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May 18, 2017

Office of Environmental Measurement and Evaluation US EPA - Region I 11 Technology Drive North Chelmsford, Massachusetts 01863

To: Mr. Bart Hoskins, EPA TOCOR

TDF No. 1258A Task Order No. 06 Task No. 01

Subject: Review and interpretation of the sediment toxicity testing results and the sediment analytical chemistry data obtained for the Troy Mills Landfill Superfund site, Troy, NH.

Dear Mr. Hoskins,

The Environmental Protection Agency (EPA) requested that the Environmental Services Assistance Team (ESAT) evaluate two complementary datasets obtained from the Troy Mills Landfill Superfund Site located in Troy, NH, as follows:

- The toxicity data from the amphipod *Hyalella azteca* and the chironomid fly *Chironomus dilutus* exposed for 10 days to seven sediment samples collected in October 2016 from local groundwater seeps by Rockwood Brook (three samples), the forested wetland (two samples), and local reference locations (two samples).
- The analytical chemistry data for the sediment samples collected from the site both in August and October of 2016 to evaluate the nature and extent of contamination by metals and Bis(2-ethylhexyl)phthalate (BEHP).

The purpose of this task is to provide recommendations for monitoring future releases of BEHP and/or metals based on interpreting the available sediment toxicity data and analytical chemistry data.

The Technical Direction Form (TDF) requested the following elements in the deliverable:

- An evaluation of the likelihood of population-level effects to the Benthic Macroinvertebrate (BMI) community in Rockwood Brook and the forested wetland.
- A summary and interpretation of the sediment analytical chemistry data for the samples collected in August and October 2016.
- Recommendations on a future monitoring program of sediment chemical analyses to determine if current risks are stable or increasing.

The major findings of the review are as follows:

#### 1. Sediment toxicity testing results

The sediment toxicity tests identified effects on survival and biomass in both test species only in sediment sample SW-Leach A-01. This sample was collected from an orange-colored seep which supplies most of the surface water flowing through the forested wetland. Significant effects

were not observed in either test species exposed to the remaining four site sediment samples. Based on this first line of evidence, it was concluded that the conditions in Rockwood Brook sediments are unlikely to result in population-level effects to the local BMI community from exposure to seepage, whereas the sediment sample collected from where orange-colored seep water originates at location SW-Leach A-01 caused measurable effects.

#### 2. Sediment analytical chemistry data results

The sediment analytical chemistry data did not identify any particular analyte to explain the toxicity measured in sediment sample SW-Leach A-01. This toxicity, while real, appears to result from unknown causes. It is plausible, but unproven, that the toxic response may be associated with specific physical-chemical conditions (e.g., iron floc) prevailing at the seep itself.

The lack of an obvious chemical signature in the four remaining site sediment samples collected from the forested wetland area and Rockwood Brook, and the two reference samples, corroborated the toxicity test results. Based on this second line of evidence, it was concluded that the conditions in the sediment samples collected from the three Rockwood Brook seeps and seep FW-01 in the forested wetland are unlikely to result in population-level effects to the local BMI community.

#### 3. Recommended monitoring program of sediment chemical analyses

The TDF requested that ESAT develop a monitoring program based only on periodic sediment chemical analyses. Only sediment sample SW-Leach A-01 was toxic. The location from where this sample was collected is the main "source" for the orange-colored water that flows through the forested wetland. That location makes it a logical choice for future monitoring. Yet, the chemical analysis did not identify any analytes that may be responsible for the observed toxic responses.

The lack of an obvious cause for the toxicity in SW-Leach A-01 represents a dilemma for proposing a defensible sediment monitoring program. ESAT discussed this issue with the task order contracting officer representative to try to develop a workable solution. After reviewing all the data, it was concluded that the sediment toxicity at this location was real but could not be linked to any of the measured analytes. In addition, future sampling at location SW-Leach A-01 would not resolve the current disconnect between chemistry and toxicity. As such, it was determined that a sediment chemistry monitoring program could not be developed given the existing conditions at sample location SW-Leach A-01.

The task was authorized on April 17, 2017 under TDF No. 1258. EPA modified the TDF on April 26, 2017 (TDF No. 1258A) requesting to include a map of the August and October 2016 sampling locations and to attach a copy of the Troy Mills sediment toxicity test report as an appendix.

Do not hesitate to contact me at (617)918-8669 or (207)883-4780 with questions or comments.

Sincerely,

Stanislas Pounds

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Review and interpretation of the sediment toxicity testing results and the sediment analytical chemistry data for the Troy Mills Landfill Superfund Site, Troy, NH.

> TDF No. 1258A Task Order No. 06 Task No. 01

> > Submitted to:

The Task Order Contracting Officer Representative Office of Environmental Measurement and Evaluation USEPA - New England Regional Laboratory 11 Technology Drive North Chelmsford, MA 01863-2431

Submitted by:

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May 18, 2017

EPA Contract EP-W-13-021

# 1.0 GENERAL INTRODUCTION

# 1.1 <u>Task Description</u>

The Environmental Protection Agency (EPA) requested that the Environmental Services Assistance Team (ESAT) evaluate two complementary datasets obtained from the Troy Mills Landfill Superfund Site located in Troy, NH (the site), as follows:

- The toxic response data by juveniles of the amphipod *Hyalella azteca* and the chironomid fly *Chironomus dilutus* exposed for 10 days to seven sediment samples collected from seeps at Rockwood Brook, the forested wetland, and other locations at the site in October 2016.
- The analytical chemistry data for the sediment samples collected from the site in August and October of 2016 to evaluate the nature and extent of contamination by metals and Bis(2-ethylhexyl)phthalate (BEHP).

The purpose of the task is to prepare recommendations to monitor future releases of metals and BEHP at one or more of the seeps by interpreting the August and October 2016 sediment toxicity data and analytical chemistry.

The Technical Direction Form (TDF) requested the following elements in the deliverable:

- An evaluation of the likelihood of adverse population-level effects to the Benthic Macroinvertebrate (BMI) community in Rockwood Brook and the forested wetland based on the October 2016 toxicity test results.
- A summary and interpretation of the analytical chemistry data for the sediment samples collected at the site in August and October 2016.
- Recommendations for a monitoring program based on sediment chemical analyses to determine if current risks are stable or increasing.

EPA modified the TDF on April 26, 2017 (TDF No. 1258A). The Agency moved the completion date from April 27, 2017 to May 18, 2017. It requested that the final deliverable include (a) a map showing the August 2016 and October 2016 sediment sampling locations, and (b) a copy of the sediment toxicity test report and the chemical analyses data as appendices to the technical memorandum. For completeness and future reference, ESAT also included a table to this deliverable with the available Global Positioning System (GPS) coordinates for the August and October 2016 sediment sampling locations.

# 1.2 <u>Site History</u>

The Site is located in Troy, NH. Troy Mills Inc. (TMI) manufactured acrylic fabric at this facility and generated hazardous wastes which were stored in over 7,000 55-gallon drums. TMI disposed of these drums in a nearby solid-waste landfill starting in 1967. These drums contained plasticizers, including BEHP, and mineral spirits that included benzene, di-bromo-3-chloropropane, dichloroethene, methyl ethyl ketone, methylene chloride, naphthalene, toluene, and other petroleum-based solvents. Additional drummed waste consisted of pigments, surplus mixes, and tank residuals of vinyl resins, paint resins and top-coating products. TMI ceased its disposal operations in December 2001.

The Site underwent a remedial investigation/feasibility study. This effort resulted in several removal and cleanup actions by EPA and the New Hampshire Department of Environmental Services. Interceptor trenches were installed in September-October 2001 to capture a Light Non-Aqueous Phase Liquid (LNAPL) plume. All the drums were excavated from the landfill and removed for proper off-site

disposal. The former landfill area was covered with a permeable soil cap. Multiple wells were installed around the former landfill to help monitor for groundwater quality.

Orange staining and orange flock are visible at several locations downgradient from the landfill cap. An ecological survey conducted in 2004 observed intense orange staining at the leachate culvert with the bright-orange leachate flowing downgradient through the forested wetland. The coloring is believed to originate from precipitation of metals at several groundwater seeps further upgradient or may be transported from the LNAPL collection area (i.e., the interceptor trenches).

The aquatic habitats of concern at the Site consist of Rockwood Brook and the Rockwood Brook Wetland Study Area. The brook flows south to north and continues to Sand Dam Pond, which is a recreational area located about one mile north of the Site. The brook was surveyed in 2004 and found to be quick-flowing and sandy with an occasional occurrence of silt or cobbles. It is between 1.0 to 2.5 feet deep and consists of about 25% pools and 75% riffles. No aquatic vegetation was observed in the stream, likely due to the high flow rate. Backwater areas creating pooled habitats were also observed.

The wetland area covers about 1.5 acres, and is located between the former drum disposal area and Rockwood Brook. The soils in the marsh next to Rockwood Brook are saturated with water and support common wetland vegetation, such as alder, wool grass, and ferns. White pines and eastern hemlock (amongst others) grow in the upland forested wetland further upgradient. The marsh next to Rockwood Brook was flooded in the past due to beaver activity. The 2016 site visits showed that the beaver dam in that area had been breached, allowing the ponded area behind it to drain and leave behind the current marshy habitat.

This technical memorandum is organized as follows: Section 2 reviews and interprets the sediment toxicity test data for the October 2016 samples, Section 3.0 reviews and interprets the analytical chemistry data for the August and October 2016 sediment samples, Section 4.0 discusses a monitoring program, Section 5.0 provides a summary and conclusions, and Section 6.0 lists the references.

#### 1.3 List of acronyms

- BEHP bis(2-ethylhexyl)phthalate
- BMI benthic macroinvertebrate
- EPA Environmental Protection Agency
- EqP equilibrium partitioning
- ESAT environmental services assistance team
- FW forested wetland
- GPS global positioning system
- HQ hazard quotient
- MDL method detection limit
- LNAPL light non-aqueous phase liquid
- mg/kg milligram per kilogram
- NERL New England Regional Laboratory
- ORNL Oak Ridge National Laboratory
- RB Rockwood Brook
- RSV refinement screening value
- TDF technical direction form
- TMI Troy Mills Incorporated
- TOC total organic carbon
- µg/L microgram per liter

# 2.0 <u>POTENTIAL EFFECTS OF THE SEDIMENT CONTAMINANTS ON THE BENTHIC</u> INVERTEBRATE COMMUNITY

# 2.1 Introduction

EPA visited the site on August 17, 2016 to collect sediment samples from targeted seeps next to Rockwood Brook, in the forested wetland, and from several potential reference locations. The purpose of that preliminary effort was to obtain sediment samples with a wide range of contaminant levels for chemical analyses at the New England Regional Laboratory (NERL) in North Chelmsford, MA. EPA used the results of those analyses to identify specific locations at the site that might provide a range of sediment contaminant levels to help generate a rough dose-response toxicity curve. Based on an evaluation of those initial analytical data, the Agency returned to the site on October 28, 2016 to collect a new batch of sediment samples from five site locations and two reference locations for toxicity testing and chemical analyses.

# 2.2 <u>Review of the sediment toxicity test results</u>

Appendix 1 provides a copy of the sediment toxicity report. Figures 1 and 2 at the end of this technical memorandum show the August and October 2016 sediment sampling locations, respectively, whereas Attachments 1.1 and 1.2 provide the GPS coordinates for both sampling efforts. Table 1 in Appendix 1 describes each location sampled for sediment in October 2016.

The October 2016 effort targeted sediments from (a) two reference locations, one in the forested wetland (i.e., FW-ref) and one in Rockwood Brook (i.e., RB-ref), and (b) five seeps (i.e., SW-Leach A-01, SW-Leach A-02, FW-01, RB-02, RB-03). SW-Leach A-01 represents the source of orange-stained seep water which flows downgradient through the forested wetland. The four remaining seeps were located right next to Rockwood Brook (RB-02, RB-03, and SW-Leach A-02) or in the forested wetland itself (FW-01). The Rockwood Brook seep locations can be expected to become part of the stream during high-flow events. Location FW-01 in the forested wetland could become part of the stream system again if beavers were to rebuild the old dam further downgradient in the future.

All seven sediment samples collected in October 2016 were returned to the NERL for chemical analyses and testing. The sediment toxicity tests used juveniles of two commonly-used benthic invertebrate test species, namely the amphipod *H. azteca* and the midge fly *C. dilutus*. The organisms were exposed separately to the seven sediment samples for 10 days under controlled laboratory conditions. The toxicity endpoints of interest were survival (both species), dry-weight biomass (*H. azteca*), and ash-free biomass (*C. dilutus*).

The statistical analysis of the *H. azteca* and *C. dilutus* survival and biomass data from the five site sediment samples compared to their respective reference samples showed a significant effect on both endpoints only in the organisms exposed to sediment sample SW-Leach A-01. No significant effect on survival or biomass was noted for organisms of either species in the remaining four site samples when compared to their reference samples.

The results of the *C. dilutus* test should be interpreted with some caution due to the unexpected presence of predatory species in several of the test vessels. An empty caddisfly casing, and no surviving test organisms, was found in replicate 2 of reference sample RB-ref. A live damselfly larva was also found in replicate 5 of sample RB-ref; only 30% of the test organisms survived. In addition, a live caddisfly larva was found in replicate 1 and a live damselfly larva was found in replicate 2 of sample SW-Leach A-02. No test organisms survived in those two replicates (see Tables 2 and 4 in **Appendix 1** for details).

The available toxicity data show that the conditions in sediment sample SW-Leach A-01 resulted in a significant response to both test species when compared to that observed in its reference sample,

whereas the conditions in the remaining four site sediment samples did not elicit a significant response to survival or biomass in either species.

Note that the toxicity testing results could not be used to generate the requested dose-response curve because none of the five site samples resulted in 100% mortality, which is a prerequisite for deriving such a curve.

Based on the toxicity test results, it is concluded that the current conditions in Rockwood Brook are unlikely to result in population-level effects to the local BMI community from exposure to seepage containing metals or BEHP. Exposure to sediment collected at seep SW-Leach A-01 located at the head of the forested wetland is expected to have population-level effects on the BMI community that may be present in this wetland.

# 3.0 SUMMARY OF THE 2016 SEDIMENT ANALYTICAL DATA

#### 3.1 Introduction

The two sets of sediment samples collected by EPA from the site in August and October of 2016 were analyzed for heavy metals and BEHP. Mercury was analyzed in the August, but not in the October, samples. The Agency determined, after reviewing the August 2016 analytical data, that mercury was not a concern at this site and therefore would not be analyzed in the subsequent set of sediment samples.

**Appendix 2** and **Appendix 3** to this technical memorandum provide the raw analytical data for the August and October 2016 sediment sampling events, respectively. This information was augmented by calculating Hazard Quotients (HQs) for each analyte to help place the chemical concentrations into a broader ecotoxicological context. This approach converted the raw analytical data into HQs by dividing the measured concentrations, or one half the detection limit if an analyte was not present above its Method Detection Limit (MDL), by the Refinement Screening Values (RSVs) presented in Table 2a of EPA (2015).

RSVs are considered low-effect sediment benchmarks used in Step 3.a of a baseline ecological risk assessment. Hence, they are less conservative than the no-effect screening benchmarks typically used in screening-level ecological risk assessments. This approach is appropriate given the state of the Troy Mills site, i.e., post-remediation and under long-term observation. EPA (2015) did not include RSVs for cobalt, vanadium, and BEHP. The benchmark for cobalt used in the current assessment is the "ecological screening value" (i.e., a no-effect screening level) presented in EPA (2015), whereas the benchmark for vanadium is a no-effect screening value developed by Thompson *et al.* (2005). The benchmark for BEHP is discussed in the next subsection.

An HQ below 1.0 shows that the exposure concentration falls below the benchmark and that ecological risk is unlikely. An HQ above 1.0 shows that the exposure concentration exceeds the benchmark and that a potential for ecological risk may be present. The more an HQ exceeds 1, the higher a potential for risk is assumed to the present. Note, however, that the increase in risk should not be assumed to be linear.

All the HQs for each sediment sample were summed to generate a combined number called "total risk" to help with the data interpretation and risk discussion below. Summing the sample-specific HQs in no way implies that risk is expected to be additive across the various analytes. Instead, this mathematical approach is used only as a simple and convenient tool to represent each sediment location at the site by a single standardized summed value. This number can then be directly compared against the "total risk" calculated for all the other sampling locations instead of having to evaluate the analytical data by looking at individual chemical concentrations or HQs.

# 3.2 Ecotoxicity of BEHP

EPA identified BEHP as a potential site-related contaminant. However, the data interpretation under the current TDF identified a major source of uncertainty with the two sediment benchmarks published for this analyte: EPA Region 4 recommends a screening benchmark of 0.182 mg/kg (and a refinement benchmark of 2.65 mg/kg), whereas the Oak Ridge National Laboratory (ORNL) recommends a screening benchmark of 890 mg/kg. Both benchmarks come from reputable sources but differ by over four orders of magnitude. Using the lower benchmark of 0.182 mg/kg would identify the potential for toxicity from BEHP in several of the sediment samples collected from the site, particularly in sample SW-Leach A-01 ([BEHP] = 56 mg/kg, resulting in an HQ of 308), whereas using the higher benchmark of 890 mg/kg would show that none of the measured concentrations of BEHP in sediment are of concern, including in sample SW-Leach A-01.

# Sources for the BEHP sediment ESVs

The EPA Region 4 BEHP sediment no-effect benchmark of 0.182 mg/kg was derived based on the "narcotic mode of action" (EPA, 2015) but does not appear to account for the Total Organic Carbon (TOC) content of the sediment. The available information in EPA (2015) is also unclear exactly how this value was derived.

The BEHP sediment benchmark of 890 mg/kg published by ORNL (Jones *et al.*, 1997) was developed using the Equilibrium Partitioning (EqP) approach for non-ionic organic compounds developed by EPA (EPA, 1993). Calculating a sediment benchmark using the EqP approach requires the following three input variables: a chronic surface water criterion ( $\mu$ g/L), a sediment-water partitioning coefficient (K<sub>d</sub>; L/kg), and a measured or assumed sediment TOC. The ORNL sediment benchmark of 890 mg/kg for BEHP is normalized to a sediment TOC of 1%. This benchmark would increase by a factor of 5 if the sediment TOC equaled 5% instead of the standard 1%. Conversely, this benchmark would decrease by a factor of 2 if the sediment TOC equaled 0.5% instead of the standard 1%. As an aside, the TOC levels were not measured in any of the August or October 2016 sediment samples collected at the Try Mill site.

ESAT reviewed the supporting evidence for the two BEHP sediment benchmarks. After consultation with the Agency, it was decided that ESAT would perform a focused literature search on the toxicity of BEHP in sediment to provide more supporting information to help select the correct benchmark for use in the analytical data evaluation.

# Selection of the BEHP sediment benchmark for use in the evaluation

The result of the literature search identified many published papers on the toxicity of BEHP to aquatic organisms (*i.e.*, invertebrates, fish, amphibians) exposed to this compound in surface water. With a few exceptions, the general consensus was that BEHP is not toxic to aquatic organisms up to its natural maximum water solubility of  $3 \mu g/L$  (e.g., Rhodes *et al.*, 1995; Staples *et al.*, 1997; Call *et al.*, 2001a).

ESAT only found two published papers that discussed the toxicity of BEHP to BMI in sediment. Both papers showed that BEHP is not toxic to BMIs even at high concentrations:

- Brown *et al.* (1996) exposed larvae of the midge *Chironomus riparius* for 28 days to natural river sediment spiked with 100, 1000, and 10000 mg/kg BEHP. The authors did not observe a significant reduction in the % emergence in any of the three exposure concentrations at the end of the exposure period.
- Call *et al.* (2001b) evaluated the effects of seven phthalate plasticizers (including BEHP) to the freshwater amphipod *Hyalella azteca* and the midge *C. tentans* exposed to spiked sediment samples (TOC = 4.8%) for 10 days. BEHP was tested at a single sediment concentration of

between 2,100 and 3,200 mg/kg dry weight. The authors reported no effect on survival or growth in either species. They remarked that these results were consistent with predictions derived from water-only tests and the EqP theory.

Finally, Naito *et al.* (2006) used the EqP approach to derive a no-effect sediment benchmark for BEHP equal to 615 mg/kg (based on 5% TOC) using the EqP approach and conservatively assuming a surface water toxicity threshold at the maximum water solubility of 3 µg/L.

Based on this body of evidence, ESAT concluded that the EPA R4 sediment benchmark of 0.182 mg/kg for BEHP was unrealistically low and instead selected the ORNL value of 890 mg/kg for use in the evaluation presented in the next subsection.

#### 3.3 Evaluation of the sediment analytical chemistry data

As explained in Section 2.1 above, the sediment concentration data were used to calculate HQs to support an ecotoxicological evaluation. **Appendices 2 and 3** provide the raw analytical data, the HQs and the "total risk" for each location at the site sampled in August and October of 2016, respectively. **Attachment 2** summarizes the HQs and "total risks" across the sampling locations and dates. This information can be interpreted as follows:

- The "total risk" for the two sediment reference samples collected in August and October 2016 ranged between 3.3 and 5.0.
- Except for FW-01 in August 2016 and SW-Leach A-01 on both sampling dates, the "total risk" for all the other sediment samples generally fell within the range observed in the two reference samples.
- The "total risk" was similar in the sediment samples collected in August and October 2016, except for samples FW-01 and SW-Leach A-01 in which "total risk" roughly decreased by half between those two dates. The decrease in risk appears to be mainly associated with drops in the concentrations of barium, iron, manganese, silver and/or vanadium. Note, however, that silver was not detected in SW-Leach A-01 in either the August or October 2016 sediment sample; instead the HQs for this metal were derived using one-half the MDL and are therefore uncertain.
- Except for a handful of analytes in sample SW-Leach A-01 collected in August 2016, the vast majority of the HQs fall below 1.0, with none exceeding 2.0. This general pattern suggests a low likelihood of sediment toxicity from the measured analytes in all the sediment samples collected from the site in October 2016.

As summarized in Section 2.2 above, sample SW-Leach A-01 was the only one of the five site sediment samples collected in October 2016 which showed significant toxicity to both benthic test species. The information summarized in **Attachment 2** does not identify any obvious analyte that may have caused this toxicity. The exceedances above 1.0 of the individual HQs in this sample are small, with none surpassing 1.8. ESAT's past experience with previous sediment toxicity tests at other sites does not suggest that these few minor exceedances would, by themselves, be responsible for the toxic response measured in this sample. The exact reason for the toxicity in sediment sample SW-Leach A-01 is unknown and cannot be resolved based on the available analytical chemistry data. It appears plausible, but unproven, that the observed toxic effects may be associated with specific physical-chemical conditions prevailing at the seep itself (e.g., severe iron floc).

# 4.0 RECOMMENDATION FOR A MONITORING PROGRAM

The TDF requested that ESAT recommend a simplified monitoring program based only on periodic sediment chemical analyses. The information discussed in Section 2.0 and 3.0 above, and summarized in **Attachment 2**, established that only sediment sample SW-Leach A-01 collected in October 2016 was toxic

to the two benthic invertebrate species used in the test. The location from where this sample was collected (by the culvert under the road) serves as the most important source for the water that then flows through the forested wetland. That location would be the logical choice for future monitoring. Yet, the chemical analysis of this sample for metals and BEHP did not identify any analytes that might plausibly be responsible for the observed effects.

The lack of an obvious cause behind the toxicity in SW-Leach A-01 represents a serious dilemma with proposing a defensible future sediment monitoring program. After all, such a program requires a clear analytical trigger point that would be used to decide on the need for further action (e.g., additional sampling; renewed toxicity testing; remedial action implementation). The fact that the sediment sample collected at SW-Leach A-01 in October 2016 caused an obvious toxic response that could not be linked to one or more Superfund-regulated analytes greatly limits the scope of any future monitoring program at this site.

ESAT discussed this issue at length with the Task Order Contracting Officer Representative (TOCOR) in an attempt to develop a workable solution. The conclusions of that discussion were as follows: (a) the forested wetland consists of several shallow pools that provide small patches of marginal aquatic habitat within an existing stand of pines, (b) the water and the substrate in these pools are colored bright orange as a result of iron precipitation, (c) discharge from the seep at sampling location SW-Leach A-01 and additional smaller seeps in the forested wetland do not appear to reach the emergent marshy area located further downgradient next to Rockwood Brook, and (d) none of the analytes measured in the October 2016 SW-Leach A-01 sediment sample can explain the observed toxicity to the benthic invertebrate species.

