LVWPS-A2-MW15B | 12/22/2020 | N | EM01 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,300 | 7,600 | 24 | 2,200 | 2.0 | 4.30 |
| LVWPS-A2-MW15B | 1/12/2021 | N | EM02 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,300 | 8,400 | 24 | 2,300 | 1.8 | 3.05 |
| LVWPS-A2-MW15B | 1/26/2021 | N | EM03 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,400 | 9,000 | 25 | 2,000 | 1.8 J+ | 9.30 E |
| LVWPS-A2-MW15B | 2/9/2021 | N | EM04 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 2,600 | 9,500 | 24 | 1,800 | 1.7 J- | 3.99 |
| LVWPS-A2-MW15B | 3/9/2021 | N | EM05 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,100 | 9,400 | 25 | 2,100 | 1.7 | 3.95 |
| LVWPS-A2-MW15B | 4/6/2021 | N | EM06 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 2,900 | 9,800 | 25 | 2,200 | 1.7 J+ | 3.83 |
| LVWPS-A2-MW15B | 5/5/2021 | N | EM07 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 4,000 | 10,000 | 25 J | 2,200 | 1.8 | 6.42 |
| LVWPS-A2-MW15B | 6/11/2021 | N | EM08 | Cross/Downgradient | 200 | Qal | 70.3 - 90.0 | 3,000 | 9,700 | 23 | 2,200 | 1.7 J+ | 3.96 |
| LVWPS-MW223A | 10/6/2020 | N | BL04 | Downgradient | 200 | Qal | 45.3 - 65.0 | 3,300 | 5,900 | 17 | 2,400 | 1.4 | 4.57 |
| LVWPS-MW223A | 10/6/2020 | FD | BL04 | Downgradient | 200 | Qal | 45.3 - 65.0 | 3,900 | 5,800 | 17 | 2,400 | 1.4 | ---- |
| LVWPS-MW223A | 12/22/2020 | N | EM01 | Downgradient | 200 | Qal | 45.3 - 65.0 | 4,100 | 370 | 0.54 | 2,700 | 11 | 0.33 |
| LVWPS-MW223A | 1/11/2021 | N | EM02 | Downgradient | 200 | Qal | 45.3 - 65.0 | 730 | 820 | 1.4 | 2,600 | <21 | 1.14 |
| LVWPS-MW223A | 1/26/2021 | N | EM03 | Downgradient | 200 | Qal | 45.3 - 65.0 | 2,700 | 3,700 | 9.1 | 2,600 | 1.4 J+ | 1.03 E |
| LVWPS-MW223A | 2/8/2021 | N | EM04 | Downgradient | 200 | Qal | 45.3 - 65.0 | 2,700 | 3,500 | 9.6 | 2,500 | 1.5 | 0.24 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-MW223A | 3/8/2021 | N | EM05 | Downgradient | 200 | Qal | 45.3 - 65.0 | 2,900 | 4,400 | 12 | 2,400 | 1.5 | 0.78 |
| LVWPS-MW223A | 4/5/2021 | N | EM06 | Downgradient | 200 | Qal | 45.3 - 65.0 | 3,100 | 5,000 | 14 | 2,500 | 1.4 | 0.73 |
| LVWPS-MW223A | 5/5/2021 | N | EM07 | Downgradient | 200 | Qal | 45.3 - 65.0 | 1,200 | 1,700 | 5.5 | 2,500 | 1.5 | 0.65 |
| LVWPS-MW223A | 6/7/2021 | N | EM08 | Downgradient | 200 | Qal | 45.3 - 65.0 | 1,600 | 4,500 | 13 | 2,500 | 1.3 | 0.16 |
| LVWPS-MW223B | 10/6/2020 | N | BL04 | Downgradient | 200 | Qal | 70.3 - 90.0 | 3,300 | 6,100 | 20 | 2,100 | 1.8 | 4.26 |
| LVWPS-MW223B | 12/22/2020 | N | EM01 | Downgradient | 200 | Qal | 70.3 - 90.0 | 2,100 | 2,800 | 6.7 J- | 2,100 | 3.5 | 0.44 |
| LVWPS-MW223B | 1/11/2021 | N | EM02 | Downgradient | 200 | Qal | 70.3 - 90.0 | 1,700 | 2,100 | 6.6 | 2,300 | 30 J | 0.75 |
| LVWPS-MW223B | 1/28/2021 | N | EM03 | Downgradient | 200 | Qal | 70.3 - 90.0 | 330 | 470 J- | 1.8 | 1,700 | 10 | 7.53 E |
| LVWPS-MW223B | 2/8/2021 | N | EM04 | Downgradient | 200 | Qal | 70.3 - 90.0 | 270 | 240 | 0.51 | 1,600 | 2.4 | 0.38 |
| LVWPS-MW223B | 3/8/2021 | N | EM05 | Downgradient | 200 | Qal | 70.3 - 90.0 | 390 | 1,300 | 3.0 | 1,200 | 2.2 | 0.62 |
| LVWPS-MW223B | 4/5/2021 | N | EM06 | Downgradient | 200 | Qal | 70.3 - 90.0 | 1,500 | 3,700 | 11 | 1,600 | 2.1 | 1.02 |
| LVWPS-MW223B | 5/5/2021 | N | EM07 | Downgradient | 200 | Qal | 70.3 - 90.0 | 560 | 350 J | 0.99 | 1,200 | 1.5 | 0.56 |
| LVWPS-MW223B | 6/7/2021 | N | EM08 | Downgradient | 200 | Qal | 70.3 - 90.0 | 420 | 880 | 2.8 | 1,000 | 1.5 | 0.26 |
| LVWPS-MW223C | 10/7/2020 | N | BL04 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 5,700 | 7,700 | 14 | 2,100 | 1.1 | 2.77 |
| LVWPS-MW223C | 1/11/2021 | N | EM02 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 46 | 64 | 0.10 | 270 | <21 | 0.92 |
| LVWPS-MW223C | 2/8/2021 | N | EM04 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 2,600 | 4,300 | 9.2 | 2,000 | 1.1 | 1.08 |
| LVWPS-MW223C | 3/8/2021 | N | EM05 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 2,700 | 5,300 | 8.8 | 1,900 | 1.1 | 1.47 |
| LVWPS-MW223C | 4/6/2021 | N | EM06 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 2,800 | 4,700 | 8.3 | 2,000 | 1.1 J+ | 1.76 |
| LVWPS-MW223C | 6/8/2021 | N | EM08 | Downgradient | 200 | UMCf | 95.5 - 110.0 | 2,500 | 3,800 | 8.1 | 2,000 | 0.99 J+ | 0.34 |
| LVWPS-MW208A | 10/9/2020 | N | BL04 | Downgradient | 250 | Qal | 39.9 - 59.5 | 1,900 | 2,900 | 12 | 2,100 | 0.93 | 5.77 |
| LVWPS-MW208A | 12/23/2020 | N | EM01 | Downgradient | 250 | Qal | 39.9 - 59.5 | 2,200 | 2,300 | 9.4 | 1,900 | 0.81 | 4.14 |
| LVWPS-MW208A | 1/13/2021 | N | EM02 | Downgradient | 250 | Qal | 39.9 - 59.5 | 13,000 J | 2,600 | 11 | 2,000 | 0.88 | 5 |
| LVWPS-MW208A | 1/27/2021 | N | EM03 | Downgradient | 250 | Qal | 39.9 - 59.5 | 2,200 | 2,600 | 11 | 2,000 | 0.92 | 5.82 E |
| LVWPS-MW208A | 2/10/2021 | N | EM04 | Downgradient | 250 | Qal | 39.9 - 59.5 | 2,400 | 2,500 | 11 | 2,100 | 0.96 | 5.07 |
| LVWPS-MW208A | 3/10/2021 | N | EM05 | Downgradient | 250 | Qal | 39.9 - 59.5 | 1,800 J+ | 2,800 | 10 J- | 1,900 | 0.91 | 4.85 |
| LVWPS-MW208A | 4/6/2021 | N | EM06 | Downgradient | 250 | Qal | 39.9 - 59.5 | 1,600 | 2,500 | 12 | 2,000 | 0.90 J+ | 4.64 |
| LVWPS-MW208A | 5/4/2021 | N | EM07 | Downgradient | 250 | Qal | 39.9 - 59.5 | 1,800 | 2,500 | 12 | 2,000 | 1.0 | 5.36 |
| LVWPS-MW208A | 6/7/2021 | N | EM08 | Downgradient | 250 | Qal | 39.9 - 59.5 | 0.99 J | 2,800 | 14 | 2,200 | 1.0 | 2.30 |
| LVWPS-MW208B | 10/9/2020 | N | BL04 | Downgradient | 250 | Qal | 65.3 - 85.0 | 2,100 | 3,200 | 12 | 2,000 | 1.0 | 5.90 |
| LVWPS-MW208B | 12/23/2020 | N | EM01 | Downgradient | 250 | Qal | 65.3 - 85.0 | 870 | 42 J | 0.23 | 1,900 | 11 | 0.31 |
| LVWPS-MW208B | 12/23/2020 | FD | EM01 | Downgradient | 250 | Qal | 65.3 - 85.0 | 810 | 39 J | 0.23 | 1,900 | 11 | ---- |
| LVWPS-MW208B | 1/13/2021 | N | EM02 | Downgradient | 250 | Qal | 65.3 - 85.0 | 63 | 46 | 0.33 | 1,800 | 8.4 | 0.83 |
| LVWPS-MW208B | 1/27/2021 | N | EM03 | Downgradient | 250 | Qal | 65.3 - 85.0 | 74 | 56 J | 0.25 | 1,600 | 9.9 | 3.35 E |
| LVWPS-MW208B | 1/27/2021 | FD | EM03 | Downgradient | 250 | Qal | 65.3 - 85.0 | 63 | 55 J | 0.28 | 1,600 | 10 | ---- |
| LVWPS-MW208B | 2/11/2021 | N | EM04 | Downgradient | 250 | Qal | 65.3 - 85.0 | 150 | 180 | 0.83 J- | 1,400 J- | 1.4 | 1.54 |
| LVWPS-MW208B | 3/10/2021 | N | EM05 | Downgradient | 250 | Qal | 65.3 - 85.0 | 330 | 380 | 2.3 | 1,900 | 1.2 | 0.44 |
| LVWPS-MW208B | 4/6/2021 | N | EM06 | Downgradient | 250 | Qal | 65.3 - 85.0 | 340 | 430 | 2.4 | 1,900 | 1.1 J+ | 0.61 |
| LVWPS-MW208B | 5/4/2021 | N | EM07 | Downgradient | 250 | Qal | 65.3 - 85.0 | 310 | 370 | 2.3 | 1,900 | 1.7 | 1.44 |
| LVWPS-MW208B | 6/9/2021 | N | EM08 | Downgradient | 250 | Qal | 65.3 - 85.0 | 750 | 880 | 4.3 | 1,900 | 1.2 J | 0.95 |
| LVWPS-MW221A | 10/6/2020 | N | BL04 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 990 J- | 710 | 8.4 | 1,500 J+ | 0.51 J- | 7.60 |
| LVWPS-MW221A | 12/22/2020 | N | EM01 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 610 | 710 | 8.2 | 1,500 | 1.7 J | 6.85 |
| LVWPS-MW221A | 1/12/2021 | N | EM02 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 710 | 740 | 8.3 | 1,600 | 0.46 J | 6.62 |
| LVWPS-MW221A | 1/28/2021 | N | EM03 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 720 | 750 | 8.2 | 1,500 | 0.48 J | 7.82 E |
| LVWPS-MW221A | 2/8/2021 | N | EM04 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 700 | 780 | 8.4 | 1,600 | 0.61 | 6.41 |
| LVWPS-MW221A | 3/9/2021 | N | EM05 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 720 | 800 | 8.2 | 1,700 | 0.49 J | 6.92 |
| LVWPS-MW221A | 4/6/2021 | N | EM06 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 720 | 1,000 | 8.7 | 1,700 | 0.56 J+ | 6.98 |
| LVWPS-MW221A | 5/3/2021 | N | EM07 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 510 | 530 | 8.1 | 1,600 | 0.51 | 9.43 E |
| LVWPS-MW221A | 6/8/2021 | N | EM08 | Far Cross/Downgradient | 300 | Qal | 50.3 - 70.0 | 700 | 830 | 8.8 | 1,700 | 0.54 J+ | 6.39 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A2-MW16A | 10/9/2020 | N | BL04 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 3,500 | 5,800 | 22 | 2,100 | 1.6 | 5.17 |
| LVWPS-A2-MW16A | 12/22/2020 | N | EM01 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 3,600 | 5,600 | 21 | 2,000 | 1.8 | 3.55 |
| LVWPS-A2-MW16A | 1/12/2021 | N | EM02 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 2,900 | 5,300 | 21 | 2,300 | 1.7 | 3.87 |
| LVWPS-A2-MW16A | 1/25/2021 | N | EM03 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 3,900 | 5,300 | 20 | 2,000 | 1.8 J+ | 3.87 |
| LVWPS-A2-MW16A | 2/9/2021 | N | EM04 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 2,600 | 5,600 | 22 | 1,900 | 1.7 J- | 3.35 |
| LVWPS-A2-MW16A | 3/12/2021 | N | EM05 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 2,600 | 5,700 | 23 | 2,000 | 2.0 J+ | 3.86 |
| LVWPS-A2-MW16A | 4/6/2021 | N | EM06 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 2,500 | 5,800 | 24 | 2,100 | 1.8 J+ | 4.41 |
| LVWPS-A2-MW16A | 5/5/2021 | N | EM07 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 3,100 | 5,700 | 24 J | 2,100 | 1.6 | 5.84 |
| LVWPS-A2-MW16A | 6/10/2021 | N | EM08 | Cross/Downgradient | 350 | Qal | 35.8 - 55.5 | 2,600 | 6,600 | 5.0 | 2,100 | 1.8 | 4.48 |
| LVWPS-A2-MW16B | 10/9/2020 | N | BL04 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,600 | 9,000 | 22 | 2,200 | 1.5 | 4.45 |
| LVWPS-A2-MW16B | 10/9/2020 | FD | BL04 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,400 | 9,100 | 22 | 2,200 | 1.6 | ---- |
| LVWPS-A2-MW16B | 12/22/2020 | N | EM01 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 4,100 | 7,800 | 22 J- | 2,100 | 2.0 | 3.44 |
| LVWPS-A2-MW16B | 1/12/2021 | N | EM02 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,000 | 9,200 | 22 | 2,300 | 1.7 | 3.57 |
| LVWPS-A2-MW16B | 1/25/2021 | N | EM03 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,500 | 8,400 | 20 | 2,000 | 1.8 J+ | 3.63 |
| LVWPS-A2-MW16B | 2/9/2021 | N | EM04 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 2,900 | 8,500 | 22 | 1,900 | 1.7 J- | 2.68 |
| LVWPS-A2-MW16B | 3/12/2021 | N | EM05 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,000 | 10,000 | 11 | 2,100 | 1.8 J+ | 8.61 |
| LVWPS-A2-MW16B | 4/6/2021 | N | EM06 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,000 | 9,700 | 23 | 2,200 | 1.7 J+ | 4.10 |
| LVWPS-A2-MW16B | 5/5/2021 | N | EM07 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 3,900 | 12,000 | 24 J | 2,200 | 1.6 | 7.00 |
| LVWPS-A2-MW16B | 6/10/2021 | N | EM08 | Cross/Downgradient | 350 | Qal | 60.3 - 80.0 | 2,900 | 8,000 | 23 | 2,100 | 1.5 | 2.96 |
| LVWPS-MW207 | 9/28/2020 | N | BL04 | Far Cross/Downgradient | 425 | Qal | 68.1 - 87.8 | 2,200 | 14,000 | 18 | 1,800 | 1.5 | 1.55 |
| LVWPS-MW207 | 12/22/2020 | N | EM01 | Far Cross/Downgradient | 425 | Qal | 68.1 - 87.8 | 4,900 | 13,000 | 17 | 1,900 | 1.6 | 1.27 |
| LVWPS-MW207 | 1/29/2021 | N | EM03 | Far Cross/Downgradient | 425 | Qal | 68.1 - 87.8 | 2,500 | 14,000 | 14 | 1,800 | 1.7 | 1.09 |
| LVWPS-MW207 | 3/12/2021 | N | EM05 | Far Cross/Downgradient | 425 | Qal | 68.1 - 87.8 | 3,000 | 14,000 | 19 | 1,800 | 1.6 J+ | 2.38 |
| LVWPS-MW207 | 6/15/2021 | N | EM08 | Far Cross/Downgradient | 425 | Qal | 68.1 - 87.8 | 2,800 | 14,000 | 18 | 1,800 | 1.5 | 1.04 |
| LVWPS-MW212A | 10/5/2020 | N | BL04 | Far Cross/Downgradient | 450 | Qal | 34.3 - 54.0 | 390 | 460 | 8.5 | 1,200 | 0.47 J | 6.73 |
| LVWPS-MW212A | 12/21/2020 | N | EM01 | Far Cross/Downgradient | 450 | Qal | 34.3 - 54.0 | 400 | 510 | 8.9 | 1,200 | 0.43 J | 6.56 |
| LVWPS-MW212A | 1/27/2021 | N | EM03 | Far Cross/Downgradient | 450 | Qal | 34.3 - 54.0 | 400 | 470 | 8.7 | 1,200 | 0.45 J | 8.10 E |
| LVWPS-MW212A | 3/12/2021 | N | EM05 | Far Cross/Downgradient | 450 | Qal | 34.3 - 54.0 | 380 | 460 | 8.6 | 1,200 | 0.41 J | 6.60 |
| LVWPS-MW212A | 6/14/2021 | N | EM08 | Far Cross/Downgradient | 450 | Qal | 34.3 - 54.0 | 310 | 440 | 9.4 | 1,300 | 0.42 J | 6.19 |
| LVWPS-MW212B | 10/5/2020 | N | BL04 | Far Cross/Downgradient | 450 | Qal | 59.8 - 79.5 | 170 | 200 | 7.7 | 980 | 0.32 J | 6.48 |
| LVWPS-MW212B | 12/22/2020 | N | EM01 | Far Cross/Downgradient | 450 | Qal | 59.8 - 79.5 | 150 | 190 | 7.8 | 1,100 | 0.29 J | 6.57 |
| LVWPS-MW212B | 1/27/2021 | N | EM03 | Far Cross/Downgradient | 450 | Qal | 59.8 - 79.5 | 210 | 200 | 8.1 | 1,100 | <1.0 | 9.04 E |
| LVWPS-MW212B | 3/12/2021 | N | EM05 | Far Cross/Downgradient | 450 | Qal | 59.8 - 79.5 | 180 | 180 | 8.2 | 1,100 | <2.6 | 6.95 |
| LVWPS-MW212B | 6/14/2021 | N | EM08 | Far Cross/Downgradient | 450 | Qal | 59.8 - 79.5 | 180 | 240 | 8.8 | 1,100 | 0.40 J | 4.80 |
| LVWPS-MW220A | 10/5/2020 | N | BL04 | Far Downgradient | 500 | Qal | 60.3 - 80.0 | 3,100 | 9,400 | 21 | 2,100 | 1.6 | 3.77 |
| LVWPS-MW220A | 12/21/2020 | N | EM01 | Far Downgradient | 500 | Qal | 60.3 - 80.0 | 3,100 | 7,000 | 20 | 2,200 | 1.8 | 3.31 |
| LVWPS-MW220A | 1/28/2021 | N | EM03 | Far Downgradient | 500 | Qal | 60.3 - 80.0 | 3,500 | 9,000 | 22 | 2,200 | 1.6 | 3.77 E |
| LVWPS-MW220A | 3/11/2021 | N | EM05 | Far Downgradient | 500 | Qal | 60.3 - 80.0 | 2,800 | 9,800 | 20 | 2,000 | 1.7 | 2.54 |
| LVWPS-MW220A | 6/10/2021 | N | EM08 | Far Downgradient | 500 | Qal | 60.3 - 80.0 | 2,900 | 12,000 | 4.7 | 2,100 | 1.6 | 2.76 |
| LVWPS-MW209 | 10/6/2020 | N | BL04 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 2,700 | 8,500 | 22 | 2,200 | 1.6 | 4.40 |
| LVWPS-MW209 | 10/6/2020 | FD | BL04 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 2,800 | 9,000 | 22 | 2,200 | 1.6 | ---- |
| LVWPS-MW209 | 12/21/2020 | N | EM01 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 3,000 | 7,600 | 18 | 2,200 | 1.8 | 2.38 |
| LVWPS-MW209 | 1/27/2021 | N | EM03 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 2,600 | 7,800 | 19 | 2,000 | 1.8 | 2.94 E |
| LVWPS-MW209 | 3/11/2021 | N | EM05 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 2,700 | 8,500 | 18 | 2,100 | 1.7 | 2.66 |
| LVWPS-MW209 | 6/10/2021 | N | EM08 | Far Downgradient | 625 | Qal | 71.3 - 91.0 | 2,800 | 11,000 | 21 J+ | 2,000 | 1.7 | 2.09 |
| LVWPS-MW209A | 10/6/2020 | N | BL04 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 2,800 | 6,800 | 21 | 2,200 | 1.7 | 4.72 |
| LVWPS-MW209A | 12/21/2020 | N | EM01 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 3,000 | 5,300 | 20 | 2,300 | 1.6 | 3.96 |
| LVWPS-MW209A | 1/27/2021 | N | EM03 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 2,300 | 3,700 | 14 | 2,100 | 2.4 | 2.59 E |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-MW209A | 3/11/2021 | N | EM05 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 1,800 | 3,500 | 11 | 2,000 | 1.8 | 2.25 |
| LVWPS-MW209A | 6/10/2021 | N | EM08 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 2,100 | 2,400 | 15 | 1,800 | 1.6 | 5.96 |
| LVWPS-MW218A | 10/5/2020 | N | BL04 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 5,100 | 14,000 | 20 | 1,900 | 1.4 | 4.72 |
| LVWPS-MW218A | 12/21/2020 | N | EM01 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 3,200 | 14,000 | 21 | 2,000 | 1.5 | 3.89 |
| LVWPS-MW218A | 1/26/2021 | N | EM03 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 3,400 | 12,000 | 19 | 1,800 | 1.5 J+ | 4.61 E |
| LVWPS-MW218A | 3/15/2021 | N | EM05 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 2,900 | 12,000 | 20 | 1,800 | 1.5 | 4.05 |
| LVWPS-MW218A | 6/11/2021 | N | EM08 | Far Downgradient | 625 | Qal | 35.3 - 55.0 | 2,700 | 13,000 | 20 | 2,000 | 1.6 J+ | 3.52 |
| LVWPS-MW211 | 9/30/2020 | N | BL04 | Far Cross/Downgradient | 650 | Qal | 50.0 - 69.7 | 2,000 | 3,200 | 14 | 2,100 | 1.1 | 6.33 |
| LVWPS-MW211 | 12/21/2020 | N | EM01 | Far Cross/Downgradient | 650 | Qal | 50.0 - 69.7 | 2,100 | 3,000 | 13 | 1,900 | 0.99 | 5.52 |
| LVWPS-MW211 | 1/29/2021 | N | EM03 | Far Cross/Downgradient | 650 | Qal | 50.0 - 69.7 | 850 | 1,300 | 4.4 | 1,800 | 1.3 J | 1.20 |
| LVWPS-MW211 | 3/12/2021 | N | EM05 | Far Cross/Downgradient | 650 | Qal | 50.0 - 69.7 | 950 | 1,300 | 6.0 | 1,800 | 1.4 J | 1.24 |
| LVWPS-MW211 | 6/9/2021 | N | EM08 | Far Cross/Downgradient | 650 | Qal | 50.0 - 69.7 | 1,200 | 1,400 | 6.0 | 1,800 | 1.1 | 0.62 |
| LVWPS-MW210A | 10/6/2020 | N | BL04 | Far Downgradient | 850 | Qal | 35.3 - 55.0 | 2,600 | 12,000 | 20 | 1,800 | 1.5 | 2.44 |
| LVWPS-MW210A | 12/21/2020 | N | EM01 | Far Downgradient | 850 | Qal | 35.3 - 55.0 | 3,100 | 13,000 | 21 | 2,000 | 1.6 | 2.04 |
| LVWPS-MW210A | 1/29/2021 | N | EM03 | Far Downgradient | 850 | Qal | 35.3 - 55.0 | 2,900 | 11,000 | 17 | 1,800 | 1.6 | 2.66 |
| LVWPS-MW210A | 3/12/2021 | N | EM05 | Far Downgradient | 850 | Qal | 35.3 - 55.0 | 2,900 | 11,000 | 9.7 | 1,900 | 1.7 J+ | 2.78 |
| LVWPS-MW210A | 6/10/2021 | N | EM08 | Far Downgradient | 850 | Qal | 35.3 - 55.0 | 2,700 | 10,000 | 21 | 1,800 | 1.4 | 2.06 |
| LVWPS-MW210B | 10/6/2020 | N | BL04 | Far Downgradient | 850 | Qal | 70.1 - 89.8 | 2,800 | 9,700 | 22 | 2,100 | 1.6 | 3.60 |
| LVWPS-MW210B | 12/21/2020 | N | EM01 | Far Downgradient | 850 | Qal | 70.1 - 89.8 | 2,800 | 8,300 | 15 | 2,100 | 1.9 | 1.48 |
| LVWPS-MW210B | 1/29/2021 | N | EM03 | Far Downgradient | 850 | Qal | 70.1 - 89.8 | 2,400 | 7,800 | 14 | 2,000 | 1.8 | 1.62 |
| LVWPS-MW210B | 3/12/2021 | N | EM05 | Far Downgradient | 850 | Qal | 70.1 - 89.8 | 2,500 | 9,600 | 8.5 | 2,000 | 1.9 J+ | 1.48 |
| LVWPS-MW210B | 6/10/2021 | N | EM08 | Far Downgradient | 850 | Qal | 70.1 - 89.8 | 3,000 | 8,600 | 20 | 2,000 | 1.6 | 1.21 |
| **Zone 3** | | | | | | | | | | | | | |
| LVWPS-A3-MW08 | 10/8/2020 | N | BL04 | Upgradient | -60 | Qal | 84.8 - 104.5 | 120 | 180 | 8.5 | 1,600 | 0.81 | 4.73 |
| LVWPS-A3-MW08 | 1/14/2021 | N | EM02 | Upgradient | -60 | Qal | 84.8 - 104.5 | 71 | 160 | 8.4 | 1,700 | 1.1 J | 6.42 |
| LVWPS-A3-MW08 | 2/11/2021 | N | EM04 | Upgradient | -60 | Qal | 84.8 - 104.5 | 83 | 170 | 8.1 J- | 1,600 | 0.80 | 6.32 |
| LVWPS-A3-MW08 | 3/10/2021 | N | EM05 | Upgradient | -60 | Qal | 84.8 - 104.5 | 66 | 150 | 8.4 | 1,500 | <1.0 | 5.94 |
| LVWPS-A3-MW08 | 4/9/2021 | N | EM06 | Upgradient | -60 | Qal | 84.8 - 104.5 | 61 | 150 | 7.8 | 1,600 | <1.0 | 6.86 |
| LVWPS-A3-MW08 | 6/9/2021 | N | EM08 | Upgradient | -60 | Qal | 84.8 - 104.5 | 68 | 140 | 8.2 | 1,500 | <1.0 | 6.40 |
| LVWPS-U3-MW08A | 10/8/2020 | N | BL04 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 15,000 | 22,000 | 14 | 2,300 | 0.47 J | 5.05 |
| LVWPS-U3-MW08A | 1/15/2021 | N | EM02 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 14,000 | 20,000 | 14 | 2,400 | <1.0 | 4.22 |
| LVWPS-U3-MW08A | 2/12/2021 | N | EM04 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 14,000 | 20,000 | 13 | 2,300 | 0.40 J | 4.55 |
| LVWPS-U3-MW08A | 3/12/2021 | N | EM05 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 12,000 | 19,000 | 12 | 2,200 | 0.40 J | 4.31 |
| LVWPS-U3-MW08A | 4/9/2021 | N | EM06 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 14,000 | 20,000 | 13 | 2,400 | 0.33 J | 4.90 |
| LVWPS-U3-MW08A | 6/16/2021 | N | EM08 | Upgradient | -60 | UMCf-cg | 117.8 - 142.5 | 13,000 | 17,000 | 14 | 2,500 | <1.0 | 4.41 |
| LVWPS-U3-MW08B | 10/8/2020 | N | BL04 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 6,100 | 8,100 | 4.9 | 2,200 | 2.6 | 2.46 |
| LVWPS-U3-MW08B | 1/15/2021 | N | EM02 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 7,400 | 8,100 | 5.3 | 2,200 | 1.0 J | 0.86 |
| LVWPS-U3-MW08B | 2/12/2021 | N | EM04 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 5,700 | 8,100 | 5.5 | 2,000 | 0.68 | 1.04 |
| LVWPS-U3-MW08B | 3/12/2021 | N | EM05 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 5,200 | 8,500 | 5.6 | 2,000 | <1.0 | 0.97 |
| LVWPS-U3-MW08B | 4/15/2021 | N | EM06 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 5,000 J- | 8,700 J- | 4.9 J- | 2,100 J- | 0.81 J- | 0.80 |
| LVWPS-U3-MW08B | 6/16/2021 | N | EM08 | Upgradient | -60 | UMCf-cg | 149.3 - 174.0 | 5,500 | 7,200 | 6.2 | 2,200 | <1.0 | 0.90 |
| LVWPS-A3-MW07 | 10/8/2020 | N | BL04 | Upgradient | -55 | Qal | 54.8 - 74.5 | 100 | 210 | 6.4 | 1,100 | 0.45 J | 6.98 |
| LVWPS-A3-MW07 | 1/15/2021 | N | EM02 | Upgradient | -55 | Qal | 54.8 - 74.5 | 130 | 230 | 7.1 | 1,200 | <1.0 | 6.70 |
| LVWPS-A3-MW07 | 2/11/2021 | N | EM04 | Upgradient | -55 | Qal | 54.8 - 74.5 | 130 | 200 | 7.5 J- | 1,100 | 0.34 J | 6.71 |
| LVWPS-A3-MW07 | 3/11/2021 | N | EM05 | Upgradient | -55 | Qal | 54.8 - 74.5 | 160 | 250 | 7.1 | 1,200 | 0.37 J | 5.93 |
| LVWPS-A3-MW07 | 4/8/2021 | N | EM06 | Upgradient | -55 | Qal | 54.8 - 74.5 | 120 | 150 | 7.0 | 1,100 | <1.0 | 6.42 |
| LVWPS-A3-MW07 | 6/10/2021 | N | EM08 | Upgradient | -55 | Qal | 54.8 - 74.5 | 120 | 180 J | 7.5 | 1,100 | 0.33 J | 6.28 |
| LVWPS-U3-MW07A | 10/9/2020 | N | BL04 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 250 | 540 | 5.9 | 1,200 | 0.39 J | 5.45 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U3-MW07A | 1/15/2021 | N | EM02 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 260 | 530 | 6.1 | 1,200 | 0.37 J | 6.37 |
| LVWPS-U3-MW07A | 2/11/2021 | N | EM04 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 300 | 440 | 6.6 J- | 1,100 | 0.27 J | 6.50 |
| LVWPS-U3-MW07A | 3/11/2021 | N | EM05 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 260 | 430 | 5.9 | 1,200 | <1.0 | 6.23 |
| LVWPS-U3-MW07A | 4/8/2021 | N | EM06 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 250 | 470 | 5.8 | 1,200 | 0.32 J | 6.50 |
| LVWPS-U3-MW07A | 6/10/2021 | N | EM08 | Upgradient | -55 | UMCf-cg | 82.8 - 97.5 | 220 | 410 J+ | 6.3 | 1,100 | 0.34 J | 6.20 |
| LVWPS-U3-MW07B | 10/9/2020 | N | BL04 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,800 | 8,500 | 9.2 | 2,100 | 0.41 J | 6.07 |
| LVWPS-U3-MW07B | 1/14/2021 | N | EM02 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,600 | 7,900 | 9.5 | 2,100 | <2.1 | 6.26 |
| LVWPS-U3-MW07B | 2/12/2021 | N | EM04 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,900 | 7,400 | 9.4 | 1,800 | 0.41 J | 6.51 |
| LVWPS-U3-MW07B | 3/12/2021 | N | EM05 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,500 | 7,400 | 9.3 | 2,700 | <1.0 | 7.04 |
| LVWPS-U3-MW07B | 4/13/2021 | N | EM06 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,400 | 7,400 | 9.5 | 2,000 | 0.35 J | 6.13 |
| LVWPS-U3-MW07B | 6/11/2021 | N | EM08 | Upgradient | -55 | UMCf-cg | 104.8 - 124.5 | 4,500 | 7,700 | 9.3 | 1,800 | 0.38 J | 6.29 |
| LVWPS-U3-IW01 | 10/9/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 80.2 - 115.0 | 3,100 | 4,900 | 8.3 | ---- | ---- | 5.57 |
| LVWPS-U3-IW02A | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 79.3 - 99.0 | 10,000 | 15,000 | 14 | ---- | ---- | 4.02 |
| LVWPS-U3-IW02B | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 104.8 - 124.5 | 5,200 | 9,700 | 9.4 | ---- | ---- | 3.61 |
| LVWPS-U3-IW03A | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 77.8 - 102.5 | 1,800 | 3,500 | 8.3 | ---- | ---- | 3.56 |
| LVWPS-U3-IW03B | 10/6/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 109.3 - 139.0 | 1,600 | 3,200 | 7.9 | ---- | ---- | 4.91 |
| LVWPS-U3-IW04A | 10/7/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 93.3 - 123.0 | 210 | 390 | 7.7 | ---- | ---- | 5.74 |
| LVWPS-U3-IW04B | 10/7/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 129.3 - 159.0 | 680 | 1,100 | 5.8 | ---- | ---- | 3.71 |
| LVWPS-U3-IW05A | 10/7/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 91.3 - 126.0 | 230 | 380 | 7.8 | ---- | ---- | 5.74 |
| LVWPS-U3-IW05B | 10/7/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 132.8 - 167.5 | 530 | 870 | 7.4 | ---- | ---- | 5.83 |
| LVWPS-U3-IW06A | 10/7/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 86.3 - 111.0 | 340 | 540 | 7.6 | ---- | ---- | 5.89 |
| LVWPS-U3-IW06B | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 117.8 - 142.5 | 5,700 | 1,800 | 7.6 | ---- | ---- | 4.72 |
| LVWPS-U3-IW06C | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 149.3 - 174.0 | 3,800 | 4,100 | 8.1 | ---- | ---- | 5.71 |
| LVWPS-U3-IW07A | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 86.3 - 111.0 | 1,400 | 2,000 | 7.1 | ---- | ---- | 3.57 |
| LVWPS-U3-IW07B | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 117.8 - 142.5 | 9,400 | 15,000 | 9.0 | ---- | ---- | 0.80 |
| LVWPS-U3-IW07C | 10/9/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 149.3 - 174.0 | 7,300 | 14,000 | 8.0 | ---- | ---- | 0.73 |
| LVWPS-U3-IW08A | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 86.3 - 111.0 | 1,900 | 2,600 | 5.8 | ---- | ---- | 0.79 |
| LVWPS-U3-IW08A | 10/8/2020 | FD | BL04 | Injection Well Transect | 0 | UMCf-cg | 86.3 - 111.0 | 1,900 | 2,600 | 5.5 | ---- | ---- | ---- |
| LVWPS-U3-IW08B | 10/8/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 117.8 - 142.5 | 15,000 | 21,000 | 12 | ---- | ---- | 0.94 |
| LVWPS-U3-IW08C | 10/9/2020 | N | BL04 | Injection Well Transect | 0 | UMCf-cg | 149.3 - 174.0 | 2,400 | 3,500 | 2.3 | ---- | ---- | 0.66 |
| LVWPS-U3-MW03A | 10/2/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,300 | 4,500 | 7.5 | 2,800 | 0.57 J- | 6.40 |
| LVWPS-U3-MW03A | 10/2/2020 | FD | BL04 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,500 | 4,500 | 7.5 | 2,800 | 0.62 J- | ---- |
| LVWPS-U3-MW03A | 1/14/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,400 | 5,500 | 7.4 | 2,900 | <2.1 | 4.38 |
| LVWPS-U3-MW03A | 2/11/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,400 | 4,800 | 7.5 | 2,800 | 0.37 J | 5.40 |
| LVWPS-U3-MW03A | 3/11/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,100 | 4,900 | 7.2 | 3,000 | <1.0 | 5.31 |
| LVWPS-U3-MW03A | 4/6/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 2,800 | 4,600 | 7.7 | 2,800 | <1.0 | 5.30 |
| LVWPS-U3-MW03A | 6/10/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 86.3 - 111.0 | 3,100 | 3,400 | 7.4 | 2,600 | <1.0 | 5.28 |
| LVWPS-U3-MW03B | 10/2/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 3,800 | 13,000 | 9.1 | 1,900 | 0.41 J | 3.23 |
| LVWPS-U3-MW03B | 1/14/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 100 | <10 | <0.014 | 1,900 J- | 61 | 0.23 |
| LVWPS-U3-MW03B | 2/11/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 86 | 21 J | <0.014 | 1,900 | 38 | 0.57 |
| LVWPS-U3-MW03B | 3/12/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 430 | 93 J | <0.028 | 1,600 | 48 | 0.49 |
| LVWPS-U3-MW03B | 4/12/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 320 | <10 | <0.014 | 1,500 | 33 | 0.46 |
| LVWPS-U3-MW03B | 6/14/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 151.1 - 175.7 | 110 | <24 | <0.014 | 1,600 | 1.1 | 1.06 |
| LVWPS-U3-MW03C | 10/1/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 4,900 | 12,000 | 7.7 | 1,900 | 0.32 J | 2.96 |
| LVWPS-U3-MW03C | 1/14/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 4,800 | 4,300 | 1.6 | 2,000 | 2.6 | 0.43 |
| LVWPS-U3-MW03C | 2/11/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 5,700 | 6,800 | 3.4 | 2,000 | 3.9 | 0.46 |
| LVWPS-U3-MW03C | 3/11/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 6,000 | 8,600 | 4.2 | 2,100 | 1.3 | 0.62 |
| LVWPS-U3-MW03C | 4/13/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 6,100 | 12,000 | 5.6 | 2,000 | 0.39 J | 1.06 |

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**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U3-MW03C | 6/11/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 117.8 - 142.5 | 6,600 | 12,000 | 6.2 | 1,900 | 0.31 J | 0.62 |
| LVWPS-U3-MW09 | 10/7/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | 3,500 | 6,100 | 4.8 | 1,300 | <0.26 | 4.35 |
| LVWPS-U3-MW09 | 1/15/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | 14 | <10 | <0.014 | 1,100 | 300 | 0.52 |
| LVWPS-U3-MW09 | 2/10/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | 90 | <10 | <0.014 | 1,100 | 97 | 0.72 |
| LVWPS-U3-MW09 | 3/12/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | 130 | <10 | <0.014 UJ | 610 | 76 | 0.33 |
| LVWPS-U3-MW09 | 4/8/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | 75 | <10 | <0.014 | 740 | 50 | 0.41 |
| LVWPS-U3-MW09 | 6/11/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 82.8 - 107.5 | <0.31 | <24 | <0.014 | 63 | 10 | 0.23 |
| LVWPS-U3-MW13A | 10/7/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 3,900 | 7,200 | 11 | 2,000 | 0.45 J | 5.44 |
| LVWPS-U3-MW13A | 1/15/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 3,900 | 7,400 | 10 | 2,100 | <1.0 | 4.84 |
| LVWPS-U3-MW13A | 2/11/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 4,200 | 6,300 | 10 | 2,000 | 0.45 J | 5.32 |
| LVWPS-U3-MW13A | 3/12/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 4,100 | 6,500 | 9.9 J- | 1,900 | <1.0 | 4.53 |
| LVWPS-U3-MW13A | 4/8/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 3,800 | 6,400 | 9.0 | 2,000 | 0.37 J | 5.70 |
| LVWPS-U3-MW13A | 6/11/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 96.3 - 121.0 | 3,500 | 5,700 | 9.7 | 1,900 | <1.0 | 5.64 |
| LVWPS-U3-MW13B | 10/7/2020 | N | BL04 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | 350 | 550 | 6.8 | 1,500 | 0.45 J | 5.92 |
| LVWPS-U3-MW13B | 1/15/2021 | N | EM02 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 910 | 65 | 0.2 |
| LVWPS-U3-MW13B | 1/15/2021 | FD | EM02 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 920 | 65 | ---- |
| LVWPS-U3-MW13B | 2/12/2021 | N | EM04 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 830 | 130 | 0.47 |
| LVWPS-U3-MW13B | 2/12/2021 | FD | EM04 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 850 | 130 | ---- |
| LVWPS-U3-MW13B | 3/15/2021 | N | EM05 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 880 | 22 | 0.38 |
| LVWPS-U3-MW13B | 3/15/2021 | FD | EM05 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 900 | 25 | ---- |
| LVWPS-U3-MW13B | 4/14/2021 | N | EM06 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 1,200 | 11 | 0.47 |
| LVWPS-U3-MW13B | 4/14/2021 | FD | EM06 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <10 | <0.014 | 1,200 | 12 | ---- |
| LVWPS-U3-MW13B | 6/17/2021 | N | EM08 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <24 | <0.014 | 1,200 | 7.9 | 0.45 |
