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ENVIRONMENT
& HEALTH

October 15, 2019

TECHNICAL MEMORANDUM

To: Steve Clough
Nevada Environmental Response Trust

From: John Pekala, CEM#2347, Expires 9/20/2020, Ramboll
Linda Martello, Ramboll
Mary Sorensen, CSE, Ramboll

Re: OU-3 BERA Work Plan Modification No. 1 – Additional Pore Water and Sediment Sampling Locations in the Las Vegas Wash
Nevada Environmental Response Trust Site
Henderson, Nevada
Ramboll Project No. 1690011200-033

This Technical Memorandum presents Ramboll's recommended Modification No. 1 to the OU-3 Baseline Ecological Risk Assessment (BERA) Work Plan for the Las Vegas Wash (Wash) located in Henderson, Nevada. This Modification includes the addition of five new pore water sample locations and one new sediment sample location to evaluate potential influx of perchlorate into the Wash from the north bank. The OU-3 BERA Work Plan, which included a Field Sampling Plan as Appendix A (Work Plan; Ramboll 2019) were approved by the Nevada Division of Environmental Protection (NDEP) on February 1, 2019 as part of the NERT OU-3 Remedial Investigation (RI). The OU-3 BERA field sampling in the Wash is scheduled for October and November 2019 and Spring 2020. The Work Plan includes sampling along 15 transects along the Wash (12 transects within OU-3 and 3 reference location transects outside of and upstream of OU-3) (Figure 1). Sampling planned for October and November 2019 includes the collection of bank soil, surface water, sediment, sediment pore water, and fish and benthic invertebrates (i.e., sediment dwelling organisms) tissue residue samples. The sampling program planned for spring 2020 includes collecting benthic community assessment samples, which are timed in the spring to facilitate the optimal timing given the life cycles for the organisms of interest.

The need for additional pore water and sediment sampling locations requested for the OU-3 BERA is based on recent groundwater data collected by AECOM that indicates elevated concentrations of perchlorate is present in groundwater on the north bank of the Wash in the eastern portion of OU-3 (AECOM 2019) (Figure 2). AECOM reported perchlorate concentrations of 1,500 µg/L or higher present in three wells (NERT4.38N1, NERT4.21N1, LNDMW2) located north of the Wash between the Lower Narrows Weir and the Homestead Weir. These concentrations are in excess of the secondary chronic value (SCV) for perchlorate of 600 µg/L developed by the United States Environmental Protection Agency (USEPA) for the protection of aquatic organisms (USEPA 2002). Perchlorate concentrations also exceeded the SCV at well LNDMW1 on the south bank near Transect I and at wells

NERT3.58S1, WMW3.5S and NERT3.60S1 on the south bank near Transect L. Based on these results, additional pore water sampling is proposed along the north and south banks of the Wash at Transect I (Figure 3a), along the north bank of the Wash at Transects J and K (Figure 3b), and along the south bank of the Wash at Transect L (Figure 3b). Additional sediment sampling is proposed co-located with the pore water sample location along the north bank of the Wash at Transect I (Figure 3a). The locations of sediment samples already proposed to be collected as part of the original OU-3 BERA Work Plan (Ramboll 2019) may be shifted slightly to be co-located with other newly proposed pore water samples.

This modification to the Work Plan includes the addition of five pore water sample locations and one sediment sample location in the eastern portion of the Wash along transects where sampling is already planned, as follows:

Transect	Additional Proposed Samples		Figure Number
	Pore Water	Sediment[(a)]	
Transect I	2	1	Figure 3a
Transect J	1	0	Figure 3b
Transect K	1	0	Figure 3b
Transect L	1	0	Figure 3b

[(a)] Only one new sediment sample is needed. The location of already planned sediment samples will be shifted to be co-located with the new pore water sample locations.