The sediment toxicity observed at this location, while real, cannot be readily linked to the measured analytes. In addition, future sampling at location SW-Leach A-01 appears unlikely to resolve the current disconnect between chemistry and toxicity. It also appears that the toxicity may be linked to seep-related physical-chemical conditions instead of specific analytes regulated under Superfund. As such, it was determined that a defensible sediment analytical chemistry monitoring program could not be developed given the existing conditions at sample location SW-Leach A-01.

# 5.0 SUMMARY AND CONCLUSION

EPA tasked ESAT with evaluating two complementary datasets obtained from the Troy Mills Landfill Superfund Site, as follows: (a) the toxicity data of seven sediment samples collected in October 2016 from seeps by Rockwood Brook and the forested wetland to evaluate the potential effects of exposure to metals and BEHP on *H. azteca* and *C. dilutus*, and (b) the analytical chemistry data for the sediment samples collected in August and October of 2016 from the site. The TDF requested that ESAT interpret these two independent lines of evidence and recommend a monitoring program of sediment chemical analyses to determine if current risks may be stable or increasing in the future.

# Sediment toxicity testing results

The sediment toxicity tests identified a significant effect on survival and biomass in both benthic invertebrate species exposed to sample SW-Leach A-01 collected in October 2016. This sample was collected from a seep not directly associated with either the forested wetland area or Rockwood Brook, and also does not represent viable BMI habitat. Significant effects were not observed in either test species exposed to the remaining four site sediment samples. Based on this first line of evidence, it was concluded that the current conditions in Rockwood Brook are unlikely to result in population-level effects to the local BMI community from exposure to seepage from the site. However, conditions in the forested wetland, as represented by sample SW-Leach A-01, might impact the local BMI population in that habitat.

# • Sediment analytical chemistry data results

The sediment analytical chemistry data did not identify any particular analyte that could plausibly explain the severe level of toxicity measured by the two test species exposed to sediment sample SW-Leach A-01 collected in October 2016. The observed toxicity, while real, appears to result from unknown causes. It seems plausible, but unproven, that the toxic response may be associated with specific physical-chemical conditions prevailing at the seep itself (e.g., iron floc).

The lack of an obvious chemical signature in the four remaining site sediment samples collected from the forested wetland area and Rockwood Brook, and the two reference samples, corroborated the toxicity test results. Based on this second line of evidence, it was concluded that the existing levels of metals and BEHP in sediment collected at seeps associated with Rockwood Brook and the forested wetland are unlikely to result in population-level effects to the local BMI community from exposure to seepage from the site.

#### Recommended monitoring program of sediment chemical analyses

The TDF requested that ESAT develop a monitoring program based on periodic sediment chemical analyses. Only sediment sample SW-Leach A-01 was toxic. The location from where this sample was collected is the main source for the orange-colored water that flows through the forested wetland. That location makes it a logical choice for future monitoring. Yet, the chemical analysis did not identify any specific analytes responsible for the observed toxicity.

The lack of an obvious cause for the toxicity in SW-Leach A-01 represents a dilemma for proposing a defensible sediment monitoring program. ESAT discussed this issue with TOCOR to try to develop a workable solution. After reviewing all the data, it was concluded that the sediment toxicity at this location was real but could not be linked to any of the measured analytes in the sediment sample. In addition, future sampling at location SW-Leach A-01 would not help resolve the current disconnect between chemistry and toxicity. As such, it was determined that a sediment chemistry monitoring program could not be developed given the existing conditions at sample location SW-Leach A-01.

# 6.0 REFERENCES

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FIGURES

Figure 1: August 17, 2016 sediment sampling locations, Troy Mills Landfill Superfund Site, Troy Mills, NH

	NUMERAL PROPERTY OF AN	TO PERSON AND AND ADDRESS OF A DRESS OF
Sample	Coordinates	
FW Ref	42° 48.145'N. 7	2° 11.307'W
RB Ref	42° 48.218'N, 7	2° 11.292'W
RB 01	42° 48.201'N, 7	2° 11.276'W
RB 02	42° 48.215'N, 7	2° 11.272'W
RB 03	42° 48.258'N. 7	2° 11.284'W
RB 04	42° 48.264'N, 7	2° 11.277'W
RB 05	42° 48.269'N, 7	2° 11.270'W
FW 01	42° 48.169'N, 7	2° 11.284'W
SW Leach A-01	42° 48.170'N, 7	2° 11.246'W
SW Leach B-01	42° 48.250'N, 7	2° 11.279'W



FW REF

**RB REF** 

RB 01

FW 01

Google Earth \* the locations of samples RB 04 and SW-LEACH B-01 were estimated

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**RB 02** 

RB 05

RB 03 RB 04



SW-LEACH A-01



300 ft

Figure 2: October 28, 2016 sediment sampling locations, Troy Mills Landfill Superfund Site, Troy Mills, NH

	<ul> <li>Alle Ales CARE and an entry of the state of</li></ul>
Sample	Coordinates
FW-01	42° 48.155'N, 72° 11.289'W
SW-Leach A-01	42° 48.169'N, 72° 11.246'W
SW-Leach A-02	42° 48.201'N, 72° 11.270'W
RB-02	42° 48.208'N, 72° 11.279'W
RB-03	42° 48.258'N, 72° 11.283'W
FW-Ref	42° 48.134'N, 72° 11.286'W
RB-Ref	42° 48.214'N, 72° 11.295'W



FW-01

RB-03



Google Earth

© 2016 Google

# Legend

- FW-01 FW-Ref
- RB-02
- RB-03
- RB-Ref
- SW-Leach A-01
- SW-Leach A-02

# SW-Leach A-02

# SW-Leach A-01

ATTACHMENTS

Attachment 1.1: GPS coordinates for the August 17, 2016 sediment sampling effort, Troy Mills Landfill Superfund Site, Troy Mills, NH										
Sample location GPS Coordinates										
FW-Ref	42°48.145'N	72°11.307'W								
RB-Ref	42°48.218'N	72°11.292'W								
RB-01	42°48.201'N	72°11.276'W								
RB-02	42°48.215'N	72°11.272'W								
RB-03	42°48.258'N	72°11.284'W								
RB-04	42°48.264'N	72°11.277'W								
RB-05	42°48.269'N	72°11.270'W								
FW-01	42°48.169'N	72°11.284'W								
SW-Leach A-01	42°48.170'N	72°11.246'W								
SW-Leach B-01	42°48.250'N	72°11.279'W								

Attachment 1.2: GPS coordinates for the October 28, 2016 sediment sampling effort, Troy Mills Landfill Superfund Site, Troy Mills, NH										
Sample location GPS Coordinates										
FW-01	42°48.155'N	72°11.289'W								
SW-Leach A-01	42°48.169'N	72°11.246'W								
SW-Leach A-02	42°48.201'N	72°11.270'W								
RB-02	42°48.208'N	72°11.279'W								
RB-03	42°48.258'N	72°11.283'W								
FW-Ref	42°48.134'N	72°11.286'W								
RB-Ref	42°48.217'N	72°11.295'W								

	Allacini	ient z. su	mmary 0	i the naza	ra quotie	ents and		sinthe	seannent	samples	conected	1100011	locations	at the Tr	Oy IVIIII La	numi su	pertuna s	ite in Aug	ust and t	JCLOBET Z	010	
	FW	-ref	RB	-ref	FW	-01	RB	-01	RB-02 RB-03 RB-04				RB-05		SW-Leach A-01		SW-Leach A-02		SW-Lea	ach B-01		
Analyte	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016	Aug 2016	Oct 2016
Aluminum	0.2	0.1	0.2	0.2	0.3	0.2	0.2		0.2	0.2	0.2	0.3	0.2		0.1		0.1	0.2		0.2	0.2	
Antimony	0.0	0.1	0.1	0.1	0.1	0.1	0.1		0.0	0.1	0.1	0.1	0.1		0.0		0.6	0.4		0.1	0.0	
Arsenic	0.2	0.1	0.1	0.1	0.3	0.1	0.0		0.1	0.1	0.1	0.1	0.1		0.0		0.9	0.2		0.1	0.1	
Barium	1.1	0.8	1.3	1.1	2.0	1.2	1.0		0.9	0.98	1.3	1.4	0.8		0.5		3.7	1.8		1.2	0.8	
Beryllium																						
Cadmium	0.1	0.1	0.1	0.1	0.2	0.1	0.1		0.1	0.1	0.1	0.1	0.1		0.1		1.4	0.5		0.1	0.1	
Chromium	0.1	0.1	0.1	0.1	0.2	0.1	0.1		0.1	0.1	0.1	0.2	0.1		0.1		0.1	0.2		0.1	0.1	
Cobalt	0.1	0.1	0.1	0.1	0.4	0.2	0.1		0.1	0.1	0.2	0.3	0.3		0.1		0.3	0.1		1.1	0.1	
Copper	0.1	0.1	0.1	0.1	0.2	0.1	0.1		0.1	0.1	0.1	0.1	0.1		0.0		0.1	0.2		0.1	0.1	
Iron	0.3	0.2	0.4	0.4	1.4	0.5	0.3		0.2	0.2	0.4	0.4	0.4		0.2		9.5	1.8		0.7	0.5	
Lead	0.4	0.1	0.2	0.1	0.3	0.2	0.1		0.1	0.1	0.2	0.2	0.1		0.1		0.1	0.0		0.1	0.1	
Manganese	0.2	0.2	0.2	0.3	1.6	0.5	0.3		0.1	0.1	0.5	0.5	0.4		0.2		1.1	0.8		1.1	0.4	
Mercury	0.2		0.1		0.3		0.1		0.1		0.1		0.0		0.0		0.1				0.1	
Nickel	0.2	0.1	0.2	0.2	0.4	0.2	0.2		0.2	0.2	0.2	0.3	0.2		0.1		0.3	0.3		0.2	0.1	
Selenium	0.1	0.1	0.1	0.1	0.2	0.1	0.1		0.1	0.1	0.1	0.1	0.1		0.1		1.4	0.5		0.1	0.1	
Silver	0.3	0.3	0.3	0.3	0.5	0.3	0.3		0.2	0.3	0.3	0.3	0.3		0.2		3.2	1.2		0.2	0.3	
Thallium																						
Vanadium	1.2	0.5	1.2	0.9	1.5	0.96	0.8		0.8	0.8	1.0	1.1	0.9		0.4		3.1	1.4		0.9	0.8	
Zinc	0.2	0.1	0.1	0.1	0.3	0.2	0.1		0.2	0.8	0.2	0.2	0.1		0.1		0.1	0.2		0.1	0.1	
BEHP	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.1		0.0	0.0	
"total risk"	5.0	3.3	4.9	4.3	10.1	5.2	4.1		3.5	4.5	5.3	5.7	4.3		2.3		26.0	10.0		6.4	4.0	
Toxicity?		no		no		no				no		no						ves		no		

APPENDICES

# **APPENDIX 1**

TOXICITY TEST REPORT FOR SEDIMENT SAMPLES COLLECTED ON October 2016 FROM THE TROY MILLS LANDFILL SUPERFUND SITE, TROY MILLS, NH

#### Results for 10-Day Sediment Toxicity Tests Using *H. azteca* and *C. dilutus* Troy Mills Landfill Superfund Site Troy, NH

Submitted to the:

Task Order Contracting Officer Representative Office of Environmental Measurement and Evaluation USEPA - New England Regional Laboratory 11 Technology Drive North Chelmsford, Massachusetts 01863

Submitted by:

ESAT - Region I EP-W-13-021

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> TDF No. 1144 Task Order No. 06 Task No. 04

> > March 3, 2017

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- Appendix F Sampling Map

#### 1.0 INTRODUCTION

This report describes the toxicity testing results of 7 sediment samples that were collected from two general areas (Rockwood Brook and Rockwood Brook Wetland Study Area, WSA) and two specific surface water seeps (SW-Leach A-01 and SW-Leach A-02) at the Troy Mills Landfill Superfund Site (the Site) in Troy, NH. Two reference sediment samples were also collected, one associated with each general sampling area, the Forested Wetland and Rockwood Brook.

Troy Mills, Inc. (TMI) manufactured acrylic fabric at its facility. TMI disposed of around 7,670 drums in the 2acre landfill dating back to 1967. TMI ceased disposal operations in December 2001. The site is bordered to the north by an inactive but regulated 8-acre solid-waste landfill. The solid-waste landfill is not part of the Superfund site. The ecological habitats of concern at the site are Rockwood Brook and the Rockwood Brook WSA. The latter is located to the northwest of the TMI between the former drum disposal area and Rockwood Brook. The soils in the WSA are water-saturated and support wetland plants. Beavers constructed a dam across from the access road to a gravel pit downstream from the Site which resulted in a beaver pond located directly downstream from the confluence of the West Branch and East Branch of Rockwood Brook. The United States Environmental Protection Agency (EPA) noted during an August 17, 2016 site visit that this beaver dam had been breached, draining the beaver pond and revealing groundwater seeps in the wetland area. Two channels currently run through this area; the first one occurs along the eastern edge of the former beaver pond closer to the site, whereas the second one occurs in the middle of the former beaver pond and is farther from the site. Orange staining and orange floc are visible at the leachate culvert, the point of discharge from the Troy Mills landfill, and into the wetland area. Iron floc was also noted during the site visit by EPA on August 17, 2016.

The 7 sediment samples from the Site and reference locations were collected on October 28, 2016. The Environmental Services Assistance Team (ESAT) assisted with the sampling conducted by the EPA New England Regional Laboratory (NERL) out of North Chelmsford, MA. All sediment samples were delivered to the NERL and were kept at 4°C until test initiation. An aliquot sample was collected and submitted to the NERL Chemistry section for analysis of metals and BNAs.

#### 1.2 Technical Direction Forms

The EPA issued Technical Direction Form (TDF) No. 1144 on October 18, 2016. The TDF requested that ESAT perform a two-species bulk sediment toxicity test on 7 samples collected from the Troy Mills Landfill Superfund Site. The TDF instructed that split samples would be collected and submitted to the NERL Chemistry section for analysis of metals and BNAs.

#### 2.0 STUDY OBJECTIVES

As requested under the TDF, ESAT helped EPA collect 7 sediment samples on October 28th, 2016 and transported them to the NERL for toxicity testing and chemical analyses. The samples were collected according to the Standard Operating Procedure (SOP) for sediment collection (EPA 2016). ESAT used samples collected for biological toxicity testing in a 10-day aquatic toxicity test using juveniles of the benthic freshwater amphipod, *Hyalella azteca*, and larvae of the midge fly, *Chironomus dilutus*.

The objective was to determine if responses by the test organisms exposed to Site sediment samples collected from Rockwood Brook and the WSA differed significantly from the responses measured in the two reference sediment samples. The WSA and Rockwood Brook were evaluated to determine the current extent of contaminated sediment and whether some areas may need to be re-assessed for ecological risk to benthic invertebrates. A laboratory control sample was included in the toxicity test to verify that the organisms were heathy and that the test passed Test Acceptability Criteria (TAC) specified by (EPA 2002).

The toxicity endpoints measured at the end of the 10-day exposure period consisted of survival and biomass for *H. azteca* and survival and ash-free biomass for *C. dilutus*. Survival was determined by counting the number of live organisms in each replicate at the end of the test. Biomass was obtained by weighing the surviving organisms in each replicate and dividing that weight by the number of organisms introduced at the start of the test (i.e., 10). The *H.* 

*azteca* biomass was based on the dry weight of the surviving organisms, whereas the *C. dilutus* biomass was based on the ash-free dry weight of the surviving organisms.

# 3.0 MATERIALS & METHODS

# 3.1 Sediment Sample Collection Locations

**Table 1** lists sediment sample location information, collection dates, and sample IDs for all collected samples.

#### Rockwood Brook

Rockwood Brook is located to the northwest of TMI. The "lower access road" runs along the western side of the landfill and divides the landfill area from the wetland. Three main channels of Rockwood Brook, all flowing south to north, were sampled for sediment. The most southern branch, called the "Rockwood Eastern Branch", flows parallel to the access road and through the forested wetland. It eventually joins the main branch of the Rockwood Brook to the north and enters the southern point of the former beaver pond which is not forested. The brook then branches into two separate channels, one to the west and one to the east. The east channel of the brook flows along the eastern boarder of wetland closer to the site and is directly fed by the staining seeps from TMI flowing under the access road. The west channel flows parallel down the center of the former beaver pond and does not come into contact with any seeps and shows no visual signs of contamination from TMI.

#### WSA

The Rockwood Brook WSA is located to the south of the former beaver pond. It is a forested wetland area where the eastern branch of Rockwood Brook flows through before connecting with the main branch and splitting into the east and west channels in the former beaver pond.

**Appendix A** provides the chain-of-custody records for all the sediment samples. **Appendix E** provides the site sample locations map

#### 3.2 Toxicity Testing Methods

Two Parallel 10-day sediment toxicity tests were run using juveniles of the freshwater amphipod, *H. azteca*, and larvae of the midge-fly, *C. dilutus*.

The tests started on November 8, 2016 and ended on November 18, 2016. They followed the procedures presented in (EPA 2014). The test chambers consisted of 300-ml glass beakers with Nitex-covered notched openings and cheesecloth attached to the outside to allow for a flow-through system. Eight replicates per species were used for each sediment sample. Artificial sediment, consisting of a prescribed mixture of fine sand, medium sand, ASP 400 (kaolin), calcium carbonate, alpha cellulose and humic acid was used for the laboratory control (EPA 2014). Each test chamber received about 100 ml of lab control or site sediment and was placed into the Sediment Toxicity Testing System (STTS) at the NERL one day before the test organisms were added. Following the introduction of sediments, one renewal cycle was run in the STTS to fill the test vessels with overlying water, which consisted of 90 mg CaCO<sub>3</sub>/L Hardness Process Water (HPW). The vessels were left to sit overnight undisturbed. The overlying water was tested for conductivity, pH and Dissolved Oxygen (DO) before the test organisms were introduced. The hardness and alkalinity of each new batch of water used during the test was checked to verify that the concentrations of these two parameters fell within an acceptable range (i.e., hardness around 90 mg/L and alkalinity between 60 and 70 mg/L).

Ten second-to-third instar larval stage *C. dilutus* (age 11-12 days) were randomly introduced to each test chamber for the midge test. Ten juvenile *H. azteca* that had been sieved through a #60 sieve three days prior to the test were introduced into each test chamber for the amphipod test. Healthy and active organisms were chosen and carefully transferred, keeping each one completely submerged in water from the holding tray to the test chamber. The test chamber temperatures were kept at  $23 \pm 1^{\circ}$ C with a 16:8-hour light/dark cycle using cool-white fluorescent lights for the duration of the toxicity tests. Water renewals initially occurred once daily using the automatic renewal system associated with the STTS. The renewal cycle for the test banks containing the *C. dilutus* was adjusted to twelve hour intervals during the test when measured DO levels fell below 4.0 mg/L.

Each *H. azteca* replicate was fed 1.0 ml of a Yeast-Alfalfa-Fish flake chow mixture (YAF) daily after the

morning renewals. Each *C. dilutus* replicate was fed 1.5 ml of 4 g/L Tet-Shake daily after the morning renewals. Water flow, renewal time, light intensity, and the minimum and maximum temperatures were recorded daily in the STTS monitoring log. The C. *dilutus* beakers were fed only 0.75 mL Tet-shake on days 3 and 6 and 1.0 mL on days 4 and 5 of testing due to low DO values in sample SW-Leach A-02 (3.97 mg/L).

Temperature, pH, DO, conductivity, hardness, alkalinity, and ammonia were measured in a composite sample of overlying water from the eight replicates for each sample location at the start of the test (day 0) and recorded in the Biology Chemistry log book. Temperature, pH, DO, and conductivity were measured each subsequent morning throughout the exposure period in composite samples of overlying water obtained from each sample station and each test species. Temperature, pH, DO, and conductivity were also measured in composite samples of overlying water for each sample station and test species at the end of the 10-day exposure period. **Appendix B** and **Appendix C** present the water chemistry data for the *H. azteca* and *C.dilutus* tests, respectively. These data are further discussed in **Section 4.1**.

The renewal cycle was ended on day 10 of the tests. The surviving test organisms were retrieved from each beaker, rinsed with deionized water to remove any debris and placed on small pre-weighed, pre-labeled aluminum pans. The surviving number of organisms from each replicate was obtained from each pan and recorded on bench sheets. The organisms in the pans were dried overnight at 100°C and then weighed to obtain dry weights. The *C. dilutus* were then ashed for an additional 2 hours at 550°C in a muffle furnace in order to obtain an Ash-Free Dry Weight (AFDW) for each replicate. The combined dry weights of the organisms in each replicate were recorded in the Biology Laboratory Organism Weight Logbook. **Appendix D** provides all the laboratory bench sheets.

#### 3.3 Statistical Analysis Methods

Statistical analyses of the survival and biomass data for both test species were conducted using CETIS ® (Comprehensive Environmental Toxicity Information System) v. 1.8.7.16 according to the EPA decision tree in (EPA 2000). The survival and biomass data from each species were analyzed separately.

**Appendix D** provides the CETIS <sup>®</sup> statistical print-outs. Biomass for *C. dilutus* was calculated by dividing AFDW by the number of introduced organisms per replicate at the end of the test and reported as the average sample Ash-Free Dry Biomass (AFDB). Biomass for *H. azteca* was calculated by dividing the dry weights by the number of introduced organisms per replicate at the end of the test. Final dry weights were divided by the number of introduced organisms and reported as the average sample dry biomass.

# 4.0 RESULTS

# 4.1 Sediment Toxicity Test Overlying Water Chemistry

#### H. azteca

The conditions in the test vessels met the performance criteria for daily overlying water chemistry requirements (EPA 2000), as indicated in **Appendix B**. The overlying water temperatures, as measured during the daily chemistry checks, deviated no greater than ±1°C from 23°C, ranging between 22.01°C and 23.54°C during the 10-day test period.

Conditions of the STTS banks were maintained according to SOP (EPA 2014). Instances occurred when the STTS bank temperatures deviated out of the 23°C±1°C range. On days 1 and 2, the *H. azteca* banks read just below 22.0°C for the minimum temperatures, adjustments were applied and the banks stayed within range for the remainder of the test. The maximum bank temperatures remained within range throughout the test. The range of temperatures recorded were 21.6 °C to 23.4 °C. The specific temperatures are available in the STTS Monitoring Logbook.

Day 0 (initial water chemistry) NH<sub>3</sub> concentrations in all *H. azteca* samples were non-detect (ND) at <1.0mg NH<sub>3</sub>/L. The NH<sub>3</sub> concentrations on Day 10 (final water chemistry) in all of the exposure chambers were also ND. Ammonia criteria calculations were not performed because all levels were ND.

#### <u>C.dilutus</u>

The conditions in the test vessels met the performance criteria for daily overlying water chemistry requirements (EPA 2000), as indicated in **Appendix B**. The overlying water temperatures, as measured during the daily chemistry checks, deviated no greater than ±1°C from 23°C, ranging between 22.03°C and 23.42°C during the 10-day test period.

Conditions of the STTS banks were maintained according to SOP (EPA 2014). Instances occurred when the STTS bank temperatures deviated out of the 23°C±1°C range. The *C. dilutus* banks read just below 22.0°C for the minimum temperatures on all test days besides on day 9, the minimum had risen to 22.2 °C. The maximum bank temperatures remained within range throughout the test. The range of temperatures recorded were 21.5 °C to 23.1 °C. The specific temperatures are available in the STTS Monitoring Logbook.

Day 0 (initial water chemistry) NH<sub>3</sub> concentrations in all *C. dilutus* exposure chambers were ND at <1.0mg NH<sub>3</sub>/L. The NH<sub>3</sub> concentrations on Day 10 (final water chemistry) in all of the exposure chambers were also ND. Ammonia criteria calculations were not performed because all levels were ND.

#### 4.2 H. azteca Survival & Biomass

The two endpoints for the *H. azteca* test consisted of survival and average dry biomass after 10 days of exposure. The minimum TAC for survival in the laboratory control organisms equals 80% (EPA 2000). The test met this TAC with a control survival of 97.5%.

