

# MEMO

Date **November 15, 2018**  
To **Nevada Environmental Response Trust**  
From **John Pekala, Scott Warner, and Chris Ritchie**  
Copy to **Nevada Division of Environmental Protection  
United States Environmental Protection Agency**  
Subject **In-Situ Bioelectrochemical Laboratory-Scale  
Treatability Study Monthly Progress Report**

## **TASK PROGRESS UPDATE: SEPTEMBER 2018**

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Ramboll US Corporation (Ramboll) has prepared this memorandum which summarizes Ramboll's progress during September 2018 toward successfully implementing the In-Situ Bioelectrochemical Laboratory-Scale Treatability Study.

## **TASK M24 – IN-SITU BIOELECTROCHEMICAL LABORATORY-SCALE TREATABILITY STUDY**

- Task Leaders – Scott Warner / Chris Ritchie
- Current Status
  - Eight batch tests were completed to evaluate the generation of organic carbon in addition to hydrogen. Preliminary results indicate that acetate can be generated in high quantities (approximately 250 mg/L), providing sufficient electron donor to support perchlorate reduction; however, the mechanisms of cathodic reduction of inorganic carbon to organic carbon are complex. Therefore, for subsequent column tests with site groundwater will be spiked to a known constant acetate concentration to reduce the number of variables in the experimental design.
  - Microcosms with original site soils and synthetic groundwater were set up to evaluate electron donor (acetate and formate, hydrogen) and acceptor (nitrate, nitrite, chlorate, perchlorate, sulfate) utilization. Preliminary results indicate acetate and formate are readily consumed; however, electron acceptor preferences were not able to be resolved. Nitrate, nitrite, chlorate, and perchlorate appeared to be concurrently removed, while sulfate was not.
  - Physical column design for flow-through column tests has been completed, and columns were constructed and packed with site soils.
  - An additional electrochemical cell has been constructed, tested, and instrumented, for use in subsequent sand tank prototype testing.

- Schedule and Progress Updates
  - Analytical interferences mentioned in the last monthly progress report (regarding measuring organic carbon content and inorganic electron acceptors in the presence of high total dissolved solids concentration and high salinity values) have been resolved.
  - Flow-through column testing is scheduled to begin by October 31.
  - Column testing is expected to continue through December, which is about two months longer than previously projected. A field study work plan is still anticipated to be prepared in Q1 2019 provided that the data continue to support moving forward.
- Health and Safety
  - There were no safety incidents during September 2018.

## **In-Situ Bioelectrochemical Laboratory-Scale Treatability Study Progress Update**

**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 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:** 

## In-Situ Bioelectrochemical Laboratory-Scale Treatability Study Progress Update

**Nevada Environmental Response Trust Site  
(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 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:** Prepared In-Situ Bioelectrochemical Laboratory-Scale Treatability Study Progress Update, Nevada Environmental Response Trust Site, Henderson, Nevada



November 15, 2018

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**John M. Pekala, PG**

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Date

**Principal**

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