The deployment of sediment pore water passive diffusion samplers is described in detail in Section 4.3.3 of the OU-3 BERA FSP (Ramboll 2019; Appendix A). The additional samples proposed in this Modification No. 1 will be collected and analyzed in the same way as the other pore water and sediment samples already planned for collection in October and November 2019.

Please contact us should you have any questions about the recommended additional investigation locations.

References

AECOM. 2019. *Preliminary Draft* Data Gap Investigation – Phase II Groundwater Quality Assessment, NERT Remedial Investigation – Downgradient Study Area, Nevada Environmental Response Trust Site, Henderson, Nevada, August.

Ramboll. 2019. Baseline Ecological Risk Assessment Work Plan for Operable Unit 3, Revision 1. Nevada Environmental Response Trust Site, Henderson, Nevada, February. Approved by NDEP on February 1, 2019.

USEPA. 2002. Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization. NCEA-1-0503 January 16, 2002.

Figures

Figure 1 OU-3 BERA Field Sampling Transect Locations in the Las Vegas Wash

Figure 2 OU-3 BERA Sampling Transect Locations with AECOM Preliminary Perchlorate Concentrations in Groundwater, July 2019

Figure 3a OU-3 BERA New Proposed Sediment and Pore Water Sampling Locations at Transect I

Figure 3b OU-3 BERA New Proposed Pore Water Sampling Locations at Transects J, K and L

OU-3 BERA Work Plan Modification No. 1
Additional Pore Water and Sediment Sampling Locations in the Las Vegas Wash

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

Nevada Environmental Response Trust (Trust) 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 the Trust. Based on my own involvement and/or my inquiry of the person or persons who manage the system(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, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Signature: Jay A Steinberg Not Individually, but Solely as President of the 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: 10/10/19

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OU-3 BERA Work Plan Modification No. 1
Additional Pore Water and Sediment Sampling Locations in the Las Vegas Wash

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

Responsible Certified Environmental Manager (CEM) for this project

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 provided 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.

October 15, 2019

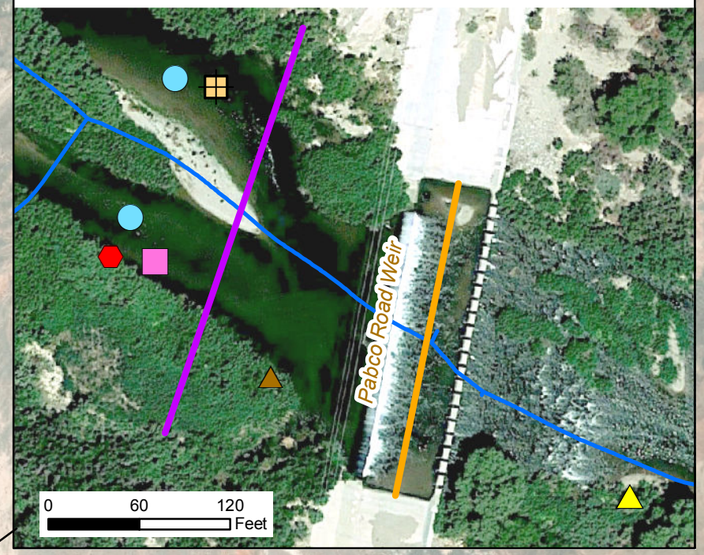
John M. Pekala, PG
Principal

Date

Certified Environmental Manager
Ramboll US Corporation
CEM Certificate Number: 2347
CEM Expiration Date: September 20, 2020

FIGURES

Proposed Sample Types to be Collected at the 15 Transects in the Wash



Las Vegas Wasteway

1
2
3
Upper Diversion Weir
Monson Weir
Visitor Center Weir
DU Wetlands No. 2
DU Wetlands No. 1
Silver Bowl
Archery Weir
Duck Creek
Duck Creek Confluence Weir
Transect A
Transect B
Sunrise Mountain Wier (Under Construction)
Upper Narrows Weir
Transect C
Transect D
Pabco Road Weir
LAS VEGAS WASH
Transect E
Historic Lateral Weir
Transect F
Bostick Weir
Transect G
Calico Ridge
Transect H
Transect I
Lower Narrows
Transect J
Homestead Weir
Transect K
Transect L
Three Kids Weir
Rainbow Gardens Weir
Fire Station Weir
Powerline Weir
Henderson Bird Viewing Preserve
OU-3