CETIS first ran separate Analysis of Variance (ANOVA) tests to evaluate the distribution and variance of the two survival datasets, i.e. HA FW-Ref, H SW-Leach A-01 and HA FW-01, plus HA RB-Ref, HA RB-02, HA RB-03, and H SW-Leach A-02. It then further explored the outcome by using the Dunnett Multiple Comparison Test (for HA FW-Ref vs. HA FW-01 and H SW-Leach A-01) and the Steel Many-One Rank Sum Test (for HA RB-Ref vs. the three remaining site samples) to identify any site samples showing significant survival effects.

**Table 2** presents the survival data, whereas **Figure 1** summarizes the outcome of the statistical analyses. The lowest average survival in SW- Leach A-01 (71.253%) was significantly lower compared to its reference FW-Ref (92.5%). The average survival in the four remaining site samples did not differ significantly from that observed in their respective reference samples.

CETIS first ran separate Analysis of Variance (ANOVA) tests to evaluate the distribution and variance of the two biomass datasets, i.e. HA FW-Ref, H SW-Leach A-01 and HA FW-01, plus HA RB-Ref, HA RB-02, HA RB-03, and H SW-Leach A-02. It then further explored the outcome by using the Dunnett Multiple Comparison Test to identify any site samples showing significant survival effects.

**Table 3** presents the biomass data, whereas **Figure 2** summarizes the outcome of the statistical analyses. Average biomass in the organisms exposed to SW- Leach A-01 was significantly lower compared to that measured in its reference FW-Ref. The average biomass in the four remaining site samples did not differ significantly from that observed in their respective reference samples.

#### 4.3 *C. dilutus* Survival & Biomass

The endpoints for the *C. dilutus* test consisted of survival and AFDB after 10 days of exposure. (EPA 2000) specifies that the minimum TAC for survival in the laboratory control organisms equals 70%. The test met this TAC with a control survival of 97.14%.

CETIS first ran separate ANOVAs to evaluate the distribution and variance of the two survival datasets, i.e. Cdi FW-Ref, C SW-Leach A-01 and Cdi FW-01, plus Cdi RB-Ref, Cdi RB-02, Cdi RB-03, and C SW-Leach A-02. It then further explored the outcome by using the Dunnett Multiple Comparison Test (for Cdi FW-Ref vs. Cdi FW-01 and C SW-Leach A-01) and the Wilcoxon/Bonferroni Adj Test (for Cdi RB-Ref vs. the three remaining site samples) to identify any site samples showing significant survival effects.

**Table 4** presents the survival data, whereas **Figure 3** summarizes the outcome of the statistical tests. The lowest average survival in SW- Leach A-01 (22.5%) was significantly lower compared to its reference FW-Ref (90.0%). The average survival in the organisms exposed to the four remaining site samples did not differ significantly from that observed in their respective reference samples. As explained in Section 5 (Discussion), however, part of the reason for the lack of significant effect may be due to the low survival (52.86%) caused by predation measured in reference sample Cdi RB-Ref.

The minimum TAC for growth in *C. dilutus* is 0.48mg of the mean AFDW per surviving organism to occur in the control organisms at the end of the 10-day exposure period (EPA 2000). The test met this TAC.

CETIS first ran separate ANOVAs to evaluate the distribution and variance of the two biomass datasets, i.e. Cdi FW-Ref, C SW-Leach A-01 and Cdi FW-01, plus Cdi RB-Ref, Cdi RB-02, Cdi RB-03, and C SW-Leach A-02. It then further explored the outcome by using the Bonferroni Adjusted *t*-Test to identify any site samples showing significant biomass effects.

**Table 5** provides the average AFDB data, whereas **Figure 4** summarizes the outcome of the statistical tests. AFDB in the organisms exposed to SW- Leach A-01 was significantly lower compared to that measured in the site reference FW-Ref. The average AFDB in the organisms exposed to the remaining four site samples did not differ significantly from that observed in their respective reference samples. As explained in Section 5 (Discussion), however, part of the reason for the lack of significant effect may be due to low survival from predation observed in reference sample Cdi RB-Ref and several other samples.

#### 5.0 DISCUSSION

#### 5.1 *H. azteca* Survival and Biomass

The average survival in the two reference locations equaled 92.5% (HA FW-Ref) and 96.25% (HA RB-Ref). Only one of the five site samples, HA SW-Leach A-01 had a significantly lower average survival compared to its reference sample (HA FW-Ref).

The average dry biomass in the two reference locations equaled 0.098 mg (HA FW-Ref) and 0.094 mg (HA RB-Ref). CETIS used the Dunnett Multiple Comparison Test (for HA FW-Ref vs. HA FW-01 and H SW-Leach A-01) and the Steel Many-One Rank Sum Test (for HA RB-Ref vs. the three remaining site samples) to identify any site samples showing significant effects. Organisms exposed to SW- Leach A-01 showed a significant difference in growth when compared to FW-Ref. No other significant difference was observed in the average dry biomass of the four remaining site samples compared to their associated reference samples. The lowest and highest average dry biomass in the five site samples occurred in H SW-Leach A-01 (0.057mg) and HA RB-03 (0.108mg), respectively.

#### 5.2 *C. dilutus* Survival and Biomass

The average survival in the two reference locations equaled 90% (Cdi FW-Ref) and 52.86% (Cdi RB-Ref). The lowest percent survival was observed in Cdi SW-Leach A-01 (22.5%) while the highest percent survival occurred in Cdi FW-Ref (90%). Only one of the five site samples, Cdi SW-Leach A-01 had a significantly lower average survival compared to its reference sample (HA FW-Ref).

The average AFDW in the two reference locations equaled 1.222 mg (Cdi FW-Ref) and 0.760 mg (Cdi RB-Ref). CETIS used the Bonferroni Adjusted *t*-Test to identify any site samples showing significant biomass effects.

Only one of the five site samples, Cdi SW-Leach A-01 had a significantly lower AFDB compared to its reference sample (HA FW-Ref).

The reference locations had an average biomass of 1.222 mg (FW-Ref) and 0.760 mg (RB-Ref). Sample SW-Leach A-01 had the overall lowest biomass (0.257 mg) and FW-Ref had the highest biomass (1.222 mg).

In sample SW-Leach A-02, a caddis fly was found in replicate 1 and an odonate larvae was found in replicate 2. RB-Ref replicate 2 contained an empty caddis fly casing and had no surviving organisms at test completion. In RB-Ref replicate 6, a large odonate larvae was found and only 3 of the test organisms survived. The low survival in these

sample replicates could be contributed to the presence of a potential predator species but cannot be known for sure, and for this reason the results of the *C. dilutus* test should be used with caution. Initially, RB-Ref replicate 6 was used in the statistical analysis but was later removed to see if a decreased amount of predation in the reference sample could affect the statistical outcome. The results of the statistics showed no difference. The data point was left out of the statistical analysis in the final report.

Several replicates (Cdi Control Rep 4, Cdi RB-03 rep 4, C SW-Leach A-01 rep 1 and C SW-Leach A-01 rep 5) were removed from the *C. dilutus* biomass statistical analysis (Appendix D) due to pan disturbances in the final ash free weight weighing process. Since the final AFDB for these pans could not be accurately determined, they were removed from the statistical analysis. The issues occurred after survival counts had been determined, so the survival statistics are unaffected.

#### 6.0 REFERENCES

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EPA. 2014. ECASOP. Standard Operating Procedure for Static Bulk Sediment Toxicity Testing. Revision 6; 3/18/14.

EPA. 2015. ECASOP CETIS6. Standard Operating Procedure Toxicity Testing Method Using CETIS Version 1.8.7.16. Revision 6; 11/13/2015.

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TABLES

1	Table 1: Sediment toxicity tests sample locations
Sample ID (Collection Date)	Location information
	WSA
FW-Ref (10/28/2016)	Reference for Forested Wetland- A distinct seep of groundwater located upgradient from the source of contamination and upstream of potential seeps in the forested wetland.
FW-01 (10/28/2016)	A seep located in the forested wetland upgradient of SW-Leach-A01 and downgradient of monitoring well MW-A28. This seep is located at the edge of a more open sedge area and a braided stream with pools. This area is visibly stained with floc from the seeps. The sediment sample was collected at the first sign of heavy floc.
SW-Leach A-01 (10/28/2016)	Historical sampling location next to the road. Leach-A01 is a long-recognized seep which has generated a preferential flow pathway for groundwater discharge due to the culvert under the upper access road. This seep is large. Orange precipitation from this seep meanders through a few pooled areas, and eventually shows up at the border of the forested wetland and the emergent wetland. The sediment sample was collected at a point very near the initial discharge.
	Rockwood Brook
RB-Ref (10/28/2016)	Reference for Rock Brook- Located in the middle of the wetland in a distinct channel away from the seeps. This is the western channel that runs through the former beaver pond farther from the site. The channel has no visible staining or flock from groundwater discharges.
RB-02 (10/28/2016)	A seep located upstream to the breached beaver dam and near historical location Sed-03/SW-3. It is also located downstream of SW-Leach-A02
RB-03 (10/28/2016)	A seep with floc located upstream of the breached beaver dam and downstream of Leach-B01, where SW/SE33 enters Rockwood Brook.
SW-Leach A-02 (10/28/2016)	Located along the eastern channel of Rockwood Brook that runs close to the site, where a second seep appears to flow into what used to be the beaver pond. The sediment sample was collected at the edge of the wetland at the lower end of the seep, where a clear line of the end of the flock was noted.

Table 2. Summary of *H. azteca* survival

	HA Lab	HA FW-	HA RB-	HA FW-	HA RB-	HA RB-	H SW-	H SW-
Replicate	Control	Ref	Ref	01	02	03	Leach A-01	Leach A-02
1	100.0	80.0	90.0	100.0	100.0	80.0	80.0	100.0
2	100.0	80.0	100.0	100.0	100.0	100.0	60.0	90.0
3	90.0	90.0	100.0	100.0	80.0	100.0	60.0	100.0
4	100.0	100.0	100.0	90.0	90.0	100.0	100.0	100.0
5	100.0	100.0	80.0	80.0	40.0	100.0	100.0	100.0
6	100.0	100.0	100.0	80.0	90.0	100.0	60.0	90.0
7	100.0	90.0	100.0	100.0	100.0	100.0	50.0	90.0
8	90.0	100.0	100.0	100.0	100.0	90.0	60.0	90.0
Average Survival (%)	97.50	92.50	96.25	93.75	87.50	96.25	71.25	95.00
Standard Deviation (%)	4.6	8.9	7.4	9.2	20.5	7.4	19.6	5.3

# Table 3. Summary of *H. Azteca* dry biomass

	HA Lab	HA FW-	HA RB-	HA FW-	HA RB-	HA RB-	H SW-	H SW-
Replicate	Control	Ref	Ref	01	02	03	Leach A-01	Leach A-02
1	0.068	0.085	0.076	0.109	0.113	0.079	0.079	0.09901
2	0.068	0.073	0.108	0.089	0.113	0.117	0.037	0.088
3	0.067	0.12	0.099	0.099	0.072	0.103	0.06	0.09301
4	0.067	0.117	0.11	0.083	0.09701	0.127	0.069	0.081
5	0.082	0.095	0.062	0.076	0.046	0.112	0.067	0.083
6	0.090	0.11	0.121	0.11	0.118	0.095	0.05	0.113
7	0.085	0.08	0.089	0.124	0.097	0.102	0.049	0.073
8	0.09199	0.103	0.08401	0.104	0.122	0.135	0.049	0.086
Average Dry Biomass (mg)	0.07737	0.09788	0.09363	0.09925	0.09725	0.10875	0.05750	0.08950
Standard Deviation (mg)	0.01098	0.01749	0.01956	0.01584	0.02620	0.01794	0.01369	0.01228

# Table 4. Summary of *C. dilutus* Survival

	Cdi Lab	Cdi FW-	Cdi RB-	Cdi	Cdi	Cdi	C SW-	C SW-
Replicate	Control	Ref	Ref	FW-01	RB-02	RB-03	Leach A-01	Leach A-02
1	100.0	90.0	100.0	90.0	90.0	70.0	0.0	0.0
2	100.0	80.0	0.0	90.0	10.0	50.0	30.0	0.0
3	100.0	80.0	60.0	100.0	80.0	90.0	70.0	90.0
4	90.0	90.0	100.0	100.0	80.0	20.0	20.0	90.0
5	100.0	100.0	30.0	80.0	90.0	50.0	20.0	90.0
6	80.0	100.0	-	100.0	90.0	70.0	10.0	90.0
7	100.0	90.0	80.0	70.0	80.0	50.0	10.0	50.0
8	100.0	90.0	0.0	10.0	50.0	90.0	20.0	90.0
Average Survival (%)	96.25	90.00	52.86	80.00	71.25	61.25	22.50	62.50
Standard Deviation (%)	7.4	7.6	41.1	30.2	28.0	23.6	21.2	41.0

(-) indicates no data, data point was left out of statistical analysis

# Table 5. Summary of *C. dilutus* AFDB

	Cdi Lab	Cdi FW-	Cdi RB-	Cdi FW-	Cdi RB-	Cdi RB-	C SW-	C SW-
Replicate	Control	Ref	Ref	01	02	03	Leach A-01	Leach A-02
1	1.240	1.264	1.331	1.223	0.860	0.788	0.000	0.000
2	1.163	1.197	0.000	1.287	0.131	0.644	0.578	0.000
3	1.301	1.330	0.782	1.379	0.722	0.928	0.787	1.039
4	-	1.279	1.229	1.316	0.691	-	-	1.089
5	1.257	1.281	0.613	1.161	0.917	0.455	-	1.050
6	1.222	1.349	-	1.231	0.748	0.665	0.078	0.670
7	1.313	1.206	1.366	1.060	0.921	0.644	0.038	0.464
8	1.228	0.872	0.000	0.097	0.347	1.039	0.061	0.711
Average Ash-free Dry Biomass	1 246	1 222	0 760	1 004	0.667	0 739	0.257	0.628
(ilig) Standard	1.240	1.222	0.700	1.094	0.007	0.730	0.257	0.020
Deviation (mg)	0.1	0.2	0.6	0.4	0.3	0.2	0.3	0.4

(-) indicates no data, data point was left out of statistical analysis

FIGURES



Figure 1. Outcome of the statistical analyses of the *H. azteca* survival data

Figure 2. Outcome of the statistical analyses of the H. azteca average dry biomass data





Figure 3. Outcome of the statistical analyses of the C. dilutus survival data

Figure 4. Outcome of the statistical analyses of the C. dilutus average AFDB



# APPENDIX A

# Chain-of-Custody Records
6/00036 Troy Mills SAMPLERS: (Signature)			NO.					1/24/						
			OF	OF 13 9 5 PEMARKS					REMARKS					
STA. NO.				ATE TIME OU BE STATION LOCATION		TAINERS	/	10/0	N. C. P.	A CITY				
W-Leach A-DI	10/25/16	1215		X	5ED-16-5W-Leach A-01	3	V	~	$\checkmark$			1		
RB-03	10/28/16	1300		X	SED-16-RB03	5	$\checkmark$	1	~			2 duplia	de co	interiners
2B-REF	10/28/16	1430		X	SED-16-RB-REF	3	1	$\checkmark$	$\checkmark$			L.		
W-Leach A-02	10/2.8/16	1400		X	SED-16-SW-Leach A-O2	3	$\checkmark$	1	$\checkmark$					
FW-01	10/28/16	1100		X	SED-16 - FW-01	3	1	$\checkmark$	1					
FW-REF	10/28/16	1030		X	SED-16-FW-REP	3	1	$\bigvee$	~					
RB-02	10/28/16	1325		X	SED-16- RB-02	3	1	$\checkmark$	1					
Rin-16-BNA	10/28/16	1425	-	×	RIN-16-BNA	2				$\checkmark$		cointainers lab	ebd la	f2 and 20f2
ZIN-K-HE	ALS 1425/12	1425		×	RIN-16-METALS	1			$\checkmark$					*
BTL-16-BNA	10/28/16	1755		X	BTL-16-BNA	1				$\checkmark$				
					· ·									
******														
Relinquis	hed by: 1	Signature		le	Date / Time Received by: (Signatur	e)	Rel	inqui	hed b	iy: (Sig	neture)	Date	/Time	Received by: (Signature)
Relinquis	hed by:	Signature	1		Date / Time Received by: (Signatur	e)	Rei	inquis	hed b	iy: (Sig	nature)	Date	/Time	Received by: (Signature)
Relinquis	hed by:	Signature	1)		Date / Time Received for Laborate (Signature)	ory by:	10	Da	te /T	ime R : Ol	Rem	arks	1	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

Appendix B

Summary of Overlying Water Toxicity Test Chemistry (H. azteca)

#### Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry *H. azteca*

H. azteca 10-day Exposure Test											
Initial Chemistry–Day 0 (11/8/16)											
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)	Hardness (mg/L CaCO <sub>3</sub> )	Alkalinity (mg/L CaCO <sub>3)</sub>	Total Ammonia (mg/L NH3)				
Ha Control	442	8.14	7.46	22.91	104	76	ND				
Ha FW-Ref	335	7.35	6.46	22.98	76	48.5	ND				
Ha RB-Ref	342	7.13	6.27	22.68	72	45	ND				
Ha FW-01	353	7.25	6.59	22.72	80	49	ND				
Ha RB-02	373	7.35	6.89	22.66	84	53	ND				
Ha RB-03	345	7.22	6.83	22.73	72	43.5	ND				
Ha SW-Leach A-01	388	7.25	6.24	22.66	96	64	ND				
Ha SW-Leach A-02	405	7.18	6.26	22.69	100	74	ND				

# H. azteca Sediment Toxicity 10-Day Exposure Test: Troy Mills Inc.

\* ND = Not Detected (<1.0 mg/L)

H. azteca 10-Day Exposure Test								
Waste Chemistry-Day 1 (11/9/16)								
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)				
Ha Control	377	7.95	6.51	22.75				
Ha FW-Ref	335	7.40	6.38	22.78				
Ha RB-Ref	332	7.12	5.51	22.54				
Ha FW-01	370	7.22	6.30	22.27				
Ha RB-02	350	7.28	6.26	22.30				
Ha RB-03	307	7.19	5.43	22.29				
Ha SW-Leach A-01	335	7.18	5.64	22.35				
Ha SW-Leach A-02	408	7.18	5.26	22.59				
H. azteca 10-Day Exposure Test								
Waste Chemistry-Day 2 (11/10/16)								
Sample ID	Conductivity (umhos/cm)	рН	DO (mg/L)	Temperature (°C)				
Ha Control	376	7.90	7.09	22.01				
Ha FW-Ref	328	7.33	6.07	22.04				
Ha RB-Ref	332	7.23	5.81	22.31				
Ha FW-01	365	7.29	6.77	22.03				
Ha RB-02	328	7.30	6.36	22.10				
Ha RB-03	297	7.23	5.66	22.47				
Ha SW-Leach A-01	332	7.27	5.83	22.25				
Ha SW-Leach A-02	397	7.21	4.68	22.12				
	$H_{i}$	<i>azteca</i> 10-Day Expo	osure Test					
	Wa	ste Chemistry-Day 3	<u>3 (11/11/16)</u>					
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)				
Ha Control	403	7.78	5.97	22.87				
Ha FW-Ref	340	7.35	5.46	22.76				
Ha RB-Ref	341	7.19	5.31	22.64				
Ha FW-01	390	7.34	5.79	22.92				
Ha RB-02	349	7.30	5.68	22.77				
Ha RB-03	316	7.29	5.80	22.82				
Ha SW-Leach A-01	339	7.29	5.42	22.77				
Ha SW-Leach A-02	416	7.31	5.29	22.84				

Prepared by: CO 2/3/17 Reviewed By: ZZ 2/3/17

#### Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry *H. azteca*

H. azteca 10-Day Exposure Test Waste Chemistry-Day 4 (11/12/16)									
Sample ID	Conductivity (umbos/cm)	pH	DO (mg/L)	Temperature (°C)					
Ha Control	394	7.73	6.03	22.43					
Ha FW-Ref	342	7.37	5.89	22.39					
Ha RB-Ref	346	7.26	5.65	22.66					
Ha FW-01	393	7.34	5.68	22.42					
Ha RB-02	355	7.38	6.22	22.61					
Ha RB-03	320	7.31	5.92	22.47					
Ha SW-Leach A-01	339	7.37	6.33	22.61					
Ha SW-Leach A-02	417	7.28	5.31	22.78					
	H. az Waste	<i>teca</i> 10-Day Exposu Chemistry-Day 5 (1	ure Test 11/13/16)						
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Ha Control	441	7.73	5.54	22.05					
Ha FW-Ref	388	7.50	5.66	22.41					
Ha RB-Ref	369	7.27	5.25	22.50					
Ha FW-01	386	7.42	5.72	22.66					
Ha RB-02	385	7.45	5.83	22.12					
Ha RB-03	373	7.34	5.60	22.17					
Ha SW-Leach A-01	390	7.40	5.45	22.44					
Ha SW-Leach A-02	404	7.27	4.49	22.29					
<i>H. azteca</i> 10-Day Exposure Test Waste Chemistry-Day 6 (11/14/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Ha Control	441	7.71	5.25	22.19					
Ha FW-Ref	395	7.43	5.67	22.23					
Ha RB-Ref	385	7.32	5.39	22.30					
Ha FW-01	390	7.44	5.65	22.81					
Ha RB-02	391	7.47	5.93	22.35					
Ha RB-03	383	7.34	5.37	22.39					
Ha SW-Leach A-01	398	7.44	5.66	22.48					
Ha SW-Leach A-02	411	7.29	4.58	22.53					
H. azteca 10-Day Exposure Test Waste Chemistry-Day 7 (11/15/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Ha Control	426	7.64	5.21	22.10					
Ha FW-Ref	384	7.38	5.58	22.08					
Ha RB-Ref	374	7.33	5.86	22.36					
Ha FW-01	385	7.39	5.32	22.53					
Ha RB-02	384	7.41	5.80	22.03					
Ha RB-03	374	7.32	5.48	22.14					
Ha SW-Leach A-01	386	7.39	5.71	22.15					
Ha SW Leach A 02	395	7.21	4.26	22.26					

#### Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry *H. azteca*

<i>H. azteca</i> 10-Day Exposure Test Waste Chemistry-Day 8 (11/16/16)									
Sample ID	Conductivity (µmhos/cm)	pH	DO (mg/L)	Temperature (°C)					
Ha Control	422	7.64	5.16	22.75					
Ha FW-Ref	384	7.45	5.47	22.91					
Ha RB-Ref	374	7.33	5.50	23.09					
Ha FW-01	382	7.42	5.70	23.31					
Ha RB-02	380	7.41	5.77	22.98					
Ha RB-03	375	7.39	5.70	23.23					
Ha SW-Leach A-01	387	7.44	4.98	23.48					
Ha SW-Leach A-02	395	7.26	4.58	23.54					
H. azteca 10-Day Exposure Test									
	Waste	Chemistry-Day 9 (	11/17/16)						
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Ha Control	421	7.62	5.56	22.79					
Ha FW-Ref	384	7.43	5.77	22.78					
Ha RB-Ref	375	7.36	5.87	22.87					
Ha FW-01	383	7.48	6.08	22.66					
Ha RB-02	381	7.44	6.17	22.77					
Ha RB-03	378	7.37	5.91	23.20					
Ha SW-Leach A-01	387	7.41	5.78	22.83					
Ha SW-Leach A-02	393	7.21	4.40	22.87					

H. azteca 10-Day Exposure Test Waste Chemistry-Day 10 (11/18/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)	Total Ammonia (ppm NH3)				
Ha Control	418	7.58	5.90	22.68	ND				
Ha FW-Ref	387	7.38	6.10	22.70	ND				
Ha RB-Ref	378	7.27	5.63	22.80	ND				
Ha FW-01	387	7.40	6.11	22.84	ND				
Ha RB-02	381	7.36	6.05	22.61	ND				
Ha RB-03	378	7.31	5.84	22.71	ND				
Ha SW-Leach A-01	387	7.41	6.14	22.85	ND				
Ha SW-Leach A-02	393	7.18	4.29	22.94	ND				

\* ND = Not Detected (<1.0 mg/L)