| LVWPS-U3-MW13B | 6/17/2021 | FD | EM08 | Downgradient | 25 | UMCf-cg | 132.8 - 147.5 | <0.31 | <24 | <0.014 | 1,200 | 7.2 | ---- |
| LVWPS-A3-MW02 | 10/5/2020 | N | BL04 | Downgradient | 45 | Qal | 52.8 - 72.5 | 100 | 150 | 7.0 | 900 | 0.29 J | 6.42 |
| LVWPS-A3-MW02 | 1/14/2021 | N | EM02 | Downgradient | 45 | Qal | 52.8 - 72.5 | 100 | 140 | 7.2 | 1,000 | 0.35 J | 6.18 |
| LVWPS-A3-MW02 | 2/11/2021 | N | EM04 | Downgradient | 45 | Qal | 52.8 - 72.5 | 130 | 130 | 7.4 J- | 920 | 0.28 J | 6.68 |
| LVWPS-A3-MW02 | 3/11/2021 | N | EM05 | Downgradient | 45 | Qal | 52.8 - 72.5 | 120 | 140 | 7.3 | 1,000 | 0.29 J | 6.17 |
| LVWPS-A3-MW02 | 4/9/2021 | N | EM06 | Downgradient | 45 | Qal | 52.8 - 72.5 | 120 | 150 | 7.4 | 980 | 0.35 J | 6.30 |
| LVWPS-A3-MW02 | 6/10/2021 | N | EM08 | Downgradient | 45 | Qal | 52.8 - 72.5 | 160 | 190 J+ | 7.4 | 970 | 0.27 J | 6.05 |
| LVWPS-U3-MW02A | 10/5/2020 | N | BL04 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 3,000 | 770 | 5.7 | 1,400 | 0.54 | 2.01 |
| LVWPS-U3-MW02A | 1/14/2021 | N | EM02 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 1,900 | 3,200 | 6.0 | 1,500 | 0.37 J | 3.75 |
| LVWPS-U3-MW02A | 1/14/2021 | FD | EM02 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,300 | 3,300 | 6.1 | 1,500 | 0.41 J | ---- |
| LVWPS-U3-MW02A | 2/11/2021 | N | EM04 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,700 | 4,200 | 5.2 J- | 1,400 | 0.41 J | 2.51 |
| LVWPS-U3-MW02A | 2/11/2021 | FD | EM04 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,900 | 4,200 | 5.3 J- | 1,300 | 0.46 J | ---- |
| LVWPS-U3-MW02A | 3/11/2021 | N | EM05 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,400 | 3,600 | 5.6 | 1,500 | 0.48 J | 2.93 |
| LVWPS-U3-MW02A | 3/11/2021 | FD | EM05 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,500 | 3,700 | 6.3 | 1,500 | 0.44 J | ---- |
| LVWPS-U3-MW02A | 4/9/2021 | N | EM06 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,300 | 3,400 | 6.0 | 1,400 | 0.45 J | 3.12 |
| LVWPS-U3-MW02A | 4/9/2021 | FD | EM06 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,300 | 3,400 | 6.0 | 1,400 | 0.41 J | ---- |
| LVWPS-U3-MW02A | 6/10/2021 | N | EM08 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,200 | 2,200 J+ | 6.3 | 1,400 | 0.39 J | 3.67 |
| LVWPS-U3-MW02A | 6/10/2021 | FD | EM08 | Downgradient | 45 | UMCf-cg | 82.3 - 97.0 | 2,200 | 2,600 J+ | 6.4 | 1,400 | 0.40 J | ---- |
| LVWPS-U3-MW02B | 10/5/2020 | N | BL04 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 8,400 | 12,000 | 10 | 2,000 | 2.1 | 1.70 |
| LVWPS-U3-MW02B | 1/14/2021 | N | EM02 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 190 | 370 | 0.29 | 1,800 | 14 | 0.49 |
| LVWPS-U3-MW02B | 2/11/2021 | N | EM04 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 6,100 | 9,800 | 9.2 J- | 1,900 | 2.7 | 1.42 |
| LVWPS-U3-MW02B | 3/11/2021 | N | EM05 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 7,200 | 12,000 | 7.4 | 2,100 | 3.4 | 0.73 |
| LVWPS-U3-MW02B | 4/12/2021 | N | EM06 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 5,700 | 9,800 | 9.3 J- | 2,000 | 2.1 | 1.20 |
| LVWPS-U3-MW02B | 6/10/2021 | N | EM08 | Downgradient | 45 | UMCf-cg | 103.0 - 122.5 | 6,100 | 8,700 | 9.4 | 2,000 | 1.5 | 1.22 |
| LVWPS-A3-MW06 | 10/5/2020 | N | BL04 | Downgradient | 50 | Qal | 55.3 - 75.0 | 110 | 150 | 9.0 | 1,300 | 0.45 J | 7.24 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-A3-MW06 | 1/15/2021 | N | EM02 | Downgradient | 50 | Qal | 55.3 - 75.0 | 100 | 160 | 8.6 | 1,400 | 0.61 J- | 6.47 |
| LVWPS-A3-MW06 | 2/10/2021 | N | EM04 | Downgradient | 50 | Qal | 55.3 - 75.0 | 120 | 140 | 8.9 | 1,300 | 0.48 J | 6.27 |
| LVWPS-A3-MW06 | 3/12/2021 | N | EM05 | Downgradient | 50 | Qal | 55.3 - 75.0 | 140 | 150 J+ | 8.2 | 1,200 | 0.43 J | 6.28 |
| LVWPS-A3-MW06 | 4/9/2021 | N | EM06 | Downgradient | 50 | Qal | 55.3 - 75.0 | 96 | 150 | 8.1 | 1,300 | 0.43 J | 6.32 |
| LVWPS-A3-MW06 | 6/11/2021 | N | EM08 | Downgradient | 50 | Qal | 55.3 - 75.0 | 110 | 160 | 8.2 | 1,200 | 0.58 J+ | 6.38 |
| LVWPS-U3-MW06A | 10/5/2020 | N | BL04 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | 9,900 | 15,000 | 13 | 1,700 | 0.48 J | 5.05 |
| LVWPS-U3-MW06A | 1/15/2021 | N | EM02 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | <6,300 | 13,000 | 12 | 1,800 J- | <1.0 | 4.12 |
| LVWPS-U3-MW06A | 2/12/2021 | N | EM04 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | 9,400 | 15,000 | 12 | 1,700 | 0.50 | 3.39 |
| LVWPS-U3-MW06A | 3/15/2021 | N | EM05 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | 15,000 | 25,000 | 17 | 1,800 | <1.0 | 2.72 |
| LVWPS-U3-MW06A | 4/9/2021 | N | EM06 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | 15,000 | 24,000 | 16 | 2,000 | <1.0 | 3.16 |
| LVWPS-U3-MW06A | 6/11/2021 | N | EM08 | Downgradient | 50 | UMCf-cg | 90.3 - 115.0 | 11,000 | 18,000 | 10 | 1,900 | <1.0 | 1.16 |
| LVWPS-U3-MW06B | 10/7/2020 | N | BL04 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 630 | 1,200 | 6.6 | 1,500 | 0.43 J | 4.23 |
| LVWPS-U3-MW06B | 1/14/2021 | N | EM02 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 820 | 1,500 | 6.1 | 1,600 | 0.58 | 2.37 |
| LVWPS-U3-MW06B | 2/11/2021 | N | EM04 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 1,100 | 1,600 | 5.9 | 1,500 | 0.58 | 2.68 |
| LVWPS-U3-MW06B | 3/11/2021 | N | EM05 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 1,400 | 2,000 | 6.1 | 1,600 | 0.56 | 2.96 |
| LVWPS-U3-MW06B | 4/13/2021 | N | EM06 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 680 | 1,400 | 6.5 | 1,500 | 0.57 | 1.02 |
| LVWPS-U3-MW06B | 6/16/2021 | N | EM08 | Downgradient | 50 | UMCf-cg | 125.3 - 149.9 | 1,500 | 2,100 J+ | 6.7 | 1,500 | 0.57 | 2.82 |
| LVWPS-U3-MW05B | 10/2/2020 | N | BL04 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 9.4 | <10 | <0.014 | 1,900 | 8.4 | 2.07 |
| LVWPS-U3-MW05B | 1/15/2021 | N | EM02 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 96 J | 39 J | <0.014 | 1,900 | 7.3 | 1.11 |
| LVWPS-U3-MW05B | 2/11/2021 | N | EM04 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 460 | 130 | <0.014 | 1,800 | 5.9 | 0.42 |
| LVWPS-U3-MW05B | 3/11/2021 | N | EM05 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 510 | 250 | 0.11 | 1,900 | 4.9 | 1.18 |
| LVWPS-U3-MW05B | 4/8/2021 | N | EM06 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 590 | 440 | 0.12 J+ | 2,000 | 4.3 | 0.88 |
| LVWPS-U3-MW05B | 6/10/2021 | N | EM08 | Downgradient | 75 | UMCf-cg | 85.2 - 104.7 | 790 | 710 | 0.23 | 1,700 | 3.3 | 0.75 |
| LVWPS-A3-MW10 | 10/5/2020 | N | BL04 | Downgradient | 100 | Qal | 56.3 - 76.0 | 200 | 200 | 7.5 | 870 | 0.26 J | 7.31 |
| LVWPS-A3-MW10 | 1/14/2021 | N | EM02 | Downgradient | 100 | Qal | 56.3 - 76.0 | 190 | 220 | 7.7 | 930 | 0.44 J | 6.97 |
| LVWPS-A3-MW10 | 2/11/2021 | N | EM04 | Downgradient | 100 | Qal | 56.3 - 76.0 | 180 | 180 | 7.9 J- | 950 | <0.26 | 6.84 |
| LVWPS-A3-MW10 | 3/11/2021 | N | EM05 | Downgradient | 100 | Qal | 56.3 - 76.0 | 170 | 200 | 8.4 | 910 | 0.34 J | 6.76 |
| LVWPS-A3-MW10 | 4/9/2021 | N | EM06 | Downgradient | 100 | Qal | 56.3 - 76.0 | 160 | 200 | 8.0 | 980 | 0.26 J | 6.59 |
| LVWPS-A3-MW10 | 6/10/2021 | N | EM08 | Downgradient | 100 | Qal | 56.3 - 76.0 | 170 | 210 | 8.8 | 1,000 | 0.43 J | 1.19 |
| LVWPS-A3-MW11 | 10/7/2020 | N | BL04 | Downgradient | 100 | Qal | 53.8 - 73.5 | 78 | 160 | 9.2 | 1,600 | 0.96 | 8.50 |
| LVWPS-A3-MW11 | 1/15/2021 | N | EM02 | Downgradient | 100 | Qal | 53.8 - 73.5 | 55 J | 140 | 8.4 | 1,700 | 0.72 | 6.84 |
| LVWPS-A3-MW11 | 2/11/2021 | N | EM04 | Downgradient | 100 | Qal | 53.8 - 73.5 | 68 | 150 | 7.6 | 1,600 | 0.65 | 6.69 |
| LVWPS-A3-MW11 | 3/11/2021 | N | EM05 | Downgradient | 100 | Qal | 53.8 - 73.5 | 63 | 140 | 7.8 | 1,700 | 0.82 | 6.40 |
| LVWPS-A3-MW11 | 4/8/2021 | N | EM06 | Downgradient | 100 | Qal | 53.8 - 73.5 | 55 | 150 | 8.2 | 1,600 | 0.60 | 6.23 |
| LVWPS-A3-MW11 | 6/10/2021 | N | EM08 | Downgradient | 100 | Qal | 53.8 - 73.5 | 52 | 160 | 8.1 | 1,400 | 0.62 | 6.41 |
| LVWPS-U3-MW10A | 10/5/2020 | N | BL04 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 2,600 | 3,200 | 3.0 | 1,800 | 0.77 | 0.99 |
| LVWPS-U3-MW10A | 1/14/2021 | N | EM02 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 0.96 J | <10 | <0.014 | 1,200 | 310 | 0.76 |
| LVWPS-U3-MW10A | 2/11/2021 | N | EM04 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 8.4 J | <10 | <0.014 UJ | 1,100 | 4.6 | 0.89 |
| LVWPS-U3-MW10A | 3/11/2021 | N | EM05 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 11 | <10 | <0.014 | 1,100 | 5.7 | 0.28 |
| LVWPS-U3-MW10A | 4/8/2021 | N | EM06 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | <0.31 | <10 | <0.014 | 1,300 | 1.8 | 0.33 |
| LVWPS-U3-MW10A | 6/10/2021 | N | EM08 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 43 J | 51 J | 0.035 J | 1,400 | <1.0 | 2.68 |
| LVWPS-U3-MW10A | 6/10/2021 | FD | EM08 | Downgradient | 100 | UMCf-cg | 85.3 - 95.0 | 110 J | 130 J | 0.082 | 1,300 | 1.0 J | ---- |
| LVWPS-U3-MW10B | 10/5/2020 | N | BL04 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | 3,200 | 4,200 | 6.5 | 1,600 | 0.32 J | 6.76 |
| LVWPS-U3-MW10B | 1/14/2021 | N | EM02 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | 0.69 J | <10 | <0.014 | 1,500 | 280 | 0.54 |
| LVWPS-U3-MW10B | 2/11/2021 | N | EM04 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | <0.31 | <10 | <0.014 UJ | 98 | 42 | 0.76 |
| LVWPS-U3-MW10B | 3/11/2021 | N | EM05 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | <0.31 | <10 | <0.014 | 190 | 42 | 0.34 |
| LVWPS-U3-MW10B | 4/9/2021 | N | EM06 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | <0.31 | <10 | <0.014 | 49 | 45 | 0.34 |
| LVWPS-U3-MW10B | 6/9/2021 | N | EM08 | Downgradient | 100 | UMCf-cg | 101.3 - 121.0 | <0.31 | <24 | <0.014 | 140 | 9.6 | 0.26 |
| LVWPS-U3-MW11A | 10/7/2020 | N | BL04 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 10,000 | 16,000 | 9.8 | 2,000 | 0.42 J | 2.55 |
| LVWPS-U3-MW11A | 1/15/2021 | N | EM02 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 11,000 | 18,000 | 11 | 2,000 | <1.0 | 3.02 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U3-MW11A | 2/12/2021 | N | EM04 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 11,000 | 18,000 | 12 | 2,000 | 0.30 J | 3.14 |
| LVWPS-U3-MW11A | 3/11/2021 | N | EM05 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 12,000 | 17,000 | 11 | 2,200 | <1.0 | 2.34 |
| LVWPS-U3-MW11A | 4/9/2021 | N | EM06 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 9,900 | 15,000 | 11 | 2,100 | 0.40 J | 3.71 |
| LVWPS-U3-MW11A | 6/10/2021 | N | EM08 | Downgradient | 100 | UMCf-cg | 86.3 - 106.0 | 20,000 | 15,000 | 12 | 2,000 | 0.43 J | 3.00 |
| LVWPS-U3-MW11B | 10/7/2020 | N | BL04 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 4,100 | 9,600 | 5.2 | 1,900 | 0.33 J | 1.23 |
| LVWPS-U3-MW11B | 1/18/2021 | N | EM02 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 5,400 | 7,600 | 4.9 | 2,100 | <1.0 | 2.13 |
| LVWPS-U3-MW11B | 2/12/2021 | N | EM04 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 3,800 | 7,000 | 4.9 | 1,800 | <0.26 | 1.44 |
| LVWPS-U3-MW11B | 3/12/2021 | N | EM05 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 4,200 | 7,500 | 4.6 | 1,800 | <1.0 | 0.51 |
| LVWPS-U3-MW11B | 4/14/2021 | N | EM06 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 3,800 | 7,200 | 4.8 | 1,900 | <1.0 | 2.78 |
| LVWPS-U3-MW11B | 6/16/2021 | N | EM08 | Downgradient | 100 | UMCf-cg | 112.3 - 137.0 | 4,300 | 4,000 | 5.0 | 2,000 | <1.0 | 1.13 |
| LVWPS-U3-MW11C | 10/8/2020 | N | BL04 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 5,300 | 7,100 | 8.5 | 2,000 | 0.46 J | 4.73 |
| LVWPS-U3-MW11C | 1/18/2021 | N | EM02 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 6,500 | 6,800 | 8.1 | 2,000 | <1.0 | 4.03 |
| LVWPS-U3-MW11C | 2/12/2021 | N | EM04 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 3,800 | 6,200 | 8.3 | 1,700 | 0.34 J | 2.92 |
| LVWPS-U3-MW11C | 3/12/2021 | N | EM05 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 4,200 | 6,700 | 7.8 | 1,700 | <1.0 | 3.34 |
| LVWPS-U3-MW11C | 4/14/2021 | N | EM06 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 4,100 | 7,500 | 7.8 | 1,900 | <1.0 | 2.80 |
| LVWPS-U3-MW11C | 6/17/2021 | N | EM08 | Downgradient | 100 | UMCf-cg | 143.3 - 163.0 | 4,100 | 5,100 | 7.2 | 1,800 | <1.0 | 2.81 |
| LVWPS-A3-MW12 | 10/5/2020 | N | BL04 | Downgradient | 150 | Qal | 59.3 - 79.0 | 200 | 270 | 7.2 | 1,200 | 0.40 J | 6.48 |
| LVWPS-A3-MW12 | 1/13/2021 | N | EM02 | Downgradient | 150 | Qal | 59.3 - 79.0 | 230 | 260 | 7.1 | 1,200 | 0.35 J | 5.84 |
| LVWPS-A3-MW12 | 2/12/2021 | N | EM04 | Downgradient | 150 | Qal | 59.3 - 79.0 | 190 | 280 | 7.6 | 1,200 | 0.41 J | 8.24 |
| LVWPS-A3-MW12 | 3/12/2021 | N | EM05 | Downgradient | 150 | Qal | 59.3 - 79.0 | 140 | 190 | 5.8 | 1,100 | 0.45 J | 4.29 |
| LVWPS-A3-MW12 | 4/14/2021 | N | EM06 | Downgradient | 150 | Qal | 59.3 - 79.0 | 140 | 190 | 5.4 | 1,100 | 0.41 J | 3.69 |
| LVWPS-A3-MW12 | 6/11/2021 | N | EM08 | Downgradient | 150 | Qal | 59.3 - 79.0 | 140 | 210 | 5.5 | 1,100 | 0.50 J+ | 2.31 |
| LVWPS-U3-MW12A | 10/6/2020 | N | BL04 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 2,700 | 4,200 | 5.1 | 1,800 | 0.38 J | 2.67 |
| LVWPS-U3-MW12A | 1/15/2021 | N | EM02 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 2,300 | 3,200 | 3.3 | 1,800 | 0.60 | 1.07 |
| LVWPS-U3-MW12A | 2/12/2021 | N | EM04 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 2,000 | 2,800 | 2.5 | 1,600 | 3.7 | 1.79 |
| LVWPS-U3-MW12A | 3/12/2021 | N | EM05 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 1,700 | 2,500 | 2.0 | 1,600 | <1.0 | 0.63 |
| LVWPS-U3-MW12A | 4/15/2021 | N | EM06 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 2,100 J- | 3,300 J- | 1.6 J- | 1,600 J- | <1.0 UJ | 1.12 |
| LVWPS-U3-MW12A | 6/11/2021 | N | EM08 | Downgradient | 150 | UMCf-cg | 88.3 - 108.0 | 3,900 | 5,500 | 5.1 | 1,900 | <1.0 | 2.06 |
| LVWPS-U3-MW12B | 10/6/2020 | N | BL04 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 6,000 | 4,900 | 6.6 | 1,700 | 0.27 J | 5.94 |
| LVWPS-U3-MW12B | 1/15/2021 | N | EM02 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 1,900 | 2,600 | 2.7 | 2,000 | 0.45 J | 1.79 |
| LVWPS-U3-MW12B | 2/12/2021 | N | EM04 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 830 | 980 | 0.99 | 1,500 | 27 | 0.94 |
| LVWPS-U3-MW12B | 3/12/2021 | N | EM05 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 820 | 1,100 | 1.3 | 1,500 | 1.8 J+ | 1.28 |
| LVWPS-U3-MW12B | 4/15/2021 | N | EM06 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 7.6 J- | 1,200 J- | 1.4 J- | 1,500 J- | 0.41 J | 1.38 |
| LVWPS-U3-MW12B | 6/14/2021 | N | EM08 | Downgradient | 150 | UMCf-cg | 113.3 - 138.0 | 1,000 | 1,500 | 1.6 | 1,500 | 0.64 | 1.39 |
| LVWPS-MW212C | 10/5/2020 | N | BL04 | Downgradient | 260 | UMCf-cg | 100.3 - 120.0 | 7,800 | 11,000 | 8.4 | ---- | ---- | 4.32 |
| LVWPS-MW212C | 4/14/2021 | N | EM06 | Downgradient | 260 | UMCf-cg | 100.3 - 120.0 | 6,700 | 12,000 | 8.4 | 2,100 | 0.37 J | 3.77 |
| LVWPS-MW212C | 6/15/2021 | N | EM08 | Downgradient | 260 | UMCf-cg | 100.3 - 120.0 | 6,200 | 8,800 | 7.7 | 2,100 | <1.0 | 7.47 |
| LVWPS-MW212D | 10/8/2020 | N | BL04 | Downgradient | 260 | UMCf-cg | 125.5 - 145.0 | 6,800 | 11,000 | 10 | ---- | ---- | 5.60 |
| LVWPS-MW212D | 4/14/2021 | N | EM06 | Downgradient | 260 | UMCf-cg | 125.5 - 145.0 | 6,000 | 11,000 | 9.9 | 2,500 | 0.41 J | 4.36 |
| LVWPS-MW212D | 6/16/2021 | N | EM08 | Downgradient | 260 | UMCf-cg | 125.5 - 145.0 | 5,900 | 7,500 | 10 | 2,500 | 0.41 J | 4.04 |
| LVWPS-MW222A | 10/2/2020 | N | BL04 | Cross Gradient | N/A | UMCf/UMCf-cg | 80.3 - 100.0 | 2,900 | 3,800 | 4.1 | ---- | ---- | 2.97 |
| LVWPS-MW222B | 10/7/2020 | N | BL04 | Cross Gradient | N/A | UMCf-cg | 150.3 - 170.0 | 1,500 | 1,200 | 1.6 | ---- | ---- | 3.10 |
| LVWPS-MW222C | 10/2/2020 | N | BL04 | Cross Gradient | N/A | UMCf-cg | 214.0 - 233.5 | 1,500 | 1,300 | 2.4 | ---- | ---- | 2.25 |
| LVWPS-U3-MW01B | 10/5/2020 | N | BL04 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 2,000 | 1,800 | 0.24 | 1,700 | 6.3 | 2.06 |
| LVWPS-U3-MW01B | 1/15/2021 | N | EM02 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 1,900 | 2,700 | 0.79 | 1,800 | 3.9 | 1.26 |
| LVWPS-U3-MW01B | 2/11/2021 | N | EM04 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 2,300 | 2,500 | 1.8 | 1,800 | 3.6 | 1.35 |
| LVWPS-U3-MW01B | 3/15/2021 | N | EM05 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 2,200 | 2,700 | 1.3 | 1,700 | 3.0 | 0.98 |
| LVWPS-U3-MW01B | 4/9/2021 | N | EM06 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 2,200 | 2,800 | 1.5 | 1,800 | 2.5 | 1.18 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-U3-MW01B | 6/11/2021 | N | EM08 | Cross Gradient | N/A | UMCf-cg | 83.8 - 103.3 | 2,300 | 2,100 | 1.6 | 1,800 | 2.2 J+ | 2.41 |
| LVWPS-U3-MW04B | 10/2/2020 | N | BL04 | Cross Gradient | N/A | UMCf-cg | 78.2 - 97.7 | 120 | 67 J | <0.014 | 1,600 | 6.8 | 2.03 |
| **Extraction** | | | | | | | | | | | | | |
| LVWPS-EW01 | 9/29/2020 | N | BL04 | N/A | N/A | Qal | 44.8 - 84.5 | 2,900 | 13,000 | 23 | 2,200 | 1.6 | 2.76 |
| LVWPS-EW01 | 3/12/2021 | N | EM05 | N/A | N/A | Qal | 44.8 - 84.5 | 3,400 | 14,000 | 23 | 2,000 | 1.7 J+ | 2.34 |
| LVWPS-EW02 | 9/29/2020 | N | BL04 | N/A | N/A | Qal | 28.3 - 58.0 | 2,900 | 5,500 | 20 | 2,100 | 1.9 | 4.29 |
| LVWPS-EW02 | 3/12/2021 | N | EM05 | N/A | N/A | Qal | 28.3 - 58.0 | 2,900 | 7,000 | 23 | 2,000 | 1.9 J+ | 4.54 |
| LVWPS-EW03 | 9/30/2020 | N | BL04 | N/A | N/A | Qal | 40.3 - 70.0 | 3,100 | 5,000 | 18 | 2,100 | 1.7 | 4.09 |
| LVWPS-EW03 | 3/12/2021 | N | EM05 | N/A | N/A | Qal | 40.3 - 70.0 | 2,900 | 5,300 | 21 | 2,000 | 2.2 J+ | 3.92 |
| LVWPS-EW03 | 3/12/2021 | FD | EM05 | N/A | N/A | Qal | 40.3 - 70.0 | 3,000 | 5,500 | 22 | 2,100 | 2.1 J+ | ---- |
| LVWPS-EW04 | 9/30/2020 | N | BL04 | N/A | N/A | Qal | 26.3 - 46.0 | 2,800 | 5,200 | 20 | 2,100 | 2.0 | 4.35 |
| LVWPS-EW04 | 3/12/2021 | N | EM05 | N/A | N/A | Qal | 26.3 - 46.0 | 2,900 | 5,600 | 23 | 2,100 | 2.1 J+ | 4.68 |
| LVWPS-EW05 | 9/29/2020 | N | BL04 | N/A | N/A | Qal | 50.3 - 80.0 | 2,800 | 11,000 | 23 | 2,100 | 1.8 | 2.32 |
| LVWPS-EW05 | 9/29/2020 | FD | BL04 | N/A | N/A | Qal | 50.3 - 80.0 | 2,800 | 11,000 | 23 | 2,100 | 1.7 | ---- |
| LVWPS-EW05 | 3/15/2021 | N | EM05 | N/A | N/A | Qal | 50.3 - 80.0 | 3,100 | 12,000 | 24 | 2,100 | 1.8 | 2.22 |
| LVWPS-MW206A | 9/30/2020 | N | BL04 | N/A | N/A | Qal | 39.8 - 59.5 | 3,400 J- | 8,500 | 23 | ---- | ---- | 3.77 |
| LVWPS-MW206B | 9/30/2020 | N | BL04 | N/A | N/A | Qal | 69.9 - 89.5 | 2,800 | 16,000 | 10 | ---- | ---- | 1.84 |
| LVWPS-MW206C | 9/30/2020 | N | BL04 | N/A | N/A | UMCf | 100.3 - 120.0 | 4,900 J- | 6,000 | 3.4 | ---- | ---- | 2.70 |
| LVWPS-MW206D | 10/6/2020 | N | BL04 | N/A | N/A | UMCf | 125.3 - 145.0 | 9.5 | <10 | <0.014 | ---- | ---- | 2.08 |
| **General Vicinity** | | | | | | | | | | | | | |
| LVWPS-MW201A | 9/28/2020 | N | BL04 | N/A | N/A | Qal | 28.2 - 47.8 | 1,800 | 11,000 | 13 | ---- | ---- | 0.59 |
| LVWPS-MW201B | 9/28/2020 | N | BL04 | N/A | N/A | UMCf | 60.1 - 79.8 | 610 | 560 | 0.55 | ---- | ---- | 1.13 |
| LVWPS-MW202 | 9/29/2020 | N | BL04 | N/A | N/A | Qal | 41.8 - 61.5 | 1,100 | 6,000 | 12 | ---- | ---- | 0.80 |
| LVWPS-MW203A | 9/30/2020 | N | BL04 | N/A | N/A | Qal | 34.8 - 54.5 | 120 | <40 | 9.3 | ---- | ---- | 0.74 |
| LVWPS-MW203A | 9/30/2020 | FD | BL04 | N/A | N/A | Qal | 34.8 - 54.5 | 120 | <40 | 9.3 | ---- | ---- | ---- |
| LVWPS-MW203B | 9/30/2020 | N | BL04 | N/A | N/A | UMCf | 75.1 - 94.7 | 2.6 J- | <40 | <0.014 | ---- | ---- | 0.88 |
| LVWPS-MW203C | 9/30/2020 | N | BL04 | N/A | N/A | UMCf (Semi-Cons) | 100.3 - 120.0 | <0.31 | <20 | <0.014 | ---- | ---- | 0.65 |
| LVWPS-MW204C | 10/7/2020 | N | BL04 | N/A | N/A | UMCf (Semi-Cons) | 150.5 - 170.0 | 46 | <100 | <0.028 | ---- | ---- | 2.40 |
| LVWPS-MW205B | 9/28/2020 | N | BL04 | N/A | N/A | Qal | 64.9 - 84.6 | 1,300 | 6,300 | 12 | ---- | ---- | 0.50 |
| LVWPS-MW205C | 9/29/2020 | N | BL04 | N/A | N/A | Qal | 100.3 - 120.0 | 790 | 2,700 | 11 | ---- | ---- | 0.87 |
| LVWPS-MW206E | 10/5/2020 | N | BL04 | N/A | N/A | UMCf (Semi-Cons) | 195.5 - 205.0 | 39 | <100 | <0.014 | ---- | ---- | 2.11 |
| LVWPS-MW209B | 10/6/2020 | N | BL04 | N/A | N/A | UMCf-cg | 110.3 - 130.0 | 2,700 | 8,300 | 21 | ---- | ---- | 4.30 |
| LVWPS-MW209C | 10/7/2020 | N | BL04 | N/A | N/A | UMCf-cg | 151.0 - 170.5 | 8,500 | 12,000 | 14 | ---- | ---- | 2.44 |
| LVWPS-MW210C | 10/1/2020 | N | BL04 | N/A | N/A | UMCf-cg | 100.3 - 120.0 | 10,000 J- | 17,000 | 15 | ---- | ---- | 2.59 |
| LVWPS-MW210D | 10/7/2020 | N | BL04 | N/A | N/A | UMCf-cg | 130.4 - 140.0 | 8,500 | 10,000 | 3.8 | ---- | ---- | 3.24 |
| LVWPS-MW210E | 10/7/2020 | N | BL04 | N/A | N/A | UMCf-cg | 145.5 - 165.0 | 4,400 | 7,100 | 2.2 | ---- | ---- | 2.19 |
| LVWPS-MW213 | 10/1/2020 | N | BL04 | N/A | N/A | Qal | 40.1 - 59.8 | 170 | 260 | 3.2 | ---- | ---- | 4.96 |
| LVWPS-MW213 | 10/1/2020 | FD | BL04 | N/A | N/A | Qal | 40.1 - 59.8 | 140 | 270 | 3.2 | ---- | ---- | ---- |
| LVWPS-MW214 | 10/7/2020 | N | BL04 | N/A | N/A | Qal | 34.4 - 44.0 | 2,500 | 3,700 | 14 | ---- | ---- | 5.16 |
| LVWPS-MW215A | 10/8/2020 | N | BL04 | N/A | N/A | Qal | 13.5 - 33.2 | 2,600 J- | 9,700 | 17 | ---- | ---- | 1.26 |
| LVWPS-MW215B | 10/9/2020 | N | BL04 | N/A | N/A | Horse Springs | 40.7 - 45.3 | 2,600 | 6,700 | 11 | ---- | ---- | 1.46 |
| LVWPS-MW216 | 10/7/2020 | N | BL04 | N/A | N/A | Qal | 10.4 - 20.0 | 1,100 | 930 | 4.0 | ---- | ---- | 0.66 |
| LVWPS-MW216 | 10/7/2020 | FD | BL04 | N/A | N/A | Qal | 10.4 - 20.0 | 1,100 | 940 | 4.1 | ---- | ---- | ---- |
| LVWPS-MW218B | 10/2/2020 | N | BL04 | N/A | N/A | UMCf/UMCf-cg | 100.3 - 120.0 | 8,400 | 13,000 | 16 | ---- | ---- | 5.83 |
| LVWPS-MW218C | 10/2/2020 | N | BL04 | N/A | N/A | UMCf/UMCf-cg | 136.0 - 155.5 | 5,300 | 7,200 | 4.3 | ---- | ---- | 1.78 |
| LVWPS-MW219A | 10/9/2020 | N | BL04 | N/A | N/A | Qal | 35.1 - 49.8 | 3,500 | 8,500 | 19 | ---- | ---- | 5.78 |
| LVWPS-MW219B | 10/9/2020 | N | BL04 | N/A | N/A | UMCf/Horse Springs | 75.3 - 95.0 | 2.2 | <100 | <0.014 | ---- | ---- | 3.23 |
| LVWPS-MW219C | 10/9/2020 | N | BL04 | N/A | N/A | UMCf/Horse Springs | 115.5 - 135.0 | 53 | <10 | 0.045 J | ---- | ---- | 2.43 |

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**Table 2**
**Groundwater Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Well | Sample Date | QC Type | Event | Location | Distance from Injection Transect | Screened Lithology | Screened Interval | Perchlorate by USEPA Method 314.0 | Chlorate by USEPA Method 300.1B | Nitrate (as N) by USEPA Method 300.0 | Sulfate by USEPA Method 300.0 | Total Organic Carbon by SM 5310B | Dissolved Oxygen Field Measurement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | feet | | ft bgs | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| LVWPS-MW220B | 10/7/2020 | N | BL04 | N/A | N/A | UMCf-cg | 134.5 - 154.0 | 4,200 | 10,000 | 12 | ---- | ---- | 2.66 |
| LVWPS-MW221B | 10/6/2020 | N | BL04 | N/A | N/A | UMCf/UMCf-cg | 83.7 - 103.2 | 6,600 | 11,000 | 5.8 | 1,500 J+ | 0.54 | 3.09 |
| LVWPS-MW224B | 10/7/2020 | N | BL04 | N/A | N/A | UMCf | 106.8 - 126.5 | 200 | 220 | 0.63 | ---- | ---- | 1.48 |
| LVWPS-MW224C | 10/8/2020 | N | BL04 | N/A | N/A | UMCf (Semi-Cons) | 174.5 - 194.0 | 30 | <100 | 0.068 | ---- | ---- | 2.10 |
| LVWPS-MW225A | 10/7/2020 | N | BL04 | N/A | N/A | Qal | 49.3 - 69.0 | 2,300 | 5,200 | 22 | ---- | ---- | 4.35 |
| LVWPS-MW225A | 10/7/2020 | FD | BL04 | N/A | N/A | Qal | 49.3 - 69.0 | 2,300 | 5,200 | 22 | ---- | ---- | ---- |
| LVWPS-MW225B | 10/7/2020 | N | BL04 | N/A | N/A | UMCf | 90.5 - 110.0 | 4,000 | 5,100 | 3.3 | ---- | ---- | 1.92 |
| LVWPS-MW226A | 10/1/2020 | N | BL04 | N/A | N/A | Qal | 40.3 - 55.0 | 2,800 | 5,100 | 19 | ---- | ---- | 3.71 |
| LVWPS-MW226A | 10/1/2020 | FD | BL04 | N/A | N/A | Qal | 40.3 - 55.0 | 2,300 | 4,900 | 19 | ---- | ---- | ---- |
| LVWPS-MW226B | 10/1/2020 | N | BL04 | N/A | N/A | UMCf (Semi-Cons) | 77.5 - 97.0 | 37 | <100 | <0.014 | ---- | ---- | 0.79 |
| LVWPS-U2-MW07 | 10/2/2020 | N | BL04 | N/A | N/A | UMCf | 88.2 - 108.0 | 1,600 | 2,600 | 10 | 1,900 | 0.74 | 5.79 |
| LVWPS-U2-MW10 | 10/2/2020 | N | BL04 | N/A | N/A | UMCf | 90.2 - 110.0 | 6,000 | 8,900 | 15 | 2,200 | 1.1 | 4.16 |
| LVWPS-U2-MW13 | 10/2/2020 | N | BL04 | N/A | N/A | UMCf | 94.7 - 109.5 | 5,400 | 11,000 | 17 | 2,100 | 1.2 | 3.58 |
| LVWPS-U2-MW13 | 10/2/2020 | FD | BL04 | N/A | N/A | UMCf | 94.7 - 109.5 | 5,800 | 11,000 | 17 | 2,300 | 1.4 | ---- |
| LVWPS-U2-MW19 | 10/2/2020 | N | BL04 | N/A | N/A | UMCf | 91.2 - 111.0 | 12,000 | 14,000 | 14 | 2,100 | 1.0 | 3.29 |
| LVWPS-U2-MW20 | 10/2/2020 | N | BL04 | N/A | N/A | UMCf | 88.2 - 108.0 | 6,000 | 13,000 | 12 | 2,200 | 1.5 | 1.38 |

Notes:

| | |
|---|---|
| ---- | Not tested. |
| J- | The result is an estimated quantity, but the result may be biased low. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| J+ | The result is an estimated quantity, but the result may be biased high. |
| < | The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |
| Transect Distance | Approximate distance from Injection Well Transect in feet. |
| N/A | Not Applicable. |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| **Zone 1** | | | | | | | | | | | | | | | | | | | | | | |
| LVWPS-A1-MW06 | 9/29/2020 | 69.1 | LVWPS-A1-MW06-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW06 | 12/28/2020 | 69.1 | LVWPS-A1-MW06-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 563.2 ** | 44.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW06 | 1/14/2021 | 69.1 | LVWPS-A1-MW06-EM02 | EM02 | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 562.6 ** | 34.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW06 | 2/9/2021 | 69.1 | LVWPS-A1-MW06-EM04 | EM04 | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 562.2 ** | 37.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW06 | 3/9/2021 | 69.1 | LVWPS-A1-MW06-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.3 ** | 39.9 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW06 | 4/9/2021 | 69.1 | LVWPS-A1-MW06-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 24 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW06 | 5/11/2021 | 69.1 | LVWPS-A1-MW06-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 44.1 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW06 | 6/9/2021 | 69.1 | LVWPS-A1-MW06-EM08 | EM08 | Upgradient | -60 | ND | ND | ND | ND | 515.4 * | 1.63 | ND | ND | 563.0 ** | 48.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW07 | 9/30/2020 | 68.1 | LVWPS-A1-MW07-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW07 | 12/29/2020 | 68.1 | LVWPS-A1-MW07-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 562.1 ** | 32.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW07 | 1/14/2021 | 68.1 | LVWPS-A1-MW07-EM02 | EM02 | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 561.9 ** | 21.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW07 | 2/10/2021 | 68.1 | LVWPS-A1-MW07-EM04 | EM04 | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 561.7 ** | 22.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW07 | 3/9/2021 | 68.1 | LVWPS-A1-MW07-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.3 ** | 34.8 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW07 | 4/7/2021 | 68.1 | LVWPS-A1-MW07-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 29.3 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW07 | 5/11/2021 | 68.1 | LVWPS-A1-MW07-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.2 ** | 30.2 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW07 | 6/9/2021 | 68.1 | LVWPS-A1-MW07-EM08 | EM08 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 36.4 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06A | 9/29/2020 | 95.1 | LVWPS-U1-MW06A-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW06A | 12/28/2020 | 95.1 | LVWPS-U1-MW06A-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 562.2 ** | 4.66 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06A | 1/14/2021 | 95.1 | LVWPS-U1-MW06A-EM02 | EM02 | Upgradient | -60 | ND | ND | ND | ND | ND | ND | ND | ND | 562.5 ** | 3.81 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06A | 2/9/2021 | 95.1 | LVWPS-U1-MW06A-EM04 | EM04 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06A | 3/10/2021 | 95.1 | LVWPS-U1-MW06A-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 563.4 ** | 1.68 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06A | 4/12/2021 | 95.1 | LVWPS-U1-MW06A-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 563.4 ** | 3.02 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06A | 5/11/2021 | 95.1 | LVWPS-U1-MW06A-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 563.6 ** | 1.08 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06A | 6/9/2021 | 95.1 | LVWPS-U1-MW06A-EM08 | EM08 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | 562.7 ** | 1.86 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW06B | 9/29/2020 | 121.3 | LVWPS-U1-MW06B-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW06B | 12/28/2020 | 121.3 | LVWPS-U1-MW06B-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | 515.1 | 7.50 | 506.8 | 0.125 | 562.5 ** | 2.85 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 1/12/2021 | 121.3 | LVWPS-U1-MW06B-EM02 | EM02 | Upgradient | -60 | ND | ND | ND | ND | 515.1 | 2.02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 2/10/2021 | 121.3 | LVWPS-U1-MW06B-EM04 | EM04 | Upgradient | -60 | ND | ND | ND | ND | 514.4 | 0.937 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 3/10/2021 | 121.3 | LVWPS-U1-MW06B-EM05 | EM05 | Upgradient | -60 | ND | ND | ND | ND | 514.5 | 1.38 | ND | ND | 562.7 ** | 1.95 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 4/8/2021 | 121.3 | LVWPS-U1-MW06B-EM06 | EM06 | Upgradient | -60 | ND | ND | ND | ND | 515.1 | 2.05 | ND | ND | 563.0 ** | 2.67 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 5/11/2021 | 121.3 | LVWPS-U1-MW06B-EM07 | EM07 | Upgradient | -60 | ND | ND | ND | ND | 514.3 | 0.887 | ND | ND | 564.0 ** | 1.54 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW06B | 6/9/2021 | 121.3 | LVWPS-U1-MW06B-EM08 | EM08 | Upgradient | -60 | ND | ND | ND | ND | 510.8 ** | 0.530 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 9/30/2020 | 98.5 | LVWPS-U1-MW07-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW07 | 12/29/2020 | 98.5 | LVWPS-U1-MW07-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | 515.3 | 37.2 | 507.1 | 0.684 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 1/14/2021 | 98.5 | LVWPS-U1-MW07-EM02 | EM02 | Upgradient | -60 | ND | ND | ND | ND | 514.9 | 0.690 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 2/10/2021 | 98.5 | LVWPS-U1-MW07-EM04 | EM04 | Upgradient | -60 | ND | ND | ND | ND | 514.7 | 0.992 | 507.1 | 0.243 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 3/12/2021 | 98.5 | LVWPS-U1-MW07-EM05 | EM05 | Upgradient | -60 | ND | ND | ND | ND | 515.2 | 0.824 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 4/7/2021 | 98.5 | LVWPS-U1-MW07-EM06 | EM06 | Upgradient | -60 | ND | ND | ND | ND | 515.2 | 0.847 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 5/11/2021 | 98.5 | LVWPS-U1-MW07-EM07 | EM07 | Upgradient | -60 | ND | ND | ND | ND | 515.2 | 0.791 | 507.1 | 0.325 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW07 | 6/10/2021 | 98.5 | LVWPS-U1-MW07-EM08 | EM08 | Upgradient | -60 | ND | ND | ND | ND | 514.1 | 0.684 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR02 | 9/28/2020 | 67.8 | LVWPS-A1-DR02-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-DR02 | 12/13/2020 | 67.8 | LVWPS-A1-DR02-20201213-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR02 | 12/14/2020 | 67.8 | LVWPS-A1-DR02-20201214 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR02 | 12/29/2020 | 67.8 | LVWPS-A1-DR02-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR02 | 1/12/2021 | 67.8 | LVWPS-A1-DR02-EM02 | EM02 | Downgradient | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | 562.8 ** | 16.