N
W
E
S
0
1,800
3,600
Feet

Example Sample Locations

- Sediment, Benthic Invertebrate Tissue, and Benthic Invertebrate Community
- Sediment Pore Water
- Surface Soil
- Surface Water
- Sediment

Proposed Sampling Transects

- Surface Water, Sediment, Benthic Invertebrate Tissue, Benthic Invertebrate Community, and Fish Tissue Samples
- Surface Soil, Sediment Pore Water, Surface Water, Sediment, Benthic Invertebrate Tissue, Benthic Invertebrate Community, and Fish Tissue Samples

- Reference Sample Locations (All Analysis)
- Fish Zones
- USGS Continuous Streamflow Location
- NERT/AMPAC/TIMET/COH Outfall Location
- Weirs
- Las Vegas Wash
- Operable Unit Boundary

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OU-3 BERA Field Sampling Transect Locations in the Las Vegas Wash

Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
1

PROJECT: 16900069433-018

H:\LePetomane\NERT\GIS\EcoRisk Figures\2018\Figure X Eco Sampling Locations v3.mxd

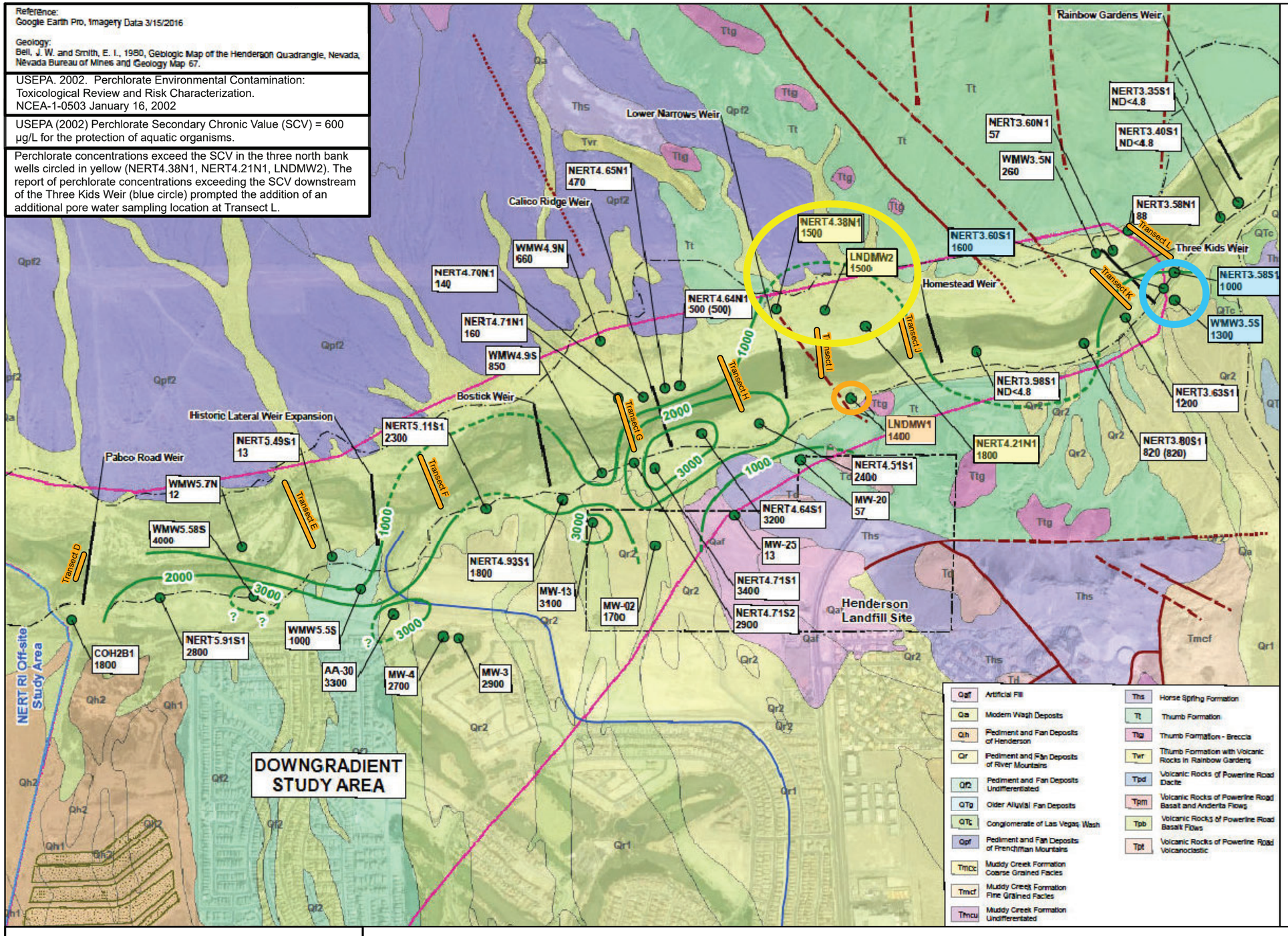
Reference:
Google Earth Pro, Imagery Data 3/15/2016