#### APPENDIX C

Summary of Overlying Water Toxicity Test Chemistry (C. dilutus)

#### Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry *C. dilutus*

C. dilutus 10-day Exposure Test											
Initial Chemistry–Day 0 (11/8/16)											
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)	Hardness (mg/L CaCO <sub>3</sub> )	Alkalinity (mg/L CaCO <sub>3)</sub>	Total Ammonia (mg/L NH3)				
Cdi Control	444	8.14	7.81	22.58	104	76	ND				
Cdi FW-Ref	351	7.35	6.76	22.61	76	48.5	ND				
Cdi RB-Ref	345	7.19	6.79	22.73	72	45	ND				
Cdi FW-01	355	7.29	6.90	22.53	80	49	ND				
Cdi RB-02	377	7.36	7.21	22.59	84	53	ND				
Cdi RB-03	345	7.26	6.95	22.65	72	43.5	ND				
Cdi SW-Leach A-01	386	7.28	6.36	22.69	96	64	ND				
Cdi SW-Leach A-02	405	7.22	6.37	22.65	100	74	ND				
* ND Not Detected ( $(1,0,m,\pi/1)$ )											

# C dilutus Sediment Toxicity 10-Day Exposure Test: Troy Mills Inc.

\* ND = Not Detected (<1.0 mg/L)

C. dilutus 10-Day Exposure Test									
Waste Chemistry-Day 1 (11/9/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	454	7.65	5.90	22.30					
Cdi FW-Ref	385	7.18	5.16	22.49					
Cdi RB-Ref	379	7.06	4.79	22.10					
Cdi FW-01	382	7.13	4.66	22.29					
Cdi RB-02	401	7.22	5.63	22.31					
Cdi RB-03	374	7.11	4.88	22.20					
Cdi SW-Leach A-01	408	7.16	4.05	22.28					
Cdi SW-Leach A-02	422	7.12	3.97	22.45					
	С.	dilutus 10-Day Expo	sure Test						
	Wa	ste Chemistry-Day 2	(11/10/16)						
Sample ID	Conductivity (umhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	460	7.95	6.25	22.38					
Cdi FW-Ref	382	7.20	5.13	22.68					
Cdi RB-Ref	372	7.05	4.74	22.15					
Cdi FW-01	376	7.13	5.09	22.08					
Cdi RB-02	394	7.29	5.78	22.35					
Cdi RB-03	374	7.22	5.60	22.21					
Cdi SW-Leach A-01	412	7.28	5.63	22.23					
Cdi SW-Leach A-02	413	7.15	4.29	22.12					
	С.	dilutus 10-Day Expo	sure Test						
	Wa	ste Chemistry-Day 3	(11/11/16)						
Sample ID	Conductivity	nH	DO (mg/L)	Temperature $(^{\circ}C)$					
	(µmhos/cm)	pii	DO (IIIg/L)	Temperature ( C)					
Cdi Control	479	7.77	5.92	22.77					
Cdi FW-Ref	399	7.21	4.95	22.71					
Cdi RB-Ref	385	7.09	4.77	22.82					
Cdi FW-01	394	7.13	4.39	22.65					
Cdi RB-02	408	7.27	5.50	22.80					
Cdi RB-03	393	7.20	5.01	22.83					
Cdi SW-Leach A-01	427	7.32	5.46	22.87					
Cdi SW-Leach A-02	433	7.16	4.15	22.95					

Prepared by: CO 1/31/17 Reviewed By: ZZ 2/3/17

# Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry

C. dilutus 10-Day Exposure Test Waste Chemistry-Day 4 (11/12/16)									
Sample ID	Conductivity (umhos/cm)	pH	DO (mg/L)	Temperature (°C)					
Cdi Control	490	7.75	5.86	22.86					
Cdi FW-Ref	409	7.26	5.17	22.80					
Cdi RB-Ref	392	7.13	5.16	22.88					
Cdi FW-01	402	7.21	4.98	22.72					
Cdi RB-02	414	7.37	6.12	22.92					
Cdi RB-03	397	7.26	5.57	22.69					
Cdi SW-Leach A-01	430	7.43	6.09	22.90					
Cdi SW-Leach A-02	433	7.26	4.87	22.97					
	C. di	lutus 10-Day Exposu	re Test						
	Waste	Chemistry-Day 5 (1	1/13/16)						
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	419	7.67	5.15	22.75					
Cdi FW-Ref	387	7.31	4.52	22.76					
Cdi RB-Ref	377	7.19	4.81	22.15					
Cdi FW-01	385	7.24	4.10	22.16					
Cdi RB-02	389	7.43	5.25	22.16					
Cdi RB-03	385	7.29	5.13	22.69					
Cdi SW-Leach A-01	399	7.46	4.76	22.55					
Cdi SW-Leach A-02	401	7.22	4.40	22.18					
C. dilutus 10-Day Exposure Test									
Sample ID	Conductivity (umbos/cm)	pH	DO (mg/L)	Temperature (°C)					
Cdi Control	406	7 65	5 67	22 77					
Cdi FW-Ref	380	7.05	5.07	22.17					
Cdi RB-Ref	373	7.20	4 90	22.03					
Cdi FW-01	378	7.10	4.96	22.03					
Cdi RB-02	385	7.52	6.12	22.27					
Cdi RB-03	376	7.51	5.86	22.14					
Cdi SW-Leach A-01	389	7.53	6.08	22.29					
Cdi SW-Leach A-02	392	7.29	4 61	22.71					
	C. di	utus 10-Day Exposu	re Test	22.71					
	Waste	Chemistry-Day 7 (1	1/15/16)						
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	410	7.50	5.26	22.37					
Cdi FW-Ref	379	7.19	4.55	22.19					
Cdi RB-Ref	374	7.11	4.31	22.38					
Cdi FW-01	380	7.20	4.51	22.49					
Cdi RB-02	383	7.36	5.55	22.10					
Cdi RB-03	380	7.28	4.93	22.05					
Cdi SW-Leach A-01	392	7.47	5.81	22.09					
Cdi SW-Leach A-02	394	7.20	4.38	22.30					

#### Troy Mills -- Troy, NH Sediment Toxicity Test Chemistry *C. dilutus*

<i>C. dilutus</i> 10-Day Exposure Test Waste Chemistry-Day 8 (11/16/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	406	7.51	5.08	23.38					
Cdi FW-Ref	381	7.22	4.30	23.21					
Cdi RB-Ref	374	7.19	4.66	23.25					
Cdi FW-01	379	7.27	6.36	23.28					
Cdi RB-02	383	7.33	5.19	23.14					
Cdi RB-03	377	7.28	4.84	23.23					
Cdi SW-Leach A-01	389	7.47	5.61	23.31					
Cdi SW-Leach A-02	391	7.23	5.45	23.42					
C. dilutus 10-Day Exposure Test									
	Waste	e Chemistry-Day 9 (1	<u>1/17/16)</u>						
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)					
Cdi Control	409	7.52	5.09	22.96					
Cdi FW-Ref	384	7.23	4.25	22.89					
Cdi RB-Ref	377	7.22	4.69	22.78					
Cdi FW-01	381	7.28	4.61	22.66					
Cdi RB-02	384	7.34	5.17	22.75					
Cdi RB-03	380	7.26	4.63	22.64					
Cdi SW-Leach A-01	390	7.49	6.12	22.74					
Cdi SW-Leach A-02	393	7.20	3.80	22.94					

C. dilutus 10-Day Exposure Test Waste Chemistry-Day 10 (11/18/16)									
Sample ID	Conductivity (µmhos/cm)	рН	DO (mg/L)	Temperature (°C)	Total Ammonia (ppm NH3)				
Cdi Control	410	7.47	5.44	22.96	ND				
Cdi FW-Ref	390	7.21	4.48	22.88	ND				
Cdi RB-Ref	377	7.18	4.76	22.82	ND				
Cdi FW-01	382	7.23	5.07	22.95	ND				
Cdi RB-02	385	7.29	5.49	22.71	ND				
Cdi RB-03	384	7.23	4.96	22.79	ND				
Cdi SW-Leach A-01	393	7.47	6.54	22.84	ND				
Cdi SW-Leach A-02	390	7.17	4.29	22.96	ND				

\* ND = Not Detected (<1.0 mg/L)

#### APPENDIX D

**Bench Sheets and Statistical Test Print-outs** 

BULK 1	O-DAY S	EDIMEN	T TOXICITY TE	ST	STTS 2014
N#_16100036	Fo	or Site: T	roy Mills		
start Date: 11/8	12016	End	Date: 11/18/	2016	
species: <u>H. azte</u>	ca				
Sample ID	Pan	Por	# Suphial	Initiala	Nata (Observations
HA Lab Control	1 1	63	+ Sulvival	initials	Notes/Observations
HA Lab Control	2	54	10	NE	a contraction of the second
HA Lab Control	3	7	9	Co	
HA Lab Control	4	30	10	ME	
HA Lab Control	5	38	1.7	ME	
HA Lab Control	6	13	10	ME	an a submitted a submitted and
HA Lab Control	7	52	10	BH	and a second
HA Lab Control	8	49	9	ME	and the second
HA FW-Ref	1	35	8	(0	
HA FW-Ref	2	44	8	Co	and a second protocol and a second
HA FW-Ref	3	57	9	The I	In the second
HA FW-Ref	4	27	10	ME	
HA FW-Ref	5	2	10	10	
HA FW-Ref	6	5	10	NF-	
HA FW-Ref	7	45	9	BH	
HA FW-Ref	8	46	10	The	
HA RB-Ref	1	47	9	0	
HA RB-Ref	2	40	10	BH	
HA RB-Ref	3	62	10	BH	
HA RB-Ref	4	24	10	ME	
HA RB-Ref	5	17	8	BH	
HA RB-Ref	6	21	10	ME	
HA RB-Ref	7	36	10	IF	
HA RB-Ref	8	9	10	BH	
HA FW-01	1	12	10	BH	
HA FW-01	2	18	10	CO	
HA FW-01	3	31	10	60	
HA FW-01	4	56	9	<b>(6</b>	2
HA FW-01	5	11	8	ME	
HA FW-01	6	22	8	Co	
HA FW-01	7	20	10	BH	
HA FW-01	8	4	10	<0	

RUIK 10	DAY SE	DIMENT	TOXICITY TES	Т	<u>STTS 2014</u>
NH 11.1 120036	For	Site: Tr	ov Mills		
tart Date: 11/8/1	2016	End D	ate: 11/18/3	2014	
Spacies: H aztera					
species. <u>II. azcecu</u>			10.0		
Sample ID	Rep	Pos	# Survival	Initials	Notes/Observations
HA RB-02	1	3	10	CO	
HA RB-02	2	28	10	60	
HA RB-02	3	53	8	60	
HA RB-02	4	58	9	BH	
HA RB-02	5	42	4	ME	
HA RB-02	6	29	9	BH	
HA RB-02	7	51	10	01	
HA RB-02	8	32	10	MF	
HA RB-03	1	60	8	Re	
HA RB-03	2	55	10	MR	
HA RB-03	3	37	10	BH	
HA RB-03	4	59	10	MR	
HA RB-03	5	41	10	NF	
HA RB-03	6	19	10	CO	
HA RB-03	7	23	10	3#	
HA RB-03	8	33	9	1F	
H SW-Leach A-01	1	16	8	me	
H SW-Leach A-01	2	50	6	de	
H SW-Leach A-01	3	34	6	BH	
H SW-Leach A-01	4	61	10	MF	
H SW-Leach A-01	5	64	10	ME	
H SW-Leach A-01	6	39	G	Co	
H SW-Leach A-01	7	8	5	BH	
H SW-Leach A-01	8	48	6	BH	
H SW-Leach A-02	1	6	10	Co	and a second
H SW-Leach A-02	2	26	9	ME	
H SW-Leach A-02	3	1	10	MF	
H SW-Leach A-02	4	25	10	BH	
H SW-Leach A-02	5	14	FO	BH	
H SW-Leach A-02	6	15	9	IF	
H SW-Leach A-02	7	10	9	BĦ	
H SW-Leach A-02	8	43	9	CD	

BUIK 1	D-DAY SI	DIMENT	TOXICITY TE	ST	STTS 2014
DN# 16100026	Fo	r Site: Tr	ov Mills		
Start Date: 11/8	12016	End D	ate: 11/18	12616	
Species: C dilutu	IS				
openes. <u>e. unut</u>	h		-		
Sample ID	Rep	Pos	# Survival	Initials	Notes/Observations
Cdi Lab Control	1	15	0	- AC	
Cdi Lab Control	2	38	10	22	
Cdi Lab Control	3	14	10	MR	
Cdi Lab Control	4	33	9	MG	
Cdi Lab Control	5	55	10	27	
Cdi Lab Control	6	10	8	MR	
Cdi Lab Control	7	19	ic	MR	
Cdi Lab Control	8	43	્ર	NF	
Cdi FW-Ref	1	34	9	OProt	· ·
Cdi FW-Ref	2	53	4	22	
Cdi FW-Ref	3	2	8.	ZZ	2 sets of 2 worms air stude together
Cdi FW-Ref	4	62	G	MR	
Cdi FW-Ref	5	49	31	The	
Cdi FW-Ref	6	7	10	MR.	
Cdi FW-Ref	7	63	9		
Cdi FW-Ref	8	60	9	22	
Cdi RB-Ref	1	20	10	MR	
Cdi RB-Ref	2	· 5	0	INF	1 Empty Cadis Fly casing
Cdi RB-Ref	3	45	6	22	
Cdi RB-Ref	4	16	10	MR	
Cdi RB-Ref	5	47	3	MR	
Cdi RB-Ref	6	35	3	MP	large inself large bound
Cdi RB-Ref	7	22	8	ME	
Cdi RB-Ref	8	23	0	22/MF	1 Devel C.d. lutus floating
Cdi FW-01	1	17	9	ORiver	
Cdi FW-01	2	18	9	MR	e
Cdi FW-01	3	31	10	22	
Cdi FW-01	4	32	10	SPE.	
Cdi FW-01	5	11	8	Chine -	
Cdi FW-01	6	12	110	MR	
Cdi FW-01	7	50	7	John .	
Cdi FW-01	8	30	01	John -	

Cdi FW-Ref Rep 8 #60 and Cdi Leach A-01 Rep 2 #39 had large discrepancies between survival # on bench steel and pan court other weighing. #60 had 4 touter dilutes and #39 had 4 too many. Possible explanation: the dilutes somehow moved (pan himped, cart justle during transport, desirator bunged etc.) from #60 pan to #39 pan. Pan #60 was above pan #39 in the disirator, and the size of the extraved livtus in #39 (much large than the other 3 in the pan): BULK 10-DAY SEDIMENT TOXICITY TEST

STTS 2014

PN# 161000 36 For Site: Troy Mills

Start Date: 11/8/2016

18/2016 End Date: 11/18/2016

Species: C. dilutus Notes/Observations Initials Rep Pos # Survival Sample ID MF 9 64 1 Cdi RB-02 confirmed I dead organism 22 2 9 Cdi RB-02 カ 8 Cdi RB-02 3 58 P Cdi RB-02 4 4 0 -p 5 44 Cdi RB-02 Cdi RB-02 6 3 D 1 7 27 8 CO Cdi RB-02 1 48 5 8 Cdi RB-02 \*7 -> 1 21 Cdi RB-03 2 2 56 4 Cdi RB-03 952 た Cdi RB-03 3 26 -4 37 Cdi RB-03 5 5 28 Cdi RB-03 -6 to Cdi RB-03 13 B 7 6 Cdi RB-03 2 9 8 36 Cdi RB-03 ME 1 1 0 C SW-Leach A-01 3 22 C SW-Leach A-01 2 39 7 NG C SW-Leach A-01 3 29 NC MR 4 51 C SW-Leach A-01 Bre 8 C SW-Leach A-01 5 MR ì 6 C SW-Leach A-01 46 net C SW-Leach A-01 7 57 2 MF 40 C SW-Leach A-01 8 Liea Caddis Fly 0 found MR C SW-Leach A-02 1 25 found 1 ordinate larvae 0 MK 2 61 C SW-Leach A-02 0 C SW-Leach A-02 3 59 q dilutus pupa C SW-Leach A-02 4 24 22

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 Report Date:
 10 Jan-17 14:34 (p 1 of 2)