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR02 | 2/11/2021 | 67.8 | LVWPS-A1-DR02-EM04 | EM04 | Downgradient | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | 562.7 ** | 43.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR02 | 3/15/2021 | 67.8 | LVWPS-A1-DR02-EM05 | EM05 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | 562.4 ** | 34.7 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-DR02 | 4/13/2021 | 67.8 | LVWPS-A1-DR02-EM06 | EM06 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | 563.1 ** | 19.7 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-DR02 | 5/11/2021 | 67.8 | LVWPS-A1-DR02-EM07 | EM07 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 31.6 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-DR02 | 6/9/2021 | 67.8 | LVWPS-A1-DR02-EM08 | EM08 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | 562.7 ** | 28.3 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-DR02A | 9/28/2020 | 101.6 | LVWPS-U1-DR02A-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-DR02A | 12/13/2020 | 101.6 | LVWPS-U1-DR02A-20201213-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.3 | 23.4 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/13/2020 | 101.6 | LVWPS-U1-DR02A-20201213-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.2 | 11.8 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/13/2020 | 101.6 | LVWPS-U1-DR02A-20201213-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 514.6 | 10.0 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/13/2020 | 101.6 | LVWPS-U1-DR02A-20201213-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.1 | 12.9 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-5 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-6 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.4 | 2.63 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-6 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 516.1 | 3.35 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.6 | 5.08 | --- | --- | ND | ND | --- | --- | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.9 | 3.81 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.3 | 22.9 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/14/2020 | 101.6 | LVWPS-U1-DR02A-20201214-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.3 | 18.4 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 12/29/2020 | 101.6 | LVWPS-U1-DR02A-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.9 ** | 8.30 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02A | 1/12/2021 | 101.6 | LVWPS-U1-DR02A-EM02 | EM02 | Downgradient | 6.5 | ND | ND | ND | ND | 515.3 | 14.7 | 516.7 ** | 14.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02A | 2/11/2021 | 101.6 | LVWPS-U1-DR02A-EM04 | EM04 | Downgradient | 6.5 | ND | ND | ND | ND | 516.1 | 54.6 | 516.2 ** | 10.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02A | 3/15/2021 | 101.6 | LVWPS-U1-DR02A-EM05 | EM05 | Downgradient | 6.5 | ND | ND | ND | ND | 515.7 | 18.7 | 515.4 ** | 2.00 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02A | 4/13/2021 | 101.6 | LVWPS-U1-DR02A-EM06 | EM06 | Downgradient | 6.5 | ND | ND | ND | ND | 515.6 | 16.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02A | 5/11/2021 | 101.6 | LVWPS-U1-DR02A-EM07 | EM07 | Downgradient | 6.5 | ND | ND | ND | ND | 515.3 | 10.7 | 513.0 ** | 0.810 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02A | 6/9/2021 | 101.6 | LVWPS-U1-DR02A-EM08 | EM08 | Downgradient | 6.5 | ND | ND | ND | ND | 515.4 | 9.76 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 9/28/2020 | 137.5 | LVWPS-U1-DR02B-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-DR02B | 12/13/2020 | 137.5 | LVWPS-U1-DR02B-20201213-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 506.8 | 0.087 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/13/2020 | 137.5 | LVWPS-U1-DR02B-20201213-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/13/2020 | 137.5 | LVWPS-U1-DR02B-20201213-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/14/2020 | 137.5 | LVWPS-U1-DR02B-20201214-5 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/14/2020 | 137.5 | LVWPS-U1-DR02B-20201214-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/14/2020 | 137.5 | LVWPS-U1-DR02B-20201214-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/14/2020 | 137.5 | LVWPS-U1-DR02B-20201214-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/14/2020 | 137.5 | LVWPS-U1-DR02B-20201214-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 12/29/2020 | 137.5 | LVWPS-U1-DR02B-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 507.0 | 1.01 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR02B | 1/12/2021 | 137.5 | LVWPS-U1-DR02B-EM02 | EM02 | Downgradient | 6.5 | ND | ND | ND | ND | 515.2 | 2.99 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 2/11/2021 | 137.5 | LVWPS-U1-DR02B-EM04 | EM04 | Downgradient | 6.5 | ND | ND | ND | ND | 515.4 | 12.4 | 507.2 | 0.173 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 3/15/2021 | 137.5 | LVWPS-U1-DR02B-EM05 | EM05 | Downgradient | 6.5 | ND | ND | ND | ND | 515.4 | 4.14 | 507.9 | 0.098 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 4/13/2021 | 137.5 | LVWPS-U1-DR02B-EM06 | EM06 | Downgradient | 6.5 | ND | ND | ND | ND | 515.7 | 3.72 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 5/11/2021 | 137.5 | LVWPS-U1-DR02B-EM07 | EM07 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 6.63 | 510.7 ** | 0.155 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR02B | 6/9/2021 | 137.5 | LVWPS-U1-DR02B-EM08 | EM08 | Downgradient | 6.5 | ND | ND | ND | ND | 515.7 | 10.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR01 | 9/28/2020 | 72.5 | LVWPS-A1-DR01-BL04 | BL04 | Downgradient | 7.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-DR01 | 12/13/2020 | 72.5 | LVWPS-A1-DR01-20201213-1 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR01 | 12/14/2020 | 72.5 | LVWPS-A1-DR01-20201214 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR01 | 12/29/2020 | 72.5 | LVWPS-A1-DR01-INJ | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A1-DR01 | 1/12/2021 | 72.5 | LVWPS-A1-DR01-EM02 | EM02 | Downgradient | 7.5 | ND | ND | ND | ND | ND | ND | ND | ND | 561.2 ** | 8.58 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR01 | 2/11/2021 | 72.5 | LVWPS-A1-DR01-EM04 | EM04 | Downgradient | 7.5 | ND | ND | ND | ND | 515.9 | 1.46 | ND | ND | 562.2 ** | 25.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR01 | 3/15/2021 | 72.5 | LVWPS-A1-DR01-EM05 | EM05 | Downgradient | 7.5 | ND | ND | ND | ND | 516.2 | 0.990 | ND | ND | 562.3 ** | 23.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR01 | 4/13/2021 | 72.5 | LVWPS-A1-DR01-EM06 | EM06 | Downgradient | 7.5 | ND | ND | --- | --- | ND | ND | --- | --- | 561.9 ** | 8.43 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-DR01 | 5/11/2021 | 72.5 | LVWPS-A1-DR01-EM07 | EM07 | Downgradient | 7.5 | ND | ND | ND | ND | 515.2 | 1.52 | ND | ND | 562.2 ** | 16.8 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-DR01 | 6/9/2021 | 72.5 | LVWPS-A1-DR01-EM08 | EM08 | Downgradient | 7.5 | ND | ND | --- | --- | ND | ND | --- | --- | 562.7 ** | 14.6 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-DR01A | 9/28/2020 | 102.6 | LVWPS-U1-DR01A-BL04 | BL04 | Downgradient | 7.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-DR01A | 12/13/2020 | 102.6 | LVWPS-U1-DR01A-20201213-1 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/13/2020 | 102.6 | LVWPS-U1-DR01A-20201213-2 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/13/2020 | 102.6 | LVWPS-U1-DR01A-20201213-3 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 507.1 | 0.959 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/13/2020 | 102.6 | LVWPS-U1-DR01A-20201213-4 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 513.8 | 0.901 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-5 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-6 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.2 | 3.35 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-1 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 514.9 | 1.79 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-2 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.2 | 18.2 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-3 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 506.8 | 1.18 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/14/2020 | 102.6 | LVWPS-U1-DR01A-20201214-4 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.0 | 3.03 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 12/29/2020 | 102.6 | LVWPS-U1-DR01A-INJ | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 507.0 | 0.700 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01A | 1/12/2021 | 102.6 | LVWPS-U1-DR01A-EM02 | EM02 | Downgradient | 7.5 | ND | ND | ND | ND | 515.4 | 22.8 | 515.4 ** | 1.98 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01A | 2/11/2021 | 102.6 | LVWPS-U1-DR01A-EM04 | EM04 | Downgradient | 7.5 | ND | ND | ND | ND | 515.5 | 31.1 | 507.2 | 1.59 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01A | 3/15/2021 | 102.6 | LVWPS-U1-DR01A-EM05 | EM05 | Downgradient | 7.5 | ND | ND | ND | ND | 515.4 | 8.59 | 507.4 | 1.33 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01A | 4/13/2021 | 102.6 | LVWPS-U1-DR01A-EM06 | EM06 | Downgradient | 7.5 | ND | ND | ND | ND | 515.7 | 10.9 | 516.8 ** | 2.90 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01A | 5/11/2021 | 102.6 | LVWPS-U1-DR01A-EM07 | EM07 | Downgradient | 7.5 | ND | ND | ND | ND | 515.4 | 16.9 | 507.3 | 1.25 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01A | 6/9/2021 | 102.6 | LVWPS-U1-DR01A-EM08 | EM08 | Downgradient | 7.5 | ND | ND | ND | ND | 515.5 | 19.3 | 507.2 | 1.07 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 9/28/2020 | 136.1 | LVWPS-U1-DR01B-BL04 | BL04 | Downgradient | 7.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-DR01B | 9/28/2020 | 136.1 | LVWPS-U1-DR01B-BL04-FD | BL04 | Downgradient | 7.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-DR01B | 12/13/2020 | 136.1 | LVWPS-U1-DR01B-20201213-1 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.4 | 17.1 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/13/2020 | 136.1 | LVWPS-U1-DR01B-20201213-2 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 514.1 | 177 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/13/2020 | 136.1 | LVWPS-U1-DR01B-20201213-3 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 513.7 | 179 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-5 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 513.2 | 165 | --- | --- | ND | ND | --- | --- | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-6 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 513.5 | 96.5 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-1 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.7 | 136 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-2 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.7 | 167 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-3 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.7 | 259 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/14/2020 | 136.1 | LVWPS-U1-DR01B-20201214-4 | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 513.8 | 204 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 12/29/2020 | 136.1 | LVWPS-U1-DR01B-INJ | INJ | Downgradient | 7.5 | --- | --- | ND | ND | --- | --- | 515.4 ** | 65.6 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-DR01B | 1/12/2021 | 136.1 | LVWPS-U1-DR01B-EM02 | EM02 | Downgradient | 7.5 | ND | ND | ND | ND | 516.5 | 91.9 | 15.8 ** | 56.9 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 2/11/2021 | 136.1 | LVWPS-U1-DR01B-EM04 | EM04 | Downgradient | 7.5 | ND | ND | ND | ND | 517.3 | 98.7 | 515.5 ** | 144 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 3/15/2021 | 136.1 | LVWPS-U1-DR01B-EM05 | EM05 | Downgradient | 7.5 | ND | ND | ND | ND | 517.1 | 127 | 515.7 ** | 138 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 4/13/2021 | 136.1 | LVWPS-U1-DR01B-EM06 | EM06 | Downgradient | 7.5 | ND | ND | ND | ND | 516.4 | 246 | 515.1 ** | 299 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 5/11/2021 | 136.1 | LVWPS-U1-DR01B-EM07 | EM07 | Downgradient | 7.5 | ND | ND | ND | ND | 516.2 | 226 | 508.2 | 2.77 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-DR01B | 6/9/2021 | 136.1 | LVWPS-U1-DR01B-EM08 | EM08 | Downgradient | 7.5 | ND | ND | ND | ND | 516.2 | 118 | 515.9 ** | 31.4 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW01A | 9/28/2020 | 102.6 | LVWPS-U1-MW01A-BL04 | BL04 | Downgradient | 22 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW01A | 12/13/2020 | 102.6 | LVWPS-U1-MW01A-20201213 | INJ | Downgradient | 22 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW01A | 12/28/2020 | 102.6 | LVWPS-U1-MW01A-INJ | INJ | Downgradient | 22 | ND | ND | ND | ND | ND | ND | ND | ND | 558.0 ** | 3.15 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW01A | 1/14/2021 | 102.6 | LVWPS-U1-MW01A-EM02 | EM02 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01A | 2/10/2021 | 102.6 | LVWPS-U1-MW01A-EM04 | EM04 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01A | 3/11/2021 | 102.6 | LVWPS-U1-MW01A-EM05 | EM05 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01A | 4/8/2021 | 102.6 | LVWPS-U1-MW01A-EM06 | EM06 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01A | 5/11/2021 | 102.6 | LVWPS-U1-MW01A-EM07 | EM07 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01A | 6/10/2021 | 102.6 | LVWPS-U1-MW01A-EM08 | EM08 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 9/28/2020 | 143.4 | LVWPS-U1-MW01B-BL04 | BL04 | Downgradient | 22 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW01B | 12/28/2020 | 143.4 | LVWPS-U1-MW01B-INJ | INJ | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 1/14/2021 | 143.4 | LVWPS-U1-MW01B-EM02 | EM02 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 2/10/2021 | 143.4 | LVWPS-U1-MW01B-EM04 | EM04 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 3/11/2021 | 143.4 | LVWPS-U1-MW01B-EM05 | EM05 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 4/7/2021 | 143.4 | LVWPS-U1-MW01B-EM06 | EM06 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 5/11/2021 | 143.4 | LVWPS-U1-MW01B-EM07 | EM07 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW01B | 6/10/2021 | 143.4 | LVWPS-U1-MW01B-EM08 | EM08 | Downgradient | 22 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW08A | 9/30/2020 | 106.1 | LVWPS-U1-MW08A-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW08A | 12/29/2020 | 106.1 | LVWPS-U1-MW08A-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 516.2 | 470 | 514.7 ** | 12.2 | 567.0 | 5.61 | 561.3 ** | 1.28 | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 1/12/2021 | 106.1 | LVWPS-U1-MW08A-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 101 | 515.6 ** | 12.6 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 2/9/2021 | 106.1 | LVWPS-U1-MW08A-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 29.9 | 507.4 | 4.74 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 3/11/2021 | 106.1 | LVWPS-U1-MW08A-EM05 | EM05 | Downgradient | 25 | ND | ND | ND | ND | 515.4 | 88.1 | 513.4 ** | 3.02 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 4/8/2021 | 106.1 | LVWPS-U1-MW08A-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 69.6 | 507.1 | 1.32 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 5/11/2021 | 106.1 | LVWPS-U1-MW08A-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 67.3 | 507.3 | 1.25 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08A | 6/9/2021 | 106.1 | LVWPS-U1-MW08A-EM08 | EM08 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 18.2 | 507.1 | 0.827 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 9/30/2020 | 137.6 | LVWPS-U1-MW08B-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW08B | 12/13/2020 | 137.6 | LVWPS-U1-MW08B-20201213-1 | INJ | Downgradient | 25 | --- | --- | ND | ND | --- | --- | 514.9 | 11.0 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW08B | 12/13/2020 | 137.6 | LVWPS-U1-MW08B-20201213 | INJ | Downgradient | 25 | --- | --- | ND | ND | --- | --- | 515.8 | 2.54 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW08B | 12/13/2020 | 137.6 | LVWPS-U1-MW08B-20201213-2 | INJ | Downgradient | 25 | --- | --- | ND | ND | --- | --- | 515.2 | 16.5 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW08B | 12/14/2020 | 137.6 | LVWPS-U1-MW08B-20201214 | INJ | Downgradient | 25 | --- | --- | ND | ND | --- | --- | 515.2 | 6.92 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW08B | 12/29/2020 | 137.6 | LVWPS-U1-MW08B-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.4 | 185 | 515.0 ** | 8.54 | 567.2 | 3.09 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 12/29/2020 | 137.6 | LVWPS-U1-MW08B-INJ-FD | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.4 | 199 | 514.7 ** | 11.3 | 567.6 | 3.54 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 1/11/2021 | 137.6 | LVWPS-U1-MW08B-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 11.2 | 515.7 ** | 4.91 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 1/11/2021 | 137.6 | LVWPS-U1-MW08B-EM02-FD | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.7 | 9.63 | 517.5 ** | 11.3 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 2/9/2021 | 137.6 | LVWPS-U1-MW08B-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.8 | 33.4 | 515.3 ** | 4.34 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 2/9/2021 | 137.6 | LVWPS-U1-MW08B-EM04-FD | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.8 | 31.7 | 515.6 ** | 3.77 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 3/10/2021 | 137.6 | LVWPS-U1-MW08B-EM05 | EM05 | Downgradient | 25 | ND | ND | ND | ND | 515.8 | 58.2 | 507.3 | 0.661 | 570.0 | 2.99 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 4/9/2021 | 137.6 | LVWPS-U1-MW08B-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 3.71 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 5/11/2021 | 137.6 | LVWPS-U1-MW08B-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 3.19 | 507.4 | 0.550 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW08B | 6/9/2021 | 137.6 | LVWPS-U1-MW08B-EM08 | EM08 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 2.10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW02A | 9/29/2020 | 106.4 | LVWPS-U1-MW02A-BL04 | BL04 | Downgradient | 32.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW02A | 12/13/2020 | 106.4 | LVWPS-U1-MW02A-20201213 | INJ | Downgradient | 32.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW02A | 12/29/2020 | 106.4 | LVWPS-U1-MW02A-INJ | INJ | Downgradient | 32.5 | ND | ND | ND | ND | ND | ND | ND | ND | 560.6 ** | 1.92 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW02A | 1/14/2021 | 106.4 | LVWPS-U1-MW02A-EM02 | EM02 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02A | 2/11/2021 | 106.4 | LVWPS-U1-MW02A-EM04 | EM04 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02A | 3/11/2021 | 106.4 | LVWPS-U1-MW02A-EM05 | EM05 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02A | 4/8/2021 | 106.4 | LVWPS-U1-MW02A-EM06 | EM06 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | 561.6 ** | 1.31 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02A | 5/11/2021 | 106.4 | LVWPS-U1-MW02A-EM07 | EM07 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | 562.4 ** | 0.971 | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U1-MW02A | 6/10/2021 | 106.4 | LVWPS-U1-MW02A-EM08 | EM08 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02B | 10/7/2020 | 149.1 | LVWPS-U1-MW02B-BL04 | BL04 | Downgradient | 32.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW02B | 12/13/2020 | 149.1 | LVWPS-U1-MW02B-20201213 | INJ | Downgradient | 32.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW02B | 12/13/2020 | 149.1 | LVWPS-U1-MW02B-20201213 | INJ | Downgradient | 32.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW02B | 12/29/2020 | 149.1 | LVWPS-U1-MW02B-INJ | INJ | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02B | 1/14/2021 | 149.1 | LVWPS-U1-MW02B-EM02 | EM02 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02B | 2/11/2021 | 149.1 | LVWPS-U1-MW02B-EM04 | EM04 | Downgradient | 32.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW02B | 3/11/2021 | 149.1 | LVWPS-U1-MW02B-EM05 | EM05 | Downgradient | 32.5 | ND | ND | ND | ND | 514.9 | 1.54 | ND | ND | 560.6 ** | 1.57 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW02B | 4/6/2021 | 149.1 | LVWPS-U1-MW02B-EM06 | EM06 | Downgradient | 32.5 | ND | ND | ND | ND | 514.9 | 0.863 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW02B | 5/11/2021 | 149.1 | LVWPS-U1-MW02B-EM07 | EM07 | Downgradient | 32.5 | ND | ND | ND | ND | 515.3 | 1.69 | ND | ND | 561.4 ** | 1.23 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW02B | 6/11/2021 | 149.1 | LVWPS-U1-MW02B-EM08 | EM08 | Downgradient | 32.5 | ND | ND | ND | ND | 514.3 | 1.11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW04 | 9/30/2020 | 79.2 | LVWPS-A1-MW04-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW04 | 12/29/2020 | 79.2 | LVWPS-A1-MW04-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.2 ** | 25.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW04 | 1/13/2021 | 79.2 | LVWPS-A1-MW04-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 561.0 ** | 2.34 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW04 | 2/9/2021 | 79.2 | LVWPS-A1-MW04-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW04 | 3/9/2021 | 79.2 | LVWPS-A1-MW04-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 563.0 ** | 1.95 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW04 | 4/7/2021 | 79.2 | LVWPS-A1-MW04-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 1.14 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW04 | 5/11/2021 | 79.2 | LVWPS-A1-MW04-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW04 | 6/8/2021 | 79.2 | LVWPS-A1-MW04-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 11.7 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW05 | 9/30/2020 | 78.9 | LVWPS-A1-MW05-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW05 | 12/29/2020 | 78.9 | LVWPS-A1-MW05-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.3 ** | 39.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW05 | 1/15/2021 | 78.9 | LVWPS-A1-MW05-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.3 ** | 14.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW05 | 2/10/2021 | 78.9 | LVWPS-A1-MW05-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.1 ** | 36.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW05 | 3/10/2021 | 78.9 | LVWPS-A1-MW05-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.3 ** | 29.9 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW05 | 4/8/2021 | 78.9 | LVWPS-A1-MW05-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.2 ** | 25.5 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW05 | 5/10/2021 | 78.9 | LVWPS-A1-MW05-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 37.5 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW05 | 6/9/2021 | 78.9 | LVWPS-A1-MW05-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.4 ** | 34.6 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 9/30/2020 | 111.5 | LVWPS-U1-MW04A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW04A | 12/29/2020 | 111.5 | LVWPS-U1-MW04A-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 1/13/2021 | 111.5 | LVWPS-U1-MW04A-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 2/10/2021 | 111.5 | LVWPS-U1-MW04A-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 3/9/2021 | 111.5 | LVWPS-U1-MW04A-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 4/7/2021 | 111.5 | LVWPS-U1-MW04A-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 5/11/2021 | 111.5 | LVWPS-U1-MW04A-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04A | 6/8/2021 | 111.5 | LVWPS-U1-MW04A-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 10/1/2020 | 152.1 | LVWPS-U1-MW04B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW04B | 12/29/2020 | 152.1 | LVWPS-U1-MW04B-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 1/13/2021 | 152.1 | LVWPS-U1-MW04B-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 2/9/2021 | 152.1 | LVWPS-U1-MW04B-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 3/9/2021 | 152.1 | LVWPS-U1-MW04B-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 4/9/2021 | 152.1 | LVWPS-U1-MW04B-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 5/11/2021 | 152.1 | LVWPS-U1-MW04B-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW04B | 6/8/2021 | 152.1 | LVWPS-U1-MW04B-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 9/29/2020 | 107.8 | LVWPS-U1-MW05A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW05A | 12/29/2020 | 107.8 | LVWPS-U1-MW05A-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 1/18/2021 | 107.8 | LVWPS-U1-MW05A-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 2/10/2021 | 107.8 | LVWPS-U1-MW05A-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 3/10/2021 | 107.8 | LVWPS-U1-MW05A-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 4/8/2021 | 107.8 | LVWPS-U1-MW05A-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 5/10/2021 | 107.8 | LVWPS-U1-MW05A-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05A | 6/9/2021 | 107.8 | LVWPS-U1-MW05A-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 9/29/2020 | 149.1 | LVWPS-U1-MW05B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW05B | 12/29/2020 | 149.1 | LVWPS-U1-MW05B-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 1/13/2021 | 149.1 | LVWPS-U1-MW05B-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 2/10/2021 | 149.1 | LVWPS-U1-MW05B-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 3/9/2021 | 149.1 | LVWPS-U1-MW05B-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 4/7/2021 | 149.1 | LVWPS-U1-MW05B-EM06 | EM06 | Downgradient | 50 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U1-MW05B | 5/10/2021 | 149.1 | LVWPS-U1-MW05B-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW05B | 6/11/2021 | 149.1 | LVWPS-U1-MW05B-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW09 | 9/30/2020 | 95.5 | LVWPS-A1-MW09-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A1-MW09 | 1/13/2021 | 95.5 | LVWPS-A1-MW09-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.4 | 10.5 | ND | ND | 561.7 ** | 4.93 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW09 | 2/11/2021 | 95.5 | LVWPS-A1-MW09-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW09 | 3/11/2021 | 95.5 | LVWPS-A1-MW09-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 1.92 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW09 | 4/8/2021 | 95.5 | LVWPS-A1-MW09-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.1 ** | 2.42 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW09 | 5/10/2021 | 95.5 | LVWPS-A1-MW09-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 563.2 ** | 3.44 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW09 | 6/11/2021 | 95.5 | LVWPS-A1-MW09-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.3 ** | 4.67 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217A | 9/30/2020 | 61 | LVWPS-MW217A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW217A | 1/12/2021 | 61 | LVWPS-MW217A-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.2 | 6.87 | ND | ND | 562.9 ** | 42.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217A | 2/9/2021 | 61 | LVWPS-MW217A-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 562.5 ** | 33.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217A | 3/12/2021 | 61 | LVWPS-MW217A-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 562.1 ** | 20.