Geology:
Bell, J. W. and Smith, E. I., 1980, Geologic Map of the Henderson Quadrangle, Nevada, Nevada Bureau of Mines and Geology Map 67.

USEPA. 2002. Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization. NCEA-1-0503 January 16, 2002

USEPA (2002) Perchlorate Secondary Chronic Value (SCV) = 600 µg/L for the protection of aquatic organisms.

Perchlorate concentrations exceed the SCV in the three north bank wells circled in yellow (NERT4.38N1, NERT4.21N1, LNDMW2). The report of perchlorate concentrations exceeding the SCV downstream of the Three Kids Weir (blue circle) prompted the addition of an additional pore water sampling location at Transect L.



Legend

- Groundwater Monitoring Well
- Weir
- C-1 Channel
- Northern Rapid Infiltration Basins
- NERT RI Downgradient Study Area
- NERT RI Off-site Study Area
- Fault, dashed where inferred, dotted where concealed
- Perchlorate Concentration Isocontour (dashed where inferred)

Perchlorate Concentration in µg/L

µg/L - Micrograms per liter

(###) - Duplicates in (parentheses)

- BERA Sampling Transects

NOTE: Basemap is from AECOM's NERT RI Downgradient Study Area, Figure 9 (Preliminary Draft Data Gap Investigation - Phase II Groundwater Quality Assessment, NERT Remedial Investigation - Downgradient Study Area). The map has been modified to include the BERA Sampling Transects.