 Test Code:
 6-0637-9979/1116HATROYCSED

But bit         Strend in the control strend control contro control contro control control contro control contro contro contro	Hyalella 10-d	Survival	and G	rowth Sedimen	t Test					U.S. EPA Region I La
Bandle Stort Tray. Alle, Soft Tray. Malle, Soft T	Start Date: End Date: Sample Date:	08 Nov 28 Oct-	-16 -16	Species: Protocol Material:	Hyalella ( EPA/600) Lab Cont	azteca /R-99/064 (2000) rol		Sample Code: Sample Sourc Sample Statio	HA Lab Control e: In house n: HA Control	
Sample Code         Fer Pare         R Exponde         <	Batch Notes:	2016 T	roy Mil	Is Sed Tox Test -	- H. azteca					
Inductorind         I         R1	Sample Cod	e Re	og de	* # Exposed #	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Aean Length-mm	Notes
Mol Lab Control         2         40         100         10000000         100         10000000         100000000         100000000         100000000         100000000         100000000         100000000         100000000         100000000         1000000000         10000000000         1000000000         10000000000         1000000000000000000000000000000000000	HA Lab Control	-	63	10	10	1017.77	1017.09	10		
Mol Lue Control         3         7         10         9         10123         1023         9           Mol Lue Control         4         30         10         10         107.38         10064         10           Mol Lue Control         8         30         10         10         1007.32         1000.32         10           Mul Lue Control         8         13         10         10         1007.32         1000.32         10           Mul Lue Control         1         35         10         9         9         1003.32         10           Mul Lue Control         1         35         10         9         96415         100.32         100.32           Mul Lue Control         1         35         10         9         96415         100.32         100.32           Mul Mul Control         1         3         10         10         10         10         10           Mul	HA Lab Control	CN	54	10	10	1003.62	1002.94	10		
Nu Lue Connel         4         10         10/10         10/10         10/10           Nu Lue Connel         1         10         10         10/10         10/10         10/10           Nu Lue Connel         1         13         10         10         10/10         10/10         10/10           Nu Lue Connel         1         2         10         10         10/10         10/10         10/10           Nu Lue Connel         1         2         10         10         10/10         10/10         10/10           Nu Lue Connel         1         2         10         10         10/10         10/10         10/10           Nu Lue Connel         1         2         2         10         10         10/10         10/10           Nu Lue Connel         2         2         40         10         10/10         10/10         10/10           Nu Lue Connel         2         4         2         4         10         10/10         10/10         10/10           Nu Lue Connel         2         4         2         4         10/10         10/10         10/10         10/10           Nu Lue Connel         2         2         10 <td>HA Lab Control</td> <td>63</td> <td>2 2</td> <td>10</td> <td>6</td> <td>1013.37</td> <td>1012.7</td> <td>6</td> <td></td> <td></td>	HA Lab Control	63	2 2	10	6	1013.37	1012.7	6		
ML MG Control         S         <	HA Lab Control	4	1 30	10	10	1017.36	1016.69	10		
IVI LIB Control         I         10         100         100         100         100         100           IVI LIB Control         I	HA Lab Control	43	36	10	10	1021.75	1020.93	10		
IVI Lab Control         I <thi< th="">         I         I</thi<>	HA Lab Control	3	12	10	10	1001.22	1000.32	10		
M Lub Control         I         <	HA Lab Control	1	52	10	10	1038.53	1037.68	6		
HAF Waler         1         25         10         6         94.3         98.3         6         94.3           HAF Waler         2         7         10         6         103.07         1000.01         8           HAF Waler         3         2         7         10         10         100.020         100.031         100.033         100           HAF Waler         5         2         10         10         102.425         100.333         10           HAF Waler         7         45         10         102.425         100.33         10           HAF Waler         7         40         10         102.425         100.33         10           HAF Waler         7         40         10         102.425         102.33         10           HAF Waler         7         40         10         102.224         102.324         102.324           HAF Waler         7         40         10         102.324         102.324         102.324           HAF Waler         7         10         102.324         102.324         102.324         102.324           HAF Waler         7         10         102.324         102.324         102.324	HA Lab Control		46	10	6	1048.96	1048.04	6		
HA FWReit         2         44         10         6         103.34         103.34         6           HA FWReit         2         5         7         10         10         100.134         1080.14         8           HA FWReit         5         2         10         10         100.134         1080.14         8         1           HA FWReit         6         2         10         10         102.133         100.14         8         1           HA FWReit         6         2         10         10         107.133         100.14         8         1           HA FWReit         7         4         10         101         107.133         100.14         8         1           HA FWReit         7         4         10         107.24         102.66         10         10         107.12         100.14         1           HA FWReit         2         10         10         10         102.24         106.66         10         10         107.12         100.14         10         107.12         100.14         10         107.12         100.14         10         107.12         100.14         10         107.12         107.12         1	HA FW-Ref		35	10 .	8	994.75	993.9	8		
HA FW-Ref         3         5         7         10         0         1001         0         1001         0         1001         0         1001	HA FW-Ref		2 4/	10	8	1053.07	1052.34	8		
HA PURRef         I         Z2         10         10         101020         100         100         100         100         100         100           HA PURRef         E         Z         10         10         1027.43         100.83         10           HA PURRef         F         Z         10         10         1027.43         1028.34         9           HA PURRef         F         10         9         1077.43         1028.44         9           HA PURRef         I         47         10         9         1077.02         1028.44         9           HA RURRef         I         47         10         9         977.65         10         9           HA RURRef         I         4         2         10         10         1027.14         10         9           HA RURRef         I         I         10         100         1027.02         10         10         10         10           HA RURRef         I         I         I         10         1027.14         1028.14         10         10           HA RURRef         I         I         I         1028.14         I         I         10	HA FW-Ref		3 51	10	6	1061,34	1060.14	8		
HAF Mether         5         2         10         10         102.4.35         102.4.35         102.4.35         102.4.35           HA FWHerl         6         5         10         10         102.7.34         102.6.53         10           HA FWHerl         7         4         6         10         10         102.7.34         102.6.45         10           HA FWHerl         7         4         7         10         10         102.7.24         102.6.46         9           HA FWHerl         2         40         10         102.7.24         102.6.46         9         9           HA FBAerl         2         40         10         102.7.24         102.8.74         102.8.74         102.8.74           HA FBAerl         5         10         10         102.2.14         10         102.2.14         10         102.2.14           HA FBAerl         6         17         10         102.2.14         10         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14         102.2.14	HA FW-Ref		1 27	10	10	1010.03	1008,86	10		
HA FWARE         6         10         10         102.18.3         1020.58         10           HA FWARE         7         45         10         9         1027.24         1026.64         9           HA FWARE         8         46         10         9         1027.24         1026.64         9           HA FWARE         8         46         10         10         1027.02         1026.69         10           HA RB Ref         2         47         10         103.107         1026.99         10           HA RB Ref         3         62         10         10         103.107         1026.99         10           HA RB Ref         5         17         10         103.107         1028.19         1025.24         10           HA RB Ref         6         17         10         103.107         1029.99         10         10           HA RB Ref         6         17         10         1023.24         1020.14         10         10           HA RB Ref         7         8         10         1023.24         10         10         10         10           HA RB Ref         7         9         10         1023.24	HA FW-Ref	-	10	10	10	1024.25	1023.3	10		
HAFWARE         7         45         10         9         102.43         1026.44         9         0           HAFWARE         8         46         10         10         102.102         1025.46         10         10           HAFWARE         2         10         10         10         102.102         1025.46         10         10           HAFBARE         2         10         10         1027.12         1025.98         10         10           HAFBARE         2         2         10         10         1025.19         1025.24         10         10           HAFBARE         2         10         10         1025.14         1025.14         1025.14         10         10           HAFBARE         5         17         10         1025.14         1025.14         10         10           HAFBARE         5         10         10         1025.14         1025.14         10         10         10           HAFBARE         5         10         10         1025.14         1028.14         8         10         10           HAFBARE         1         10         1028.14         1028.14         10         10	HA FW-Ref		3 5	10	10	1021.63	1020.53	10		
HAFWRef         8         46         10         10         102.102	HA FW-Ref	-	7 4	10	6	1027.24	1026.44	6		
HA RB-Ref         1         47         10         9         977.26         976.5         9           HA RB-Ref         2         40         10         10         103.17         1023.49         103           HA RB-Ref         2         40         10         10         100         103.17         1023.49         102           HA RB-Ref         3         62         10         10         1023.14         1023.04         10           HA RB-Ref         5         17         10         10         1023.14         1022.04         10           HA RB-Ref         5         17         10         10         1023.14         1023.14         10           HA RB-Ref         6         10         10         1023.14         10         10         10           HA RB-Ref         7         36         10         103.14         1023.77         10         10           HA RB-Ref         8         9         10         10         103.62         10         10           HA RB-Ref         1         12         10         10         103.62         10         10           HA RB-Ref         1         1         12	HA FW-Ref		8 4	5 10	10	1027.02	1025.99	10		
HA RB-Ref         2         40         10         1031.07         1028.98         10           HA RB-Ref         3         52         10         7         10         1026.19         1025.2         10           HA RB-Ref         5         17         10         10         1023.14         1025.04         10           HA RB-Ref         5         17         10         8         1023.14         1023.04         10           HA RB-Ref         5         17         10         8         1023.14         1023.04         10           HA RB-Ref         6         21         10         10         1021.06         1020.14         10           HA RB-Ref         6         2         10         10         1021.06         1020.14         10           HA RB-Ref         6         2         10         10         1021.06         1020.14         10           HA RB-Ref         6         2         10         10         1021.05         100         10         10           HA RB-Ref         7         36         10         103.14         1036.35         10         10         10           HA RB-Ref         8 <td< td=""><td>HA RB-Ref</td><td></td><td>1 4</td><td>10</td><td>6</td><td>977.26</td><td>976.5</td><td>6</td><td></td><td></td></td<>	HA RB-Ref		1 4	10	6	977.26	976.5	6		
HA RB-Ref         3         82         10         10         1028.19         1025.2         10           HA RB-Ref         6         17         10         10         1023.14         1022.04         10           HA RB-Ref         5         17         10         8         1022.04         10           HA RB-Ref         5         17         10         10         1023.14         1022.04         10           HA RB-Ref         5         17         10         10         1022.66         1020.77         10           HA RB-Ref         7         36         10         10         10         1021.66         1020.77         10           HA RB-Ref         7         36         10         10         1021.66         1020.77         10           HA RB-Ref         6         1         10         101         1021.66         1020.77         10           HA RB-Ref         7         36         10         10         1021.66         1020.77         10           HA RB-Ref         6         10         10         101.477         101.362         10         10           HA FW-01         7         10         10	HA RB-Ref		2 41	0 10	10	1031.07	1029.99	10		
HA RB-Ref         4         24         10         10         102.3.4         102.2.04         10           HA RB-Ref         5         17         10         8         102.3.4         102.3.4         102.3.4         8           HA RB-Ref         6         21         10         10         100.3.2.6         102.8.14         8         8           HA RB-Ref         7         36         10         10         100.3.26         100.80.5	HA RB-Ref		3 6	2 10	. 10	1026.19	1025.2	10		
HA RB-Ref         5         17         10         8         1029.76         1029.14         8           HA RB-Ref         6         21         10         10         100         100         100         100           HA RB-Ref         7         36         10         10         100         100         100         100         100           HA RB-Ref         7         36         10         10         100         100         100         100         100         100           HA RB-Ref         7         36         10         10         100         100         103.32         100         100           HA RW OI         3         10         10         10         101.47.1         1013.62         10         100           HA RW OI         3         31         10         10         101.47.3         10         100	HA RB-Ref		4 2	1 10	10	1023.14	1022.04	10		
HA RB-Ref         6         21         10         10         1009.26         1008.05         10           HA RB-Ref         7         36         10         10         1021.66         1020.77         10           HA RB-Ref         8         9         10         10         1021.66         1020.77         10           HA RB-Ref         8         9         10         10         1014.71         103.62         10           HA RB-Ref         8         10         10         10         103.62         10         10           HA RW-01         2         18         10         10         1013.62         10         10           HA FW-01         3         10         10         10         103.62         10         10           HA FW-01         6         10         10         983.44         982.45         10         10         10           HA FW-01         6         10         10         983.44         982.45         10         10         10         10           HA FW-01         6         10         10         993.66         8         9         10         10         10         10         10	HA RB-Ref		5	7 10	8	1029.76	1029.14	80		
HA RB-Ref         7         36         10         10         102.166         1020.77         10           HA RB-Ref         8         9         10         10         10         103.18         104.71         10           HA RB-Ref         8         9         10         10         10         104.71         104.34         10           HA FW-01         1         12         10         10         10         101.471         1013.62         10           HA FW-01         2         18         10         10         10         1013.62         10           HA FW-01         3         31         10         10         10         883.44         982.45         10           HA FW-01         5         11         10         9         999.19         988.36         9         9           HA FW-01         6         20         10         9         999.19         988.36         8         8           HA FW-01         7         20         10         8         999.19         998.36         8         8           HA FW-01         7         20         10         8         9991.36         8         8 <td>HA RB-Ref</td> <td>Ē</td> <td>6 2</td> <td>10</td> <td>10</td> <td>1009.26</td> <td>1008.05</td> <td>10</td> <td></td> <td></td>	HA RB-Ref	Ē	6 2	10	10	1009.26	1008.05	10		
HA RB-Ref         8         9         10         10         1050.18         1048.34         10           HA FW-01         1         12         10         10         1014.71         1013.62         10           HA FW-01         2         18         10         10         10         1013.62         10           HA FW-01         2         18         10         10         1020.39         1019.5         10           HA FW-01         3         31         10         10         983.45         10         982.45         10           HA FW-01         3         31         10         9         983.45         10         9         9           HA FW-01         5         11         10         9         99.19         988.36         9         9           HA FW-01         6         22         10         8         90.105         8         8         9         8           HA FW-01         7         20         10         10         989.96         8         9         8         8         8         8         8         8         8         8         8         8         8         8         8	HA RB-Ref		7 3	5 10	10	1021.66	1020.77	10		
HA FW-01         1         12         10         10         1014,71         1013.62         10           HA FW-01         2         18         10         10         10         1013.62         10           HA FW-01         2         18         10         10         1020.39         1019.5         10           HA FW-01         3         31         10         10         983.44         982.45         10           HA FW-01         4         56         10         9         991.99         998.36         9           HA FW-01         5         11         10         8         1020.21         1019.45         8           HA FW-01         6         22         10         8         991.06         989.96         8           HA FW-01         7         20         10         8         991.06         989.96         8           HA FW-01         7         20         10         969.66         968.65         10         968.66         10           HA FW-01         8         4         10         969.65         968.65         10         968.66         10	HA RB-Ref		8	10	10	1050.18	1049.34	10		
HA FW-01         2         18         10         10         102.39         1019.5         10           HA FW-01         3         31         10         10         983.44         982.45         10           HA FW-01         3         31         10         9         999.19         988.36         9           HA FW-01         5         11         10         9         999.19         998.36         9           HA FW-01         5         11         10         8         1020.21         1019.45         8           HA FW-01         6         22         10         8         989.98         8         8           HA FW-01         7         20         10         8         969.106         989.98         8         8           HA FW-01         7         20         10         10         968.65         10         10         10         10         968.65         10         10         10         10         10         10         10         968.65         10         10         10         10         10         10         10         10         10         10         10         968.65         10         10	HA FW-01		1	2 10	10	1014.71	1013.62	10		
HA FW-01         3         31         10         10         10         983.44         982.45         10           HA FW-01         4         56         10         9         999.19         998.36         9           HA FW-01         5         11         10         8         1020.21         1019.45         8         9           HA FW-01         6         22         10         8         1020.21         1019.45         8         8           HA FW-01         6         22         10         8         969.96         8         8           HA FW-01         7         20         10         10         968.65         10         8         8           HA FW-01         8         4         10         10         968.65         10         10         10         968.65         10	HA FW-01		2 1	10	10	1020.39	1019.5	10		
HA FW-01         4         56         10         9         999.19         998.36         9           HA FW-01         5         11         10         8         1020.21         1019.45         8            HA FW-01         6         22         10         8         951.06         968.96         8             HA FW-01         7         20         10         8         968.98         8              HA FW-01         7         20         10         10         968.39         968.65         10         10         968.65         10           HA FW-01         8         4         10         10         969.72         968.68         10         10         969.72         968.68         10	HA FW-01		3	1 10	10	983.44	982.45	10		
HA FW-01         5         11         10         8         1020.21         1019.45         8           HA FW-01         6         22         10         8         991.06         989.98         8           HA FW-01         7         20         10         10         969.68         968.65         10           HA FW-01         8         4         10         10         968.65         10	HA FW-01		4 5	6 <b>10</b>	6	999.19	998.36	6		
HA FW-01         6         22         10         8         991.06         899.96         8           HA FW-01         7         20         10         10         968.65         10         10           HA FW-01         8         4         10         10         969.72         968.65         10	HA FW-01		5 1	1 10	8	1020.21	1019.45	Ø		
HA FW-01         7         20         10         10         968.65         10           HA FW-01         B         4         10         10         969.72         968.68         10	HA FW-01		6 2	2 10	89	991.08	989,98	8		
HA FW-01 B 4 10 10 969.72 968.68 10	HA FW-01	-	7 2	0 10	10	969.89	968.65	10		
	HA FW-01		8	1 10	10	969.72	968.68	10	- (0)	

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 Report Date:
 10 Jan-17 14:34 (p 2 of 2)

 Test Code:
 6-0637-9979/1116HATROYCSED

Sample Code	Rep	Pos	# Exposed	# Survived	<b>Total Weight-mg</b>	Tare Weight-mg	Pan Count	Mean Length-mm	Notes
HA RB-02	-	3	10	10	1014.89	1013.76	10		
HA RB-02	2	28	10	10	994.71	993.58	10		
HA RB-02	3	53	10	8	988.07	987,35	8		
HA RB-02	4	58	10	6	1064.42	1063.45	6		
HA RB-02	2	42	10	4	1018.7	1018.24	4		
HA RB-02	9	29	10	6	1030.21	1029.03	6		
HA RB-02	7	51	10	10	1010.82	1009.85	10		
HA RB-02	80	32	10	10	1023.34	1022.12	10		
HA RB-03	-	60	10	8	1015.56	1014.77	8		
HA RB-03	2	55	10	10	1008,25	1007.09	10		
HA RB-03	3	37	10	10	986.17	985.14	10		
HA RB-03	4	69	10	10	992.24	990.97	10		
HA RB-03	5	41	10	10	989.55	968.43	92		
HA RB-03	9	19	10	10	1015.36	1014.41	10		
HA RB-03	2	23	10	10	1045.52	. 1044.5	10		
HA RB-03	8	33	10	6	1015.62	1014.27	6		
H SW-Leach A-01	-	16	10	8	1017.41	1016.62	8		
H SW-Leach A-01	2	50	10	9	1036.87	1036.5	9		
H SW-Leach A-01	3	34	10	9	1015.59	1014.99	9		
H SW-Leach A-01	4	61	10	10	1015.25	1014.56	10		
H SW-Leach A-01	5	64	10	10	1021.86	1021.19	10		
H SW-Leach A-01	9	39	10	9	1014.11	1013.61	9		
H SW-Leach A-01	2	8	10	5	1005.13	1004.64	5		
H SW-Leach A-01	8	48	10	ø	1022.63	1022.14	9		
H SW-Leach A-02	-	9	10	10	1027.81	1026.82	10		
H SW-Leach A-02	5	26	10	æ	981.52	980.64	6		
H SW-Leach A-02	3	-	10	10	989.28	988.35	10		
H SW-Leach A-02	4	25	10	10	990.73	989.92	10		
H SW-Leach A-02	5	14	10	10	983.99	983.16	10		
H SW-Leach A-02	9	15	10	6	961.61	960.48	6		
H SW-Leach A-02	2	10	10	6	1011.68	1010.95	6		
H SW-Leach A-02	8	43	10	8	1048.44	1047.58	6		

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CETIS™ v1.8.7.16

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QA:

Analyst: ZZ

000-446-187-2

 Report Date:
 09 Mar-17 15:15 (p 1 of 2)

 Test Code:
 1116HATROYCSED | 06-0637-9979

U.S. EPA Region I Lab

Hyalella 10-d S	Surviv	al and Growth S	ediment Te	st							U.:	S. EPA Re	gion i Lau
Analysis ID: Analyzed:	04-07 09 M	717-1785 Iar-17 15:14	Endpoint: Analysis:	Surv Para	ival Rate metric-Con	trol vs Treat	ments		Offici	Version: al Results:	CETISv1.8 Yes	8.7	
Batch ID:	17-62	236-5666	Test Type:	Surv	ival-Growth				Analy	st:			
Start Date:	08 N	ov-16	Protocol:	EPA	/600/R-99/0	64 (2000)		1	Dilue	nt: Not	Applicable		
Ending Date:			Species:	Hyal	ella azteca	8			Brine	:			
Duration:	NA		Source:	In-H	ouse Cultur	e			Age:				
Batch Note:	2016	Troy Mills Sed T	ox Test - H.	aztec	a			+					
Sample Codè		Sample Notes											
HA FW-Ref		2016 Troy Mills	Sed Tox Te	st - H	. azteca								
HA FW-01		2016 Troy Mills	Sed Tox Te	st - H	. azteca								
H SW-Leach A-	-01	2016 Troy Mills	Sed Tox Te	st - H	. azteca								
Sample Code		Sample ID	Sam	ole Da	te Rece	eive Date	Sample A	ge	Clien	t Name		Project	
HA FW-Ref		05-6737-7348	28 00	t-16			11d Oh		EPA I	Region I		I roy wills	
HA FW-01		08-6061-8510	28 00	:t-16			11d Oh						
H SW-Leach A	-01	00-2057-0158	28 0	ct-16			11d Oh						
Sample Code		Material Type	Sam	ole Sc	ource		Station Lo	ocatio	n		Latitude	Long	gitude
HA FW-Ref		Site Sediment	Troy	Mills L	andfill		HA FW-Re	ef					
HA FW/-01		Site Sediment	Troy	Mills L	andfill		HA FW-01	I					
H SW-Leach A	-01	Site Sediment	Troy	Mills I	andfill		HA SW-Le	each A	-01				
Data Transfor	m	Zeta	Alt H	lyp	Trials	Seed		PMS	D	Test Resu	ılt		
Angular (Corre	cted)	NA	C > 1	-	NA	NA		13.3	%				
	-1- 0												
Dunnett Multij	pie C	Omparison rest	Tost	Ctot	Critical	MSD DF	P-Value	P-Ty	pe	Decision(	α:5%)		
Sample Code	VS	Sample Code	0.22	10	2 022	0.186 14	0.7489	CDF		Non-Signi	ficant Effect		
HA FVV-Ket		H SW-Leach A-	01 2.859	•	2.022	0.186 14	0.0088	CDF		Significant	Effect		
ANOVA Table	IOVA Table										•		
ANOVA Table Source Sum Squares		Mean	Mean Square		DF	F Stat	P-Va	alue	Decision(	a:5%)			
Between		0.3980753	0.199	0.1990376		2	5.905	0.00	92	Significant	Effect		
Error		0.7078395	0.033	37066	4	21	-						
Error 0.7078395 Total 1.105915					23								
Distributional	Tests	3			non konstructure and and alle								
Attribute		Test		Test Stat		Critical	P-Value	Decision(a:1%)					
Variances		Bartlett Equality	of Variance	1	3.376	9.21	0.1849	Equa	al Vari	ances			
Distribution		Shapiro-Wilk W	Normality		0.8935	0.884	0.0157	Norm	nal Di	stribution		a and a second second	
Survival Rate	Sum	mary										000000	
Sample Code		Cou	nt Mea	n	95% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
HA FW-Ref		8	0.92	5	0.8509	0.9991	0.95	0.8		1	0.03134	9.58%	0.0%
HA FW-01		8	0.93	75	0.8609	1	1	0.8		.1	0.03239	9.77%	-1.35%
H SW-Leach A	-01	8	0.71	25	0.5487	0.8763	0.6	0.5		1 -	0.06928	21.5%	22.91%
Angular (Corr	ected	) Transformed S	ummary										
Sample Code		Cou	nt Mea	n	95% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
HA FW-Ref		8	1.29	5	1.181	1.409	1.331	1.10	7	1.412	0.0481	10.51%	1.670/
HA FW-01		8	1.31	5	1.198	1.433	1.412	1.10	7	1.412	0.04961	10.07%	-1.5/%
H SW-Leach A	-01	8	1.03	3	0.8229	1.242	0.8861	0.78	54	1.412	0.09993	24.2370	20.2170

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Test Code:

1116HATROYCSED | 06-0637-9979

Analyst: 22 OA: 10

U.S. EPA Region I Lab

#### the stalls 10 d Survival and Growth Sediment Test

Hyalella 10-d	Survival and Gro	will Sec	milent res						
Analysis ID: Analyzed:	04-0717-1785 09 Mar-17 15:14	Ei 4 Ai	ndpoint: nalysis:	Survival Rate Parametric-Co	ntrol vs Tre	atments	CET	'IS Version: cial Results:	CETISv1.8.7 · Yes
Survival Rate	Detail								D 0
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Kep s
HA FW-Ref	and the second	0.8	0.8	0.9	1	1	1	0.9	1
LA EW 01		1	1	1	0.9	0.8	0.8	1	1
H SW-Leach	4-01	0.8	0.6	0.6	1	1	0.6	0.5	0.6
Angular (Con	rected) Transform	ned Deta	ail					1000	-
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
HA EW-Ref		1.107	1.107	1.249	1.412	1.412	1.412	1.249	1.412
		1,412	1,412	1.412	1.249	1.107	1.107	1.412	1.412
H SW-Leach	A-01	1.107	0.8861	0.8861	1.412	1.412	0.8861	0.7854	0.8861
Survival Rate	Binomials								
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
HA FW-Ref		8/10	8/10	9/10	10/10	10/10	10/10	9/10	10/10
HA EW-01		10/10	10/10	10/10	9/10	8/10	8/10	10/10	10/10
H SW-Leach	A-01	8/10	6/10	6/10	10/10	10/10	6/10	5/10	6/10

Graphics



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 Report Date:
 09 Mar-17 15:15 (p 1 of 2)

 Test Code:
 1116HATROYCSED | 06-0637-9979

			liment Toot								U.S.	EPA Regi	on I Lab
iyalella 10-d S	urviva	and Growth Se	diment lest						CETIS	Version:	CETISv1.8.	7	
Analysis ID:	14-135 09 Ma	i9-5150 E	Indpoint: S Analysis: N	lonparam	ate etric-C	ontrol v	s Tre	atments	Officia	al Results:	Yes		
Cotob ID:	17-623	36-5666 T	'est Type: S	urvival-G	rowth				Analy	st:	Annlieghla		
act Data:	08 No	/-16 F	Protocol: E	PA/600/F	2-99/06	4 (2000	))		Diluer	IT: NOU	Applicable		
Start Date.	00 110	s	Species: H	iyalella a	zteca				Brine:				
noing Date.	NA	5	Source: I	n-House	Culture				Age:	-			
Juration.		Free Mille Sed To	v Test - H. az	teca									
Batch Note:	2016	I TOY WINS SEC TO.	× 1000 111										
Sample Code		Sample Notes		LL arto	00								
HA RB-Ref		2016 Troy Mills S	Sed Tox Test	- H. azie	ua .						525		
HA RB-02		2016 Troy Mills	Sed Tox Test	- H. azle	(d								
HA RB-03		2016 Troy Mills	Sed Tox Test	- H. azte	ca								······································
H SW-Leach A	-02	2016 Troy Mills	Sed Tox Test	- H. azte					clion	+ Namo		Project	
Sample Code	se o tradicio	Sample ID	Sampl	e Date	Rece	ive Dat	e	11d Oh	EPA	Region I		Troy Mills	
HA RB-Ref		14-8487-5507	28 Oct	-16				114 06	Great 2 %				
HA RB-02		08-9266-2963	28 Oct-	-16				110 011					
HA RB-03		08-4604-6141	28 Oct	-16									
H SW-Leach A	-02	16-6814-8225	28 Oct	-16				110 UN			Lotitudo	Long	itude
Sample Code		Material Type	Sampl	e Source	)			Station Lo	cation		Lautude	Long	
HA RB-Ref		Site Sediment	Troy M	lills Landf				HA RD-RE	1				
HA RB-02		Site Sediment	Troy N	lills Landf	111			LA DD 02					
HA RB-03		Site Sediment	Troy N	lills Landf	<b>ill</b>			MA RB-03	ach ( 02				
H SW-Leach A	4-02	Site Sediment	Troy N	fills Land	Fill			HA SVV-Le	ach A-02		- 14		
Data Transfor	m	Zeta	Alt Hy	p Tria	ls	Seed			PMSD	Test Res			
Angular (Corre	ected)	NA	C > T	NA		NA			10.070				
Steel Many-O	ne Rai	nk Sum Test							1020 <u>22</u> 10 20.	B	1 50/ )		
Sample Code	VS	Sample Code	Test S	Stat Crit	ical	Ties	DF	P-Value	P-Type	Decision	ificant Effect		
HA RB-Ref		HA RB-02	59.5	48		3	14	0.3667	Asymp	Non-Sign	ificant Effect		
TRATE		HA RB-03	68	48		3	14	0.7500	Asymp	Non-Sigr	ificant Effect		
		H SW-Leach A-	02 62	48		2	14	0.4826	Asymp	Non-oigi			
ANOVA Table	•							-	D Mahaa	Decision	a(a:5%)		
Source		Sum Squares	Mean	Square		DF		F Stat	P-Value	Non Sig	afficant Effect		
Between		0.06723899	0.022	41299		3		0.9204	0.4430	Non-oigi	infoarte Erie er		
Error		0.681875	0.024	35268		28							
Total		0.749114				31						-	
Distributiona	al Test	5								(			
Attribute		Test		Te	st Stat	Critic	al	P-Value	Decisión	i(a:1%)		and the second se	
Variances		Bartlett Equality	of Variance	9.5	601	11.34		0.0233	Equal va	nal Dietribu	tion		
Distribution		Shapiro-Wilk W	/ Normality	0.7	956	0.908	31	<0.0001	Non-non		1971		
Survival Rat	e Sum	mary					5.55 peter			REAV	Std Err	GV%	%Effect
Sample Cod	e	Cou	nt Mear	95	% LCL	95%	UCL	Median	Min	1	0.02631	7.73%	0.0%
HA RB-Ref		8	0.962	25 0.9	9003	1		0.05	0.4	1	0.07258	23.46%	9.09%
HA RB-02		8	0.875	5 0.7	7034	1		1.90	0.9	1	0.02631	7.73%	0.0%
HA RB-03		8	0,962	25 0.9	9003	1	47	0.95	0.0	1	0.0189	5.63%	1.3%
H SW-l each	A-02	8	0.95	0.9	9053	0.994	47	0.95	0.0	59 <b>.</b> 9.17			