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217A | 4/8/2021 | 61 | LVWPS-MW217A-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.3 ** | 15.7 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217A | 5/11/2021 | 61 | LVWPS-MW217A-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.8 ** | 33.8 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217A | 6/9/2021 | 61 | LVWPS-MW217A-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 562.8 ** | 21.3 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 9/30/2020 | 110.1 | LVWPS-MW217B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW217B | 1/13/2021 | 110.1 | LVWPS-MW217B-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 2/10/2021 | 110.1 | LVWPS-MW217B-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 3/10/2021 | 110.1 | LVWPS-MW217B-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 4/8/2021 | 110.1 | LVWPS-MW217B-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 5/11/2021 | 110.1 | LVWPS-MW217B-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217B | 6/9/2021 | 110.1 | LVWPS-MW217B-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217C | 10/5/2020 | 165.1 | LVWPS-MW217C-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW217C | 1/13/2021 | 165.1 | LVWPS-MW217C-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 560.3 ** | 1.90 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217C | 1/13/2021 | 165.1 | LVWPS-MW217C-EM02-FD | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 558.2 ** | 2.70 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217C | 2/10/2021 | 165.1 | LVWPS-MW217C-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 561.6 ** | 1.30 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217C | 2/10/2021 | 165.1 | LVWPS-MW217C-EM04-FD | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 558.8 ** | 1.68 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW217C | 3/10/2021 | 165.1 | LVWPS-MW217C-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 559.2 ** | 1.44 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217C | 4/9/2021 | 165.1 | LVWPS-MW217C-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217C | 5/11/2021 | 165.1 | LVWPS-MW217C-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 559.2 ** | 1.76 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW217C | 6/14/2021 | 165.1 | LVWPS-MW217C-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 9/30/2020 | 120 | LVWPS-U1-MW09A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW09A | 1/13/2021 | 120 | LVWPS-U1-MW09A-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 2/10/2021 | 120 | LVWPS-U1-MW09A-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 3/11/2021 | 120 | LVWPS-U1-MW09A-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 4/8/2021 | 120 | LVWPS-U1-MW09A-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 5/10/2021 | 120 | LVWPS-U1-MW09A-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09A | 6/10/2021 | 120 | LVWPS-U1-MW09A-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09B | 9/30/2020 | 142.4 | LVWPS-U1-MW09B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW09B | 1/13/2021 | 142.4 | LVWPS-U1-MW09B-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 566.9 | 11.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW09B | 2/10/2021 | 142.4 | LVWPS-U1-MW09B-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 566.6 | 6.50 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW09B | 3/11/2021 | 142.4 | LVWPS-U1-MW09B-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 565.5 | 2.02 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09B | 4/8/2021 | 142.4 | LVWPS-U1-MW09B-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09B | 5/10/2021 | 142.4 | LVWPS-U1-MW09B-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 563.6 ** | 1.17 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW09B | 6/10/2021 | 142.4 | LVWPS-U1-MW09B-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW10 | 10/1/2020 | 80.5 | LVWPS-A1-MW10-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW10 | 10/1/2020 | 80.5 | LVWPS-A1-MW10-BL04-FD | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A1-MW10 | 1/13/2021 | 80.5 | LVWPS-A1-MW10-EM02 | EM02 | Downgradient | 150 | ND | ND | ND | ND | 515.3 | 7.16 | ND | ND | 562.1 ** | 34.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW10 | 2/8/2021 | 80.5 | LVWPS-A1-MW10-EM04 | EM04 | Downgradient | 150 | ND | ND | ND | ND | ND | ND | ND | ND | 560.8 ** | 4.60 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW10 | 3/9/2021 | 80.5 | LVWPS-A1-MW10-EM05 | EM05 | Downgradient | 150 | ND | ND | ND | ND | ND | ND | ND | ND | 564.6 | 1.30 | ND | ND | ND | ND | ND | ND |
| LVWPS-A1-MW10 | 4/7/2021 | 80.5 | LVWPS-A1-MW10-EM06 | EM06 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | 561.5 ** | 10.1 | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW10 | 5/11/2021 | 80.5 | LVWPS-A1-MW10-EM07 | EM07 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A1-MW10 | 6/8/2021 | 80.5 | LVWPS-A1-MW10-EM08 | EM08 | Downgradient | 150 | ND | ND | ND | ND | 514.2 * | 0.647 | ND | ND | 562.3 ** | 14.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW10A | 10/2/2020 | 111.6 | LVWPS-U1-MW10A-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW10A | 1/13/2021 | 111.6 | LVWPS-U1-MW10A-EM02 | EM02 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10A | 2/9/2021 | 111.6 | LVWPS-U1-MW10A-EM04 | EM04 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10A | 3/9/2021 | 111.6 | LVWPS-U1-MW10A-EM05 | EM05 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10A | 4/7/2021 | 111.6 | LVWPS-U1-MW10A-EM06 | EM06 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10A | 5/11/2021 | 111.6 | LVWPS-U1-MW10A-EM07 | EM07 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10A | 6/9/2021 | 111.6 | LVWPS-U1-MW10A-EM08 | EM08 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10B | 10/2/2020 | 142.5 | LVWPS-U1-MW10B-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW10B | 1/12/2021 | 142.5 | LVWPS-U1-MW10B-EM02 | EM02 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U1-MW10B | 2/9/2021 | 142.5 | LVWPS-U1-MW10B-EM04 | EM04 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10B | 3/9/2021 | 142.5 | LVWPS-U1-MW10B-EM05 | EM05 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10B | 4/7/2021 | 142.5 | LVWPS-U1-MW10B-EM06 | EM06 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10B | 5/11/2021 | 142.5 | LVWPS-U1-MW10B-EM07 | EM07 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW10B | 6/8/2021 | 142.5 | LVWPS-U1-MW10B-EM08 | EM08 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW204 | 9/28/2020 | 60 | LVWPS-MW204-BL04 | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW204 | 9/28/2020 | 60 | LVWPS-MW204-BL04-FD | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW204B | 9/28/2020 | 111.2 | LVWPS-MW204B-BL04 | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW03B | 9/29/2020 | 144.2 | LVWPS-U1-MW03B-BL04 | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U1-MW03B | 12/29/2020 | 144.2 | LVWPS-U1-MW03B-INJ | INJ | Cross Gradient | N/A | ND | ND | ND | ND | ND | ND | ND | ND | 560.1 ** | 4.66 | ND | ND | ND | ND | ND | ND |
| LVWPS-U1-MW03B | 1/14/2021 | 144.2 | LVWPS-U1-MW03B-EM02 | EM02 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW03B | 2/11/2021 | 144.2 | LVWPS-U1-MW03B-EM04 | EM04 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW03B | 3/11/2021 | 144.2 | LVWPS-U1-MW03B-EM05 | EM05 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | 563.0 ** | 1.01 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW03B | 4/9/2021 | 144.2 | LVWPS-U1-MW03B-EM06 | EM06 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | 562.1 ** | 1.5 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW03B | 5/11/2021 | 144.2 | LVWPS-U1-MW03B-EM07 | EM07 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 1.32 | --- | --- | ND | ND | --- | --- |
| LVWPS-U1-MW03B | 6/10/2021 | 144.2 | LVWPS-U1-MW03B-EM08 | EM08 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| **Zone 2** | | | | | | | | | | | | | | | | | | | | | | |
| LVWPS-MW224A | 10/7/2020 | 65 | LVWPS-MW224A-BL04 | BL04 | Far Upgradient | -225 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW224A | 12/23/2020 | 65 | LVWPS-MW224A-EM01 | EM01 | Far Upgradient | -225 | ND | ND | ND | ND | ND | ND | ND | ND | 562.0 ** | 3.35 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW224A | 1/18/2021 | 65 | LVWPS-MW224A-EM02 | EM02 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 1/29/2021 | 65 | LVWPS-MW224A-EM03 | EM03 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 2/12/2021 | 65 | LVWPS-MW224A-EM04 | EM04 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 3/11/2021 | 65 | LVWPS-MW224A-EM05 | EM05 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 4/13/2021 | 65 | LVWPS-MW224A-EM06 | EM06 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 5/12/2021 | 65 | LVWPS-MW224A-EM07 | EM07 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW224A | 6/15/2021 | 65 | LVWPS-MW224A-EM08 | EM08 | Far Upgradient | -225 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 10/8/2020 | 49.8 | LVWPS-A2-MW01A-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW01A | 12/12/2020 | 49.8 | LVWPS-A2-MW01A-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 12/23/2020 | 49.8 | LVWPS-A2-MW01A-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 1/13/2021 | 49.8 | LVWPS-A2-MW01A-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 1/25/2021 | 49.8 | LVWPS-A2-MW01A-EM03 | EM03 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 2/10/2021 | 49.8 | LVWPS-A2-MW01A-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 3/10/2021 | 49.8 | LVWPS-A2-MW01A-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 4/7/2021 | 49.8 | LVWPS-A2-MW01A-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 5/6/2021 | 49.8 | LVWPS-A2-MW01A-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01A | 6/9/2021 | 49.8 | LVWPS-A2-MW01A-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 10/8/2020 | 79.7 | LVWPS-A2-MW01B-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW01B | 12/15/2020 | 79.7 | LVWPS-A2-MW01B-INJ | INJ | Upgradient | -50 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 573.6 | 0.135 | --- | --- | ND | ND |
| LVWPS-A2-MW01B | 12/23/2020 | 79.7 | LVWPS-A2-MW01B-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 1/13/2021 | 79.7 | LVWPS-A2-MW01B-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 1/25/2021 | 79.7 | LVWPS-A2-MW01B-EM03 | EM03 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 2/10/2021 | 79.7 | LVWPS-A2-MW01B-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 3/10/2021 | 79.7 | LVWPS-A2-MW01B-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 4/7/2021 | 79.7 | LVWPS-A2-MW01B-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 5/6/2021 | 79.7 | LVWPS-A2-MW01B-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW01B | 6/9/2021 | 79.7 | LVWPS-A2-MW01B-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 10/8/2020 | 49.8 | LVWPS-A2-MW02A-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW02A | 10/8/2020 | 49.8 | LVWPS-A2-MW02A-BL04-FD | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW02A | 12/12/2020 | 49.8 | LVWPS-A2-MW02A-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 12/23/2020 | 49.8 | LVWPS-A2-MW02A-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 1/12/2021 | 49.8 | LVWPS-A2-MW02A-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 1/25/2021 | 49.8 | LVWPS-A2-MW02A-EM03 | EM03 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 2/9/2021 | 49.8 | LVWPS-A2-MW02A-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 3/9/2021 | 49.8 | LVWPS-A2-MW02A-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 4/7/2021 | 49.8 | LVWPS-A2-MW02A-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 5/5/2021 | 49.8 | LVWPS-A2-MW02A-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02A | 6/11/2021 | 49.8 | LVWPS-A2-MW02A-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 10/8/2020 | 79.9 | LVWPS-A2-MW02B-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW02B | 12/12/2020 | 79.9 | LVWPS-A2-MW02B-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 12/23/2020 | 79.9 | LVWPS-A2-MW02B-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW02B | 1/13/2021 | 79.9 | LVWPS-A2-MW02B-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 1/25/2021 | 79.9 | LVWPS-A2-MW02B-EM03 | EM03 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 2/10/2021 | 79.9 | LVWPS-A2-MW02B-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 3/10/2021 | 79.9 | LVWPS-A2-MW02B-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 4/9/2021 | 79.9 | LVWPS-A2-MW02B-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 5/5/2021 | 79.9 | LVWPS-A2-MW02B-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW02B | 6/8/2021 | 79.9 | LVWPS-A2-MW02B-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 10/9/2020 | 47.9 | LVWPS-A2-MW03A-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW03A | 10/9/2020 | 47.9 | LVWPS-A2-MW03A-BL04-FD | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW03A | 12/12/2020 | 47.9 | LVWPS-A2-MW03A-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 2.46 | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 12/23/2020 | 47.9 | LVWPS-A2-MW03A-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 1/14/2021 | 47.9 | LVWPS-A2-MW03A-EM02 | EM02 | Upgradient | -50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.6 ** | 1.59 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW03A | 1/25/2021 | 47.9 | LVWPS-A2-MW03A-EM03 | EM03 | Upgradient | -50 | ND | ND | ND | ND | ND | ND | ND | ND | 561.1 ** | 1.10 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW03A | 2/10/2021 | 47.9 | LVWPS-A2-MW03A-EM04 | EM04 | Upgradient | -50 | ND | ND | ND | ND | ND | ND | ND | ND | 563.3 ** | 1.68 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW03A | 3/10/2021 | 47.9 | LVWPS-A2-MW03A-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 4/5/2021 | 47.9 | LVWPS-A2-MW03A-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 5/5/2021 | 47.9 | LVWPS-A2-MW03A-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03A | 6/9/2021 | 47.9 | LVWPS-A2-MW03A-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 10/9/2020 | 73.8 | LVWPS-A2-MW03B-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW03B | 12/12/2020 | 73.8 | LVWPS-A2-MW03B-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 12/23/2020 | 73.8 | LVWPS-A2-MW03B-EM01 | EM01 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 1/14/2021 | 73.8 | LVWPS-A2-MW03B-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 1/26/2021 | 73.8 | LVWPS-A2-MW03B-EM03 | EM03 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 2/10/2021 | 73.8 | LVWPS-A2-MW03B-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 3/10/2021 | 73.8 | LVWPS-A2-MW03B-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 4/6/2021 | 73.8 | LVWPS-A2-MW03B-EM06 | EM06 | Upgradient | -50 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A2-MW03B | 5/5/2021 | 73.8 | LVWPS-A2-MW03B-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW03B | 6/9/2021 | 73.8 | LVWPS-A2-MW03B-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 10/8/2020 | 106.9 | LVWPS-U2-MW01-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW01 | 1/4/2021 | 106.9 | LVWPS-U2-MW01-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 1/14/2021 | 106.9 | LVWPS-U2-MW01-EM02 | EM02 | Upgradient | -50 | ND | ND | ND | ND | 514.9 | 1.13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW01 | 2/10/2021 | 106.9 | LVWPS-U2-MW01-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 3/10/2021 | 106.9 | LVWPS-U2-MW01-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 4/7/2021 | 106.9 | LVWPS-U2-MW01-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 5/12/2021 | 106.9 | LVWPS-U2-MW01-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW01 | 6/9/2021 | 106.9 | LVWPS-U2-MW01-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 10/8/2020 | 112.4 | LVWPS-U2-MW02-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW02 | 1/4/2021 | 112.4 | LVWPS-U2-MW02-INJ | INJ | Upgradient | -50 | ND | ND | ND | ND | 513.7 ** | 0.685 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW02 | 1/12/2021 | 112.4 | LVWPS-U2-MW02-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 2/9/2021 | 112.4 | LVWPS-U2-MW02-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 3/9/2021 | 112.4 | LVWPS-U2-MW02-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 4/5/2021 | 112.4 | LVWPS-U2-MW02-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 5/12/2021 | 112.4 | LVWPS-U2-MW02-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW02 | 6/8/2021 | 112.4 | LVWPS-U2-MW02-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 10/9/2020 | 99.8 | LVWPS-U2-MW03-BL04 | BL04 | Upgradient | -50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW03 | 1/4/2021 | 99.8 | LVWPS-U2-MW03-INJ | INJ | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 1/14/2021 | 99.8 | LVWPS-U2-MW03-EM02 | EM02 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 2/10/2021 | 99.8 | LVWPS-U2-MW03-EM04 | EM04 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 3/10/2021 | 99.8 | LVWPS-U2-MW03-EM05 | EM05 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 4/6/2021 | 99.8 | LVWPS-U2-MW03-EM06 | EM06 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 5/12/2021 | 99.8 | LVWPS-U2-MW03-EM07 | EM07 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW03 | 6/9/2021 | 99.8 | LVWPS-U2-MW03-EM08 | EM08 | Upgradient | -50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-DR01A | 9/28/2020 | 53.7 | LVWPS-A2-DR01A-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-DR01A | 12/7/2020 | 53.7 | LVWPS-A2-DR01A-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.8 | 28.4 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 12/8/2020 | 53.7 | LVWPS-A2-DR01A-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 565.8 | 286 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 12/9/2020 | 53.7 | LVWPS-A2-DR01A-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 569.0 | 5,920 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 12/12/2020 | 53.7 | LVWPS-A2-DR01A-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.5 | 104 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 12/20/2020 | 53.7 | LVWPS-A2-DR01A-20201220 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 574.1 | 11.6 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 12/21/2020 | 53.7 | LVWPS-A2-DR01A-20201221 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 574.1 | 9.77 | --- | --- | ND | ND |
| LVWPS-A2-DR01A | 1/12/2021 | 53.7 | LVWPS-A2-DR01A-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 574 | 567.0 ** | 44.1 | ND | ND | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-DR01A | 2/12/2021 | 53.7 | LVWPS-A2-DR01A-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 84.7 | 567.0 | 23.6 | ND | ND | ND | ND |
| LVWPS-A2-DR01A | 3/15/2021 | 53.7 | LVWPS-A2-DR01A-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 41.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-DR01A | 4/12/2021 | 53.7 | LVWPS-A2-DR01A-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 36.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-DR01A | 5/12/2021 | 53.7 | LVWPS-A2-DR01A-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 515.4 | 1.93 | ND | ND | 568.4 | 270 | 573.6 | 2.78 | ND | ND | ND | ND |
| LVWPS-A2-DR01A | 6/9/2021 | 53.7 | LVWPS-A2-DR01A-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 48.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 9/28/2020 | 94.5 | LVWPS-A2-DR01B-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-DR01B | 12/7/2020 | 94.5 | LVWPS-A2-DR01B-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.8 | 32.5 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/8/2020 | 94.5 | LVWPS-A2-DR01B-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.2 | 22.2 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/9/2020 | 94.5 | LVWPS-A2-DR01B-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.2 | 503 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/11/2020 | 94.5 | LVWPS-A2-DR01B-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.2 ** | 379 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/20/2020 | 94.5 | LVWPS-A2-DR01B-20201220-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 568.0 ** | 115 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/20/2020 | 94.5 | LVWPS-A2-DR01B-20201220-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.1 ** | 168 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/20/2020 | 94.5 | LVWPS-A2-DR01B-20201220-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.0 ** | 223 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/20/2020 | 94.5 | LVWPS-A2-DR01B-20201220-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.0 ** | 272 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/21/2020 | 94.5 | LVWPS-A2-DR01B-20201221-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.2 ** | 146 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/21/2020 | 94.5 | LVWPS-A2-DR01B-20201221-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.0 ** | 381 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/21/2020 | 94.5 | LVWPS-A2-DR01B-20201221-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.2 ** | 107 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 12/21/2020 | 94.5 | LVWPS-A2-DR01B-20201221-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.6 ** | 126 | --- | --- | ND | ND |
| LVWPS-A2-DR01B | 1/12/2021 | 94.5 | LVWPS-A2-DR01B-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 568.7 | 2,170 | 567.7 ** | 95.5 | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 2/12/2021 | 94.5 | LVWPS-A2-DR01B-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.3 | 18.6 | 568.2 ** | 111 | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 3/15/2021 | 94.5 | LVWPS-A2-DR01B-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 569.1 | 1,240 | 568.0 ** | 59.7 | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 4/12/2021 | 94.5 | LVWPS-A2-DR01B-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 569.1 | 609 | 575.0 | 44.5 | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 5/12/2021 | 94.5 | LVWPS-A2-DR01B-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 568.7 | 137 | 567.2 | 88.7 | ND | ND | ND | ND |
| LVWPS-A2-DR01B | 6/9/2021 | 94.5 | LVWPS-A2-DR01B-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 568.1 | 30.3 | 567.9 ** | 16.3 | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 9/28/2020 | 43.9 | LVWPS-A2-DR02A-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-DR02A | 12/7/2020 | 43.9 | LVWPS-A2-DR02A-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.1 | 326 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/8/2020 | 43.9 | LVWPS-A2-DR02A-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.2 | 13.5 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/9/2020 | 43.9 | LVWPS-A2-DR02A-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.0 | 189 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/9/2020 | 43.9 | LVWPS-A2-DR02A-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.0 | 216 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/12/2020 | 43.9 | LVWPS-A2-DR02A-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 567.1 | 72.7 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/20/2020 | 43.9 | LVWPS-A2-DR02A-20201220 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 573.1 | 0.323 | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 12/21/2020 | 43.9 | LVWPS-A2-DR02A-20201221 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A2-DR02A | 1/12/2021 | 43.9 | LVWPS-A2-DR02A-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 29.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 2/12/2021 | 43.9 | LVWPS-A2-DR02A-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 566.6 | 7.09 | 574.2 | 1.95 | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 3/15/2021 | 43.9 | LVWPS-A2-DR02A-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 566.9 | 8.79 | 573.2 | 4.70 | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 4/12/2021 | 43.9 | LVWPS-A2-DR02A-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 566.7 | 13.1 | 573.7 | 4.39 | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 5/12/2021 | 43.9 | LVWPS-A2-DR02A-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 515.7 | 12.6 | 507.9 | 0.960 | 567.0 | 66.7 | 571.8 ** | 12.4 | ND | ND | ND | ND |
| LVWPS-A2-DR02A | 6/9/2021 | 43.9 | LVWPS-A2-DR02A-EM08 | EM08 | Downgradient | 7 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-DR02B | 9/28/2020 | 67.7 | LVWPS-A2-DR02B-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-DR02B | 12/7/2020 | 67.7 | LVWPS-A2-DR02B-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 506.0 | 0.022 | --- | --- | 573.4 | 0.244 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/8/2020 | 67.7 | LVWPS-A2-DR02B-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.2 | 115 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/9/2020 | 67.7 | LVWPS-A2-DR02B-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.9 | 98.0 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/12/2020 | 67.7 | LVWPS-A2-DR02B-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 566.6 | 250 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/20/2020 | 67.7 | LVWPS-A2-DR02B-20201220-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.1 ** | 28.1 | --- | --- | 566.7 ** | 275 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/20/2020 | 67.7 | LVWPS-A2-DR02B-20201220-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.5 ** | 15.1 | --- | --- | 567.0 ** | 246 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/20/2020 | 67.7 | LVWPS-A2-DR02B-20201220-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.6 ** | 35.6 | --- | --- | 566.1 ** | 71.9 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/20/2020 | 67.7 | LVWPS-A2-DR02B-20201220-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.3 ** | 28.8 | --- | --- | 566.9 ** | 258 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/21/2020 | 67.7 | LVWPS-A2-DR02B-20201221-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 516.1 ** | 37.2 | --- | --- | 566.2 ** | 134 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/21/2020 | 67.7 | LVWPS-A2-DR02B-20201221-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.9 ** | 58.9 | --- | --- | 566.5 ** | 204 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/21/2020 | 67.7 | LVWPS-A2-DR02B-20201221-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.5 ** | 46.5 | --- | --- | 565.4 ** | 25.7 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 12/21/2020 | 67.7 | LVWPS-A2-DR02B-20201221-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.5 ** | 45.7 | --- | --- | 566.5 ** | 48.0 | --- | --- | ND | ND |
| LVWPS-A2-DR02B | 1/12/2021 | 67.7 | LVWPS-A2-DR02B-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 516.3 | 24.4 | 515.4 ** | 11.6 | 567.4 | 57.4 | 565.9 ** | 24.5 | ND | ND | ND | ND |
| LVWPS-A2-DR02B | 2/12/2021 | 67.7 | LVWPS-A2-DR02B-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 516.8 | 33.5 | 514.6 ** | 15.6 | 566.2 | 168 | 566.9 ** | 59.0 | ND | ND | ND | ND |
| LVWPS-A2-DR02B | 3/15/2021 | 67.7 | LVWPS-A2-DR02B-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | 516.1 | 40.8 | 517.4 ** | 13.8 | 567.1 | 87.4 | 567.0 ** | 17.0 | ND | ND | ND | ND |
| LVWPS-A2-DR02B | 4/12/2021 | 67.7 | LVWPS-A2-DR02B-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | 515.8 | 14.2 | 507.3 | 1.83 | 567.2 | 51.2 | 573.8 | 6.61 | ND | ND | ND | ND |
| LVWPS-A2-DR02B | 5/12/2021 | 67.7 | LVWPS-A2-DR02B-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 2.90 | 573.6 | 1.49 | ND | ND | ND | ND |
