



December 16, 2021

**TECHNICAL MEMORANDUM**

To: Steve Clough  
Nevada Environmental Response Trust

From: John Pekala, CEM#2347, Expires 9/20/2022, Ramboll  
Linda Martello, Ramboll, and Mary Sorensen, CSE, Ramboll

**Re: OU-3 BERA Work Plan Modification No. 2 – Additional Benthic  
Community Assessment Sampling Locations in the Las Vegas Wash  
Nevada Environmental Response Trust Site  
Henderson, Nevada  
Ramboll Project No. 1690020169-008**

This Technical Memorandum presents Ramboll’s recommended Modification No. 2 to the OU-3 Baseline Ecological Risk Assessment (BERA) Work Plan, Revision 1 (the “OU-3 BERA Work Plan”; Ramboll 2019) for the Las Vegas Wash (Wash) located in Henderson, Nevada. This Modification includes the addition of six new benthic community analysis sample locations to evaluate whether constituents originating from OU-1 and migrating via groundwater to the Las Vegas Wash could be impacting the benthic invertebrate community in the Wash.

The OU-3 BERA Work Plan, which included a Field Sampling Plan (FSP) as Appendix A, was submitted to the Nevada Division of Environmental Protection (NDEP) on February 1, 2019 and approved by NDEP on April 8, 2019, as part of the NERT OU-3 Remedial Investigation (RI). The OU-3 BERA Work Plan and FSP included the evaluation of the benthic invertebrate community. Benthic invertebrates were collected in June 2020 using grab sampling and Hester-Dendy samplers at 15 transects included in the OU-3 BERA Work Plan (and as shown with purple lines on Figure 1) plus one location in the City of Henderson Bird Viewing Pond (Figure 1).

During the evaluation of ecological data from the June 2020 field effort, it became apparent that the benthic invertebrate community data, a critical line of evidence in the OU-3 BERA, suggested a potentially impaired community because of the small quantity of invertebrates available for collection. The other three lines of evidence used in the OU-3 BERA<sup>1</sup> suggested minimal impact from the five chemicals being evaluated in the OU-3 BERA. As such, the benthic community line of evidence is inconsistent with the other lines of evidence and represents an uncertainty in the risk characterization.

The OU-3 BERA sampling locations used in the 2019-2020 field sampling effort were selected to be consistent with the Trust’s monthly surface water sampling program locations (Ramboll Environ 2017) plus additional transects to obtain more complete coverage of the Wash. The samples collected for the evaluation of the benthic invertebrate community

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<sup>1</sup> The four lines of evidence used and specified in the approved OU-3 BERA work plan include (1) comparison of media concentrations against ecological screening values (ESVs), (2) evaluation of tissue residues in invertebrates and fish, (3) benthic community assessment, and (4) food web modeling to evaluate impacts to wildlife (birds and mammals).

followed this approach and were intentionally co-located with the chemistry samples collected for the OU-3 BERA which is standard practice when sampling to evaluate ecological risk. Based on observations made during the sampling event, the habitat conditions at these locations are depositional which is not optimal habitat for benthic invertebrates and may have contributed to the low yield from the 2020 benthic invertebrate community sampling event. A prior sampling of benthic invertebrates by the Las Vegas Wash Coordination Committee (LVWCC) from 2000 through 2010 (Nelson 2011, U.S. Bureau of Reclamation 2011) was conducted to evaluate the health of the invertebrate community within the Wash. During this study, the LVWCC observed that similar low counts in benthic species and number of individuals were present in the mainstem sampling areas that occur between the weirs. However, they observed significantly greater number of species and individuals living on the weirs present within the Wash. As such, it appears that benthic invertebrates are present within the Las Vegas Wash in healthy populations but in areas with rocky substrate (e.g., along the weirs) where surface water flow is greater as opposed to areas with higher sediment deposition. Through this work plan modification, a focused field sampling effort in Spring of 2022 is proposed, as described herein, to collect new data in the vicinity of LVWCCs previous sampling to satisfy the additional line of evidence and complete the BERA.

The sampling proposed will focus on the areas conducive to the presence of invertebrates, specifically along the weirs, to evaluate the overall health of the benthic invertebrate community in the Wash. The field sampling will involve the collection of invertebrates for taxonomic evaluation from a total of six sample locations in the Wash. Specifically, samples will be collected from one location, along a weir, within each of the six fish tissue sampling zones within the Las Vegas Wash (Figure 1) in the Spring of 2022 assuming access can be obtained by the end of May 2022. If access is not obtained by this timeframe the sampling will be delayed until Spring 2023. Sampling is planned for the Spring to facilitate the optimal timing given the life cycles for the organisms of interest. Three replicate samples per location will be collected and individually packaged for taxonomic identification to document the variability of the benthic community as part of the data evaluation.