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Analyst:\_ ZC\_ QA:\_ (O

CET	TIS	Ana	lvtica	Re	port
V I.m 1	200	51114			

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Test Code:

	and a second									S FPARE	dion I Lap
Hyalella 10-d	Survival and Gro	owth S	ediment Te	st							3
Analysis ID: Analyzed:	14-1359-5150 09 Mar-17 15:14	4	Endpoint: Analysis:	Survival Rate Nonparametric-	Control vs T	reatments	CET Offi	TS Version: cial Results:	CETISv1 Yes	.8.7	
Angular (Cor	rected) Transform	med Su	ummary						1. Carlos and <b>1. Car</b> los (1. Carlos		N/ 7766 6
Sample Code		Coun	it Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Enect
UA PR-Ref		8	1.354	1.258	1.449	1.412	1.107	1.412	0.04056	8.48%	0.0%
HA RB-02		8	1.242	1.032	1.453	1.331	0.6847	1.412	0.08909	20.28%	0.2270
HA PR-03		8	1.354	1.258	1.449	1.412	1.107	1.412	0.04056	8.48%	4 70/
H SW-Leach	4-02	8	1.331	1.258	1.403	1.331	1.249	1.412	0.0308	6.55%	1.7 %
Survival Rate	Detail										
Sample Code		Rep 1	1 Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8		
UA DR Dof		0.9	1	1	1	0.8	1	1	1		
		1	1	0.8	0.9	0.4	0.9	1	1		
HA RD-02		0.8	i	1	1	1	1	1	0.9		
HA RB-03		1	0.0	1	1	1	0.9	0.9	0.9		
H SW-Leach	A-02	-	0.5								and and an
Angular (Cor	rected) Transfor	med D	etail						Den 0		
Sample Code	)	Rep	1 Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Kep 8		
HA RB-Ref		1.249	9 1.412	1.412	1.412	1.107	1.412	1.412	1.412		
HA RB-02		1.412	2 1.412	1.107	1.249	0.6847	1.249	1.412	1.412		
HA RB-03		1.107	7 1.412	1.412	1.412	1.412	1.412	1.412	1.249		
H SW-Leach	A-02	1.412	2 1.249	1.412	1.412	1.412	1.249	1.249	1.249		
Survival Rate	e Binomials										
Sample Code	Ð	Rep	1 Rep 2	2 Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8		
HA RB-Ref		9/10	10/10	10/10	10/10	8/10	10/10	10/10	10/10		
HA RB-02	62	10/10	0 10/10	8/10	9/10	4/10	9/10	10/10	10/10		
HA RB-03		8/10	10/10	10/10	10/10	10/10	10/10	10/10	9/10		
U CIALL anch	A-02	10/10	9/10	10/10	10/10	10/10	9/10	9/10	9/10		10- AL
1 OWV-Ledul	r to the								And the second se		

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Analyst: 22 QA: 6

 Report Date:
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 Test Code:
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U.S. EPA Region I I sh

		al and Grouth S	adiment T	est							0.5	. EPA Reg	IOIT I Lab
Hyalella 10-d S	Surviv	al and Growin S	eument n						CETIS	Version	CETISv1.8	7	
Analysis ID:	19-93	350-9499	Endpoint:	Mear	Dry Bioma	ss-mg		nonte	Offici	al Results:	Yes		
Analyzed:	09 M	ar-17 15:14	Analysis:	Para	metric-Conti	rol vs In	eam	nents	Omo				
Batch ID:	17-62	236-5666	Test Type	: Survi	ival-Growth				Analy	St:	Instinction		
Start Date:	08 N	ov-16	Protocol:	EPA	600/R-99/0	64 (2000	))		Dilue	nt: NOT P	opplicable		
Ending Date:			Species:	Hyal	ella azteca				Brine				
Duration:	NA		Source:	In-Ho	ouse Culture	}			Age:				
Batch Note:	2016	Troy Mills Sed T	ox Test - H	. azteca	a								
Sample Code		Sample Notes											
HA FW-Ref		2016 Troy Mills	Sed Tox T	est - H	. azteca								
HA FW-01		2016 Troy Mills	Sed Tox T	est - H	. azteca								
H SW-Leach A	A-01	2016 Troy Mills	Sed Tox T	'est - H	. azteca								
		Sample ID	San	nole Da	te Rece	ive Date	9	Sample Ag	je Clien	t Name		Project	
Sample Code		05 6737-7348	28 (	Dct-16				11d Oh	EPA	Region I		Troy Mills	
HA FW-Rer		02.6061-8510	28 (	Oct-16				11d Oh					
HA FW-01	1 01	00-2057-0158	28 0	Dct-16				11d Oh					
H SW-Leach A	4-01	00-2037-0100						Station Lo	cation		Latitude	Long	itude
Sample Code	)	Material Type	San	Inple Sc	andfill			HA FW-Re	f				
HA FW-Ref		Site Sediment	Tro	y wins i	andfill			HA FW-01					
HA FW-01		Site Sediment	110	y Willis I	Landfill			HA SW-Le	ach A-01				
H SW-Leach	A-01	Site Sediment	Iro	y wins i	Lanunn				DHCD	Test Pesi	ılt		
Data Transfo	m	Zeta	Alt	Нур	Trials	Seed			16.3%	Test Nest			
Untransforme	d	NA	C >	Т	NA	NA			10.070				
Dunnett Mult	tiple C	omparison Test											
Comple Code	o ve	Sample Code	Tes	t Stat	Critical	MSD	DF	P-Value	P-Type	Decision	a:5%)		
Sample Cour	e 43	HA FW-01	-0.1	747	2.022	0.016	14	0.7324	CDF	Non-Signi	ficant Effect		
LNA L WHITCH		H SW-Leach A	-01 5.1	28	2.022	0.016	14	<0.0001	CDF	Significan	( Elleci		
ANOVA Table	•												
Altora russ	-	Cum Cauaras	Me	an Sou	Jare	DF		F Stat	P-Value	Decision	(α:5%)		
Source		Sum Squales	0.0	045003	305	2		18.15	< 0.0001	Significan	t Effect		
Between		0.005000011	0.0	002480	075	21		c					
Error		0.01420877				23							
									4				
Distributiona	al Test	<b>.</b>			Test Stat	Critica	al	P-Value	Decision	(a:1%)			
Attribute		Test		00	0.3913	9.21		0.8223	Equal Va	riances			12
Variances		Bartlett Equalit	y or varian		0.9576	0.884		0.3927	Normal D	istribution			
Distribution		Snapiro-wilk v	Vittoimanty										
Mean Dry Bi	omas	s-mg Summary				AF6/ 1		Modian	Min	Max	Std Err	CV%	%Effect
Sample Cod	le	Col	unt Me	ean	95% LCL	90%	JUL C	0.000	0.073	0.12	0.006183	17.87%	0.0%
HA FW-Ref		8	0.0	9788	0.08325	0.112	5	0.1015	0.076	0.124	0.005599	15.96%	-1.41%
HA FW-01		8	0.0	19925	0.06001	0.112	94	0.055	0.037	0.079	0.00484	23.81%	41.25%
H SW-Leach	A-01	8	0.0	010	0.04000	0.000	54	0.000					
Mean Dry Bi	iomas	s-mg Detail					5		<b>D</b>	Det 7	Dan 9		
Sample Cod	le	Re	p1 Re	ep 2	Rep 3	Rep 4	ŀ	Rep 5	Rep 6	0.0°	0.103		
HA FW-Ref		0.0	85 0.0	073	0.12	0.117		0.095	0.11	0.00	0.103		
HA FW-01		0.1	09 0.0	089	0.099	0.083		0.0/6	0.11	0.049	0.049		
H SW-Leach	A-01	0.0	79 0.0	037	0.06	0.069		0.067	0.05	0.045			
1													

000-446-187-3

Analyst: ZZ QA: (0

09 Mar-17 15:14 (p 2 of 2) Report Date: Test Code:

1116HATROYCSED | 06-0637-9979

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Analyst: ZZ QA: (0

 Report Date:
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 Test Code:
 1116HATROYCSED | 06-0637-9979

Hyalella 10-d S	Surviv	al and Growth S	ediment Tes	t								0.0	. LFA No	310111
Analysis ID:	20-3- 09 M	426-5568 lar-17 15:14	Endpoint: Analysis:	Mean I Param	Dry Bioma etric-Cont	ass-mg trol vs T	reatr	nents	CE Offi	TIS Ver icial Re	sion: sults:	CETISv1.8 Yes	.7.	
andryzou.	17.6	226.5666	Test Type:	Surviv	al-Growth				Ana	alyst:				
Satch ID:	08 M	230-3000	Protocol:	EPA/6	00/R-99/0	64 (200	0)		Dilu	uent:	Not A	pplicable		
Start Date:	00 14	04-10	Snecies:	Hvalel	la azteca		1		Bri	ne:				
Ending Date:	MA	8	Source:	In-Hou	se Cultur	в			Age	e:				
Duration:	INA													
Batch Note:	2016	Troy Mills Sed To	ox Test - H. a	zteca										
Sample Code		Sample Notes												
HA RB-Ref		2016 Troy Mills	Sed Tox Tes	t - H. a	azteca									
HA RB-02		2016 Troy Mills	Sed Tox Tes	t - H. a	azteca									
HA RB-03		2016 Troy Mills	Sed Tox Tes	t - H. a	azteca									
H SW-Leach A	-02	2016 Troy Mills	Sed Tox Tes	t - H. a	azteca									
Sample Code		Sample ID	Samp	le Date	Rece	eive Dat	e	Sample A	ge Cli	ent Nar	ne		Project	
HA RB-Ref		14-8487-5507	28 Oc	-16				11d Oh	EP.	A Regio	oni		TTOY WINS	
HA RB-02		08-9266-2963	. 28 Oc	-16				11d 0h						
HA RB-03		08-4604-6141	28 Oc	-16				11d Oh						
H SW-Leach A	-02	16-6814-8225	28 Oc	-16				11d Oh						
Sample Code		Material Type	Samp	le Sou	irce			Station Lo	ocation			Latitude	Long	gitude
HA RB-Ref		Site Sediment	Troy N	1ills La	indfill			HA RB-Re	ef					
HA BB-02		Site Sediment	Troy N	fills La	Indfill			HA RB-02						
HA PR-03		Site Sediment	Troy N	Aills La	Indfill			HA RB-03						
H SW-Leach A	1-02	Site Sediment	Troy N	Aills La	Indfill			HA SW-Le	each A-02	!	2			
Data Transfor	777	Zeta	Alt H	/p T	Frials	Seed			PMSD	Tes	t Resu	ılt		
Untransformed	1	NA	C > T	٢	NA	NA			22.6%					
Dunnett Multi	inle C	omparison Test												
Comple Code	ve	Sample Code	Test	stat (	Critical	MSD	DF	P-Value	P-Type	Dee	cision(	a:5%)		
JA DR Dof	15	HA RB-02	-0.369	4 2	2.154	0.021	14	0.8629	CDF	Nor	n-Signif	ficant Effect		
HA KD-Kei		HA RB-03	-1.541	2	2.154	0.021	14	0.9912	CDF	No	n-Signil	ficant Effect		
		H SW-Leach A-	02 0.420	1 2	2.154	0.021	14	0.5788	CDF	No	n-Signif	ficant Effect		
ANOVA Table	)													
Source		Sum Squares	Mean	Squar	re	DF		F Stat	P-Value	e De	cision(	a:5%)		
Between		0.0016432	0.000	54773	34	3		.1.421	0.2574	No	n-Signi	ncant Effect		
Error		0.01079071	0.000	385382	25	28								
Total		0.01243391				31								
Distributiona	I Test	S												
Attribute		Test		•	Test Stat	Critic	al	P-Value	Decisio	on(a:1%	0)			
Variances		Bartlett Equality	of Variance	:	3.621	11.34		0.3055	Equal V	Distribut	stier			
Distribution		Shapiro-Wilk W	Normality	(	0.9589	0.908	1	0.2554	Normal	Distribi	naon			
Mean Dry Bio	mass	s-mg Summary											01/01	of Effect
Sample Code	)	Cou	nt Mean	1	95% LCL	95% l	JCL	Median	Min	Ma	X	Std Err	20.80%	0.0%
HA RB-Ref		8	0.093	63	0.07727	0.11		0.094	0.062	0.1	21	0.000364	20.03%	-3.87%
HA RB-02		8	0.097	25	0.07535	0.119	2	0.105	0.046	0.1	22	0.009201	16 5%	-16 15%
HA RB-03		8	0.108	7	0.09375	0.123	7	0.1075	0.079	0.1	42	0.000344	13 73%	4 4%
		8	0.089	5	0.07923	0.099	11	0.087	0.073	0.1	15	0.004343	10.7070	

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Analyst: ZZ QA: CO

Report Date: 09 Mar-17 15:15 (p 2 of 2)

Test Code: 1116HATROYCSED | 06-0637-9979

U.S. EPA Region I Lab

Analyst:\_ 22 QA:\_ (0

	i dand Cro	with Sadi	mont Te	st					U.S. EFA Region
Analysis ID: Analyzed:	20-3426-5568 09 Mar-17 15:14	End Ana	dpoint: alysis:	Mean Dry Biom Parametric-Con	nass-mg ntrol vs Trea	tments	CET Offi	TS Version: cial Results:	CETISv1.8.7 Yes
Mean Dry Bio	mass-mg Detail	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
HA RB-Ref HA RB-02 HA RB-03		0.076 0.113 0.079	0.108 0.113 0.117 0.088	0.099 0.072 0.103 0.09301	0.11 0.09701 0.127 0.081	0.062 0.046 0.112 0.083	0.121 0.118 0.095 0.113	0.089 0.097 0.102 0.073	0.08401 0.122 0.135 0.086

#### Graphics





	VIUS D-0	Ival a	nd Growth St	ediment Test					U.S. EPA Kegion I Lab
Start Date: End Date: Sample Date:	08 Nov- 28 Oct-1	16	Specia Protoc Materi	es: Chironon col: EPA/600. al: Lab Cont	ius dilutus (Midge) IR-99/064 (2000) rol	ខ្លួនខ្ល	mple Code: mple Source: mple Station:	Cdi Lab Control : In house : Cdi Control	
Batch Notes:	2016 Tr	oy Mill	s Sed Tox Te	st - C. dilutus					
Sample Cod	e Rej	o Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count M	tean Length-mm	Notes
Cdi Lab Control	4-	14	10	10	1050.75	1038.35	6		
Cdi Lab Control	8	58	10	10	1032.71	1021.08	10		
Cdi Lab Control	8	40	10	10	1023.15	1010.14	10		
Cdi Lab Control	4	23	10	6	1026.06		6		
Cdi Lab Control	2	18	10	10	1008.58	996.01	10		
Cdi Lab Control	8	26	10	8	1067.53	1055.31	8		
Cdi Lab Control	~	8	10	10	1054.93	1041.8	10		
Cdi Lab Control	8	1	10	10	1045.46	1033.18	10		
Cdi FW-Ref		33	10	5	1050.25	1037.61	6		
Cdi FW-Ref		-	1 10	8	1034.05	1022.08	8		
Cdi FW-Ref		8	10	8	968.6	955.3	8		
Cdi FW-Ref		3	9 10	6	1009.82	997.03	6		
Cdi FW-Ref		10	10	10	1051.52	1038.71	6		
Cdi FW-Ref		3	8 10	10	1023.13	1009.64	10		
Cdi FW-Ref		7 3	6 10	6	1025.96	1013.9	6		
Cdi FW-Ref		8 5	6 10	6	1012.87	1004.15	2	-2000	
Cdl RB-Ref		4	1 10	10	1039.83	1026.52	10		
Cdi RB-Ref		0	1 10	0	0	0	0		
Cdi RB-Ref		3	11 10	9	1019.86	1012.04	9		
Cdi RB-Ref		4	8 10	10	1049.19	1036.9	10		
Cdi RB-Ref		5	50 10	8	1009	1002.87	3		
Cdi RB-Ref	-	8	52 10						
Cdi RB-Ref		7	51 10	8	1010.82	997.16	8		
Cdi RB-Ref		8	9 10	0	0	0	0		
Cdi FW-01		-	49 10	Ø	1017.69	1005.46	6		
Cdi FW-01		N	64 10	6	1035.62	1022.75	6		
Cdi FW-01		e	10 10	10	1020.98	1007.19	10		
Cdl FW-01		4	45 10	10	1013.02	999.86	10		
Cdi FW-01		5	26 10	8	1042.66	1031.05	8		
Cdi FW-01		8	12 10	10	991.08	978.77	10		
Cdi FW-01		7	20 10	7	1029.9	1019.3	2		
I'MI ENLAT		a	10	-	1013.16	1012.19	-		

# **CETIS Test Data Worksheet**

# Report Date: 07 Mar-17 10:17 (p 2 of 2)

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count	Mean Length-mm	Notes
Cdi RB-02	-	37	10	6	1035.4	1026.8	6		
Cdi RB-02	2	22	10	-	1032.26	1030.95	F		
Cdi RB-02	0	e	10	8	1009.31	1002.09	8		
Cdi RB-02	4	63	10	8	1026.16	1019,25	ø		
Cdi RB-02	2	24	10	6	1014.66	1005.49	6		
Cdi RB-02	9	55	10	6	1010.18	1002.7	6		
Cdi RB-02	~	16	10	8	1027.82	1018.61	8	an to tyle	
Cdi RB-02	8	60	10	5	1015.48	1012.01	പ		
Cdi RB-03	-	2	10	7	1016.32	1008.44	7		
Cdi RB-03	3	54	10	5	1055.26	1048.82	s		
Cdi RB-03	3	33	10	6	1022.2	1012.92	8		
Cdi RB-03	4	17	10	2	1002.17		2		
Cdi RB-03	5	25	10	5	984.85	980.3	5		
Cdi RB-03	9	53	10	7	1017.88	1011.23	2		
Cdi RB-03	7	62	10	2	1024.5	1018.06	ß		
Cdi RB-03	8	46	10	6	1007.05	996.66	6		
C SW-Leach A-01		13	10	0	0	0	0		
C SW-Leach A-01	2	29	10	3	1039	1033.22	7		
C SW-Leach A-01	0	30	10	2	1047.86	1039.99	2		
C SW-Leach A-01	4	27	10	2	1026.85		2		
C SW-Leach A-01	5	42	10	2	1017.59		2		~
C SW-Leach A-01	9	4	10	1	970.44	969.66	-		
C SW-Leach A-01	2	44	10	-	950.46	950.08	-		
C SW-Leach A-01	80	48	10	~	1038.32	1037.71	2		
C SW-Leach A-02	-	59	10	0	0	0	0		
C SW-Leach A-02	8	47	10	0	0	0	0		
C SW-Leach A-02	8	15	10	6	1019.49	1009.1	0		
C SW-Leach A-02	4	35	10	6	1034.25	1023.36	o		
C SW-Leach A-02	5	43	1 10	6	1035.42	1024.92	6		
C SW-Leach A-02	9	1	10	6	1045.71	1039.01	8		
C SW-Leach A-02	2	31	10	2	1026.4	1021.76	5		
C SW-Leach A-02	8	ø	10	6	989.12	982.01	6		

CETIS™ v1.8.7.16

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Analyst: ZZ

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 Report Date:
 09 Mar-17 15:03 (p 1 of 2)