| LVWPS-A2-DR02B | 6/9/2021 | 67.7 | LVWPS-A2-DR02B-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | 515.9 | 12.6 | ND | ND | 566.5 | 25.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR01 | 9/28/2020 | 131.1 | LVWPS-U2-DR01-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-DR01 | 12/7/2020 | 131.1 | LVWPS-U2-DR01-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/8/2020 | 131.1 | LVWPS-U2-DR01-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U2-DR01 | 12/9/2020 | 131.1 | LVWPS-U2-DR01-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/20/2020 | 131.1 | LVWPS-U2-DR01-20201220-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 506.2 | 0.016 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/20/2020 | 131.1 | LVWPS-U2-DR01-20201220-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/20/2020 | 131.1 | LVWPS-U2-DR01-20201220-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/20/2020 | 131.1 | LVWPS-U2-DR01-20201220-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/21/2020 | 131.1 | LVWPS-U2-DR01-20201221-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/21/2020 | 131.1 | LVWPS-U2-DR01-20201221-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/21/2020 | 131.1 | LVWPS-U2-DR01-20201221-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/21/2020 | 131.1 | LVWPS-U2-DR01-20201221-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 12/31/2020 | 131.1 | LVWPS-U2-DR01-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR01 | 1/12/2021 | 131.1 | LVWPS-U2-DR01-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 514.8 | 0.938 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR01 | 2/12/2021 | 131.1 | LVWPS-U2-DR01-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 515.6 | 0.863 | ND | ND | 566.9 | 1.57 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR01 | 3/15/2021 | 131.1 | LVWPS-U2-DR01-EM05 | EM05 | Downgradient | 7 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-DR01 | 4/12/2021 | 131.1 | LVWPS-U2-DR01-EM06 | EM06 | Downgradient | 7 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-DR01 | 5/12/2021 | 131.1 | LVWPS-U2-DR01-EM07 | EM07 | Downgradient | 7 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-DR01 | 6/9/2021 | 131.1 | LVWPS-U2-DR01-EM08 | EM08 | Downgradient | 7 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-DR02 | 9/28/2020 | 96.1 | LVWPS-U2-DR02-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-DR02 | 12/7/2020 | 96.1 | LVWPS-U2-DR02-20201207 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/8/2020 | 96.1 | LVWPS-U2-DR02-20201208 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/9/2020 | 96.1 | LVWPS-U2-DR02-20201209 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | 575.7 | 0.206 | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/20/2020 | 96.1 | LVWPS-U2-DR02-20201220-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.4 ** | 160 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/20/2020 | 96.1 | LVWPS-U2-DR02-20201220-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 151 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/20/2020 | 96.1 | LVWPS-U2-DR02-20201220-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 87.8 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/20/2020 | 96.1 | LVWPS-U2-DR02-20201220-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 97.3 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/21/2020 | 96.1 | LVWPS-U2-DR02-20201221-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 185 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/21/2020 | 96.1 | LVWPS-U2-DR02-20201221-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.4 ** | 67.3 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/21/2020 | 96.1 | LVWPS-U2-DR02-20201221-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.8 ** | 202 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/21/2020 | 96.1 | LVWPS-U2-DR02-20201221-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.4 ** | 652 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/21/2020 | 96.1 | LVWPS-U2-DR02-20201221-4-FD | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.8 ** | 464 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 12/31/2020 | 96.1 | LVWPS-U2-DR02-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 516.2 ** | 38.3 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U2-DR02 | 1/12/2021 | 96.1 | LVWPS-U2-DR02-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 516.1 | 1,610 | 515.6 ** | 97.1 | 567.2 | 8.72 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR02 | 2/12/2021 | 96.1 | LVWPS-U2-DR02-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 516.7 | 256 | 514.9 ** | 58.8 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR02 | 3/15/2021 | 96.1 | LVWPS-U2-DR02-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | 516.3 | 157 | 515.8 ** | 47.2 | 567.6 | 6.04 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR02 | 4/12/2021 | 96.1 | LVWPS-U2-DR02-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | 516.3 | 88.6 | 514.8 ** | 126 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR02 | 5/12/2021 | 96.1 | LVWPS-U2-DR02-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 516.0 | 77.6 | 515.4 ** | 77.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-DR02 | 6/9/2021 | 96.1 | LVWPS-U2-DR02-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | 516.2 | 138 | 515.3 ** | 134 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW04 | 10/6/2020 | 115.3 | LVWPS-U2-MW04-BL04 | BL04 | Cross Gradient | 12 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW04 | 12/31/2020 | 115.3 | LVWPS-U2-MW04-INJ | INJ | Cross Gradient | 12 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW04 | 1/11/2021 | 115.3 | LVWPS-U2-MW04-EM02 | EM02 | Cross Gradient | 12 | ND | ND | ND | ND | 513.8 ** | 0.471 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW04 | 2/8/2021 | 115.3 | LVWPS-U2-MW04-EM04 | EM04 | Cross Gradient | 12 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW04 | 3/8/2021 | 115.3 | LVWPS-U2-MW04-EM05 | EM05 | Cross Gradient | 12 | ND | ND | ND | ND | 514.7 | 0.770 | 507.2 | 0.055 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW04 | 4/5/2021 | 115.3 | LVWPS-U2-MW04-EM06 | EM06 | Cross Gradient | 12 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW04 | 5/12/2021 | 115.3 | LVWPS-U2-MW04-EM07 | EM07 | Cross Gradient | 12 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW04 | 6/7/2021 | 115.3 | LVWPS-U2-MW04-EM08 | EM08 | Cross Gradient | 12 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW05 | 10/5/2020 | 95.4 | LVWPS-U2-MW05-BL04 | BL04 | Cross Gradient | 12 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW05 | 12/31/2020 | 95.4 | LVWPS-U2-MW05-INJ | INJ | Cross Gradient | 12 | ND | ND | ND | ND | 516.2 | 843 | 516.4 ** | 13.1 | 567.0 ** | 4.38 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 1/13/2021 | 95.4 | LVWPS-U2-MW05-EM02 | EM02 | Cross Gradient | 12 | ND | ND | ND | ND | 515.9 | 67.7 | 516.1 ** | 113 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 2/10/2021 | 95.4 | LVWPS-U2-MW05-EM04 | EM04 | Cross Gradient | 12 | ND | ND | ND | ND | 516.7 | 38.0 | 507.5 | 5.53 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 3/10/2021 | 95.4 | LVWPS-U2-MW05-EM05 | EM05 | Cross Gradient | 12 | ND | ND | ND | ND | 518.9 | 29.3 | 507.4 | 5.03 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 4/7/2021 | 95.4 | LVWPS-U2-MW05-EM06 | EM06 | Cross Gradient | 12 | ND | ND | ND | ND | 516.1 | 22.1 | 507.3 | 9.02 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 5/12/2021 | 95.4 | LVWPS-U2-MW05-EM07 | EM07 | Cross Gradient | 12 | ND | ND | ND | ND | 516.8 | 26.5 | 507.4 | 4.64 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW05 | 6/15/2021 | 95.4 | LVWPS-U2-MW05-EM08 | EM08 | Cross Gradient | 12 | ND | ND | ND | ND | 515.8 | 4.25 | 515.1 ** | 7.84 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04A | 10/2/2020 | 53.7 | LVWPS-A2-MW04A-BL04 | BL04 | Cross Gradient | 17 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW04A | 12/14/2020 | 53.7 | LVWPS-A2-MW04A-INJ | INJ | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 12/14/2020 | 53.7 | LVWPS-A2-MW04A-INJ-FD | INJ | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 12/22/2020 | 53.7 | LVWPS-A2-MW04A-EM01 | EM01 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 12/22/2020 | 53.7 | LVWPS-A2-MW04A-EM01-FD | EM01 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 1/12/2021 | 53.7 | LVWPS-A2-MW04A-EM02 | EM02 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 1/12/2021 | 53.7 | LVWPS-A2-MW04A-EM02-FD | EM02 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 1/26/2021 | 53.7 | LVWPS-A2-MW04A-EM03 | EM03 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW04A | 1/26/2021 | 53.7 | LVWPS-A2-MW04A-EM03-FD | EM03 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 2/9/2021 | 53.7 | LVWPS-A2-MW04A-EM04 | EM04 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 2/9/2021 | 53.7 | LVWPS-A2-MW04A-EM04-FD | EM04 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 3/9/2021 | 53.7 | LVWPS-A2-MW04A-EM05 | EM05 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 4/6/2021 | 53.7 | LVWPS-A2-MW04A-EM06 | EM06 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 5/3/2021 | 53.7 | LVWPS-A2-MW04A-EM07 | EM07 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04A | 6/8/2021 | 53.7 | LVWPS-A2-MW04A-EM08 | EM08 | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04B | 10/2/2020 | 84.9 | LVWPS-A2-MW04B-BL04 | BL04 | Cross Gradient | 17 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW04B | 12/14/2020 | 84.9 | LVWPS-A2-MW04B-INJ | INJ | Cross Gradient | 17 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW04B | 12/22/2020 | 84.9 | LVWPS-A2-MW04B-EM01 | EM01 | Cross Gradient | 17 | 539.6 | 4.39 | ND | ND | 515.6 | 1.00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 1/12/2021 | 84.9 | LVWPS-A2-MW04B-EM02 | EM02 | Cross Gradient | 17 | ND | ND | ND | ND | 515.2 | 100 | 507.1 | 0.442 | 567.4 | 1.94 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 1/26/2021 | 84.9 | LVWPS-A2-MW04B-EM03 | EM03 | Cross Gradient | 17 | ND | ND | ND | ND | 514.7 | 5.70 | ND | ND | 566.0 | 1.10 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 2/9/2021 | 84.9 | LVWPS-A2-MW04B-EM04 | EM04 | Cross Gradient | 17 | ND | ND | ND | ND | 515.2 | 16.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 3/9/2021 | 84.9 | LVWPS-A2-MW04B-EM05 | EM05 | Cross Gradient | 17 | ND | ND | ND | ND | 515.2 | 23.5 | 506.2 | 0.152 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 4/6/2021 | 84.9 | LVWPS-A2-MW04B-EM06 | EM06 | Cross Gradient | 17 | ND | ND | ND | ND | 515.4 | 5.48 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 5/3/2021 | 84.9 | LVWPS-A2-MW04B-EM07 | EM07 | Cross Gradient | 17 | ND | ND | ND | ND | 514.9 | 4.68 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW04B | 6/8/2021 | 84.9 | LVWPS-A2-MW04B-EM08 | EM08 | Cross Gradient | 17 | ND | ND | ND | ND | 515.3 | 2.74 | ND | ND | 566.7 | 2.11 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 10/5/2020 | 43.9 | LVWPS-A2-MW05A-BL04 | BL04 | Cross Gradient | 17 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW05A | 12/12/2020 | 43.9 | LVWPS-A2-MW05A-INJ | INJ | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 566.8 | 16,000 | 567.3 | 157 | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 12/22/2020 | 43.9 | LVWPS-A2-MW05A-EM01 | EM01 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.4 | 5,110 | 574.9 | 43.2 | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 1/13/2021 | 43.9 | LVWPS-A2-MW05A-EM02 | EM02 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 569.7 | 1,510 | 566.3 ** | 19.2 | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 1/26/2021 | 43.9 | LVWPS-A2-MW05A-EM03 | EM03 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 570.1 | 79.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 2/9/2021 | 43.9 | LVWPS-A2-MW05A-EM04 | EM04 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.8 | 5.54 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 3/10/2021 | 43.9 | LVWPS-A2-MW05A-EM05 | EM05 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.3 | 10.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 4/7/2021 | 43.9 | LVWPS-A2-MW05A-EM06 | EM06 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 567.8 | 2.63 | 571.2 ** | 1.24 | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 5/4/2021 | 43.9 | LVWPS-A2-MW05A-EM07 | EM07 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 569.7 | 20.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW05A | 6/9/2021 | 43.9 | LVWPS-A2-MW05A-EM08 | EM08 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 566.2 ** | 1.24 | 574.7 | 1.40 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 10/5/2020 | 66 | LVWPS-A2-MW05B-BL04 | BL04 | Cross Gradient | 17 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW05B | 12/12/2020 | 66 | LVWPS-A2-MW05B-INJ | INJ | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 566.6 | 3,900 | 566.7 | 271 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 12/12/2020 | 66 | LVWPS-A2-MW05B-INJ-FD | INJ | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 566.4 | 3,430 | 566.7 | 271 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 12/22/2020 | 66 | LVWPS-A2-MW05B-EM01 | EM01 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 567.0 | 13,800 | 566.6 ** | 98.3 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 12/22/2020 | 66 | LVWPS-A2-MW05B-EM01-FD | EM01 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 566.9 | 17,200 | 566.8 ** | 59.9 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 1/13/2021 | 66 | LVWPS-A2-MW05B-EM02 | EM02 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.6 | 2,250 | 567.1 ** | 51.0 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 1/13/2021 | 66 | LVWPS-A2-MW05B-EM02-FD | EM02 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.6 | 1,750 | 567.3 ** | 46.8 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 1/26/2021 | 66 | LVWPS-A2-MW05B-EM03 | EM03 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 569.1 | 1,750 | 567.1 ** | 26.5 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 1/26/2021 | 66 | LVWPS-A2-MW05B-EM03-FD | EM03 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 569.3 | 2,430 | 566.7 ** | 19.2 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 2/9/2021 | 66 | LVWPS-A2-MW05B-EM04 | EM04 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 1,680 | 574.3 | 21.4 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 2/9/2021 | 66 | LVWPS-A2-MW05B-EM04-FD | EM04 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 3,510 | 574.3 | 22.7 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 3/10/2021 | 66 | LVWPS-A2-MW05B-EM05 | EM05 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 4,820 | 574.3 | 18.9 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 4/7/2021 | 66 | LVWPS-A2-MW05B-EM06 | EM06 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.3 | 1830 | 574.1 | 11.9 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 5/4/2021 | 66 | LVWPS-A2-MW05B-EM07 | EM07 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 569.3 | 740 | 574.2 | 3.01 | ND | ND | ND | ND |
| LVWPS-A2-MW05B | 6/9/2021 | 66 | LVWPS-A2-MW05B-EM08 | EM08 | Cross Gradient | 17 | ND | ND | ND | ND | ND | ND | ND | ND | 568.2 | 168 | 564.9 ** | 6.14 | ND | ND | ND | ND |
| LVWPS-U2-MW06 | 10/1/2020 | 131.1 | LVWPS-U2-MW06-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW06 | 12/31/2020 | 131.1 | LVWPS-U2-MW06-INJ | INJ | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 1/11/2021 | 131.1 | LVWPS-U2-MW06-EM02 | EM02 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 2/8/2021 | 131.1 | LVWPS-U2-MW06-EM04 | EM04 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 3/9/2021 | 131.1 | LVWPS-U2-MW06-EM05 | EM05 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 4/6/2021 | 131.1 | LVWPS-U2-MW06-EM06 | EM06 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 5/12/2021 | 131.1 | LVWPS-U2-MW06-EM07 | EM07 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW06 | 6/7/2021 | 131.1 | LVWPS-U2-MW06-EM08 | EM08 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 10/5/2020 | 100.6 | LVWPS-U2-MW18-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW18 | 12/31/2020 | 100.6 | LVWPS-U2-MW18-INJ | INJ | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 1/11/2021 | 100.6 | LVWPS-U2-MW18-EM02 | EM02 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 2/8/2021 | 100.6 | LVWPS-U2-MW18-EM04 | EM04 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 3/9/2021 | 100.6 | LVWPS-U2-MW18-EM05 | EM05 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 4/5/2021 | 100.6 | LVWPS-U2-MW18-EM06 | EM06 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 5/12/2021 | 100.6 | LVWPS-U2-MW18-EM07 | EM07 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW18 | 6/8/2021 | 100.6 | LVWPS-U2-MW18-EM08 | EM08 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW08A | 9/30/2020 | 47.6 | LVWPS-A2-MW08A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW08A | 12/14/2020 | 47.6 | LVWPS-A2-MW08A-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW08A | 12/23/2020 | 47.6 | LVWPS-A2-MW08A-EM01 | EM01 | Downgradient | 50 | 539.4 | 3.49 | ND | ND | ND | ND | ND | ND | 565.0 | 5.00 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 1/15/2021 | 47.6 | LVWPS-A2-MW08A-EM02 | EM02 | Downgradient | 50 | 539.4 | 3.17 | ND | ND | ND | ND | ND | ND | 567.2 | 126 | 573.5 | 4.44 | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 1/26/2021 | 47.6 | LVWPS-A2-MW08A-EM03 | EM03 | Downgradient | 50 | 539.9 | 1.07 | ND | ND | ND | ND | ND | ND | 567.2 | 6.06 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 2/10/2021 | 47.6 | LVWPS-A2-MW08A-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.6 | 3.40 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 3/10/2021 | 47.6 | LVWPS-A2-MW08A-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 46.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 4/6/2021 | 47.6 | LVWPS-A2-MW08A-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.4 | 42 | 572.8 | 0.891 | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 5/3/2021 | 47.6 | LVWPS-A2-MW08A-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 139 | 574.8 | 1.27 | ND | ND | ND | ND |
| LVWPS-A2-MW08A | 6/8/2021 | 47.6 | LVWPS-A2-MW08A-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.0 | 49.6 | 573.8 | 1.44 | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 10/1/2020 | 69.3 | LVWPS-A2-MW08B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW08B | 12/14/2020 | 69.3 | LVWPS-A2-MW08B-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.9 | 31.6 | 574.2 | 0.305 | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 12/23/2020 | 69.3 | LVWPS-A2-MW08B-EM01 | EM01 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 56.7 | 576.7 | 0.089 | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 1/15/2021 | 69.3 | LVWPS-A2-MW08B-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.9 | 27.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 1/26/2021 | 69.3 | LVWPS-A2-MW08B-EM03 | EM03 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW08B | 2/10/2021 | 69.3 | LVWPS-A2-MW08B-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW08B | 3/10/2021 | 69.3 | LVWPS-A2-MW08B-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 562.6 ** | 0.758 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 4/9/2021 | 69.3 | LVWPS-A2-MW08B-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW08B | 5/3/2021 | 69.3 | LVWPS-A2-MW08B-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 568.3 | 19.1 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08B | 6/8/2021 | 69.3 | LVWPS-A2-MW08B-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.4 | 11.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 10/1/2020 | 95.9 | LVWPS-A2-MW08C-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW08C | 12/14/2020 | 95.9 | LVWPS-A2-MW08C-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 648 | 574.4 | 0.640 | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 12/23/2020 | 95.9 | LVWPS-A2-MW08C-EM01 | EM01 | Downgradient | 50 | ND | ND | ND | ND | 516.1 | 377 | 515.2 ** | 4.82 | 568.3 | 287 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 1/15/2021 | 95.9 | LVWPS-A2-MW08C-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | 515.4 | 108 | 507.7 | 1.56 | 567.5 | 50.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 1/28/2021 | 95.9 | LVWPS-A2-MW08C-EM03 | EM03 | Downgradient | 50 | ND | ND | ND | ND | 515.1 | 86.0 | 518.8 ** | 1.92 | 567.7 | 18.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 2/10/2021 | 95.9 | LVWPS-A2-MW08C-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | 515.3 | 98.9 | 507.6 | 0.577 | 567.5 | 52.8 | 574.8 | 1.54 | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 3/10/2021 | 95.9 | LVWPS-A2-MW08C-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | 515.1 | 56.7 | 506.2 | 0.427 | 567.7 | 70.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 4/9/2021 | 95.9 | LVWPS-A2-MW08C-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | 515.5 | 27.1 | 506.9 | 0.098 | 567.1 | 33.1 | 574 | 0.351 | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 5/4/2021 | 95.9 | LVWPS-A2-MW08C-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | 514.7 | 18.6 | 511.7 ** | 0.155 | 568.3 | 32.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW08C | 6/8/2021 | 95.9 | LVWPS-A2-MW08C-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | 515.7 | 16.6 | 507.3 | 0.059 | 566.9 | 23.6 | 574.2 | 0.150 | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 10/9/2020 | 44.5 | LVWPS-A2-MW09A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW09A | 12/12/2020 | 44.5 | LVWPS-A2-MW09A-INJ | INJ | Downgradient | 50 | 539.4 | 15.2 | ND | ND | ND | ND | ND | ND | 566.6 | 109 | 573.8 | 0.643 | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 12/22/2020 | 44.5 | LVWPS-A2-MW09A-EM01 | EM01 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 695 | 573.8 | 13.2 | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 1/11/2021 | 44.5 | LVWPS-A2-MW09A-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 262 | 572.7 | 8.11 | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 1/26/2021 | 44.5 | LVWPS-A2-MW09A-EM03 | EM03 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 568.3 | 63.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 2/8/2021 | 44.5 | LVWPS-A2-MW09A-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 80.4 | 574.2 | 0.062 | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 3/8/2021 | 44.5 | LVWPS-A2-MW09A-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 276 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 4/5/2021 | 44.5 | LVWPS-A2-MW09A-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.8 | 62 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 5/4/2021 | 44.5 | LVWPS-A2-MW09A-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 19.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09A | 6/7/2021 | 44.5 | LVWPS-A2-MW09A-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 565.9 | 14.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 10/9/2020 | 68.5 | LVWPS-A2-MW09B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW09B | 12/12/2020 | 68.5 | LVWPS-A2-MW09B-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 563.6 ** | 10.6 | 575.9 | 0.243 | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 12/22/2020 | 68.5 | LVWPS-A2-MW09B-EM01 | EM01 | Downgradient | 50 | 538.9 ** | 6.99 | ND | ND | ND | ND | ND | ND | 564.8 | 6.62 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 1/14/2021 | 68.5 | LVWPS-A2-MW09B-EM02 | EM02 | Downgradient | 50 | 538.4 ** | 2.60 | ND | ND | ND | ND | ND | ND | 567.6 | 72.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 1/27/2021 | 68.5 | LVWPS-A2-MW09B-EM03 | EM03 | Downgradient | 50 | 538.0 ** | 1.14 | ND | ND | ND | ND | ND | ND | 568.1 | 99.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 2/8/2021 | 68.5 | LVWPS-A2-MW09B-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 80.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 3/8/2021 | 68.5 | LVWPS-A2-MW09B-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.0 | 185 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 4/5/2021 | 68.5 | LVWPS-A2-MW09B-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 135 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 5/4/2021 | 68.5 | LVWPS-A2-MW09B-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 121 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW09B | 6/7/2021 | 68.5 | LVWPS-A2-MW09B-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 11.8 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 10/6/2020 | 42.9 | LVWPS-A2-MW14A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW14A | 10/6/2020 | 42.9 | LVWPS-A2-MW14A-BL04-FD | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW14A | 12/12/2020 | 42.9 | LVWPS-A2-MW14A-INJ | INJ | Downgradient | 50 | 538.7 ** | 14.4 | ND | ND | ND | ND | ND | ND | 564.0 ** | 13.9 | 574.4 | 1.26 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 12/12/2020 | 42.9 | LVWPS-A2-MW14A-INJ-FD | INJ | Downgradient | 50 | 538.7 ** | 16.0 | ND | ND | ND | ND | ND | ND | 566.6 | 11.8 | 574.2 | 1.85 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 12/22/2020 | 42.9 | LVWPS-A2-MW14A-EM01 | EM01 | Downgradient | 50 | 539.4 | 15.2 | ND | ND | ND | ND | ND | ND | 566.6 | 38.6 | 573.6 | 1.44 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 12/22/2020 | 42.9 | LVWPS-A2-MW14A-EM01-FD | EM01 | Downgradient | 50 | 539.4 | 16.6 | ND | ND | ND | ND | ND | ND | 566.4 | 50.8 | 572.6 | 3.35 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 1/13/2021 | 42.9 | LVWPS-A2-MW14A-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 450 | 573.6 | 5.00 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 1/13/2021 | 42.9 | LVWPS-A2-MW14A-EM02-FD | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 396 | 573.6 | 6.19 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 1/28/2021 | 42.9 | LVWPS-A2-MW14A-EM03 | EM03 | Downgradient | 50 | ND | ND | ND | ND | 514.4 | 1.62 | ND | ND | 568.3 | 294 | 566.2 ** | 19.2 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 1/28/2021 | 42.9 | LVWPS-A2-MW14A-EM03-FD | EM03 | Downgradient | 50 | ND | ND | ND | ND | 514.8 | 1.43 | ND | ND | 567.8 | 293 | 563.5 ** | 23.1 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 2/9/2021 | 42.9 | LVWPS-A2-MW14A-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | 515.2 | 1.45 | ND | ND | 566.6 | 3,460 | 573.5 | 7.27 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 2/9/2021 | 42.9 | LVWPS-A2-MW14A-EM04-FD | EM04 | Downgradient | 50 | ND | ND | ND | ND | 515.2 | 1.19 | ND | ND | 566.3 | 2,890 | 573.8 | 6.24 | ND | ND | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW14A | 3/9/2021 | 42.9 | LVWPS-A2-MW14A-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 1,510 | 573.8 | 3.36 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 4/6/2021 | 42.9 | LVWPS-A2-MW14A-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.4 | 1810 | 573.2 | 2.19 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 5/3/2021 | 42.9 | LVWPS-A2-MW14A-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 667 | 573.2 | 1.35 | ND | ND | ND | ND |
| LVWPS-A2-MW14A | 6/8/2021 | 42.9 | LVWPS-A2-MW14A-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 98.5 | 573.6 | 2.00 | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 10/6/2020 | 64.5 | LVWPS-A2-MW14B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW14B | 12/12/2020 | 64.5 | LVWPS-A2-MW14B-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 564.0 ** | 5.37 | 573.4 | 0.222 | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 12/22/2020 | 64.5 | LVWPS-A2-MW14B-EM01 | EM01 | Downgradient | 50 | 540.1 | 1.61 | ND | ND | ND | ND | ND | ND | 567.8 | 29.6 | 574.6 | 1.34 | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 1/13/2021 | 64.5 | LVWPS-A2-MW14B-EM02 | EM02 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 104 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 1/25/2021 | 64.5 | LVWPS-A2-MW14B-EM03 | EM03 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 38.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 2/9/2021 | 64.5 | LVWPS-A2-MW14B-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 48.2 | 574.9 | 0.908 | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 3/10/2021 | 64.5 | LVWPS-A2-MW14B-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 216 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 4/6/2021 | 64.5 | LVWPS-A2-MW14B-EM06 | EM06 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 100 | 572.8 | 0.181 | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 5/3/2021 | 64.5 | LVWPS-A2-MW14B-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 20.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW14B | 6/8/2021 | 64.5 | LVWPS-A2-MW14B-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.6 | 13.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW08 | 10/1/2020 | 122.7 | LVWPS-U2-MW08-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW08 | 12/31/2020 | 122.7 | LVWPS-U2-MW08-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 1/11/2021 | 122.7 | LVWPS-U2-MW08-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 2/8/2021 | 122.7 | LVWPS-U2-MW08-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 3/8/2021 | 122.7 | LVWPS-U2-MW08-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 4/5/2021 | 122.7 | LVWPS-U2-MW08-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 5/12/2021 | 122.7 | LVWPS-U2-MW08-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW08 | 6/7/2021 | 122.7 | LVWPS-U2-MW08-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 10/9/2020 | 94.6 | LVWPS-U2-MW09-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW09 | 12/31/2020 | 94.6 | LVWPS-U2-MW09-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 1/18/2021 | 94.6 | LVWPS-U2-MW09-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 2/8/2021 | 94.6 | LVWPS-U2-MW09-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 3/8/2021 | 94.6 | LVWPS-U2-MW09-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 4/5/2021 | 94.6 | LVWPS-U2-MW09-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 5/12/2021 | 94.6 | LVWPS-U2-MW09-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW09 | 6/7/2021 | 94.6 | LVWPS-U2-MW09-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 10/6/2020 | 95.1 | LVWPS-U2-MW14-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW14 | 12/31/2020 | 95.1 | LVWPS-U2-MW14-INJ | INJ | Downgradient | 50 | ND | ND | ND | ND | 514.9 | 1.90 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW14 | 1/13/2021 | 95.1 | LVWPS-U2-MW14-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 2/9/2021 | 95.1 | LVWPS-U2-MW14-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 3/10/2021 | 95.1 | LVWPS-U2-MW14-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 4/6/2021 | 95.1 | LVWPS-U2-MW14-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 5/12/2021 | 95.1 | LVWPS-U2-MW14-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW14 | 6/9/2021 | 95.1 | LVWPS-U2-MW14-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 10/2/2020 | 50.2 | LVWPS-A2-MW11A-BL04 | BL04 | Cross/Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW11A | 12/14/2020 | 50.2 | LVWPS-A2-MW11A-INJ | INJ | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 12/23/2020 | 50.2 | LVWPS-A2-MW11A-EM01 | EM01 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 1/13/2021 | 50.2 | LVWPS-A2-MW11A-EM02 | EM02 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 1/27/2021 | 50.2 | LVWPS-A2-MW11A-EM03 | EM03 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 2/9/2021 | 50.2 | LVWPS-A2-MW11A-EM04 | EM04 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 3/9/2021 | 50.2 | LVWPS-A2-MW11A-EM05 | EM05 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 4/6/2021 | 50.2 | LVWPS-A2-MW11A-EM06 | EM06 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 5/4/2021 | 50.2 | LVWPS-A2-MW11A-EM07 | EM07 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11A | 6/8/2021 | 50.2 | LVWPS-A2-MW11A-EM08 | EM08 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 10/2/2020 | 75 | LVWPS-A2-MW11B-BL04 | BL04 | Cross/Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW11B | 12/14/2020 | 75 | LVWPS-A2-MW11B-INJ | INJ | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 12/23/2020 | 75 | LVWPS-A2-MW11B-EM01 | EM01 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 1/13/2021 | 75 | LVWPS-A2-MW11B-EM02 | EM02 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 1/27/2021 | 75 | LVWPS-A2-MW11B-EM03 | EM03 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 2/8/2021 | 75 | LVWPS-A2-MW11B-EM04 | EM04 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 3/9/2021 | 75 | LVWPS-A2-MW11B-EM05 | EM05 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 4/6/2021 | 75 | LVWPS-A2-MW11B-EM06 | EM06 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11B | 5/3/2021 | 75 | LVWPS-A2-MW11B-EM07 | EM07 | Cross/Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 560.6 ** | 4.12 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW11B | 6/8/2021 | 75 | LVWPS-A2-MW11B-EM08 | EM08 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 10/2/2020 | 99.9 | LVWPS-A2-MW11C-BL04 | BL04 | Cross/Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW11C | 12/14/2020 | 99.9 | LVWPS-A2-MW11C-INJ | INJ | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW11C | 12/23/2020 | 99.9 | LVWPS-A2-MW11C-EM01 | EM01 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 1/14/2021 | 99.9 | LVWPS-A2-MW11C-EM02 | EM02 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 1/27/2021 | 99.9 | LVWPS-A2-MW11C-EM03 | EM03 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 2/9/2021 | 99.9 | LVWPS-A2-MW11C-EM04 | EM04 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 3/10/2021 | 99.9 | LVWPS-A2-MW11C-EM05 | EM05 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW11C | 4/6/2021 | 99.9 | LVWPS-A2-MW11C-EM06 | EM06 | Cross/Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 561.2 ** | 5.88 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW11C | 5/4/2021 | 99.9 | LVWPS-A2-MW11C-EM07 | EM07 | Cross/Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 560.3 ** | 3.59 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW11C | 6/8/2021 | 99.9 | LVWPS-A2-MW11C-EM08 | EM08 | Cross/Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 559.6 ** | 1.88 | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW12A | 10/6/2020 | 39.5 | LVWPS-A2-MW12A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW12A | 12/12/2020 | 39.5 | LVWPS-A2-MW12A-INJ | INJ | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW12A | 12/22/2020 | 39.5 | LVWPS-A2-MW12A-EM01 | EM01 | Downgradient | 100 | 539.4 | 2.84 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW12A | 1/11/2021 | 39.5 | LVWPS-A2-MW12A-EM02 | EM02 | Downgradient | 100 | 538.5 ** | 7.36 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW12A | 1/27/2021 | 39.5 | LVWPS-A2-MW12A-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | 515.0 | 1.31 | ND | ND | 567.3 | 13.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW12A | 2/8/2021 | 39.5 | LVWPS-A2-MW12A-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 514.9 | 1.73 | ND | ND | 567.7 | 145 | 572.8 | 15.1 | ND | ND | ND | ND |