N

0 800 1,600 Feet

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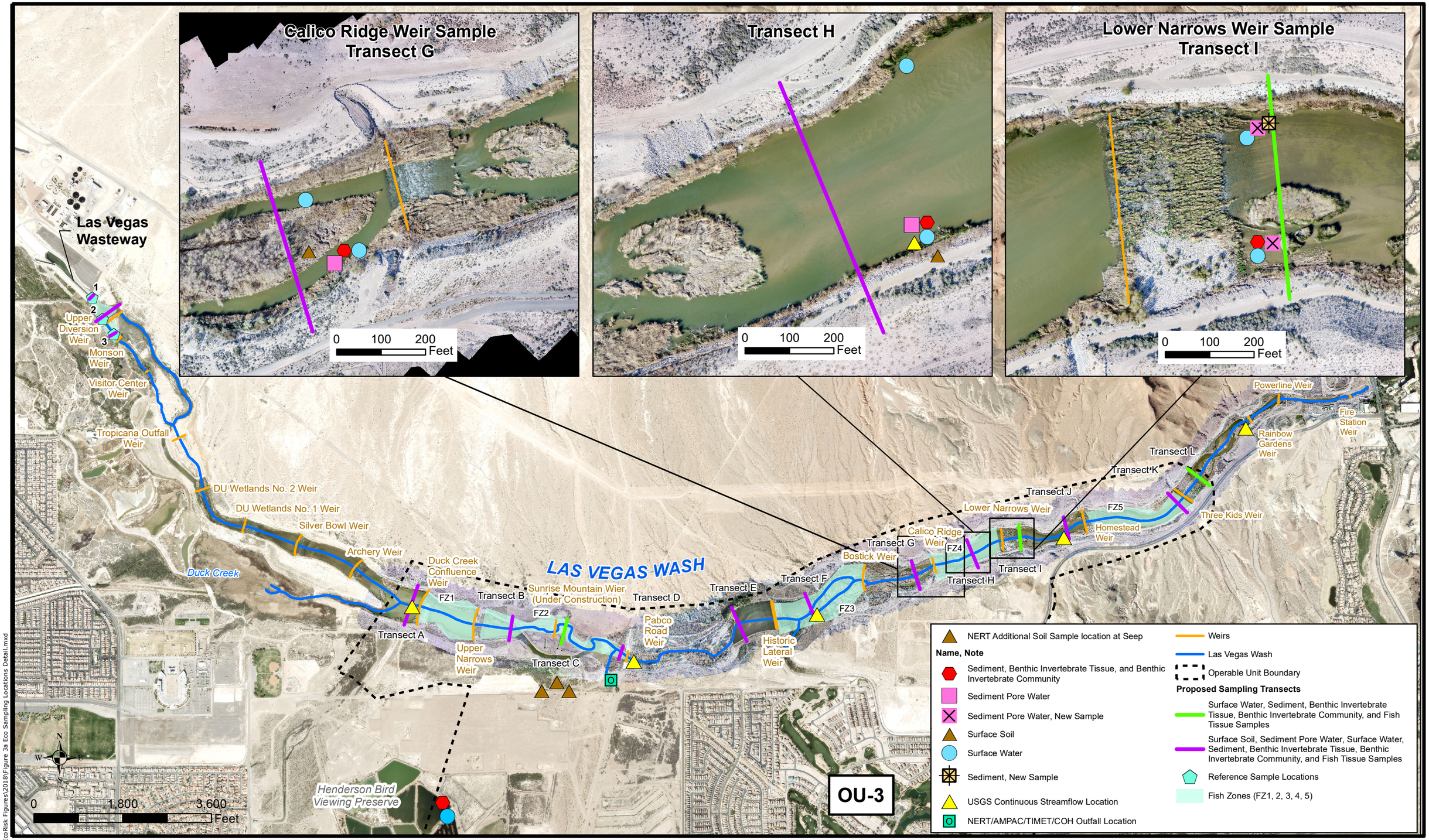
OU-3 BERA Sampling Transect Locations with AECOM Preliminary Perchlorate Concentrations in Groundwater, July 2019

Nevada Environmental Response Trust Site
Henderson, Nevada

Figure **2**

Drafter: MFS | Date: 10/7/2019 | Contract Number: 1690011200 | Approved by: | Revised:

Path: H:\LePetomane\NERT\GIS\EcoRisk Figures\Maps\OU-3 BERA Sampling.aprx



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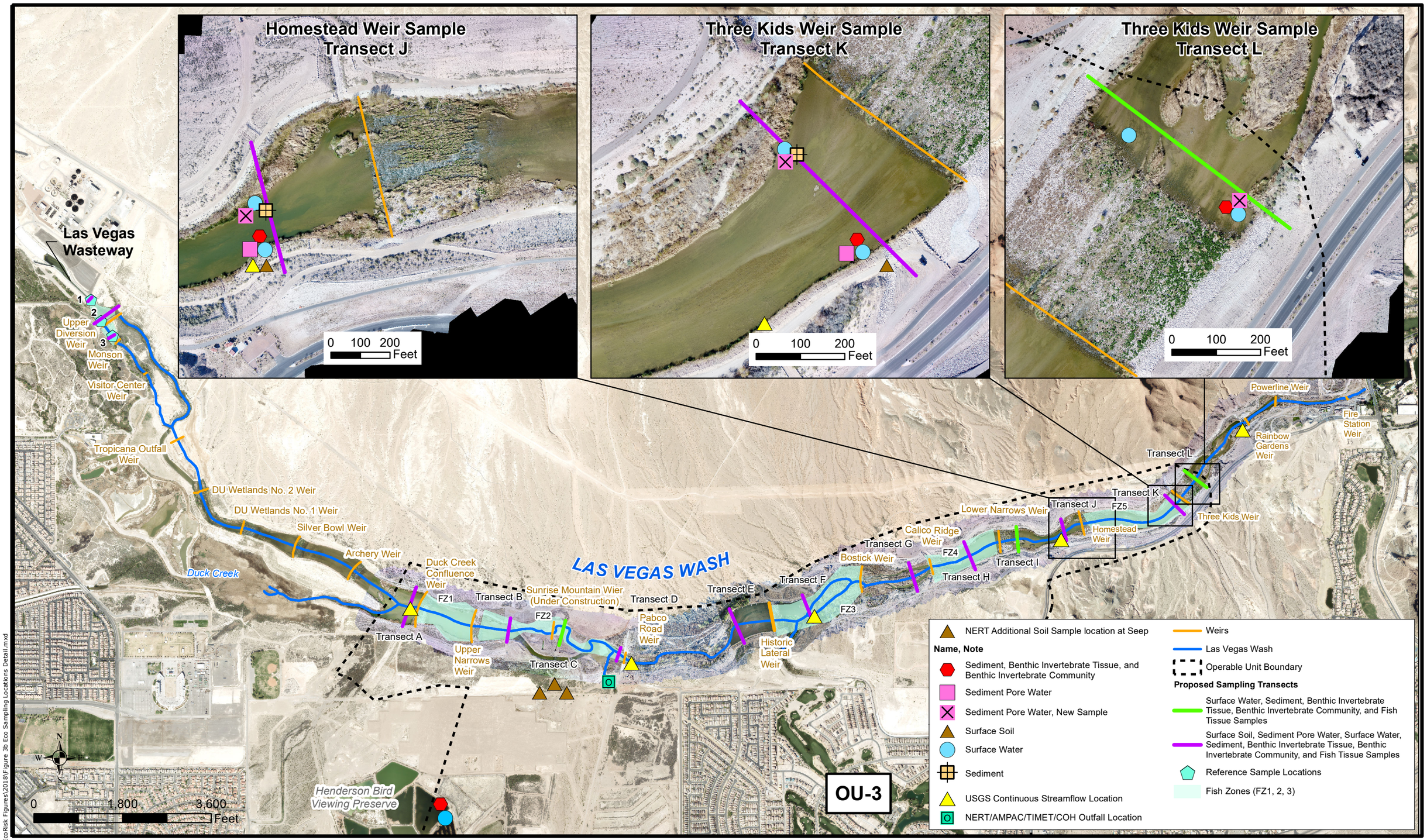
OU-3 BERA New Proposed Sediment and Pore Water Sampling Locations at Transect I

Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
3a

PROJECT: 16900069433-018



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OU-3 BERA New Proposed Pore Water Sampling Locations at Transects J, K and L

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Figure **3b**

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