 Test Code:
 1116CDITROYCSED | 13-6827-6185

Chironomus 1	0-d S	urvival and Gro	wth Sedim	ent Te	st					0.	O. LI MINO	9:01:1
Analysis ID:	06-7	885-1711	Endpoint	: Mea	n AF Bioma	ss-mg		CETI	S Version:	CETISv1.	8.7	
Analyzed:	09 N	lar-17 15:03	Analysis:	Para	ametric-Mult	iple Compa	rison	Offic	ial Results:	Yes		
Batch ID:	19-0	937-4625	Test Type	: Sun	vival-AF Gro	wth		Analy	yst:	Augligable		
Start Date:	08 N	lov-16	Protocol	EPA	V600/R-99/0	64 (2000)		Dilue	int: NOU	Applicable		
Ending Date:			Species:	Chir	onomus dilu	tus (Midge)		Brine	<b>;</b> ;			
Duration:	NA		Source:	In-H	louse Cultur	8		Age:				
Batch Note:	2016	Troy Mills Sed	Tox Test - C	C. dilutu	IS							
Sample Code		Sample Note	s									
Cdi FW-Ref		2016 Troy Mill	s Sed Tox	rest - C	. dilutus							
Cdi FW-01		2016 Troy Mill	s Sed Tox	rest - C	. dilutus							
C SW-Leach A	4-01	2016 Troy Mill	Is Sed Tox	lest - C	. dilutus						Dealact	
Sample Code		Sample ID	Sar	nple Da	ate Rece	eive Date	Sample A	ge Clier	nt Name Region I		Troy Mills	
Cdi FW-Ref		05-5825-6602	28	Oct-16		1	110 UN	EPA	Region I		1103 mints	
Cdi FW-01		03-1201-4475	28	Oct-16			11d Oh					
C SW-Leach A	<b>\-01</b>	18-2151-0801	28	Oct-16			11d Oh					
Sample Code		Material Type	e Sar	nple S	ource		Station Lo	ocation		Latitude	Long	gitude
Cdi FW-Ref		Site Sediment	t Tro	y Mills	Landfill		Cdi FW-R	ef				
Cdi FW-01		Site Sediment	t Tro	y Mills	Landfill		Cdi FW-01	1				
C SW-Leach A	4-01	Site Sediment	t Tro	y Mills	Landfill		Cdi SW-Li	each A-01			and the second second	
Data Transfor	m	Zet	a Alt	Нур	Trials	Seed		PMSD	Test Resu	ult		
11-lan of a mood	4	NΔ	0.2	Т	ALA.			29 5%				
Untransformed	1	11/1	0.		NA	NA		20.070				
Bonferroni Ad	djt Te	st		<u>.</u>	NA	NA		20.070				
Bonferroni Ac	djtTe vs	est Sample Code	Tes	st Stat	Critical	MSD DF	P-Value	P-Type	Decision(	(a:5%)		
Bonferroni Ac Sample Code Cdi FW-Ref	djtTe vs	st Sample Code Cdi FW-01		st Stat	Critical 2.093	MSD DF 0.334 14	<b>P-Value</b> 0.4319	P-Type CDF	Decision( Non-Signi	(a:5%) ficant Effect		
Bonferroni Ac Sample Code Cdi FW-Ref	djtTe vs	Sample Code Cdi FW-01 C SW-Leach A	Tes 0.8 A-01 5.6	<b>st Stat</b> 03 07	Critical 2.093 2.093	MSD DF 0.334 14 0.360 12	P-Value 0.4319 <0.0001	P-Type CDF CDF	Decision( Non-Signi Significan	(a:5%) ficant Effect t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref	djtTe vs	Sample Code Cdi FW-01 C SW-Leach A	Te: 0.8 A-01 5.6	<b>st Stat</b> 03 07	Critical 2.093 2.093	MSD DF 0.334 14 0.360 12	P-Value 0.4319 <0.0001	P-Type CDF CDF	Decision( Non-Signi Significan	α:5%) ficant Effect t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source	djtTe vs	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares	Te: 0.8 A-01 5.6 Me	an Squ	Critical 2.093 2.093	MSD DF	P-Value 0.4319 <0.0001 F Stat	P-Type CDF CDF P-Value	Decision( Non-Signi Significant	(a:5%) ficant Effect t Effect (a:5%)		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between	djtTe vs	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898	Tes 0.8 A-01 5.6 Me 1.8	an Squ 04949	Critical 2.093 2.093	MSD DF 0.334 0.360 12 DF 2	<ul> <li>P-Value</li> <li>0.4319</li> <li>&lt;0.0001</li> <li>F Stat</li> <li>17.76</li> </ul>	P-Type CDF CDF P-Value <0.0001	Decision( Non-Signi Significant Decision( Significant	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error	djtTe vs	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905	Tes 0.8 A-01 5.6 Me 1.8 0.1	an Squ 04949 016266	Critical 2.093 2.093 jare	NA MSD DF 0.334 14 0.360 12 DF 2 19	P-Value 0.4319 <0.0001 F Stat 17.76	P-Type CDF CDF P-Value <0.0001	Decision( Non-Signi Significant Decision( Significant	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total	djtTe vs	Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802	Tes           0.8           A-01         5.6           Me           1.8           0.1	an Squ 016266	Critical 2.093 2.093 ware	NA MSD DF 0.334 14 0.360 12 DF 2 19 21	<ul> <li>P-Value</li> <li>0.4319</li> <li>&lt;0.0001</li> <li>F Stat</li> <li>17.76</li> </ul>	P-Type CDF CDF P-Value <0.0001	Decision( Non-Signi Significant Decision( Significant	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional	dj t Te vs ) I Test	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s	Tes 0.8 0.9 0.1 5.6 Me 1.8 0.1	an Squ 03 07 04949 016266	Critical 2.093 2.093 are	NA MSD DF 0.334 14 0.360 12 DF 2 19 21	P-Value           0.4319           <0.0001	P-Type CDF CDF P-Value <0.0001	Decision( Non-Signi Significant Decision( Significant	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute	dj t Te vs i I Test	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test	Tes 0.8 A-01 5.6 Me 1.8 0.1	an Squ 03 07 an Squ 04949 016266	Critical 2.093 2.093 Jare Test Stat	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical	P-Value 0.4319 <0.0001 F Stat 17.76 P-Value	P-Type CDF CDF P-Value <0.0001 Decision	Decision( Non-Signi Significant Decision( Significant (a:1%)	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances	dj t Te vs ) I Test	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test Bartlett Equali	Tes 0.8 A-01 5.6 Me 1.8 0.1	an Squ 04949 016266	Critical 2.093 2.093 mare Test Stat 5.803	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21	<ul> <li>P-Value</li> <li>0.4319</li> <li>&lt;0.0001</li> <li>F Stat</li> <li>17.76</li> <li>P-Value</li> <li>0.0549</li> </ul>	P-Type CDF CDF P-Value <0.0001 Decision Equal Val	Decision( Non-Signi Significant Decision( Significant (a:1%) riances	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution	djtTe vs lTest	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V	Tes 0.8 A-01 5.6 Me 1.8 0.1 ty of Varian W Normality	an Squ 03 07 04949 016266	Critical           2.093           2.093           are           3           Test Stat           5.803           0.8771	NA           MSD         DF           0.334         14           0.360         12           DF         2           19         21           Critical         9.21           0.8757         0.8757	P-Value           0.4319           <0.0001	P-Type CDF CDF P-Value   <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution	(a:5%) ficant Effect t Effect (a:5%) t Effect		
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior	dj t Te + vs 	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V mg Summary	Tes 0.8 A-01 5.6 Me 1.8 0.1 ty of Varian	an Squ 03 07 04949 016266	NA           Critical           2.093           2.093           ware           5           Test Stat           5.803           0.8771	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757	P-Value           0.4319           <0.0001	P-Type CDF CDF P-Value <0.0001 Decision Equal Val Normal D	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution	(a:5%) ficant Effect t Effect (a:5%) t Effect	01/9/	%E#ar*
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code	dj t Te + vs - vs 	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V mg Summary Co	Tes 0.8 A-01 5.6 Me 1.8 0.1 ty of Varian W Normality unt Me	an Squ 03 07 04949 016266	NA           Critical           2.093           2.093           sare           3           Test Stat           5.803           0.8771           95% LCL	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL	P-Value 0.4319 <0.0001 F Stat 17.76 P-Value 0.0549 0.0107 Median	P-Type CDF CDF P-Value <0.0001 Decision Equal Val Normal D	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution	(a:5%) ficant Effect t Effect (a:5%) t Effect Std Err	CV%	%Effect
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref	dj t Te + vs - - - - - - - - - - - - - - - - - - -	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8	Tes 0.8 A-01 5.6 Me 1.8 0.1 ty of Varian W Normality unt Me 1.2	an Squ 03 07 04949 016266 ce	NA           Critical           2.093           2.093           pare           3           Test Stat           5.803           0.8771           95% LCL           1.096	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349	P-Value           0.4319           <0.0001	P-Type CDF CDF P-Value   <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349	(a:5%) ficant Effect t Effect (a:5%) t Effect Std Err 0.0534 0.1466	CV% 12.36% 37.88%	%Effect 0.0% 10.47%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-01	dj t Te vs ; i Test	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8	Tes           0.8           0.8           0.1           5.6           Me           1.8           0.1           ty of Varian           N Normality           unt         Me           1.2           1.0	an Squ 03 07 04949 016266 ce 22 94	NA           Critical           2.093           2.093           pare           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.2020	P-Value           0.4319           <0.0001	P-Type           CDF           CDF           CDF           P-Value           <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787	(a:5%) ficant Effect t Effect (a:5%) t Effect Std Err 0.0534 0.1466 0.1376	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-01 C SW-Leach A	dj t Te vs i vs i Test mass-	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8 8 6	Tes 0.8 0.8 0.4-01 5.6 Me 1.8 0.1 ty of Varian W Normality unt Me 1.2 1.0 0.2	an Squ 03 07 04949 016266 016266 026 016266 016666 016666 016666 016666 016666 016666 0166666 0166666 0166666 0166666 01666666 016666666 0166666666	NA           Critical           2.093           2.093           mare           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477           -0.09683	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.6108	P-Value           0.4319           <0.0001	P-Type           CDF           CDF           CDF           CDF           P-Value           <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787	(a:5%) ficant Effect t Effect (a:5%) t Effect <u>Std Err</u> 0.0534 0.1466 0.1376	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-Ref Cdi FW-Q1 C SW-Leach A	dj t Te i vs i Test mass- A-01 mass-	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8 8 6	Tes 0.8 0.8 0.1 5.6 Me 1.8 0.1 ty of Varian W Normality unt Me 1.2 1.0 0.2	an Squ 03 07 04949 016266 ce 22 94 57	NA           Critical           2.093           2.093           are           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477           -0.09683	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.6108	P-Value           0.4319           <0.0001	P-Type CDF CDF P-Value<0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787	(a:5%) ficant Effect t Effect (a:5%) t Effect Std Err 0.0534 0.1466 0.1376	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-01 C SW-Leach A Mean AF Bior Sample Code	dj t Te vs vs i Test mass- a A-01 mass-	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8 8 6 -mg Detail Rej	Tes 0.8 0.8 0.8 0.1 1.8 0.1 ty of Varian W Normality unt Me 1.2 1.0 0.2 p 1 Re	an Squ 03 07 04949 016266 01666 016666 016666 016666 016666 0166666 0166666 0166666 0166666 0166666 01666666 01666666 0166666666	NA           Critical           2.093           2.093           pare           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477           -0.09683           Rep 3	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.6108 Rep 4	P-Value           0.4319           <0.0001	P-Type           CDF           CDF           CDF           CDF           P-Value           <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787 Rep 7	(a:5%) ficant Effect t Effect (a:5%) t Effect 5td Err 0.0534 0.1466 0.1376 Rep 8 0.972	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-Ref Cdi FW-Ref Cdi FW-Ref	dj t Te vs vs i Test mass- A-01 mass-	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 S Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8 8 6 -mg Detail Re 1.2	Tes 0.8 0.8 0.8 0.1 1.8 0.1 ty of Varian W Normality unt Me 1.2 1.0 0.2 p 1 Re 64 1.1	an Squ 03 07 04949 016266 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 0166666 0166666 0166666 0166666 01666666 01666666 0166666666	NA           Critical           2.093           2.093           nare           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477           -0.09683           Rep 3           1.33	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.6108 Rep 4 1.279	P-Value           0.4319           <0.0001	P-Type           CDF           CDF           CDF           CDF           P-Value           <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787 Rep 7 1.206	(a:5%) ficant Effect t Effect (a:5%) t Effect 5td Err 0.0534 0.1466 0.1376 Rep 8 0.872 0.067	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%
Bonferroni Ac Sample Code Cdi FW-Ref ANOVA Table Source Between Error Total Distributional Attribute Variances Distribution Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-O1 C SW-Leach A Mean AF Bior Sample Code Cdi FW-Ref Cdi FW-Ref Cdi FW-01	dj t Te vs i vs i Test mass- a	st Sample Code Cdi FW-01 C SW-Leach A Sum Squares 3.609898 1.930905 5.540802 s Test Bartlett Equali Shapiro-Wilk V mg Summary Co 8 8 8 6 -mg Detail Rej 1.2 1.2	Tes 0.8 0.8 0.8 0.1 1.8 0.1 ty of Varian W Normality unt Me 1.2 1.0 0.2 p 1 Re 64 1.1 23 1.2	an Squ 03 07 04949 016266 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 016666 0166666 0166666 0166666 016666666 0166666 0166666666	NA           Critical           2.093           2.093           mare           3           Test Stat           5.803           0.8771           95% LCL           1.096           0.7477           -0.09683           Rep 3           1.33           1.379	NA MSD DF 0.334 14 0.360 12 DF 2 19 21 Critical 9.21 0.8757 95% UCL 1.349 1.441 0.6108 Rep 4 1.279 1.316 1.279	P-Value 0.4319 <0.0001 F Stat 17.76 P-Value 0.0549 0.0107 Median 1.271 1.227 0.0695 Rep 5 1.281 1.161 0.052	P-Type           CDF           CDF           CDF           P-Value           <0.0001	Decision( Non-Signi Significant Decision( Significant (a:1%) riances istribution Max 1.349 1.379 0.787 Rep 7 1.206 1.06	(a:5%) ficant Effect t Effect (a:5%) t Effect 5td Err 0.0534 0.1466 0.1376 Rep 8 0.872 0.097	CV% 12.36% 37.88% 131.2%	%Effect 0.0% 10.47% 78.97%

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Analyst: ZZ QA: CO

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U.S. EPA Region I Lab

Chironomus 10-d Survival and Growth Sediment Test



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Analyst: ZZ QA: CO

 Report Date:
 09 Mar-17 15:09 (p 1 of 2)

 Test Code:
 1116CDITROYCSED | 13-6827-6185

			•								U.S.	EPA Reg	ion I Lab
Chironomus 1	0-d Su	Irvival and Gro	wth Sedimo	ent Tes	t						CETISVI 8	7	1000
Analysis ID: Analyzed:	14-62 09 M	25-4818 ar-17 15:09	Endpoint: Analysis:	Mear Para	n AF Biomas metric-Multip	is-mg ble Com	pari	son	Offici	al Results:	Yes		
Retab (D:	19.00	37-4625	Test Type	: Survi	ival-AF Grow	vth			Analy	st:			
Batch ID.	08 M	w-16	Protocol:	EPA	600/R-99/06	54 (2000	))		Dilue	nt: Not A	pplicable		
Start Date.	00 140		Species:	Chiro	nomus dilut	us (Mide	ge)		Brine	:			
Ending Date.	NA		Source:	In-He	ouse Culture				Age:				
Duration:				al The skew									
Batch Note:	2016	Troy Mills Sed	Tox Test - C	. anutu:	5								
Sample Code		Sample Note	s		Ph. 1		-						
Cdi RB-Ref		2016 Troy Mil	Is Sed Tox T	est - C	, dilutus								
Cdi RB-02		2016 Troy Mil	Is Sed Tox T	Fest - C	. dilutus								
Cdi RB-03		2016 Troy Mil	Is Sed Tox 7	rest - C	. dilutus								
C SW-Leach A	-02	2016 Troy Mil	Is Sed Tox T	rest - C	. dilutus							<b>n</b> i i	i and
Sample Code	4	Sample ID	Sar	nple Da	nte Rece	ive Date	9	Sample Ag	ge Clien	t Name		Troy Mills	
Cdi RB-Ref		18-1639-4271	28 0	Oct-16				11d Oh	EPA	Region I		1103 1000	
Cdi RB-02		10-1616-5779	28 0	Oct-16				11d Oh		é.			
Cdi RB-03		10-8352-1382	2 28	Oct-16				11d Oh					
C SW-Leach A	-02	00-0498-9718	3 28	Oct-16				11d Oh					
Sample Code		Material Typ	e Sar	nple So	ource			Station Lo	ocation		Latitude	Long	itude
Cdi RB-Ref		Site Sedimen	nt Tro	y Mills I	Landfill			Cdi RB-Re	f				
Cdi PB-02		Site Sedimen	nt Tro	y Mills I	Landfill			Cdi RB-02					
Cdi RB-03		Site Sedimer	nt Tro	y Mills	Landfill			Cdi RB-03	10. 10 - 2000 V				
C SW-Leach A	A-02	Site Sedimer	nt Tro	y Mills	Landfill			Cdi SW-Le	each A-02				
Data Transfor	rm	Ze	ta Alt	Нур	Trials	Seed			PMSD	Test Resu	ilt		
Untransformed	d	NA	C>	• T	NA	NA			62.0%				
Bonferroni A	di t Te	st											
Semple Code	ve	Sample Code	e Te	st Stat	Critical	MSD	DF	P-Value	P-Type	Decision(	a:5%)		
Sample Code	: 43	Cdi BB-02	0.4	435	2.247	0.471	13	0.9917	CDF	Non-Signi	ficant Effect		
Cal KB-Kei		Cdi RB-03	0.1	042	2.247	0.487	12	1.0000	CDF	Non-Signi	ficant Effect		
		C SW-Leach	A-02 0.6	306	2.247	0.471	13	0.8007	CDF	Non-Signi	ncant Elleci		
ANOVA Table	9												
Source		Sum Squares	, Me	an Squ	iare	DF		F Stat	P-Value	Decision	(0:5%)		
Between		0.0846529	0.0	282176	53	3		0.1718	0.9145	Non-Signi	ncant Enect		
Fror		4.270769	0.1	642604	<b>(</b>	26							
Total		4.355422				29							
Distributiona	al Test	s				1.22	- 22			1			
Attribute		Test			Test Stat	Critica	al	P-Value	Decision	riances			
Variances		Bartlett Equa	lity of Varian	ice	7.372	11.34		0.0609	Equal Va	lietribution			
Distribution		Shapiro-Wilk	W Normality	у	0.9488	0.903	1	0.1572	Normar L	noutour			
Mean AF Bio	mass	-mg Summary				10.0000000				Marr	Std Err	CV%	%Effect
Sample Code	e	C	ount Me	ean	95% LCL	95% l	JCL	Median	Min	1 366	0.2231	77.65%	0.0%
Cdi RB-Ref		7	0,	7601	0.2142	1.306	_	0.782	0 404	0.021	0.1004	42.55%	12.24%
Cdi RB-02		8	0.0	6671	0.4298	0.904	5	0.735	0.131	1 030	0.07437	26.68%	2.97%
Cdi RB-03		7	0.	7376	0.5556	0.919	c	0.605	0.455	1.089	0.1572	70.81%	17.4%
C SW-Leach	A-02	8	0.0	6279	0.2562	0.999	0	0.0900	v	1.000			

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Analyst: ZZ QA: CO

CETIS Ana	lytical Report	rt					Rep Tes	oort Date: t Code: 11	09 Mar-17 16CDITROYCSE	7 15:09 (p 2 of 2) D   13-6827-6185
Chironomus	10-d Survival and	Grow	rth Sedimer	nt Test					U.S. EF	PA Region I Lab
Analysis ID: Analyzed:	14-6225-4818 09 Mar-17 15:09	I	Endpoint: Analysis:	Mean AF Bior Parametric-M	nass-mg ultiple Comp	parison	CE	TIS Version: icial Results:	CETISv1.8.7 Yes	-
Mean AF Blo	mäss-mg Detail	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
Cdi RB-Ref Cdi RB-02 Cdi RB-03		1.331 0.86 0.788	0 0.131 0.644	0.782 0.722 0.928	1.229 0.691 0.455	0.613 0.917 0.665	1.366 0.748 0.644	0 0.921 1.039	0.347	
C SW-Leach	4-02	0	0	1.039	1.089	1.05	0.67	0.404	0.711	
Graphics						0.8 0.7		1		/





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Analyst:\_\_\_\_\_ QA:\_\_CO

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Chironomus 1	0-d Su	rvival and Gro	wth Sedir	nent Tes	t						0.5	. EPA Regi	
CINIONOINUS		00 5554	Endnoir	t. Survi	val Rate				CETIS	Version:	CETISv1.8.	7	
Analysis ID: Analyzed:	04-473 09 Ma	33-5554 1r-17 15:03	Analysis	: Para	metric-Contr	ol vs Treat	ments		Officia	al Results:	Yes		
Rotoh ID:	19-09	37-4625	Test Typ	be: Survi	val-AF Grow	⁄th			Analy	st:	nnliachla		
Balch ID.	08 No	v-16	Protoco	I: EPA	600/R-99/06	4 (2000)			Diluer	nt: Not A	pplicable		
Start Date.	00110		Species	: Chiro	nomus dilut	us (Midge)			Brine				
Duration:	NA		Source:	In-Ho	ouse Culture				Age:				
Batch Note:	2016	Troy Mills Sed	Tox Test -	C. dilutus	5								
Sample Code		Sample Notes	5										
Cdi EM-Ref		2016 Troy Mill	s Sed Tox	Test - C.	dilutus								
Cdi EM/D1		2016 Troy Mill	s Sed Tox	Test - C	dilutus								
C SW-Leach A	-01	2016 Troy Mill	Is Sed Tox	Test - C	dilutus								
0011 200011		Denvelo ID	S	ample Da	te Rece	ve Date	Sam	ple Ag	e Clien	t Name		Project	
Sample Code		Sample ID	21	A Oct-16	10000		11d	Oh	EPA I	Region I		Troy Mills	
Cdi FW-Ref		05-5825-6602	. 20	R Oct-16			11d	Oh					
Cdi FW-01	04	18-2151-0801	21	3 Oct-16			11d	Oh					-
C SW-Leach A	4-01	10-2101-0001		ample S	ource		Stati	ion Loo	cation		Latitude	Long	itude
Sample Code		Material Type	9 3 + T	roy Mille I	andfill		Cdi F	W-Re	f				
Cdi FW-Ref		Site Sedimen	ι τ • Τ	roy Mills	andfill		Cdi F	FW-01					
Cdi FW-01		Site Sedimen	ц , • Т	roy Mills I	andfill		Cdi S	SW-Lei	ach A-01				
C SW-Leach	A-01	Site Sedimen				0			PMSD	Test Resu	lt		
Data Transfo	m	Zet	a A	It Hyp	Trials	Seea			22.5%				
Angular (Corr	ected)	NA	. C	;>1	NA	11/1							
Dunnett Mult	iple Co	omparison Tes	it							Desistant	-======================================		
Sample Code	e vs	Sample Code	, Т	est Stat	Critical	MSD DI	P-Va	alue	P-Type	Decision(	Grant Effect		
Cdi FW-Ref		Cdi FW-01	0	.8358	2.022	0.266 14	0.32	206	CDF	Significant	Effect		
		C SW-Leach	A-01 5	.953	2.022	0.266 14	<0.0	1001	CDF	Olgrimouri			
ANOVA Table	e						E 64		P.Value	Decision(	a:5%)		
Source		Sum Squares	0	lean Squ	lare		20.7	70	<0.0001	Significan	t Effect		
Between		2.881167	1	.440584		2	20.1	0	-0.0001				
Error		1.456104	(	0.0693382	27	21	• • - 1						
Total		4.337271				25							
Distributiona	al Test	5			Test Stat	Critical	P.V	alue	Decision	(a:1%)			
Attribute		Test			7 406	0.21	0.02	247	Equal Va	riances			
Variances		Bartlett Equa	lity of Vari	ance	0.885	0.884	0.0	105	Normal D	istribution			
Distribution		Shapiro-Wilk	w Norma	inty	0.000								
Survival Rat	e Sum	ma <b>ry</b>			A #0/ 1 AL	05% 1101	Me	dian	Min	Max	Std Err	CV%	%Effect
Sample Cod	e	Co	ount	Mean	95% LUL	0.9632	0.9		0.8	1	0.02673	8.4%	0.0%
Cdi FW-Ref		8		0.9	0.5472	1	0.9		0.1	1	0.1069	37.8%	11.11%
Cdi FW-01	1.3 9344	8		0.005	0.04765	0.4023	0.2		0	0.7	0.075	94.28%	75.0%
C SW-Leach	A-01	8		0.220	0.04100								
Angular (Co	rrected	d) Transformed	d Summa	ry	050/101	000/ 110	1 MA	dian	Min	Max	Std Err	CV%	%Effect
Sample Coo	le	C	ount	Mean	95% LCL	1 254	1 1 2	49	1,107	1.412	0.04079	9.2%	0.0%
Cdi FW-Ref		8		1.254	1,150	1.301	12	49	0.3218	1.412	0.1294	32.0%	8.77%
Cdi FW-01		8		1.144	0.0304	0.6764	0.4	636	0.1588	0.9912	0.08707	52.34%	62.49%
C SW-Leach	n A-01	8		0.4705	0.2040	A.41.0-4		0.000					

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Analyst:\_\_\_\_\_\_ QA:\_\_CD

Report Date: 09 Mar-17 15:03 (p 2 of 2)

Test Code: 1116CDITROYCSED | 13-6827-6185

U.S. EPA Region I Lab

and the second se		and the second second				
	40 4	Cuminal	and	Growth	Sediment	Test

10-d Survival and	a Growt	n Sedimen	[ 1631				10 Manufacture	CETISVI 87
04-4733-5554 09 Mar-17 15:03	8 3 A	indpoint: nalysis:	Survival Rate Parametric-Co	ntrol vs Tre	atments	Offi	cial Results:	Yes
Detail	_	Den 2	Pen 3	Ren 4	Rep 5	Rep 6	Rep 7	Rep 8
	Rep 1	Rep 2	0.8	0.9	1	1	0.9	0.9
	0.9	0.0	1	1	0.8	1	0.7	0.1
	0.9	0.9	07	0.2	0.2	0.1	0.1	0.2
4-01	0	0.3	0.7	V.2	·			
rected) Transform	med Det	ail						-
	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
	1.249	1.107	1.107	1.249	1.412	1.412	1.249	1.249
	1.249	1.249	1.412	1.412	1.107	1.412	0.9912	0.3218
<b>4-01</b>	0,1588	0.5796	6 0.9912	0.4636	0.4636	0.3218	0.3218	0.4636
Binomials					11 2422-00 121-044-00		D	Dan 9
,	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep /	0/10
	9/10	8/10	8/10	9/10	10/10	10/10	9/10	3/10
	9/10	9/10	10/10	10/10	8/10	10/10	7/10	1/10
A-01	0/10	3/10	7/10	2/10	2/10	1/10	1/10	2/10
	0-d Survival and 04-4733-5554 09 Mar-17 15:0 Detail A-01 rected) Transform A-01 Binomials	Rep 1           0.9         Mar-17 15:03         A           Detail         Rep 1         0.9           0.9         0.9         0.9           A-01         0         0           rected) Transformed Detail         Rep 1           1.249         1.249           A-01         0.1588           Binomials         Rep 1           9/10         9/10           9/10         0/10	Rep 1         Rep 2           0.9         0.9           Detail         Rep 1         Rep 2           0.9         0.8         0.9         0.9           0.9         0.8         0.9         0.9           0.09         0.3         rected) Transformed Detail         Rep 1         Rep 2           1.249         1.107         1.249         1.249           0.1588         0.5790         9/10         8/10           9/10         8/10         9/10         8/10           9/10         9/10         9/10         9/10	Rep 1         Rep 2         Rep 3           0.9         0.9         0.8         0.8           0.9         0.9         0.8         0.8           0.9         0.9         0.9         1           0.9         0.9         0.8         0.8           0.9         0.9         1         0           0.9         0.9         1         0           0.9         0.9         1         0           0.9         0.9         1         0           0.9         0.9         1         0           0.9         0.9         1         0           0.9         0.9         1         0           0.10         0         0.3         0.7           rected) Transformed Detail         Interview         Interview           0.1588         0.5796         0.9912           0.1588         0.5796         0.9912           0.910         8/10         8/10           9/10         8/10         8/10           9/10         9/10         10/10           0/10         3/10         7/10	Rep 1         Rep 2         Rep 3         Rep 4           0.9         0.9         0.8         0.9         0.9           0.9         0.9         0.8         0.9         0.9           0.9         0.9         0.9         1         1           0.9         0.9         0.9         1         1           0.9         0.9         0.9         1         1           0.9         0.9         1         1         1           0.9         0.9         1         1         1           0.9         0.9         1         1         1           0.9         0.9         1         1         1           0.09         0.3         0.7         0.2         1           rected) Transformed Detail	Od-4733-5554         Endpoint:         Survival Rate           09 Mar-17 15:03         Analysis:         Parametric-Control vs Treatments           Detail         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           0.9         0.8         0.8         0.9         1         0.8           0.9         0.8         0.8         0.9         1           0.9         0.9         1         1         0.8           A-01         0         0.3         0.7         0.2         0.2           rected) Transformed Detail           Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           1.249         1.107         1.107         1.249         1.412           1.249         1.249         1.412         1.107           A-01         0.1588         0.5796         0.9912         0.4636         0.4636           Binomials           9/10         8/10         9/10         10/10           9/10         9/10         10/10         8/10         9/10         10/10           9/10         8/10         9/10         10/10         8/10         9/10         <	Od-4733-5554         Endpoint:         Survival Rate         CET           09 Mar-17 15:03         Analysis:         Parametric-Control vs Treatments         Offic           Detail         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6           0.9         0.8         0.8         0.9         1         1         0.8         1           0.9         0.9         1         1         0.8         1         1         0.8         1           A-01         0         0.3         0.7         0.2         0.2         0.1         1           rected) Transformed Detail           Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6           1.249         1.107         1.107         1.249         1.412         1.412         1.412           A-01         0.1588         0.5796         0.9912         0.4636         0.4636         0.3218           Binomials           Step 3         Rep 4         Rep 5         Rep 6           9/10         8/10         8/10         9/10         10/10         10/10           9/10         8/10 <td>No-d Survival and Growth Sediment rest         CETIS Version: Official Results:           04-4733-5554 09 Mar-17 15:03         Endpoint: Analysis:         Survival Rate Parametric-Control vs Treatments         CETIS Version: Official Results:           Detail         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6         Rep 7           0.9         0.8         0.8         0.9         1         1         0.9           0.9         0.9         1         1         0.8         1         0.7           0.9         0.9         1         1         0.8         1         0.7           0.9         0.3         0.7         0.2         0.2         0.1         0.1           rected) Transformed Detail           Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6         Rep 7           1.249         1.107         1.412         1.412         1.412         1.249           1.249         1.249         1.412         1.412         1.412         0.3218           Aeo1         0.1588         0.5796         0.9912         0.4636         0.4636         0.3218         0.3218           Binomials</td>	No-d Survival and Growth Sediment rest         CETIS Version: Official Results:           04-4733-5554 09 Mar-17 15:03         Endpoint: Analysis:         Survival Rate Parametric-Control vs Treatments         CETIS Version: Official Results:           Detail         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6         Rep 7           0.9         0.8         0.8         0.9         1         1         0.9           0.9         0.9         1         1         0.8         1         0.7           0.9         0.9         1         1         0.8         1         0.7           0.9         0.3         0.7         0.2         0.2         0.1         0.1           rected) Transformed Detail           Rep 1         Rep 2         Rep 3         Rep 4         Rep 5         Rep 6         Rep 7           1.249         1.107         1.412         1.412         1.412         1.249           1.249         1.249         1.412         1.412         1.412         0.3218           Aeo1         0.1588         0.5796         0.9912         0.4636         0.4636         0.3218         0.3218           Binomials