| LVWPS-A2-MW12A | 3/8/2021 | 39.5 | LVWPS-A2-MW12A-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 514.8 | 2.24 | ND | ND | 567.6 | 340 | 573.6 | 15.9 | ND | ND | ND | ND |
| LVWPS-A2-MW12A | 4/5/2021 | 39.5 | LVWPS-A2-MW12A-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 515 | 1.3 | ND | ND | 567.4 | 302 | 573.7 | 16.1 | ND | ND | ND | ND |
| LVWPS-A2-MW12A | 5/5/2021 | 39.5 | LVWPS-A2-MW12A-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 514.7 | 2.24 | ND | ND | 567.6 | 644 | 573.8 | 7.51 | ND | ND | ND | ND |
| LVWPS-A2-MW12A | 6/7/2021 | 39.5 | LVWPS-A2-MW12A-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 515.0 | 1.96 | ND | ND | 567.5 | 1,120 | 573.6 | 6.43 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 10/7/2020 | 59 | LVWPS-A2-MW12B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW12B | 12/12/2020 | 59 | LVWPS-A2-MW12B-INJ | INJ | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW12B | 12/22/2020 | 59 | LVWPS-A2-MW12B-EM01 | EM01 | Downgradient | 100 | 539.8 | 5.04 | ND | ND | ND | ND | ND | ND | 567.6 | 205 | 566.9 ** | 8.14 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 1/12/2021 | 59 | LVWPS-A2-MW12B-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.5 | 789 | 572.8 | 6.01 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 1/27/2021 | 59 | LVWPS-A2-MW12B-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | 514.5 | 1.04 | ND | ND | 567.5 | 23.1 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 2/8/2021 | 59 | LVWPS-A2-MW12B-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 78.4 | 573.3 | 1.39 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 3/8/2021 | 59 | LVWPS-A2-MW12B-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 514.9 | 1.48 | ND | ND | 567.9 | 34.4 | 573.8 | 2.30 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 4/5/2021 | 59 | LVWPS-A2-MW12B-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567 | 16.4 | 573.9 | 1.02 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 5/5/2021 | 59 | LVWPS-A2-MW12B-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 400 | 571.5 ** | 1.37 | ND | ND | ND | ND |
| LVWPS-A2-MW12B | 6/7/2021 | 59 | LVWPS-A2-MW12B-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.3 | 23.9 | 573.8 | 1.41 | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 10/1/2020 | 50.8 | LVWPS-A2-MW13A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW13A | 12/12/2020 | 50.8 | LVWPS-A2-MW13A-INJ | INJ | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW13A | 12/22/2020 | 50.8 | LVWPS-A2-MW13A-EM01 | EM01 | Downgradient | 100 | 538.9 ** | 16.9 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW13A | 1/11/2021 | 50.8 | LVWPS-A2-MW13A-EM02 | EM02 | Downgradient | 100 | 539.5 | 2.98 | ND | ND | ND | ND | ND | ND | 567.2 | 20.8 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 1/27/2021 | 50.8 | LVWPS-A2-MW13A-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568.1 | 438 | 572.2 | 5.47 | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 2/10/2021 | 50.8 | LVWPS-A2-MW13A-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 762 | 574.2 | 0.986 | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 3/11/2021 | 50.8 | LVWPS-A2-MW13A-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 1,640 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 4/7/2021 | 50.8 | LVWPS-A2-MW13A-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568 | 843 | 574.2 | 0.697 | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 5/4/2021 | 50.8 | LVWPS-A2-MW13A-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 561 | 573.5 | 0.852 | ND | ND | ND | ND |
| LVWPS-A2-MW13A | 6/9/2021 | 50.8 | LVWPS-A2-MW13A-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 135 | 572.8 | 0.534 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 10/1/2020 | 76.1 | LVWPS-A2-MW13B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW13B | 12/12/2020 | 76.1 | LVWPS-A2-MW13B-INJ | INJ | Downgradient | 100 | 538.9 ** | 12.1 | ND | ND | ND | ND | ND | ND | 565.7 | 31.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 12/22/2020 | 76.1 | LVWPS-A2-MW13B-EM01 | EM01 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 906 | 572.8 | 14.9 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 1/12/2021 | 76.1 | LVWPS-A2-MW13B-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.0 | 11.2 | ND | ND | 568.0 | 549 | 573.5 | 8.29 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 1/27/2021 | 76.1 | LVWPS-A2-MW13B-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | 515.1 | 8.78 | ND | ND | 567.6 | 456 | 562.2 ** | 24.9 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 2/10/2021 | 76.1 | LVWPS-A2-MW13B-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.3 | 3.45 | ND | ND | 567.1 | 190 | 574.2 | 7.01 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 3/11/2021 | 76.1 | LVWPS-A2-MW13B-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 515.1 | 8.94 | ND | ND | 567.9 | 488 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 4/7/2021 | 76.1 | LVWPS-A2-MW13B-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 515.2 | 4.93 | ND | ND | 567.6 | 172 | 573.2 | 2.11 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 5/4/2021 | 76.1 | LVWPS-A2-MW13B-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 514.4 | 1.71 | ND | ND | 567.5 | 92.3 | 572.7 | 1.21 | ND | ND | ND | ND |
| LVWPS-A2-MW13B | 6/10/2021 | 76.1 | LVWPS-A2-MW13B-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 512.4 ** | 0.654 | ND | ND | 567.3 | 46.7 | 573.3 | 0.509 | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 10/1/2020 | 50.1 | LVWPS-A2-MW17A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW17A | 12/14/2020 | 50.1 | LVWPS-A2-MW17A-INJ | INJ | Downgradient | 100 | 539.0 ** | 10.4 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW17A | 12/22/2020 | 50.1 | LVWPS-A2-MW17A-EM01 | EM01 | Downgradient | 100 | 539.4 | 2.77 | ND | ND | ND | ND | ND | ND | 564.0 ** | 2.94 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 1/11/2021 | 50.1 | LVWPS-A2-MW17A-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 119 | 572.2 | 2.96 | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 1/26/2021 | 50.1 | LVWPS-A2-MW17A-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 135 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 2/8/2021 | 50.1 | LVWPS-A2-MW17A-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 289 | 574.2 | 2.15 | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 3/8/2021 | 50.1 | LVWPS-A2-MW17A-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 604 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 4/5/2021 | 50.1 | LVWPS-A2-MW17A-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568 | 495 | 572.6 | 0.698 | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 5/3/2021 | 50.1 | LVWPS-A2-MW17A-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.1 | 156 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17A | 6/7/2021 | 50.1 | LVWPS-A2-MW17A-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 566.3 | 41.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 10/1/2020 | 75.2 | LVWPS-A2-MW17B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW17B | 12/14/2020 | 75.2 | LVWPS-A2-MW17B-INJ | INJ | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW17B | 12/22/2020 | 75.2 | LVWPS-A2-MW17B-EM01 | EM01 | Downgradient | 100 | 540.0 | 1.40 | ND | ND | ND | ND | ND | ND | 567.2 | 15.1 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 1/11/2021 | 75.2 | LVWPS-A2-MW17B-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 568.0 | 110 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 1/26/2021 | 75.2 | LVWPS-A2-MW17B-EM03 | EM03 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 33.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 2/8/2021 | 75.2 | LVWPS-A2-MW17B-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.0 | 51.1 | 572.2 | 2.91 | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 3/8/2021 | 75.2 | LVWPS-A2-MW17B-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.4 | 47.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 4/5/2021 | 75.2 | LVWPS-A2-MW17B-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.7 | 37.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 5/3/2021 | 75.2 | LVWPS-A2-MW17B-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.3 | 24.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17B | 6/7/2021 | 75.2 | LVWPS-A2-MW17B-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 566.2 | 10.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 10/1/2020 | 100 | LVWPS-A2-MW17C-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW17C | 12/14/2020 | 100 | LVWPS-A2-MW17C-INJ | INJ | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW17C | 12/22/2020 | 100 | LVWPS-A2-MW17C-EM01 | EM01 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 567.9 | 300 | 573.6 | 23.2 | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 1/11/2021 | 100 | LVWPS-A2-MW17C-EM02 | EM02 | Downgradient | 100 | 538.8 ** | 5.42 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW17C | 1/26/2021 | 100 | LVWPS-A2-MW17C-EM03 | EM03 | Downgradient | 100 | 537.0 ** | 0.676 | ND | ND | 515.2 | 0.799 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 2/8/2021 | 100 | LVWPS-A2-MW17C-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.4 | 0.482 | 508.2 | 0.588 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 3/8/2021 | 100 | LVWPS-A2-MW17C-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 515.1 | 5.34 | ND | ND | 567.5 | 27.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 4/5/2021 | 100 | LVWPS-A2-MW17C-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 515.5 | 39.8 | 506 | 0.05 | 567.5 | 224 | 573.4 | 1.13 | ND | ND | ND | ND |
| LVWPS-A2-MW17C | 5/3/2021 | 100 | LVWPS-A2-MW17C-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | 515.0 | 4.81 | --- | --- | 567.7 | 39.7 | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW17C | 6/8/2021 | 100 | LVWPS-A2-MW17C-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 515.1 | 4.12 | 506.9 | 0.059 | 567.3 | 31.2 | 573.8 | 0.550 | ND | ND | ND | ND |
| LVWPS-U2-MW12 | 10/7/2020 | 95.4 | LVWPS-U2-MW12-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW12 | 1/12/2021 | 95.4 | LVWPS-U2-MW12-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW12 | 2/8/2021 | 95.4 | LVWPS-U2-MW12-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW12 | 3/8/2021 | 95.4 | LVWPS-U2-MW12-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW12 | 4/7/2021 | 95.4 | LVWPS-U2-MW12-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U2-MW12 | 5/12/2021 | 95.4 | LVWPS-U2-MW12-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 518.1 | 2.84 | ND | ND | 565.8 | 38.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW12 | 6/7/2021 | 95.4 | LVWPS-U2-MW12-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 516.0 | 5.84 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 10/1/2020 | 126.5 | LVWPS-U2-MW17-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U2-MW17 | 1/12/2021 | 126.5 | LVWPS-U2-MW17-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.2 | 2.50 | 506.5 | 0.106 | 567.2 | 50.0 | 575.7 | 1.16 | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 1/12/2021 | 126.5 | LVWPS-U2-MW17-EM02-FD | EM02 | Downgradient | 100 | ND | ND | ND | ND | 514.8 | 3.90 | 508.7 | 0.136 | 567.6 | 67.2 | 572.0 | 1.44 | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 2/8/2021 | 126.5 | LVWPS-U2-MW17-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.1 | 3.17 | ND | ND | 567.3 | 16.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 2/8/2021 | 126.5 | LVWPS-U2-MW17-EM04-FD | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.2 | 3.94 | ND | ND | 567.5 | 19.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 3/9/2021 | 126.5 | LVWPS-U2-MW17-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 514.9 | 2.79 | 506.5 | 0.030 | 567.2 | 15.2 | 572.2 | 0.110 | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 4/6/2021 | 126.5 | LVWPS-U2-MW17-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 514.9 | 3.96 | ND | ND | 567.3 | 14.2 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 5/12/2021 | 126.5 | LVWPS-U2-MW17-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 514.4 | 1.68 | ND | ND | 568.2 | 6.94 | ND | ND | ND | ND | ND | ND |
| LVWPS-U2-MW17 | 6/9/2021 | 126.5 | LVWPS-U2-MW17-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 514.4 | 0.791 | ND | ND | 566.9 | 3.99 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW15A | 10/7/2020 | 49.5 | LVWPS-A2-MW15A-BL04 | BL04 | Cross/Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW15A | 12/14/2020 | 49.5 | LVWPS-A2-MW15A-INJ | INJ | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 12/21/2020 | 49.5 | LVWPS-A2-MW15A-EM01 | EM01 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 1/11/2021 | 49.5 | LVWPS-A2-MW15A-EM02 | EM02 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 1/25/2021 | 49.5 | LVWPS-A2-MW15A-EM03 | EM03 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 2/9/2021 | 49.5 | LVWPS-A2-MW15A-EM04 | EM04 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 3/9/2021 | 49.5 | LVWPS-A2-MW15A-EM05 | EM05 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 4/6/2021 | 49.5 | LVWPS-A2-MW15A-EM06 | EM06 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 5/4/2021 | 49.5 | LVWPS-A2-MW15A-EM07 | EM07 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15A | 6/11/2021 | 49.5 | LVWPS-A2-MW15A-EM08 | EM08 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 10/8/2020 | 79.9 | LVWPS-A2-MW15B-BL04 | BL04 | Cross/Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW15B | 12/14/2020 | 79.9 | LVWPS-A2-MW15B-INJ | INJ | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 12/22/2020 | 79.9 | LVWPS-A2-MW15B-EM01 | EM01 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 1/12/2021 | 79.9 | LVWPS-A2-MW15B-EM02 | EM02 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 1/26/2021 | 79.9 | LVWPS-A2-MW15B-EM03 | EM03 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 2/9/2021 | 79.9 | LVWPS-A2-MW15B-EM04 | EM04 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 3/9/2021 | 79.9 | LVWPS-A2-MW15B-EM05 | EM05 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 4/6/2021 | 79.9 | LVWPS-A2-MW15B-EM06 | EM06 | Cross/Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW15B | 5/5/2021 | 79.9 | LVWPS-A2-MW15B-EM07 | EM07 | Cross/Downgradient | 200 | ND | ND | ND | ND | ND | ND | ND | ND | 560.1 ** | 11.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW15B | 6/11/2021 | 79.9 | LVWPS-A2-MW15B-EM08 | EM08 | Cross/Downgradient | 200 | ND | ND | ND | ND | ND | ND | ND | ND | 561.5 ** | 14.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223A | 10/6/2020 | 55.1 | LVWPS-MW223A-BL04 | BL04 | Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW223A | 10/6/2020 | 55.1 | LVWPS-MW223A-BL04-FD | BL04 | Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW223A | 12/14/2020 | 55.1 | LVWPS-MW223A-INJ | INJ | Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW223A | 12/22/2020 | 55.1 | LVWPS-MW223A-EM01 | EM01 | Downgradient | 200 | 539.4 | 6.82 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW223A | 1/11/2021 | 55.1 | LVWPS-MW223A-EM02 | EM02 | Downgradient | 200 | 538.5 ** | 22.1 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW223A | 1/26/2021 | 55.1 | LVWPS-MW223A-EM03 | EM03 | Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-MW223A | 2/8/2021 | 55.1 | LVWPS-MW223A-EM04 | EM04 | Downgradient | 200 | ND | ND | ND | ND | 513.5 ** | 0.717 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223A | 3/8/2021 | 55.1 | LVWPS-MW223A-EM05 | EM05 | Downgradient | 200 | ND | ND | ND | ND | 515.1 | 6.58 | ND | ND | 567.8 | 261 | 573.1 | 0.282 | ND | ND | ND | ND |
| LVWPS-MW223A | 4/5/2021 | 55.1 | LVWPS-MW223A-EM06 | EM06 | Downgradient | 200 | ND | ND | ND | ND | 515.3 | 2.24 | ND | ND | 567.5 | 417 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223A | 5/5/2021 | 55.1 | LVWPS-MW223A-EM07 | EM07 | Downgradient | 200 | ND | ND | ND | ND | 514.1 | 0.692 | ND | ND | 566.7 | 3.36 | 574.6 | 0.589 | ND | ND | ND | ND |
| LVWPS-MW223A | 6/7/2021 | 55.1 | LVWPS-MW223A-EM08 | EM08 | Downgradient | 200 | ND | ND | ND | ND | 515.3 | 1.44 | ND | ND | 566.9 | 357 | 576.2 | 1.05 | ND | ND | ND | ND |
| LVWPS-MW223B | 10/6/2020 | 80.1 | LVWPS-MW223B-BL04 | BL04 | Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW223B | 12/14/2020 | 80.1 | LVWPS-MW223B-INJ | INJ | Downgradient | 200 | 539.7 | 3.39 | ND | ND | ND | ND | ND | ND | 566.1 | 17.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 12/22/2020 | 80.1 | LVWPS-MW223B-EM01 | EM01 | Downgradient | 200 | 540.2 | 2.29 | ND | ND | ND | ND | ND | ND | 567.6 | 28.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 1/11/2021 | 80.1 | LVWPS-MW223B-EM02 | EM02 | Downgradient | 200 | ND | ND | ND | ND | ND | ND | ND | ND | 567.6 | 23.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 1/28/2021 | 80.1 | LVWPS-MW223B-EM03 | EM03 | Downgradient | 200 | 539.4 | 0.538 | ND | ND | 515.2 | 0.604 | ND | ND | 568.6 | 4.11 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 2/8/2021 | 80.1 | LVWPS-MW223B-EM04 | EM04 | Downgradient | 200 | ND | ND | ND | ND | 515.2 | 5.89 | 508.2 | 0.617 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 3/8/2021 | 80.1 | LVWPS-MW223B-EM05 | EM05 | Downgradient | 200 | ND | ND | ND | ND | 515.4 | 41.9 | ND | ND | 567.2 | 15.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 4/5/2021 | 80.1 | LVWPS-MW223B-EM06 | EM06 | Downgradient | 200 | ND | ND | ND | ND | 514.9 | 2.63 | ND | ND | 564.9 | 1.74 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 5/5/2021 | 80.1 | LVWPS-MW223B-EM07 | EM07 | Downgradient | 200 | ND | ND | ND | ND | 515.5 | 30.9 | 507.9 | 0.170 | 566.2 | 8.60 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223B | 6/7/2021 | 80.1 | LVWPS-MW223B-EM08 | EM08 | Downgradient | 200 | ND | ND | ND | ND | 515.6 | 15.5 | 506.7 | 0.066 | 565.9 | 4.59 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223C | 10/7/2020 | 102.6 | LVWPS-MW223C-BL04 | BL04 | Downgradient | 200 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW223C | 1/11/2021 | 102.6 | LVWPS-MW223C-EM02 | EM02 | Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW223C | 2/8/2021 | 102.6 | LVWPS-MW223C-EM04 | EM04 | Downgradient | 200 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW223C | 3/8/2021 | 102.6 | LVWPS-MW223C-EM05 | EM05 | Downgradient | 200 | ND | ND | ND | ND | 515.1 | 0.987 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223C | 4/6/2021 | 102.6 | LVWPS-MW223C-EM06 | EM06 | Downgradient | 200 | ND | ND | ND | ND | 515.4 | 0.586 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223C | 5/12/2021 | 102.6 | LVWPS-MW223C-EM07 | EM07 | Downgradient | 200 | ND | ND | ND | ND | 519.4 ** | 1.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW223C | 6/8/2021 | 102.6 | LVWPS-MW223C-EM08 | EM08 | Downgradient | 200 | ND | ND | ND | ND | 515.0 | 1.22 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208A | 10/9/2020 | 49.6 | LVWPS-MW208A-BL04 | BL04 | Downgradient | 250 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW208A | 12/12/2020 | 49.6 | LVWPS-MW208A-INJ | INJ | Downgradient | 250 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 12/23/2020 | 49.6 | LVWPS-MW208A-EM01 | EM01 | Downgradient | 250 | 539.5 | 0.792 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 1/13/2021 | 49.6 | LVWPS-MW208A-EM02 | EM02 | Downgradient | 250 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 1/27/2021 | 49.6 | LVWPS-MW208A-EM03 | EM03 | Downgradient | 250 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 2/10/2021 | 49.6 | LVWPS-MW208A-EM04 | EM04 | Downgradient | 250 | ND | ND | ND | ND | ND | ND | ND | ND | 564.7 | 2.16 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208A | 3/10/2021 | 49.6 | LVWPS-MW208A-EM05 | EM05 | Downgradient | 250 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 4/6/2021 | 49.6 | LVWPS-MW208A-EM06 | EM06 | Downgradient | 250 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208A | 5/4/2021 | 49.6 | LVWPS-MW208A-EM07 | EM07 | Downgradient | 250 | ND | ND | ND | ND | ND | ND | ND | ND | 564.6 | 1.86 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208A | 6/7/2021 | 49.6 | LVWPS-MW208A-EM08 | EM08 | Downgradient | 250 | ND | ND | ND | ND | ND | ND | ND | ND | 565.2 | 3.90 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208B | 10/9/2020 | 75 | LVWPS-MW208B-BL04 | BL04 | Downgradient | 250 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW208B | 12/12/2020 | 75 | LVWPS-MW208B-INJ | INJ | Downgradient | 250 | 538.5 ** | 0.641 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW208B | 12/23/2020 | 75 | LVWPS-MW208B-EM01 | EM01 | Downgradient | 250 | 539.7 | 10.7 | ND | ND | ND | ND | ND | ND | 567.6 | 139 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208B | 1/13/2021 | 75 | LVWPS-MW208B-EM02 | EM02 | Downgradient | 250 | ND | ND | ND | ND | 515.8 | 1.65 | ND | ND | 568.0 | 31.3 | 572.2 | 3.26 | ND | ND | ND | ND |
| LVWPS-MW208B | 1/27/2021 | 75 | LVWPS-MW208B-EM03 | EM03 | Downgradient | 250 | ND | ND | ND | ND | 514.4 | 1.26 | ND | ND | 568.6 | 16.8 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW208B | 2/11/2021 | 75 | LVWPS-MW208B-EM04 | EM04 | Downgradient | 250 | ND | ND | ND | ND | 515.5 | 23.6 | 506.8 | 0.017 | 567.4 | 594 | 573.7 | 0.891 | ND | ND | ND | ND |
| LVWPS-MW208B | 3/10/2021 | 75 | LVWPS-MW208B-EM05 | EM05 | Downgradient | 250 | ND | ND | ND | ND | 514.7 | 2.06 | ND | ND | 567.9 | 73.9 | 573.8 | 3.03 | ND | ND | ND | ND |
| LVWPS-MW208B | 4/6/2021 | 75 | LVWPS-MW208B-EM06 | EM06 | Downgradient | 250 | ND | ND | ND | ND | 514.5 | 0.71 | ND | ND | 567.4 | 29.2 | 573.3 | 1.33 | ND | ND | ND | ND |
| LVWPS-MW208B | 5/4/2021 | 75 | LVWPS-MW208B-EM07 | EM07 | Downgradient | 250 | ND | ND | ND | ND | 515.2 | 3.94 | ND | ND | 567.4 | 434 | 573.1 | 1.32 | ND | ND | ND | ND |
| LVWPS-MW208B | 6/9/2021 | 75 | LVWPS-MW208B-EM08 | EM08 | Downgradient | 250 | ND | ND | ND | ND | 514.7 | 2.07 | ND | ND | 567.3 | 490 | 573.6 | 0.642 | ND | ND | ND | ND |
| LVWPS-MW221A | 10/6/2020 | 60 | LVWPS-MW221A-BL04 | BL04 | Far Cross/Downgradient | 300 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW221A | 12/12/2020 | 60 | LVWPS-MW221A-INJ | INJ | Far Cross/Downgradient | 300 | ND | ND | ND | ND | ND | ND | ND | ND | 562.4 ** | 4.93 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW221A | 12/22/2020 | 60 | LVWPS-MW221A-EM01 | EM01 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW221A | 1/12/2021 | 60 | LVWPS-MW221A-EM02 | EM02 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW221A | 1/28/2021 | 60 | LVWPS-MW221A-EM03 | EM03 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW221A | 2/8/2021 | 60 | LVWPS-MW221A-EM04 | EM04 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW221A | 3/9/2021 | 60 | LVWPS-MW221A-EM05 | EM05 | Far Cross/Downgradient | 300 | ND | ND | ND | ND | ND | ND | ND | ND | 562.0 ** | 2.99 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW221A | 4/6/2021 | 60 | LVWPS-MW221A-EM06 | EM06 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | 564.0 ** | 2.98 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW221A | 5/3/2021 | 60 | LVWPS-MW221A-EM07 | EM07 | Far Cross/Downgradient | 300 | ND | ND | ND | ND | ND | ND | ND | ND | 562.6 ** | 2.53 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW221A | 6/8/2021 | 60 | LVWPS-MW221A-EM08 | EM08 | Far Cross/Downgradient | 300 | ND | ND | --- | --- | ND | ND | --- | --- | 562.6 ** | 2.74 | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 10/9/2020 | 46 | LVWPS-A2-MW16A-BL04 | BL04 | Cross/Downgradient | 350 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW16A | 12/14/2020 | 46 | LVWPS-A2-MW16A-INJ | INJ | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 12/22/2020 | 46 | LVWPS-A2-MW16A-EM01 | EM01 | Cross/Downgradient | 350 | ND | ND | ND | ND | 514.2 | 1.83 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW16A | 1/12/2021 | 46 | LVWPS-A2-MW16A-EM02 | EM02 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 1/25/2021 | 46 | LVWPS-A2-MW16A-EM03 | EM03 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 2/9/2021 | 46 | LVWPS-A2-MW16A-EM04 | EM04 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 3/12/2021 | 46 | LVWPS-A2-MW16A-EM05 | EM05 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 4/6/2021 | 46 | LVWPS-A2-MW16A-EM06 | EM06 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A2-MW16A | 5/5/2021 | 46 | LVWPS-A2-MW16A-EM07 | EM07 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16A | 6/10/2021 | 46 | LVWPS-A2-MW16A-EM08 | EM08 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 10/9/2020 | 70.5 | LVWPS-A2-MW16B-BL04 | BL04 | Cross/Downgradient | 350 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A2-MW16B | 12/14/2020 | 70.5 | LVWPS-A2-MW16B-INJ | INJ | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 12/22/2020 | 70.5 | LVWPS-A2-MW16B-EM01 | EM01 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 1/12/2021 | 70.5 | LVWPS-A2-MW16B-EM02 | EM02 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 1/25/2021 | 70.5 | LVWPS-A2-MW16B-EM03 | EM03 | Cross/Downgradient | 350 | 540.0 | 0.973 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 2/9/2021 | 70.5 | LVWPS-A2-MW16B-EM04 | EM04 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 3/12/2021 | 70.5 | LVWPS-A2-MW16B-EM05 | EM05 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A2-MW16B | 4/6/2021 | 70.5 | LVWPS-A2-MW16B-EM06 | EM06 | Cross/Downgradient | 350 | ND | ND | ND | ND | ND | ND | ND | ND | 560.2 * | 1.41 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW16B | 5/5/2021 | 70.5 | LVWPS-A2-MW16B-EM07 | EM07 | Cross/Downgradient | 350 | ND | ND | ND | ND | ND | ND | ND | ND | 561.5 ** | 6.79 | ND | ND | ND | ND | ND | ND |
