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May 12, 2016

Ms. Margaret Rosegay
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REVIEW OF INITIAL TESTING RESULTS FROM THE METAL SHREDDER WASTE TREATABILITY STUDY AND COMMENTS ON PROPOSED PILOT TEST WORK PLAN

Dear Ms. Rosegay:

This letter provides the Department of Toxic Substances Control's (DTSC) comments on the testing results presented by the California Chapter of the Institute of Scrap Recycling Industries (ISRI) made available through the implementation of the Metal Shredder Residue Treatability Study (Treatability Study) dated July 10, 2014. On April 18, 2016, representatives of ISRI and its consultant, Terraphase, met with DTSC to present information summarizing its work implementing the Treatability Study. This included the results of a baseline analysis of untreated metal shredder residue (MSR), and the results of the Phase 1, 2, and 3 laboratory "bench scale" testing portions of its Work Plan. At the meeting, Terraphase also presented ISRI's plan for conducting a full scale demonstration of the treatment at each facility identified in the Pilot Test Work Plan (Pilot Test), dated April 14, 2016. In Terraphase's presentation, a summary of the testing results was provided; however, the complete data package from Eurofins Calscience, the laboratory that conducted the analyses for Terraphase, was not provided. In addition, there was limited information provided on the sampling methods including sample collection, preservation, handling procedures, laboratory preparation methods, and laboratory quality control and quality assurance.

DTSC's Environmental Chemistry Laboratory (ECL) and DTSC's Engineering and Special Projects Office (ESPO) of the Brownfields and Environmental Restoration Program were tasked with providing technical comments on the information presented by Terraphase. This document incorporates their comments. It is important to note that DTSC's (including ECL's and ESPO's) review and comments are based on the limited information provided to DTSC in Terraphase's April 18, 2016 presentation.

Given these limitations, DTSC provides the following comments:

Baseline Characterization

DTSC reviewed the data provided in Tables 1 and 2, which showed the results of testing of samples of untreated MSR for total and soluble concentrations of regulated metals for comparison to the California Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) using appropriate test methods. Based on the review of the presented information, the baseline characterization appears to demonstrate that untreated MSR exceeds the STLCs and TTLCs for cadmium, lead, and zinc. Exceedance of either STLCs or TTLCs would form the basis for identification of the untreated MSR as a non-RCRA hazardous waste. This conclusion is consistent with DTSC's previous knowledge of this waste, as well as with statements made on page 5 in the Work Plan, which acknowledge that untreated MSR can exceed the regulatory thresholds established for cadmium, lead, and zinc.

Phase 1 Laboratory Bench Test Results

DTSC reviewed data from the bench test (Table 8), which showed the results of testing treated material for soluble metals. In reviewing the data presented representing treatment using 0.7 gallons per ton (gpt) of silicate and 10 percent (weight-to-weight, w/w) of cement, DTSC notes that the test results appear to show that the treatment of this material may result in soluble levels that are below the respective STLCs. Specifically, the presented analytical results for cadmium, lead, and zinc concentrations were below STLCs for samples collected at Sims Metal Management (SMM) and at Schnitzer Steel Products (SSP) facilities. Analytical results from samples collected at SA Recycling (SAR) showed soluble concentrations of cadmium and zinc to be below their respective STLCs (but not lead).

In reviewing the data presented representing treatments using 1.0 gpt of silicate and 12 percent (w/w) of cement, DTSC notes that the test results appear to show that the treatment of this material may also result in soluble levels that are below the respective STLCs. Specifically, the presented analytical results for cadmium, lead, and zinc concentrations were found to be below STLCs for samples collected at SMM and SSP. Analytical results from samples collected at SAR showed soluble concentrations of only cadmium to be below its STLC.

In summary, based on the data provided by Terraphase for initial testing results for the Treatability Study, the data appears to show that it may be possible for this waste to be treated so as to result in soluble concentrations that are consistently below STLCs.

Pilot Test Demonstration

Based on the bench scale data, DTSC approves ISRI and Terraphase to proceed with a full scale demonstration, which is the next phase of the Treatability Study. The purpose of the full scale demonstration is to determine whether the bench scale results can be achieved independently and consistently under normal operating conditions. In carrying out the full scale demonstration, DTSC requires that you comply with the conditions stated in its March 21, 2014 letter to you. Specifically:

- DTSC staff must be present during all sample collection events to ensure the quality and usability of the data;
- Replicates or splits of all samples collected (including split samples of each discreet half-hour sample collected, as well as splits of each composite sample prepared) must be made available to DTSC during sample collection events; and
- The amount of sample collected during each sample collection event must be sufficient to not only provide the needed replicate samples or split samples identified above, but also in sufficient quantity so as to allow all required analytical tests to be performed on each sample.

In reviewing the Pilot Test Work Plan prepared by Terraphase, DTSC has the following comments and requires Terraphase to modify the proposed Pilot Test Workplan as specified:

1. In section 2.2 on page 3, Terraphase proposes to demonstrate two reagent combinations at the full scale, 0.5 gpt and 5 percent (w/w) cement, and also 1.0 gpt and 10 percent (w/w) cement. It is unclear what additional information can be gained from demonstrating the lower treatment application rate which has not been shown to achieve analytical results at the bench scale below STLCs. Rather than using 0.5 gpt and 5 percent (w/w) cement, Terraphase is required to select and use the treatment application rate that has the highest likelihood to achieve soluble concentrations that are consistently below STLCs for all constituents.

2. In section 2.2, Terraphase proposes to demonstrate the treatment during only a single 8-hour shift at each facility. As stated in DTSC's September 8, 2014 letter to you regarding the Review of Meeting with Contractor for the Metal Shredder Residue Treatability study, DTSC requires that multiple sampling events be conducted at each facility so as to capture the variability that is anticipated to occur in the process that generates the waste. Although Terraphase presented no information to help understand the waste variability that might be expected, at a minimum, three sampling events must be conducted at each facility following

standard start up procedures for the treatment system.

3. In section 2.3.2 on page 4, Terraphase describes the waste treatment system at the Sims facility as being comprised of two separate systems, one for particles below 1.25 inches and a second for particles between 1.25 and 4.5 inches. As both waste treatment streams undergo separate treatment, Terraphase and DTSC would need to sample wastes being treated in both treatment systems, both upstream and downstream, in order to fully characterize the effectiveness of each treatment system. Terraphase would also need to provide detailed data on the proportionality of each waste stream, in order to demonstrate the contribution of each system to the overall waste generation.

4. In section 3.1 on page 6, Terraphase proposes a sample collection frequency of once per hour during each 8-hour shift. DTSC requires that you collect samples one each half hour, in compliance with the conditions stated in the March 21, 2014 letter.

5. DTSC requires that Terraphase provide an updated implementation schedule to facilitate our accompaniment of their sampling efforts. Please contact us to provide an estimate of when Terraphase can make the updated schedule available to DTSC.

Lastly, as you are aware, California law classifies wastes that exceed total or soluble regulatory thresholds as hazardous wastes, unless excluded by law. DTSC has not made any decisions regarding the future classification of waste from metal shredding operations, including classification based on total or soluble concentrations of constituents listed in Title 22 of the California Code of Regulations. DTSC looks forward to reviewing data generated by the Treatability Study as part of the overall evaluation required by Senate Bill 1249.

If you have any questions or concerns regarding DTSC's comments on the presented bench scale testing data or DTSC's requirements for the full scale demonstration, please contact Ms. Megan Cambridge of my staff at (916) 322-4233 or Megan.Cambridge@dtsc.ca.gov.

Sincerely,

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