Kicknet/dipnet sampling with a D-frame net will be used for sampling benthic invertebrates along a 10-meter reach at each sampling location. Kicknet/dipnet sampling is an effective method for benthic invertebrate collection in flowing water systems (USEPA 2003). The OU-3 BERA Work Plan FSP Section 4.3.5.3 stated that kicknet sampling, the technique used by the LVWCC, would be used if "grab samples and multi-plate sample devices do not provide sufficient quantity of macroinvertebrate community samples." Therefore, this sampling methodology has already been approved for use in NERT's ecological sampling activities. The method consists of standing upgradient while positioning a D-frame dipnet approximately 1 to 2 feet downgradient and "kicking" or disturbing the sediment substrate. Organisms within the surface sediment are loosened and are carried by the current into the downgradient net. A 1-minute kicknet/dipnet method with a 500-micron mesh D-frame net will be used along a 10-meter reach at each sampling location. Following sample collection, benthic invertebrate samples will be preserved immediately with a 95 percent ethanol solution and placed into plastic sampling containers. The samples will be labelled immediately after preservation, following the procedures described in Section 5 of the OU-3

Work Plan FSP. Samples for taxonomic evaluation will be sent to the Nevada-certified laboratory Watershed Assessment Associates (WAA) in Schenectady, New York<sup>2</sup>. The results will be used to assess benthic community composition and will include the following metrics: abundance, diversity, pollution tolerance, taxa richness, percent dominance, and percent predator.

Water quality parameters will also be measured at each sampling location as these parameters can influence the taxonomic results. Parameters to be measured will include water depth, percent sand, dissolved oxygen, conductivity, pH, temperature, alkalinity, and hardness. Water quality parameters will be recorded at each sampling location using a multi-meter.

For samples requiring laboratory analysis, surface water will be collected from the mid to bottom of the water column at each location using grab sampling methodology (e.g., direct filling). Surface water samples will be collected prior to benthic invertebrate collection in order to minimize the disturbance of sediment that might alter the analytical results. Following collection of a sample, the position of the sample will be recorded using GPS. Samples will be placed in the specified laboratory containers, capped, labeled, placed in sealable plastic bags, and stored in coolers on ice for shipment to the analytical laboratory. Proper sample handling techniques used to ensure the integrity and security of the samples is explained in detail in Section 5.5 of the NDEP-approved OU-3 BERA Work Plan FSP.

The results from this evaluation will be incorporated into the forthcoming OU-3 BERA, anticipated to be submitted to NDEP in 2023. Please contact us should you have any questions about the recommended additional investigation.

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<sup>2</sup> WAA is the same lab that did the prior taxonomic evaluations for the OU-3 BERA.

## References

- Nelson, S.M. 2011. Stream macroinvertebrate assemblages associated with the Las Vegas Wash watershed 2000-2010. Technical Memorandum No. 86-68220-11-01. Bureau of Reclamation. Denver, Colorado.
- Ramboll Environ. 2017. Annual Remedial Performance Report for Chromium and Perchlorate, Nevada Environmental Response Trust Site; Henderson, Nevada; July 2016-June 2017. December 8.
- Ramboll. 2019. Baseline Ecological Risk Assessment Work Plan for Operable Unit 3, Revision 1. Nevada Environmental Response Trust Site, Henderson, Nevada, February 1. Approved by NDEP on April 8, 2019.
- U.S. Bureau of Reclamation. 2011. Stream Macroinvertebrate Assemblages Associated with the Las Vegas Wash Watershed 2000-2010. Technical Memorandum No. 86-68220-11-01.
- USEPA (United States Environmental Protection Agency). 2003. Sampling and Analytical Procedures for GLNPO's Open Lake Water Quality Survey of the Great Lakes; Chapter 4 - Biological Parameters; LG406 - Standard Operating Procedure for Benthic Invertebrate Field Sampling Procedure, Revision 07. EPA 905-R-03-002. March.

## Figures

- Figure 1      Benthic Invertebrate Community Kicknet Sampling and Fish Tissue Sampling Zones

**OU-3 BERA Work Plan Modification No. 2  
Additional Benthic Community Assessment Sampling Locations in the  
Las Vegas Wash**

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

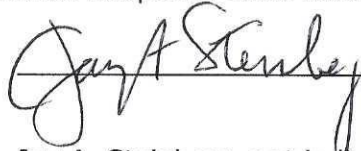
**Nevada Environmental Response Trust (NERT) Representative Certification**

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 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:**



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:**

12/14/21

OU 3 BERA Work Plan Modification No. 2  
Nevada Environmental Response Trust Site  
Henderson, Nevada

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**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.



**John M. Pekala, PG  
Principal**

December 16, 2021

**Date**

Certified Environmental Manager  
Ramboll US Consulting, Inc.  
CEM Certificate Number: 2347  
CEM Expiration Date: September 20, 2022



**Benthic Invertebrate Community Kicknet Sampling and Fish Tissue Sampling Zones**  
Nevada Environmental Response Trust Site  
Henderson, Nevada

Figure  
**1**