| LVWPS-A2-MW16B | 6/10/2021 | 70.5 | LVWPS-A2-MW16B-EM08 | EM08 | Cross/Downgradient | 350 | ND | ND | --- | --- | ND | ND | --- | --- | 563.1 ** | 15.0 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW207 | 9/28/2020 | 77.8 | LVWPS-MW207-BL04 | BL04 | Far Cross/Downgradient | 425 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW207 | 12/22/2020 | 77.8 | LVWPS-MW207-EM01 | EM01 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 514.3 | 1.72 | ND | ND | 562.3 ** | 33.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 1/18/2021 | 77.8 | LVWPS-MW207-EM02 | EM02 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 515.8 | 12.0 | ND | ND | 562.6 ** | 18.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 1/29/2021 | 77.8 | LVWPS-MW207-EM03 | EM03 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 515.5 | 8.77 | ND | ND | 560.5 ** | 11.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 2/12/2021 | 77.8 | LVWPS-MW207-EM04 | EM04 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 516.1 | 7.72 | ND | ND | 561.9 ** | 13.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 3/12/2021 | 77.8 | LVWPS-MW207-EM05 | EM05 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 515.4 | 12.4 | ND | ND | 561.7 ** | 32.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 4/16/2021 | 77.8 | LVWPS-MW207-EM06 | EM06 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 515.7 | 5.76 | ND | ND | 561.9 ** | 25.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 5/10/2021 | 77.8 | LVWPS-MW207-EM07 | EM07 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 512.4 ** | 0.473 | 507.8 | 0.057 | 562.3 ** | 25.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW207 | 6/15/2021 | 77.8 | LVWPS-MW207-EM08 | EM08 | Far Cross/Downgradient | 425 | ND | ND | ND | ND | 513.8 ** | 1.04 | ND | ND | 562.6 ** | 31.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW212A | 10/5/2020 | 43.9 | LVWPS-MW212A-BL04 | BL04 | Far Cross/Downgradient | 450 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW212A | 12/21/2020 | 43.9 | LVWPS-MW212A-EM01 | EM01 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 1/18/2021 | 43.9 | LVWPS-MW212A-EM02 | EM02 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 1/27/2021 | 43.9 | LVWPS-MW212A-EM03 | EM03 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 2/12/2021 | 43.9 | LVWPS-MW212A-EM04 | EM04 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 3/12/2021 | 43.9 | LVWPS-MW212A-EM05 | EM05 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 4/15/2021 | 43.9 | LVWPS-MW212A-EM06 | EM06 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 5/12/2021 | 43.9 | LVWPS-MW212A-EM07 | EM07 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212A | 6/14/2021 | 43.9 | LVWPS-MW212A-EM08 | EM08 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 10/5/2020 | 69.7 | LVWPS-MW212B-BL04 | BL04 | Far Cross/Downgradient | 450 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW212B | 12/22/2020 | 69.7 | LVWPS-MW212B-EM01 | EM01 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 1/18/2021 | 69.7 | LVWPS-MW212B-EM02 | EM02 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 1/27/2021 | 69.7 | LVWPS-MW212B-EM03 | EM03 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 2/12/2021 | 69.7 | LVWPS-MW212B-EM04 | EM04 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 3/12/2021 | 69.7 | LVWPS-MW212B-EM05 | EM05 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 4/15/2021 | 69.7 | LVWPS-MW212B-EM06 | EM06 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 5/12/2021 | 69.7 | LVWPS-MW212B-EM07 | EM07 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212B | 6/14/2021 | 69.7 | LVWPS-MW212B-EM08 | EM08 | Far Cross/Downgradient | 450 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 10/5/2020 | 69.8 | LVWPS-MW220A-BL04 | BL04 | Far Downgradient | 500 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW220A | 12/21/2020 | 69.8 | LVWPS-MW220A-EM01 | EM01 | Far Downgradient | 500 | ND | ND | ND | ND | ND | ND | ND | ND | 567.2 | 1.32 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW220A | 1/18/2021 | 69.8 | LVWPS-MW220A-EM02 | EM02 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 1/28/2021 | 69.8 | LVWPS-MW220A-EM03 | EM03 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 2/12/2021 | 69.8 | LVWPS-MW220A-EM04 | EM04 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 3/11/2021 | 69.8 | LVWPS-MW220A-EM05 | EM05 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 4/16/2021 | 69.8 | LVWPS-MW220A-EM06 | EM06 | Far Downgradient | 500 | ND | ND | ND | ND | ND | ND | ND | ND | 559.7 ** | 6.63 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW220A | 5/10/2021 | 69.8 | LVWPS-MW220A-EM07 | EM07 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW220A | 6/10/2021 | 69.8 | LVWPS-MW220A-EM08 | EM08 | Far Downgradient | 500 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 1.54 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209 | 10/6/2020 | 80.7 | LVWPS-MW209-BL04 | BL04 | Far Downgradient | 625 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW209 | 12/21/2020 | 80.7 | LVWPS-MW209-EM01 | EM01 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209 | 1/18/2021 | 80.7 | LVWPS-MW209-EM02 | EM02 | Far Downgradient | 625 | 541.0 | 2.14 | ND | ND | ND | ND | ND | ND | 565.6 | 17.4 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 1/27/2021 | 80.7 | LVWPS-MW209-EM03 | EM03 | Far Downgradient | 625 | 543.0 ** | 1.01 | ND | ND | ND | ND | ND | ND | 564.8 | 13.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 2/12/2021 | 80.7 | LVWPS-MW209-EM04 | EM04 | Far Downgradient | 625 | ND | ND | ND | ND | 515.7 | 0.761 | ND | ND | 564.6 ** | 37.1 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 3/11/2021 | 80.7 | LVWPS-MW209-EM05 | EM05 | Far Downgradient | 625 | ND | ND | ND | ND | 515.7 | 2.56 | ND | ND | 564.7 | 48.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 4/16/2021 | 80.7 | LVWPS-MW209-EM06 | EM06 | Far Downgradient | 625 | ND | ND | ND | ND | 516.7 | 2.81 | ND | ND | 564.0 ** | 25.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 5/10/2021 | 80.7 | LVWPS-MW209-EM07 | EM07 | Far Downgradient | 625 | ND | ND | ND | ND | 515.3 | 1.25 | ND | ND | 562.5 ** | 9.66 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209 | 6/10/2021 | 80.7 | LVWPS-MW209-EM08 | EM08 | Far Downgradient | 625 | ND | ND | ND | ND | 515.8 | 1.79 | ND | ND | 563.4 ** | 25.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW209A | 10/6/2020 | 45 | LVWPS-MW209A-BL04 | BL04 | Far Downgradient | 625 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW209A | 12/21/2020 | 45 | LVWPS-MW209A-EM01 | EM01 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 1/18/2021 | 45 | LVWPS-MW209A-EM02 | EM02 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-MW209A | 1/27/2021 | 45 | LVWPS-MW209A-EM03 | EM03 | Far Downgradient | 625 | 539.6 | 0.743 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 2/12/2021 | 45 | LVWPS-MW209A-EM04 | EM04 | Far Downgradient | 625 | 541.0 | 0.744 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 3/11/2021 | 45 | LVWPS-MW209A-EM05 | EM05 | Far Downgradient | 625 | 541.5 | 1.23 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 4/16/2021 | 45 | LVWPS-MW209A-EM06 | EM06 | Far Downgradient | 625 | 541.6 | 0.416 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 5/10/2021 | 45 | LVWPS-MW209A-EM07 | EM07 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW209A | 6/10/2021 | 45 | LVWPS-MW209A-EM08 | EM08 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW218A | 10/5/2020 | 44.9 | LVWPS-MW218A-BL04 | BL04 | Far Downgradient | 625 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW218A | 12/21/2020 | 44.9 | LVWPS-MW218A-EM01 | EM01 | Far Downgradient | 625 | ND | ND | ND | ND | ND | ND | ND | ND | 561.7 ** | 13.1 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW218A | 1/18/2021 | 44.9 | LVWPS-MW218A-EM02 | EM02 | Far Downgradient | 625 | ND | ND | ND | ND | ND | ND | ND | ND | 561.9 ** | 9.72 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW218A | 1/26/2021 | 44.9 | LVWPS-MW218A-EM03 | EM03 | Far Downgradient | 625 | ND | ND | ND | ND | ND | ND | ND | ND | 562.3 ** | 2.38 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW218A | 2/12/2021 | 44.9 | LVWPS-MW218A-EM04 | EM04 | Far Downgradient | 625 | ND | ND | ND | ND | ND | ND | ND | ND | 562.5 ** | 11.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW218A | 3/15/2021 | 44.9 | LVWPS-MW218A-EM05 | EM05 | Far Downgradient | 625 | ND | ND | ND | ND | ND | ND | ND | ND | 562.0 ** | 17.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW218A | 4/16/2021 | 44.9 | LVWPS-MW218A-EM06 | EM06 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | 562.0 ** | 12.2 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW218A | 5/10/2021 | 44.9 | LVWPS-MW218A-EM07 | EM07 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | 561.7 ** | 2.86 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW218A | 6/11/2021 | 44.9 | LVWPS-MW218A-EM08 | EM08 | Far Downgradient | 625 | ND | ND | --- | --- | ND | ND | --- | --- | 561.7 ** | 5.82 | --- | --- | ND | ND | --- | --- |
| LVWPS-MW211 | 9/30/2020 | 59.6 | LVWPS-MW211-BL04 | BL04 | Far Cross/Downgradient | 650 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW211 | 12/21/2020 | 59.6 | LVWPS-MW211-EM01 | EM01 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 513.9 ** | 2.27 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW211 | 1/18/2021 | 59.6 | LVWPS-MW211-EM02 | EM02 | Far Cross/Downgradient | 650 | 538.8 ** | 3.31 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW211 | 1/29/2021 | 59.6 | LVWPS-MW211-EM03 | EM03 | Far Cross/Downgradient | 650 | 538.0 ** | 0.958 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW211 | 2/12/2021 | 59.6 | LVWPS-MW211-EM04 | EM04 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 516.8 | 1.23 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW211 | 3/12/2021 | 59.6 | LVWPS-MW211-EM05 | EM05 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 515.4 | 3.36 | ND | ND | 564.6 | 3.90 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW211 | 4/16/2021 | 59.6 | LVWPS-MW211-EM06 | EM06 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 515.8 | 3.88 | ND | ND | 566.5 | 17.9 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW211 | 5/10/2021 | 59.6 | LVWPS-MW211-EM07 | EM07 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 514.1 | 0.794 | ND | ND | 565.9 | 5.75 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW211 | 6/9/2021 | 59.6 | LVWPS-MW211-EM08 | EM08 | Far Cross/Downgradient | 650 | ND | ND | ND | ND | 515.4 | 2.41 | ND | ND | 566.7 | 42.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 10/6/2020 | 44.8 | LVWPS-MW210A-BL04 | BL04 | Far Downgradient | 850 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW210A | 12/21/2020 | 44.8 | LVWPS-MW210A-EM01 | EM01 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 561.7 ** | 27.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 1/18/2021 | 44.8 | LVWPS-MW210A-EM02 | EM02 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 561.6 ** | 14.3 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 1/29/2021 | 44.8 | LVWPS-MW210A-EM03 | EM03 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 560.7 ** | 5.45 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 2/12/2021 | 44.8 | LVWPS-MW210A-EM04 | EM04 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 561.9 ** | 15.5 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 3/12/2021 | 44.8 | LVWPS-MW210A-EM05 | EM05 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 561.2 ** | 23.7 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 4/16/2021 | 44.8 | LVWPS-MW210A-EM06 | EM06 | Far Downgradient | 850 | ND | ND | ND | ND | 517.5 | 1.69 | ND | ND | 561.5 ** | 19.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 5/10/2021 | 44.8 | LVWPS-MW210A-EM07 | EM07 | Far Downgradient | 850 | ND | ND | ND | ND | 515.8 ** | 0.776 | ND | ND | 561.7 ** | 18.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210A | 6/10/2021 | 44.8 | LVWPS-MW210A-EM08 | EM08 | Far Downgradient | 850 | ND | ND | ND | ND | 517.7 | 6.78 | ND | ND | 566.2 | 126 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 10/6/2020 | 79.6 | LVWPS-MW210B-BL04 | BL04 | Far Downgradient | 850 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW210B | 12/21/2020 | 79.6 | LVWPS-MW210B-EM01 | EM01 | Far Downgradient | 850 | 541.0 | 2.19 | ND | ND | ND | ND | ND | ND | 563.4 ** | 19.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 1/18/2021 | 79.6 | LVWPS-MW210B-EM02 | EM02 | Far Downgradient | 850 | 540.6 ** | 3.52 | ND | ND | 516.1 | 2.89 | ND | ND | 567.2 | 101 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 1/29/2021 | 79.6 | LVWPS-MW210B-EM03 | EM03 | Far Downgradient | 850 | ND | ND | ND | ND | 515.7 | 4.72 | ND | ND | 567.5 | 90.8 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 2/12/2021 | 79.6 | LVWPS-MW210B-EM04 | EM04 | Far Downgradient | 850 | ND | ND | ND | ND | 515.4 | 0.533 | ND | ND | 564.8 | 19.7 | 575.2 | 0.078 | ND | ND | ND | ND |
| LVWPS-MW210B | 3/12/2021 | 79.6 | LVWPS-MW210B-EM05 | EM05 | Far Downgradient | 850 | ND | ND | ND | ND | 515.8 | 2.61 | ND | ND | 565.2 | 29.0 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 4/16/2021 | 79.6 | LVWPS-MW210B-EM06 | EM06 | Far Downgradient | 850 | ND | ND | ND | ND | 516.1 | 16.0 | ND | ND | 566.1 | 107 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 5/10/2021 | 79.6 | LVWPS-MW210B-EM07 | EM07 | Far Downgradient | 850 | ND | ND | ND | ND | 515.9 | 9.38 | ND | ND | 566.2 | 68.6 | ND | ND | ND | ND | ND | ND |
| LVWPS-MW210B | 6/10/2021 | 79.6 | LVWPS-MW210B-EM08 | EM08 | Far Downgradient | 850 | ND | ND | ND | ND | ND | ND | ND | ND | 561.8 ** | 13.9 | ND | ND | ND | ND | ND | ND |
| **Zone 3** | | | | | | | | | | | | | | | | | | | | | | |
| LVWPS-A3-MW08 | 10/8/2020 | 94.4 | LVWPS-A3-MW08-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW08 | 12/30/2020 | 94.4 | LVWPS-A3-MW08-INJ | INJ | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 1/14/2021 | 94.4 | LVWPS-A3-MW08-EM02 | EM02 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 2/11/2021 | 94.4 | LVWPS-A3-MW08-EM04 | EM04 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 3/10/2021 | 94.4 | LVWPS-A3-MW08-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 4/9/2021 | 94.4 | LVWPS-A3-MW08-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 5/12/2021 | 94.4 | LVWPS-A3-MW08-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW08 | 6/9/2021 | 94.4 | LVWPS-A3-MW08-EM08 | EM08 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 10/8/2020 | 130 | LVWPS-U3-MW08A-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW08A | 12/30/2020 | 130 | LVWPS-U3-MW08A-INJ | INJ | Upgradient | -60 | ND | ND | ND | ND | 514.1 | 0.439 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW08A | 1/15/2021 | 130 | LVWPS-U3-MW08A-EM02 | EM02 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 2/12/2021 | 130 | LVWPS-U3-MW08A-EM04 | EM04 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 3/12/2021 | 130 | LVWPS-U3-MW08A-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 4/9/2021 | 130 | LVWPS-U3-MW08A-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 5/12/2021 | 130 | LVWPS-U3-MW08A-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08A | 6/16/2021 | 130 | LVWPS-U3-MW08A-EM08 | EM08 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 10/8/2020 | 161.2 | LVWPS-U3-MW08B-BL04 | BL04 | Upgradient | -60 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U3-MW08B | 12/30/2020 | 161.2 | LVWPS-U3-MW08B-INJ | INJ | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 1/15/2021 | 161.2 | LVWPS-U3-MW08B-EM02 | EM02 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 2/12/2021 | 161.2 | LVWPS-U3-MW08B-EM04 | EM04 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 3/12/2021 | 161.2 | LVWPS-U3-MW08B-EM05 | EM05 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 4/15/2021 | 161.2 | LVWPS-U3-MW08B-EM06 | EM06 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 5/12/2021 | 161.2 | LVWPS-U3-MW08B-EM07 | EM07 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW08B | 6/16/2021 | 161.2 | LVWPS-U3-MW08B-EM08 | EM08 | Upgradient | -60 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 10/8/2020 | 64.5 | LVWPS-A3-MW07-BL04 | BL04 | Upgradient | -55 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW07 | 12/30/2020 | 64.5 | LVWPS-A3-MW07-INJ | INJ | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 1/15/2021 | 64.5 | LVWPS-A3-MW07-EM02 | EM02 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 2/11/2021 | 64.5 | LVWPS-A3-MW07-EM04 | EM04 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 3/11/2021 | 64.5 | LVWPS-A3-MW07-EM05 | EM05 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 4/8/2021 | 64.5 | LVWPS-A3-MW07-EM06 | EM06 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 5/12/2021 | 64.5 | LVWPS-A3-MW07-EM07 | EM07 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW07 | 6/10/2021 | 64.5 | LVWPS-A3-MW07-EM08 | EM08 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 10/9/2020 | 89.9 | LVWPS-U3-MW07A-BL04 | BL04 | Upgradient | -55 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW07A | 12/30/2020 | 89.9 | LVWPS-U3-MW07A-INJ | INJ | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 1/15/2021 | 89.9 | LVWPS-U3-MW07A-EM02 | EM02 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 2/11/2021 | 89.9 | LVWPS-U3-MW07A-EM04 | EM04 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 3/11/2021 | 89.9 | LVWPS-U3-MW07A-EM05 | EM05 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 4/8/2021 | 89.9 | LVWPS-U3-MW07A-EM06 | EM06 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 5/12/2021 | 89.9 | LVWPS-U3-MW07A-EM07 | EM07 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07A | 6/10/2021 | 89.9 | LVWPS-U3-MW07A-EM08 | EM08 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 10/9/2020 | 114.3 | LVWPS-U3-MW07B-BL04 | BL04 | Upgradient | -55 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW07B | 12/30/2020 | 114.3 | LVWPS-U3-MW07B-INJ | INJ | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 1/14/2021 | 114.3 | LVWPS-U3-MW07B-EM02 | EM02 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 2/12/2021 | 114.3 | LVWPS-U3-MW07B-EM04 | EM04 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 3/12/2021 | 114.3 | LVWPS-U3-MW07B-EM05 | EM05 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 4/13/2021 | 114.3 | LVWPS-U3-MW07B-EM06 | EM06 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 5/12/2021 | 114.3 | LVWPS-U3-MW07B-EM07 | EM07 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW07B | 6/11/2021 | 114.3 | LVWPS-U3-MW07B-EM08 | EM08 | Upgradient | -55 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 9/28/2020 | 65.5 | LVWPS-A3-DR01-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-DR01 | 12/16/2020 | 65.5 | LVWPS-A3-DR01-20201216 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A3-DR01 | 12/17/2020 | 65.5 | LVWPS-A3-DR01-20201217 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A3-DR01 | 12/29/2020 | 65.5 | LVWPS-A3-DR01-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-A3-DR01 | 1/18/2021 | 65.5 | LVWPS-A3-DR01-EM02 | EM02 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 2/12/2021 | 65.5 | LVWPS-A3-DR01-EM04 | EM04 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 3/15/2021 | 65.5 | LVWPS-A3-DR01-EM05 | EM05 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 4/15/2021 | 65.5 | LVWPS-A3-DR01-EM06 | EM06 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 5/13/2021 | 65.5 | LVWPS-A3-DR01-EM07 | EM07 | Downgradient | 6.5 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-DR01 | 6/9/2021 | 65.5 | LVWPS-A3-DR01-EM08 | EM08 | Downgradient | 6.5 | ND | ND | ND | ND | 512.2 * | 0.483 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 9/28/2020 | 108 | LVWPS-U3-DR01A-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-DR01A | 12/16/2020 | 108 | LVWPS-U3-DR01A | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 506.9 | 0.024 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/16/2020 | 108 | LVWPS-U3-DR01A | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.9 ** | 1.16 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/16/2020 | 108 | LVWPS-U3-DR01A | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.1 ** | 0.796 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/16/2020 | 108 | LVWPS-U3-DR01A | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.4 ** | 99.9 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/17/2020 | 108 | LVWPS-U3-DR01A-20201217-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 514.9 ** | 1.29 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/17/2020 | 108 | LVWPS-U3-DR01A-20201217-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.5 ** | 3.51 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/17/2020 | 108 | LVWPS-U3-DR01A-20201217-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 514.9 ** | 3.53 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/17/2020 | 108 | LVWPS-U3-DR01A-20201217-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 514.7 ** | 0.559 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 12/29/2020 | 108 | LVWPS-U3-DR01A-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 507.1 | 1.57 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01A | 1/18/2021 | 108 | LVWPS-U3-DR01A-EM02 | EM02 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 22.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 2/12/2021 | 108 | LVWPS-U3-DR01A-EM04 | EM04 | Downgradient | 6.5 | ND | ND | ND | ND | 515.8 | 18.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 3/15/2021 | 108 | LVWPS-U3-DR01A-EM05 | EM05 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 71.4 | 507.9 | 0.390 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 4/15/2021 | 108 | LVWPS-U3-DR01A-EM06 | EM06 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 19.4 | 508.2 | 0.534 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 5/13/2021 | 108 | LVWPS-U3-DR01A-EM07 | EM07 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 54.3 | 507.8 | 0.345 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01A | 6/9/2021 | 108 | LVWPS-U3-DR01A-EM08 | EM08 | Downgradient | 6.5 | ND | ND | ND | ND | 515.5 | 14.5 | 507.5 | 0.225 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 9/28/2020 | 144.1 | LVWPS-U3-DR01B-BL04 | BL04 | Downgradient | 6.5 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-DR01B | 12/16/2020 | 144.1 | LVWPS-U3-DR01B-20201216-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/16/2020 | 144.1 | LVWPS-U3-DR01B-20201216-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 514.1 ** | 155 | --- | --- | ND | ND | --- | --- | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U3-DR01B | 12/16/2020 | 144.1 | LVWPS-U3-DR01B-20201216-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.7 ** | 135 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/16/2020 | 144.1 | LVWPS-U3-DR01B-20201216-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.1 ** | 7.32 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/17/2020 | 144.1 | LVWPS-U3-DR01B-20201217-1 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.4 ** | 407 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/17/2020 | 144.1 | LVWPS-U3-DR01B-20201217-2 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.7 ** | 209 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/17/2020 | 144.1 | LVWPS-U3-DR01B-20201217-3 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.7 ** | 210 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/17/2020 | 144.1 | LVWPS-U3-DR01B-20201217-4 | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.1 ** | 39.1 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 12/29/2020 | 144.1 | LVWPS-U3-DR01B-INJ | INJ | Downgradient | 6.5 | --- | --- | ND | ND | --- | --- | 515.8 ** | 30.9 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR01B | 1/18/2021 | 144.1 | LVWPS-U3-DR01B-EM02 | EM02 | Downgradient | 6.5 | ND | ND | ND | ND | 516.2 | 74.8 | 516.8 ** | 136 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 2/12/2021 | 144.1 | LVWPS-U3-DR01B-EM04 | EM04 | Downgradient | 6.5 | ND | ND | ND | ND | 513.9 ** | 15.8 | 515.2 ** | 108 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 3/15/2021 | 144.1 | LVWPS-U3-DR01B-EM05 | EM05 | Downgradient | 6.5 | ND | ND | ND | ND | 516.4 | 313 | 516.2 ** | 137 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 4/15/2021 | 144.1 | LVWPS-U3-DR01B-EM06 | EM06 | Downgradient | 6.5 | ND | ND | ND | ND | 516.5 | 177 | 514.9 ** | 62.4 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 5/13/2021 | 144.1 | LVWPS-U3-DR01B-EM07 | EM07 | Downgradient | 6.5 | ND | ND | ND | ND | 516.3 | 246 | 514.9 ** | 86.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR01B | 6/9/2021 | 144.1 | LVWPS-U3-DR01B-EM08 | EM08 | Downgradient | 6.5 | ND | ND | ND | ND | 516.3 | 152 | 516.5 ** | 87.5 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 9/28/2020 | 98.6 | LVWPS-U3-DR02A-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-DR02A | 12/16/2020 | 98.6 | LVWPS-U3-DR02A-20201216-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.3 ** | 36.0 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/16/2020 | 98.6 | LVWPS-U3-DR02A-20201216-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 513.8 ** | 114 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/16/2020 | 98.6 | LVWPS-U3-DR02A-20201216-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.6 ** | 2.37 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/16/2020 | 98.6 | LVWPS-U3-DR02A-20201216-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 125 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/17/2020 | 98.6 | LVWPS-U3-DR02A | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.6 ** | 101 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/17/2020 | 98.6 | LVWPS-U3-DR02A | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.5 ** | 61.9 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/17/2020 | 98.6 | LVWPS-U3-DR02A | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 103 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/17/2020 | 98.6 | LVWPS-U3-DR02A | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 78.5 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/17/2020 | 98.6 | LVWPS-U3-DR02A-20201217-4-FD | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.6 ** | 83.2 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/30/2020 | 98.6 | LVWPS-U3-DR02A-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.1 ** | 73.5 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 12/30/2020 | 98.6 | LVWPS-U3-DR02A-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 516.0 ** | 67.5 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02A | 1/18/2021 | 98.6 | LVWPS-U3-DR02A-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 516.1 | 295 | 515.3 ** | 76.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 2/11/2021 | 98.6 | LVWPS-U3-DR02A-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 516.5 | 78.6 | 515.4 ** | 63.6 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 3/15/2021 | 98.6 | LVWPS-U3-DR02A-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | 516.1 | 133 | 515.5 ** | 49.4 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 4/15/2021 | 98.6 | LVWPS-U3-DR02A-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | 516.4 | 125 | 514.8 ** | 92.7 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 5/10/2021 | 98.6 | LVWPS-U3-DR02A-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 516.2 | 66.0 | 515.2 ** | 60.9 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02A | 6/9/2021 | 98.6 | LVWPS-U3-DR02A-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | 516.2 | 56.4 | 515.7 ** | 8.56 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 9/28/2020 | 130 | LVWPS-U3-DR02B-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-DR02B | 12/16/2020 | 130 | LVWPS-U3-DR02B-20201216-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 144 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/16/2020 | 130 | LVWPS-U3-DR02B-20201216-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.3 ** | 14.1 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/16/2020 | 130 | LVWPS-U3-DR02B-20201216-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.7 ** | 154 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/16/2020 | 130 | LVWPS-U3-DR02B-20201216-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.3 ** | 26.1 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/17/2020 | 130 | LVWPS-U3-DR02B-20201217-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.8 ** | 224 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/17/2020 | 130 | LVWPS-U3-DR02B-20201217-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.4 ** | 12.3 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/17/2020 | 130 | LVWPS-U3-DR02B-20201217-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.2 ** | 27.3 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 12/17/2020 | 130 | LVWPS-U3-DR02B-20201217-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.5 ** | 55.7 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02B | 1/18/2021 | 130 | LVWPS-U3-DR02B-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 516.2 | 74.3 | 515.3 ** | 60.2 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 2/11/2021 | 130 | LVWPS-U3-DR02B-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 515.5 | 4.51 | 515.4 ** | 38.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 3/15/2021 | 130 | LVWPS-U3-DR02B-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | 516.7 | 80.9 | 515.4 ** | 29.5 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 4/15/2021 | 130 | LVWPS-U3-DR02B-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | 516.6 | 40.8 | 514.7 ** | 82.4 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 5/13/2021 | 130 | LVWPS-U3-DR02B-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 516.3 | 56.7 | 514.9 ** | 74.2 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02B | 6/9/2021 | 130 | LVWPS-U3-DR02B-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | 516.4 | 60.2 | 516.0 ** | 52.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02C | 9/28/2020 | 161.5 | LVWPS-U3-DR02C-BL04 | BL04 | Downgradient | 7 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-DR02C | 12/16/2020 | 161.5 | LVWPS-U3-DR02C-20201216-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.1 | 0.337 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/16/2020 | 161.5 | LVWPS-U3-DR02C-20201216-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.0 | 0.400 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/16/2020 | 161.5 | LVWPS-U3-DR02C-20201216-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.1 | 1.10 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/16/2020 | 161.5 | LVWPS-U3-DR02C-20201216-3-FD | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.0 | 0.346 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/16/2020 | 161.5 | LVWPS-U3-DR02C-20201216-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.1 | 0.943 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/17/2020 | 161.5 | LVWPS-U3-DR02C-20201217-1 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.9 | 0.490 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/17/2020 | 161.5 | LVWPS-U3-DR02C-20201217-2 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.2 | 0.879 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/17/2020 | 161.5 | LVWPS-U3-DR02C-20201217-3 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 507.3 | 0.909 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/17/2020 | 161.5 | LVWPS-U3-DR02C-20201217-4 | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 515.3 ** | 6.41 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 12/30/2020 | 161.5 | LVWPS-U3-DR02C-INJ | INJ | Downgradient | 7 | --- | --- | ND | ND | --- | --- | 516.4 ** | 51.2 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-DR02C | 1/18/2021 | 161.5 | LVWPS-U3-DR02C-EM02 | EM02 | Downgradient | 7 | ND | ND | ND | ND | 516.1 | 11.2 | 516.6 ** | 25.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02C | 2/12/2021 | 161.5 | LVWPS-U3-DR02C-EM04 | EM04 | Downgradient | 7 | ND | ND | ND | ND | 516.8 | 7.45 | 506.2 | 1.36 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02C | 3/15/2021 | 161.5 | LVWPS-U3-DR02C-EM05 | EM05 | Downgradient | 7 | ND | ND | ND | ND | 516.3 | 13.9 | 505.3 ** | 0.721 | ND | ND | ND | ND | ND | ND | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U3-DR02C | 4/15/2021 | 161.5 | LVWPS-U3-DR02C-EM06 | EM06 | Downgradient | 7 | ND | ND | ND | ND | 516.5 | 6.23 | 507.1 | 3.81 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02C | 5/13/2021 | 161.5 | LVWPS-U3-DR02C-EM07 | EM07 | Downgradient | 7 | ND | ND | ND | ND | 516.2 | 4.61 | 515.8 ** | 10.7 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-DR02C | 6/9/2021 | 161.5 | LVWPS-U3-DR02C-EM08 | EM08 | Downgradient | 7 | ND | ND | ND | ND | 515.9 | 8.85 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03A | 10/2/2020 | 98.6 | LVWPS-U3-MW03A-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW03A | 10/2/2020 | 98.6 | LVWPS-U3-MW03A-BL04-FD | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW03A | 12/30/2020 | 98.6 | LVWPS-U3-MW03A-INJ | INJ | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 1/14/2021 | 98.6 | LVWPS-U3-MW03A-EM02 | EM02 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 2/11/2021 | 98.6 | LVWPS-U3-MW03A-EM04 | EM04 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 3/11/2021 | 98.6 | LVWPS-U3-MW03A-EM05 | EM05 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 4/6/2021 | 98.6 | LVWPS-U3-MW03A-EM06 | EM06 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 5/13/2021 | 98.6 | LVWPS-U3-MW03A-EM07 | EM07 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03A | 6/10/2021 | 98.6 | LVWPS-U3-MW03A-EM08 | EM08 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03B | 10/2/2020 | 163 | LVWPS-U3-MW03B-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW03B | 12/30/2020 | 163 | LVWPS-U3-MW03B-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.7 | 116 | 508.2 | 0.226 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 1/14/2021 | 163 | LVWPS-U3-MW03B-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.9 | 9.03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 2/11/2021 | 163 | LVWPS-U3-MW03B-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.9 | 7.36 | 509.4 | 0.161 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 3/12/2021 | 163 | LVWPS-U3-MW03B-EM05 | EM05 | Downgradient | 25 | ND | ND | ND | ND | 516.3 | 16.0 | 510.4 ** | 0.235 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 4/12/2021 | 163 | LVWPS-U3-MW03B-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 516.1 | 14.5 | 509.4 | 0.318 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 5/13/2021 | 163 | LVWPS-U3-MW03B-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 516.1 | 23.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03B | 6/14/2021 | 163 | LVWPS-U3-MW03B-EM08 | EM08 | Downgradient | 25 | ND | ND | ND | ND | 515.8 | 34.9 | 509.3 | 0.248 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 10/1/2020 | 129.9 | LVWPS-U3-MW03C-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW03C | 12/30/2020 | 129.9 | LVWPS-U3-MW03C-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 8.21 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 1/14/2021 | 129.9 | LVWPS-U3-MW03C-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 0.815 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 2/11/2021 | 129.9 | LVWPS-U3-MW03C-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.2 | 0.602 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 3/11/2021 | 129.9 | LVWPS-U3-MW03C-EM05 | EM05 | Downgradient | 25 | ND | ND | ND | ND | 514.4 | 0.841 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 4/13/2021 | 129.9 | LVWPS-U3-MW03C-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 515.0 | 0.666 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 5/13/2021 | 129.9 | LVWPS-U3-MW03C-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 514.0 ** | 0.492 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW03C | 6/11/2021 | 129.9 | LVWPS-U3-MW03C-EM08 | EM08 | Downgradient | 25 | ND | ND | --- | --- | 514.1 | 0.547 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW03C | 6/17/2021 | 129.9 | LVWPS-U3-MW03C-EM08-A | EM08 | Downgradient | 25 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-MW09 | 10/7/2020 | 97.8 | LVWPS-U3-MW09-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW09 | 12/30/2020 | 97.8 | LVWPS-U3-MW09-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.4 | 22.8 | 515.4 ** | 2.51 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW09 | 1/15/2021 | 97.8 | LVWPS-U3-MW09-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.7 | 1.98 | 518.8 ** | 4.52 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW09 | 2/10/2021 | 97.8 | LVWPS-U3-MW09-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 514.9 | 2.63 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW09 | 3/12/2021 | 97.8 | LVWPS-U3-MW09-EM05 | EM05 | Downgradient | 25 | --- | --- | ND | ND | --- | --- | 507.0 | 0.324 | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-U3-MW09 | 4/8/2021 | 97.8 | LVWPS-U3-MW09-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 9.77 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW09 | 5/13/2021 | 97.8 | LVWPS-U3-MW09-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 515.6 | 41.0 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW09 | 6/11/2021 | 97.8 | LVWPS-U3-MW09-EM08 | EM08 | Downgradient | 25 | ND | ND | ND | ND | 515.5 | 113 | 507.0 | 0.418 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13A | 10/7/2020 | 108.5 | LVWPS-U3-MW13A-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW13A | 12/30/2020 | 108.5 | LVWPS-U3-MW13A-INJ | INJ | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13A | 1/15/2021 | 108.5 | LVWPS-U3-MW13A-EM02 | EM02 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13A | 2/11/2021 | 108.5 | LVWPS-U3-MW13A-EM04 | EM04 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13A | 3/12/2021 | 108.5 | LVWPS-U3-MW13A-EM05 | EM05 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | 570.2 | 1.45 | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13A | 4/8/2021 | 108.5 | LVWPS-U3-MW13A-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | ND | ND | ND | ND | 569.5 | 1.83 | 570.8 ** | 1.56 | ND | ND | ND | ND |
| LVWPS-U3-MW13A | 5/13/2021 | 108.5 | LVWPS-U3-MW13A-EM07 | EM07 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13A | 6/11/2021 | 108.5 | LVWPS-U3-MW13A-EM08 | EM08 | Downgradient | 25 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW13B | 10/7/2020 | 140.1 | LVWPS-U3-MW13B-BL04 | BL04 | Downgradient | 25 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW13B | 12/30/2020 | 140.1 | LVWPS-U3-MW13B-INJ | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 77.9 | 507.0 | 0.133 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 12/30/2020 | 140.1 | LVWPS-U3-MW13B-INJ-FD | INJ | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 87.3 | 507.3 | 0.299 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 1/15/2021 | 140.1 | LVWPS-U3-MW13B-EM02 | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 5.08 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 1/15/2021 | 140.1 | LVWPS-U3-MW13B-EM02-FD | EM02 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 9.60 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 2/12/2021 | 140.1 | LVWPS-U3-MW13B-EM04 | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.2 | 10.7 | 507.7 | 0.267 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 2/12/2021 | 140.1 | LVWPS-U3-MW13B-EM04-FD | EM04 | Downgradient | 25 | ND | ND | ND | ND | 515.3 | 7.91 | 508.8 | 0.246 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 3/15/2021 | 140.1 | LVWPS-U3-MW13B-EM05 | EM05 | Downgradient | 25 | ND | ND | ND | ND | 514.4 | 12.2 | 505.9 | 0.128 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 4/14/2021 | 140.1 | LVWPS-U3-MW13B-EM06 | EM06 | Downgradient | 25 | ND | ND | ND | ND | 515.6 | 3.81 | 507.2 | 0.097 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 5/13/2021 | 140.1 | LVWPS-U3-MW13B-EM07 | EM07 | Downgradient | 25 | ND | ND | ND | ND | 515.2 | 2.14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW13B | 6/17/2021 | 140.1 | LVWPS-U3-MW13B-EM08 | EM08 | Downgradient | 25 | ND | ND | ND | ND | 515.1 | 2.55 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A3-MW02 | 10/5/2020 | 62.5 | LVWPS-A3-MW02-BL04 | BL04 | Downgradient | 45 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW02 | 12/30/2020 | 62.5 | LVWPS-A3-MW02-INJ | INJ | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW02 | 1/14/2021 | 62.5 | LVWPS-A3-MW02-EM02 | EM02 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW02 | 2/11/2021 | 62.5 | LVWPS-A3-MW02-EM04 | EM04 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A3-MW02 | 3/11/2021 | 62.5 | LVWPS-A3-MW02-EM05 | EM05 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW02 | 4/9/2021 | 62.5 | LVWPS-A3-MW02-EM06 | EM06 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW02 | 5/13/2021 | 62.5 | LVWPS-A3-MW02-EM07 | EM07 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW02 | 6/10/2021 | 62.5 | LVWPS-A3-MW02-EM08 | EM08 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 10/5/2020 | 89.4 | LVWPS-U3-MW02A-BL04 | BL04 | Downgradient | 45 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW02A | 12/30/2020 | 89.4 | LVWPS-U3-MW02A-INJ | INJ | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 1/14/2021 | 89.4 | LVWPS-U3-MW02A-EM02 | EM02 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 2/11/2021 | 89.4 | LVWPS-U3-MW02A-EM04 | EM04 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 3/11/2021 | 89.4 | LVWPS-U3-MW02A-EM05 | EM05 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 4/9/2021 | 89.4 | LVWPS-U3-MW02A-EM06 | EM06 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 5/13/2021 | 89.4 | LVWPS-U3-MW02A-EM07 | EM07 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02A | 6/10/2021 | 89.4 | LVWPS-U3-MW02A-EM08 | EM08 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 10/5/2020 | 112.5 | LVWPS-U3-MW02B-BL04 | BL04 | Downgradient | 45 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW02B | 12/30/2020 | 112.5 | LVWPS-U3-MW02B-INJ | INJ | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 1/14/2021 | 112.5 | LVWPS-U3-MW02B-EM02 | EM02 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 2/11/2021 | 112.5 | LVWPS-U3-MW02B-EM04 | EM04 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 3/11/2021 | 112.5 | LVWPS-U3-MW02B-EM05 | EM05 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 4/12/2021 | 112.5 | LVWPS-U3-MW02B-EM06 | EM06 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 5/13/2021 | 112.5 | LVWPS-U3-MW02B-EM07 | EM07 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW02B | 6/10/2021 | 112.5 | LVWPS-U3-MW02B-EM08 | EM08 | Downgradient | 45 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 10/5/2020 | 64.9 | LVWPS-A3-MW06-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW06 | 12/30/2020 | 64.9 | LVWPS-A3-MW06-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 1/15/2021 | 64.9 | LVWPS-A3-MW06-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 2/10/2021 | 64.9 | LVWPS-A3-MW06-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 3/12/2021 | 64.9 | LVWPS-A3-MW06-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 4/9/2021 | 64.9 | LVWPS-A3-MW06-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 5/13/2021 | 64.9 | LVWPS-A3-MW06-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 6/11/2021 | 64.9 | LVWPS-A3-MW06-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 5/13/2021 | 64.9 | LVWPS-A3-MW06-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW06 | 6/11/2021 | 64.9 | LVWPS-A3-MW06-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06A | 10/5/2020 | 102.6 | LVWPS-U3-MW06A-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW06A | 12/30/2020 | 102.6 | LVWPS-U3-MW06A-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06A | 1/15/2021 | 102.6 | LVWPS-U3-MW06A-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06A | 2/12/2021 | 102.6 | LVWPS-U3-MW06A-EM04 | EM04 | Downgradient | 50 | ND | ND | ND | ND | 513.9 ** | 0.662 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW06A | 3/15/2021 | 102.6 | LVWPS-U3-MW06A-EM05 | EM05 | Downgradient | 50 | ND | ND | ND | ND | 514.8 | 1.28 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW06A | 4/9/2021 | 102.6 | LVWPS-U3-MW06A-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | 514.4 ** | 0.295 | --- | --- | 566.6 | 1.28 | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06A | 5/13/2021 | 102.6 | LVWPS-U3-MW06A-EM07 | EM07 | Downgradient | 50 | ND | ND | ND | ND | ND | ND | ND | ND | 566.2 | 2.22 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW06A | 6/11/2021 | 102.6 | LVWPS-U3-MW06A-EM08 | EM08 | Downgradient | 50 | ND | ND | ND | ND | 514.4 ** | 0.395 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW06B | 10/7/2020 | 137.3 | LVWPS-U3-MW06B-BL04 | BL04 | Downgradient | 50 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW06B | 12/30/2020 | 137.3 | LVWPS-U3-MW06B-INJ | INJ | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 1/14/2021 | 137.3 | LVWPS-U3-MW06B-EM02 | EM02 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 2/11/2021 | 137.3 | LVWPS-U3-MW06B-EM04 | EM04 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 3/11/2021 | 137.3 | LVWPS-U3-MW06B-EM05 | EM05 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 4/13/2021 | 137.3 | LVWPS-U3-MW06B-EM06 | EM06 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 5/13/2021 | 137.3 | LVWPS-U3-MW06B-EM07 | EM07 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW06B | 6/16/2021 | 137.3 | LVWPS-U3-MW06B-EM08 | EM08 | Downgradient | 50 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 10/2/2020 | 94.8 | LVWPS-U3-MW05B-BL04 | BL04 | Downgradient | 75 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW05B | 1/15/2021 | 94.8 | LVWPS-U3-MW05B-EM02 | EM02 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 2/11/2021 | 94.8 | LVWPS-U3-MW05B-EM04 | EM04 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 3/11/2021 | 94.8 | LVWPS-U3-MW05B-EM05 | EM05 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 4/8/2021 | 94.8 | LVWPS-U3-MW05B-EM06 | EM06 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 5/13/2021 | 94.8 | LVWPS-U3-MW05B-EM07 | EM07 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW05B | 6/10/2021 | 94.8 | LVWPS-U3-MW05B-EM08 | EM08 | Downgradient | 75 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 10/5/2020 | 66.1 | LVWPS-A3-MW10-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW10 | 1/14/2021 | 66.1 | LVWPS-A3-MW10-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 2/11/2021 | 66.1 | LVWPS-A3-MW10-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 3/11/2021 | 66.1 | LVWPS-A3-MW10-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 564.6 | 2.15 | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 4/9/2021 | 66.1 | LVWPS-A3-MW10-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 5/13/2021 | 66.1 | LVWPS-A3-MW10-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW10 | 6/10/2021 | 66.1 | LVWPS-A3-MW10-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW11 | 10/7/2020 | 63.7 | LVWPS-A3-MW11-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW11 | 1/15/2021 | 63.7 | LVWPS-A3-MW11-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 565.9 | 11.2 | ND | ND | ND | ND | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-A3-MW11 | 2/11/2021 | 63.7 | LVWPS-A3-MW11-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 564.8 | 2.15 | ND | ND | ND | ND | ND | ND |
| LVWPS-A3-MW11 | 3/11/2021 | 63.7 | LVWPS-A3-MW11-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | 565.2 | 3.45 | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW11 | 4/8/2021 | 63.7 | LVWPS-A3-MW11-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW11 | 5/13/2021 | 63.7 | LVWPS-A3-MW11-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW11 | 6/10/2021 | 63.7 | LVWPS-A3-MW11-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW10A | 10/5/2020 | 89.9 | LVWPS-U3-MW10A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW10A | 1/14/2021 | 89.9 | LVWPS-U3-MW10A-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.9 | 6.08 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10A | 2/11/2021 | 89.9 | LVWPS-U3-MW10A-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.8 | 3.31 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10A | 3/11/2021 | 89.9 | LVWPS-U3-MW10A-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 515.7 | 5.55 | ND | ND | 566.1 | 4.01 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10A | 4/8/2021 | 89.9 | LVWPS-U3-MW10A-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 515.7 | 4.97 | 512.2 ** | 0.061 | 566.6 | 1.74 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10A | 5/13/2021 | 89.9 | LVWPS-U3-MW10A-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 515.6 | 9.69 | ND | ND | 565.0 | 2.30 | 569.6 ** | 3.04 | ND | ND | ND | ND |
| LVWPS-U3-MW10A | 6/10/2021 | 89.9 | LVWPS-U3-MW10A-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 515.5 | 2.31 | ND | ND | 566.1 | 2.89 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 10/5/2020 | 111.1 | LVWPS-U3-MW10B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW10B | 1/14/2021 | 111.1 | LVWPS-U3-MW10B-EM02 | EM02 | Downgradient | 100 | ND | ND | ND | ND | 515.9 | 9.62 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 2/11/2021 | 111.1 | LVWPS-U3-MW10B-EM04 | EM04 | Downgradient | 100 | ND | ND | ND | ND | 515.8 | 35.8 | 507.7 | 1.35 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 3/11/2021 | 111.1 | LVWPS-U3-MW10B-EM05 | EM05 | Downgradient | 100 | ND | ND | ND | ND | 515.4 | 152 | 507.8 | 0.300 | 567.2 | 3.70 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 4/9/2021 | 111.1 | LVWPS-U3-MW10B-EM06 | EM06 | Downgradient | 100 | ND | ND | ND | ND | 515.4 | 153 | 507.2 | 1.21 | 566.2 | 1.77 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 5/13/2021 | 111.1 | LVWPS-U3-MW10B-EM07 | EM07 | Downgradient | 100 | ND | ND | ND | ND | 515.5 | 181 | 508.3 | 0.138 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW10B | 6/9/2021 | 111.1 | LVWPS-U3-MW10B-EM08 | EM08 | Downgradient | 100 | ND | ND | ND | ND | 515.4 | 117 | 507.5 | 0.953 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW11A | 10/7/2020 | 96.2 | LVWPS-U3-MW11A-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW11A | 1/15/2021 | 96.2 | LVWPS-U3-MW11A-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11A | 2/12/2021 | 96.2 | LVWPS-U3-MW11A-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11A | 3/11/2021 | 96.2 | LVWPS-U3-MW11A-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11A | 4/9/2021 | 96.2 | LVWPS-U3-MW11A-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11A | 5/13/2021 | 96.2 | LVWPS-U3-MW11A-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11A | 6/10/2021 | 96.2 | LVWPS-U3-MW11A-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 10/7/2020 | 124.8 | LVWPS-U3-MW11B-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW11B | 1/18/2021 | 124.8 | LVWPS-U3-MW11B-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 2/12/2021 | 124.8 | LVWPS-U3-MW11B-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 3/12/2021 | 124.8 | LVWPS-U3-MW11B-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 4/14/2021 | 124.8 | LVWPS-U3-MW11B-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 5/13/2021 | 124.8 | LVWPS-U3-MW11B-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11B | 6/16/2021 | 124.8 | LVWPS-U3-MW11B-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 10/8/2020 | 153.1 | LVWPS-U3-MW11C-BL04 | BL04 | Downgradient | 100 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW11C | 1/18/2021 | 153.1 | LVWPS-U3-MW11C-EM02 | EM02 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 2/12/2021 | 153.1 | LVWPS-U3-MW11C-EM04 | EM04 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 3/12/2021 | 153.1 | LVWPS-U3-MW11C-EM05 | EM05 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 4/14/2021 | 153.1 | LVWPS-U3-MW11C-EM06 | EM06 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 5/13/2021 | 153.1 | LVWPS-U3-MW11C-EM07 | EM07 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW11C | 6/17/2021 | 153.1 | LVWPS-U3-MW11C-EM08 | EM08 | Downgradient | 100 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW12 | 10/5/2020 | 69.1 | LVWPS-A3-MW12-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-A3-MW12 | 1/13/2021 | 69.1 | LVWPS-A3-MW12-EM02 | EM02 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW12 | 2/12/2021 | 69.1 | LVWPS-A3-MW12-EM04 | EM04 | Downgradient | 150 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-A3-MW12 | 3/12/2021 | 69.1 | LVWPS-A3-MW12-EM05 | EM05 | Downgradient | 150 | ND | ND | ND | ND | 518.8 | 7.80 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A3-MW12 | 4/14/2021 | 69.1 | LVWPS-A3-MW12-EM06 | EM06 | Downgradient | 150 | ND | ND | ND | ND | 518.4 | 16.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A3-MW12 | 5/13/2021 | 69.1 | LVWPS-A3-MW12-EM07 | EM07 | Downgradient | 150 | ND | ND | ND | ND | 517.1 | 14.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-A3-MW12 | 6/11/2021 | 69.1 | LVWPS-A3-MW12-EM08 | EM08 | Downgradient | 150 | ND | ND | ND | ND | 516.8 | 13.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 10/6/2020 | 98 | LVWPS-U3-MW12A-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW12A | 1/15/2021 | 98 | LVWPS-U3-MW12A-EM02 | EM02 | Downgradient | 150 | ND | ND | ND | ND | 515.5 | 0.536 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 2/12/2021 | 98 | LVWPS-U3-MW12A-EM04 | EM04 | Downgradient | 150 | ND | ND | ND | ND | 515.9 | 1.31 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 3/12/2021 | 98 | LVWPS-U3-MW12A-EM05 | EM05 | Downgradient | 150 | ND | ND | ND | ND | 515.4 | 2.57 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 4/15/2021 | 98 | LVWPS-U3-MW12A-EM06 | EM06 | Downgradient | 150 | ND | ND | ND | ND | 516.0 | 1.69 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 5/13/2021 | 98 | LVWPS-U3-MW12A-EM07 | EM07 | Downgradient | 150 | ND | ND | ND | ND | 514.7 | 0.727 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12A | 6/11/2021 | 98 | LVWPS-U3-MW12A-EM08 | EM08 | Downgradient | 150 | ND | ND | ND | ND | 516.2 | 0.518 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12B | 10/6/2020 | 125.5 | LVWPS-U3-MW12B-BL04 | BL04 | Downgradient | 150 | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW12B | 1/15/2021 | 125.5 | LVWPS-U3-MW12B-EM02 | EM02 | Downgradient | 150 | ND | ND | ND | ND | 516.0 | 3.88 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12B | 2/12/2021 | 125.5 | LVWPS-U3-MW12B-EM04 | EM04 | Downgradient | 150 | ND | ND | ND | ND | 515.4 | 1.98 | 508.4 | 0.253 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12B | 3/12/2021 | 125.5 | LVWPS-U3-MW12B-EM05 | EM05 | Downgradient | 150 | ND | ND | ND | ND | 515.3 | 11.0 | 507.2 | 0.112 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12B | 4/15/2021 | 125.5 | LVWPS-U3-MW12B-EM06 | EM06 | Downgradient | 150 | ND | ND | ND | ND | 515.7 | 3.61 | 507.3 | 0.108 | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW12B | 5/13/2021 | 125.5 | LVWPS-U3-MW12B-EM07 | EM07 | Downgradient | 150 | ND | ND | ND | ND | 515.8 | 14.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

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**Table 3**
**Tracer Dye Analytical Results**
Las Vegas Wash Bioremediation Pilot Study

| Location | Sample Date | Depth (ft bgs) | Sample ID | Event | Location | Distance from Injection Transect | Eosine | | Eosine | | Fluorescein | | Fluorescein | | Rhodamine WT (RWT) | | Rhodamine WT (RWT) | | Sulforhodamine B (SRB) | | Sulforhodamine B (SRB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | | Charcoal | | Groundwater | |
| | | | | | | feet | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) | Peak(nm) | Conc.(ppb) |
| LVWPS-U3-MW12B | 6/14/2021 | 125.5 | LVWPS-U3-MW12B-EM08 | EM08 | Downgradient | 150 | ND | ND | ND | ND | 515.7 | 20.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW212C | 4/14/2021 | 109.8 | LVWPS-MW212C-EM06 | EM06 | Downgradient | 260 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-MW212C | 5/12/2021 | 109.8 | LVWPS-MW212C-EM07 | EM07 | Downgradient | 260 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW212C | 6/15/2021 | 109.8 | LVWPS-MW212C-EM08 | EM08 | Downgradient | 260 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-MW212D | 4/14/2021 | 135 | LVWPS-MW212D-EM06 | EM06 | Downgradient | 260 | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND |
| LVWPS-MW212D | 5/12/2021 | 135 | LVWPS-MW212D-EM07 | EM07 | Downgradient | 260 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| LVWPS-MW212D | 6/16/2021 | 135 | LVWPS-MW212D-EM08 | EM08 | Downgradient | 260 | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW01B | 10/5/2020 | 93.5 | LVWPS-U3-MW01B-BL04 | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-U3-MW01B | 1/15/2021 | 93.5 | LVWPS-U3-MW01B-EM02 | EM02 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW01B | 2/11/2021 | 93.5 | LVWPS-U3-MW01B-EM04 | EM04 | Cross Gradient | N/A | ND | ND | ND | ND | ND | ND | ND | ND | 566.8 | 1.97 | ND | ND | ND | ND | ND | ND |
| LVWPS-U3-MW01B | 3/15/2021 | 93.5 | LVWPS-U3-MW01B-EM05 | EM05 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | 568.0 | 2.92 | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW01B | 4/9/2021 | 93.5 | LVWPS-U3-MW01B-EM06 | EM06 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW01B | 5/13/2021 | 93.5 | LVWPS-U3-MW01B-EM07 | EM07 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW01B | 6/11/2021 | 93.5 | LVWPS-U3-MW01B-EM08 | EM08 | Cross Gradient | N/A | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- |
| LVWPS-U3-MW04B | 10/2/2020 | 87.7 | LVWPS-U3-MW04B-BL04 | BL04 | Cross Gradient | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| **Extraction Well Field Area** | | | | | | | | | | | | | | | | | | | | | | |
| LVWPS-EW01 | 9/29/2020 | 64.4 | LVWPS-EW01-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-EW02 | 9/29/2020 | 42.8 | LVWPS-EW02-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-EW03 | 9/30/2020 | 54.8 | LVWPS-EW03-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-EW04 | 9/30/2020 | 35.7 | LVWPS-EW04-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-EW05 | 9/29/2020 | 64.9 | LVWPS-EW05-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-EW05 | 9/29/2020 | 64.9 | LVWPS-EW05-BL04-FD | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| **General Vicinity** | | | | | | | | | | | | | | | | | | | | | | |
| LVWPS-MW209B | 10/6/2020 | 120 | LVWPS-MW209B-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |
| LVWPS-MW221B | 10/6/2020 | 93.4 | LVWPS-MW221B-BL04 | BL04 | N/A | N/A | --- | --- | --- | --- | --- | --- | ND | ND | --- | --- | ND | ND | --- | --- | --- | --- |

Notes:

| | |
|---|---|
| nm | nanometers |
| conc | concentration |
| ppb | parts per billion |
| ND | No dye detected |
| FD | field duplicate |
| N/A | Not applicable |
| ---- | Not tested |
| ** | A fluorescence peak is present that does not meet all the criteria for this dye. However, it has been calculated as a positive dye result. See note 2 below. |

1. Dye concentrations are based upon standards used at the Ozark Underground Laboratory (OUL). The standard concentrations are based upon the as sold weight of the dye that the OUL uses - 20% by weight for rhodamine WT and 75% by weight for fluorescein.

2. Emission fluorescence peaks are a function of the dye and the liquid matrix of the sample. Narrow acceptable wavelength ranges usually used as a criterion for positive dye detections do not always apply to samples from this study due to the presence of varying concentrations of emulsified vegetable oil and an eluting solution mixed in with the samples.