Graphics





 Report Date:
 09 Mar-17 15:10 (p 1 of 2)

 Test Code:
 1116CDITROYCSED | 13-6827-6185

	0 4 5	undual and Gro	wth Sedime	nt Tes	t						U.S	. EPA Reg	ion I Lab
Chironomus 1	0-0 30	ITAIAN AND OLO		0	hual Data				CETI	S Version:	CETISv1.8	.7	
Analysis ID:	13-63	23-6653 ar-17 15:09	Analysis:	Nonp	parametric-N	Iultiple (	Com	parison	Offic	ial Results:	Yes		
Malyzou.	10.00	27 4625	Test Type:	Surv	ival-AF Grov	vth			Anal	/st:			
Satch ID:	19-09	131-4020	Protocol:	EPA	/600/R-99/06	64 (200	0)		Dilue	ent: Not	Applicable		
itart Date:	08 NG	01-10	Snacios'	Chird	nomus dilut	us (Mid	ge)		Brine	ə:			
Inding Date:			Species.	In-H	ouse Culture		~ .		Age:				
Juration:	NA	and the second	Source.	11-10									
Batch Note:	2016	Troy Mills Sed	Tox Test - C.	dilutu	S								
Sample Code		Sample Notes	S		dilutue	-							
di RB-Ref		2016 Troy Mill	s Sed Tox Te	st-C	dilutus								
di RB-02		2016 Troy Mill	s Sed Tox Te	est - C	. dilutus								
di RB-03		2016 Troy Mill	Is Sed Tox Te	est - C	, dilutus								
SW-Leach A	1-02	2016 Troy Mill	Is Sed Tox Te	est - C	. dilutus					NON T		Duning	
Sample Code		Sample ID	Sam	ple Da	ate Rece	ive Dat	e	Sample Ag	ge Clier	nt Name		Troy Mills	
Cdi RB-Ref		18-1639-4271	28 0	ct-16				110 UN	EFA	Region i		,	
Cdi RB-02		10-1616-5779	28 0	ct-16				11d 0n					
Cdi RB-03		10-8352-1382	28 0	ct-16				11d 0h					
C SW-Leach A	A-02	00-0498-9718	28 0	ct-16				11d 0h					
Sample Code		Material Type	e Sam	ple So	ource	3		Station Lo	cation		Latitude	Long	jitude
Cdi RB-Ref		Site Sedimen	t Troy	Mills I	Landfill			Cdi RB-Re	ſ				
Cdi RB-02		Site Sedimen	t Troy	Mills I	Landfill			Cdi RB-02					
Cdi RD-02		Site Sedimen	t Troy	Mills	Landfill			Cdi RB-03					
C SW-Leach	A-02	Site Sedimen	t Troy	Mills	Landfill			Cdi SW-Le	each A-02				
Doto Transfo		Zet	a Alt I	Нур	Trials	Seed			PMSD	Test Res	ult		
Angular (Corre	ected)	NA	C >	T	NA	NA			79.6%			373 	
Wilcoxon/Bo	nferro	ni Adi Test											
Comple Code	a ve	Sample Code	Test	Stat	Critical	Ties	DF	P-Value	P-Type	Decision	(a:5%)		
Sample Court	, 15	Cdi BB-02	69.5		NA	1	13	1.0000	Exact	Non-Sign	ificant Effect		
Cal RB-Rei		Cdi BB-03	65		NA	0	13	1.0000	Exact	Non-Sign	ificant Effect		
		C SW-Leach	A-02 66		NA	1	13	1.0000	Exact	Non-Sigr	inficant Effect		
ANOVA Table	8												
Source		Sum Squares	Меа	n Squ	lare	DF .		F Stat	P-Value	Decision	n(a:5%)		
Between		0.1588315	0.05	29438	33	3		0.3074	0.8198	Non-Sigi	moant Eneor		
Error		4.64982	0.17	22155	5	27	e						
Total		4.808651				30							
Distributiona	al Test	s	2							1 401 1			
Attribute		Test			Test Stat	Critic	al	P-Value	Decision	n(a:1%)			
Variances		Bartlett Equal	ity of Varianc	е	4.107	11.34		0.2502	Equal Va	mailles	tion		
Distribution		Shapiro-Wilk	W Normality		0.9029	0.905	6	0.0085	Non-non				
Survival Rat	e Sum	mary									044 F	C1/0/	%Efford
Sample Cod	e	Co	ount Mea	n	95% LCL	95% l	JCL	Median	Min	Max	O 1642	82 26%	0.0%
Cdi RB-Ref		7	0.52	286	0.1265	0.930	7	0.6	0	1	0.1043	30 204	-34 8%
Cdi RB-02		8	0.7	125	0.4784	0,946	6	0.8	0.1	0.9	0.09099	38 48%	-15 88%
Cdi RB-03		8	0.6	125	0.4155	0.809	5	0.6	0.2	0.9	0.00332	65 55%	-18.24%
C SWJ each	A-02	8	0.63	25	0.2825	0.967	5	0.9	0	0.9	0.1445	00.0079	

000-446-187-3

Analyst: 2Z QA: CO

Report Date: 09 Mar-17 15:10 (p 2 of 2)

Test Code: 1116CDITROYCSED | 13-6827-6185

U.S. EPA Region I Lab

					m	Toot
Chironomus	40-d	Survival	and	Growth	Seaiment	iest

Analysis ID: Analyzed:	13-6323-6653 09 Mar-17 15:09	Enc Ana	dpoint: Su alysis: No	Survival Rate Nonparametric-Multiple Comparison		CETIS Version: Official Results:		CETISv1.8.7 Yes			
Angular (Corr	ected) Transforn	ned Sumn	nary			Modian	Min	Max	Std Err	CV%	%Effect
Sample Code		Count	Mean	95% LCL	95% 000	0.0061	0 1588	1.412	0.2024	65.58%	0.0%
Cdi RB-Ref		7	0.8164	0.3212	1.312	1 107	0.3218	1,249	0.1136	31.44%	-25.19%
Cdi RB-02		8	1.022	0.7533	1.291	0.9883	0.4636	1.249	0.09343	28.96%	-11.78%
Cdi RB-03		8	0.9125	0.6916	1.100	1 249	0.1588	1.249	0.1752	53.94%	-12.52%
C SW-Leach A	-02	8	0.9185	0.5043	1.555	1.240					
Survival Rate	Detail					D 5	Bon 6	Pen 7	Rep 8		
Sample Code		Rep 1	Rep 2	Rep 3	Rep 4	Repo	nep o	0			
Cdi RB-Ref		1	0	0.6	1	0.3	0.0	08	0.5		
Cdi RB-02		0.9	0.1	0.8	0.8	0.9	0.9	0.5	0.0		
Cdi 88-03		0.7	0.5	0.9	0.2	0.5	0.7	0.5	0.0		
C SW-Leach /	4-02	0	0	0.9	0.9	0.9	0.9	0.5	0.9	معدر حسبت ليه	
Angular (Cori	rected) Transform	med Detai	il						1		
Somnia Code		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8		
Cdi PB-Ref		1,412	0.1588	0.8861	1.412	0.5796	1.107	0.1588	0 7054		
Cdi PB-02		1.249	0.3218	1.107	1.107	1.249	1.249	1.107	0.7654		
Cdi PB-03		0.9912	0.7854	1.249	0.4636	0.7854	0.9912	0.7854	1.249		
C SW-Leach	A-02	0.1588	0.1588	1.249	1.249	1.249	1.249	0.7854	1.249		
Survival Rate	Binomials							_			
Sample Code	•	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	кер в		
Cdi RB-Ref		10/10	0/10	6/10	10/10	3/10	8/10	0/10	EHO		
Cdi RB-02		9/10	1/10	8/10	8/10	9/10	9/10	8/10	5/10		
Cdi PB-02		7/10	5/10	9/10	2/10	5/10	7/10	5/10	9/10		
Curro-00	A 02	0/10	0/10	9/10	9/10	9/10	9/10	5/10	9/10		

#### Graphics





CETIS<sup>TM</sup> v1.8.7.16 Project# 16100036 50 of 55

Analyst: ZZ QA: CO

APPENDIX E

**Control Charts** 



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APPENDIX F

Sampling Map



## **APPENDIX 2**

ANALYTICAL CHEMISTRY DATA, HAZARD QUOTIENTS, AND "TOTAL RISKS" FOR THE SEDIMENT SAMPLES COLLECTED IN <u>AUGUST 2016</u> FROM THE TROY MILL LANDFILL SUPERFUND SITE, TROY MILLS, NH

Аррен	Appendix 2: August 2016 sediment analytical data for the Troy Mills Landfill Superfund site							
Sample ID	Analyte	Units	Result	MDL		Exposure	RSV	HQ
FW-ref	Aluminum	mg/Kg	11000	13		11000	58000	0.2
FW-ref	Antimony	mg/Kg	ND	2.4	U	1.2	25.0	0.0
FW-ref	Arsenic	mg/Kg	5.0	2.4		5.0	33	0.2
FW-ref	Barium	mg/Kg	65	2.4		65	60	1.1
FW-ref	Beryllium	mg/Kg	0.98	0.95		0.98	NA	
FW-ref	Cadmium	mg/Kg	ND	1.2	U	0.6	5.0	0.1
FW-ref	Chromium	mg/Kg	12	2.4		12	111	0.1
FW-ref	Cobalt	mg/Kg	7.4	2.4		7.4	50	0.1
FW-ref	Copper	mg/Kg	18	2.4		18	149	0.1
FW-ref	Iron	mg/Kg	11000	4.8		11000	40000	0.3
FW-ref	Lead	mg/Kg	45	2.4		45	128	0.4
FW-ref	Manganese	mg/Kg	270	2.4	J	270	1100	0.2
FW-ref	Mercury	mg/Kg	0.22	0.066		0.22	1.1	0.2
FW-ref	Nickel	mg/Kg	10	2.4		10	48.4	0.2
FW-ref	Selenium	mg/Kg	ND	4.8	U	2.4	20	0.1
FW-ref	Silver	mg/Kg	ND	1.2	U	0.6	2.2	0.3
FW-ref	Thallium	mg/Kg	ND	4.8	U	2.4	NA	
FW-ref	Vanadium	mg/Kg	32	2.4		32	27.3	1.2
FW-ref	Zinc	mg/Kg	72	2.4		72	459	0.2
FW-ref	BEHP	mg/Kg	ND	0.353	U	0.177	890	0.0
-							"total risk"	5.0
FW-01	Aluminum	mg/Kg	16000	24		16000	58000	0.3
FW-01	Antimony	mg/Kg	ND	4.3	U	2.15	25.0	0.1
FW-01	Arsenic	mg/Kg	11	4.3		11	33	0.3
FW-01	Barium	mg/Kg	120	4.3		120	60	2.0
FW-01	Beryllium	mg/Kg	ND	1.7	U	0.85	NA	
FW-01	Cadmium	mg/Kg	ND	2.2	U	1.1	5.0	0.2
FW-01	Chromium	mg/Kg	17	4.3		17	111	0.2
FW-01	Cobalt	mg/Kg	19	4.3		19	50	0.4
FW-01	Copper	mg/Kg	23	4.3		23	149	0.2
FW-01	Iron	mg/Kg	55000	8.7		55000	40000	1.4
FW-01	Lead	mg/Kg	42	4.3		42	128	0.3
FW-01	Manganese	mg/Kg	1800	4.3		1800	1100	1.6
FW-01	Mercury	mg/Kg	0.3	0.12		0.3	1.1	0.3
FW-01	Nickel	mg/Kg	21	4.3		21	48.4	0.4
FW-01	Selenium	mg/Kg	ND	8.7	U	4.35	20	0.2
FW-01	Silver	mg/Kg	ND	2.2	U	1.1	2.2	0.5
FW-01	Thallium	mg/Kg	ND	8.7	U	4.35	NA	
FW-01	Vanadium	mg/Kg	40	4.3		40	27.3	1.5
FW-01	Zinc	mg/Kg	120	4.3		120	459	0.26
FW-01	BEHP	mg/Kg	ND	0.49	U	0.245	890	0.0
							"total risk"	10.1

Appendix 2	(cont'd): August 201	.6 sediment a	nalytical d	ata for the	Tro	y Mills Lan	dfill Superfund	site
Sample ID	Analyte	Units	Result	MDL		Exposure	RSV	HQ
SW-Leach A-01	Aluminum	mg/Kg	5500	160		5500	58000	0.1
SW-Leach A-01	Antimony	mg/Kg	ND	29	U	14.5	25.0	0.6
SW-Leach A-01	Arsenic	mg/Kg	31	29		31	33	0.9
SW-Leach A-01	Barium	mg/Kg	220	29		220	60	3.7
SW-Leach A-01	Beryllium	mg/Kg	ND	11	U	5.5	NA	
SW-Leach A-01	Cadmium	mg/Kg	ND	14	U	7.0	5.0	1.4
SW-Leach A-01	Chromium	mg/Kg	ND	29	U	14.5	111	0.1
SW-Leach A-01	Cobalt	mg/Kg	ND	29	U	14.5	50	0.3
SW-Leach A-01	Copper	mg/Kg	ND	29	U	14.5	149	0.1
SW-Leach A-01	Iron	mg/Kg	380000	57		380000	40000	9.5
SW-Leach A-01	Lead	mg/Kg	ND	29	U	14.5	128	0.1
SW-Leach A-01	Manganese	mg/Kg	1200	29		1200	1100	1.1
SW-Leach A-01	Mercury	mg/Kg	ND	0.11	U	0.055	1.1	0.1
SW-Leach A-01	Nickel	mg/Kg	ND	29	U	14.5	48.4	0.3
SW-Leach A-01	Selenium	mg/Kg	ND	57	U	28.5	20	1.4
SW-Leach A-01	Silver	mg/Kg	ND	14	U	7.0	2.2	3.2
SW-Leach A-01	Thallium	mg/Kg	ND	57	U	28.5	NA	
SW-Leach A-01	Vanadium	mg/Kg	85	29		85	27.3	3.1
SW-Leach A-01	Zinc	mg/Kg	33	29		33	459	0.1
SW-Leach A-01	BEHP	mg/Kg	2.3	0.508		2.3	890	0.0
							"total risk"	26.0
SW-Leach B-01	Aluminum	mg/Kg	12000	13		12000	58000	0.2
SW-Leach B-01	Antimony	mg/Kg	ND	2.3	U	1.15	25.0	0.0
SW-Leach B-01	Arsenic	mg/Kg	3.0	2.3		3.0	33	0.1
SW-Leach B-01	Barium	mg/Kg	46	2.3		46	60	0.8
SW-Leach B-01	Beryllium	mg/Kg	ND	0.93	U	0.47	NA	
SW-Leach B-01	Cadmium	mg/Kg	ND	1.2	U	0.6	5.0	0.1
SW-Leach B-01	Chromium	mg/Kg	10	2.3		10	111	0.1
SW-Leach B-01	Cobalt	mg/Kg	6.3	2.3		6.3	50	0.1
SW-Leach B-01	Copper	mg/Kg	10	2.3		10	149	0.1
SW-Leach B-01	Iron	mg/Kg	19000	4.6		19000	40000	0.5
SW-Leach B-01	Lead	mg/Kg	14	2.3		14	128	0.1
SW-Leach B-01	Manganese	mg/Kg	420	2.3		420	1100	0.4
SW-Leach B-01	Mercury	mg/Kg	0.082	0.044		0.082	1.1	0.1
SW-Leach B-01	Nickel	mg/Kg	6.7	2.3		6.7	48.4	0.1
SW-Leach B-01	Selenium	mg/Kg	ND	4.6	U	2.3	20	0.1
SW-Leach B-01	Silver	mg/Kg	ND	1.2	U	0.6	2.2	0.3
SW-Leach B-01	Thallium	mg/Kg	ND	4.6	U	2.3	NA	
SW-Leach B-01	Vanadium	mg/Kg	23	2.3		23	27.3	0.8
SW-Leach B-01	Zinc	mg/Kg	51	2.3		51	459	0.1
SW-Leach B-01	BEHP	mg/Kg	ND	0.182	U	0.091	890	0.0
							"total risk"	4.0

Appendix 2 (cont'd): August 2016 sediment analytical data for the Troy Mills Landfill Superfund site							site	
Sample ID	Analyte	Units	Result	MDL		Exposure	RSV	HQ
RB-ref	Aluminum	mg/Kg	13000	14		13000	58000	0.2
RB-ref	Antimony	mg/Kg	ND	2.5	U	1.25	25.0	0.1
RB-ref	Arsenic	mg/Kg	3.3	2.5		3.3	33	0.1
RB-ref	Barium	mg/Kg	75	2.5		75	60	1.3
RB-ref	Beryllium	mg/Kg	ND	1.0	U	0.5	NA	
RB-ref	Cadmium	mg/Kg	ND	1.2	U	0.6	5.0	0.1
RB-ref	Chromium	mg/Kg	15	2.5		15	111	0.1
RB-ref	Cobalt	mg/Kg	7.3	2.5		7.3	50	0.1
RB-ref	Copper	mg/Kg	16	2.5		16	149	0.1
RB-ref	Iron	mg/Kg	16000	5.0		16000	40000	0.4
RB-ref	Lead	mg/Kg	20	2.5		20	128	0.2
RB-ref	Manganese	mg/Kg	210	2.5		210	1100	0.2
RB-ref	Mercury	mg/Kg	0.087	0.053		0.087	1.1	0.1
RB-ref	Nickel	mg/Kg	12	2.5		12	48.4	0.2
RB-ref	Selenium	mg/Kg	ND	5.0	U	2.5	20	0.1
RB-ref	Silver	mg/Kg	ND	1.2	U	0.6	2.2	0.3
RB-ref	Thallium	mg/Kg	ND	5.0	U	2.5	NA	
RB-ref	Vanadium	mg/Kg	32	2.5		32	27.3	1.2
RB-ref	Zinc	mg/Kg	51	2.5		51	459	0.1
RB-ref	BEHP	mg/Kg	ND	0.258	U	0.129	890	0.0
								<b>F</b>
							"total risk"	4.9
RB-01	Aluminum	mg/Kg	9600	15		9600	" <b>total risk</b> " 58000	<b>4.9</b> 0.2
RB-01 RB-01	Aluminum Antimony	mg/Kg mg/Kg	9600 ND	15 2.7	U	9600 1.35	"total risk" 58000 25.0	<b>4.9</b> 0.2 0.1
RB-01 RB-01 RB-01	Aluminum Antimony Arsenic	mg/Kg mg/Kg mg/Kg	9600 ND ND	15 2.7 2.7	U U	9600 1.35 1.35	"total risk" 58000 25.0 33	<b>4.9</b> 0.2 0.1 0.0
RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium	mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND 60	15 2.7 2.7 2.7	U U	9600 1.35 1.35 60	"total risk" 58000 25.0 33 60	4.9 0.2 0.1 0.0 1.0
RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND 60 ND	15 2.7 2.7 2.7 1.1	U U U	9600 1.35 1.35 60 0.55	"total risk" 58000 25.0 33 60 NA	4.9 0.2 0.1 0.0 1.0
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND 60 ND ND	15 2.7 2.7 2.7 1.1 1.4	U U U U	9600 1.35 1.35 60 0.55 0.7	"total risk" 58000 25.0 33 60 NA 5.0	4.9 0.2 0.1 0.0 1.0  0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND ND 12	15 2.7 2.7 2.7 1.1 1.4 2.7	U U U U	9600 1.35 1.35 60 0.55 0.7 12	"total risk" 58000 25.0 33 60 NA 5.0 111	4.9 0.2 0.1 0.0 1.0  0.1 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND ND 12 7.2	15 2.7 2.7 1.1 1.4 2.7 2.7	U U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2	"total risk" 58000 25.0 33 60 NA 5.0 111 50	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND ND 12 7.2 12	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7	U U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND 12 7.2 12 120	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4	U U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 12 11000	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND 12 7.2 12 1200 12	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7	U U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.3 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND 12 7.2 12 11000 17 330	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 2.7 5.4 2.7 2.7	U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.3 0.1 0.3
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND 12 7.2 12 11000 17 330 0.085	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052	U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND 60 ND 12 7.2 12 11000 17 330 0.085 8.6	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052 2.7	U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.3 0.1 0.2
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052 2.7 5.4	U U U U	9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 149 40000 128 1100 1.1 48.4 20	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.2 0.1
RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND ND	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052 2.7 5.4 1.4		9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7 0.7	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4 20 2.2	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.2 0.1 0.3
RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND ND ND	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052 2.7 5.4 1.4 5.4		9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7 0.7 2.7	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4 20 2.2 NA	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.2 0.1 0.3 
RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium Vanadium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND ND ND ND 23	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 2.7 0.052 2.7 5.4 1.4 5.4 2.7		9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7 0.7 2.7 23	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4 20 2.2 NA 2.2 NA 27.3	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.2 0.1 0.3  0.3 0.1 0.3 0.3 0.1 0.3 0.3 0.1 0.3 0.3 0.3 0.1 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium Vanadium Zinc	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND ND ND ND ND 23 44	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 2.7 2.7 2.7 2.7 0.052 2.7 5.4 1.4 5.4 2.7 2.7 2.7		9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7 0.7 2.7 23 44	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4 20 2.2 NA 27.3 459	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.2 0.1 0.3  0.8 0.1
RB-01 RB-01	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium Vanadium Zinc BEHP	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	9600 ND ND ND 12 7.2 12 11000 17 330 0.085 8.6 ND ND ND ND 23 44 ND	15 2.7 2.7 1.1 1.4 2.7 2.7 2.7 5.4 2.7 0.052 2.7 5.4 1.4 5.4 2.7 2.7 0.242		9600 1.35 1.35 60 0.55 0.7 12 7.2 12 11000 17 330 0.085 8.6 2.7 0.7 2.7 23 44 0.121	"total risk" 58000 25.0 33 60 NA 5.0 111 50 149 40000 128 1100 1.1 48.4 20 2.2 NA 27.3 459 890	4.9 0.2 0.1 0.0 1.0  0.1 0.1 0.1 0.1 0.1 0.3 0.1 0.3 0.1 0.2 0.1 0.3 0.1 0.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5

Appendix 2 (cont'd): August 2016 sediment analytical data for the Troy Mills Landfill Superfund site							l site	
Sample ID	Analyte	Units	Result	MDL		Exposure	RSV	HQ
RB-02	Aluminum	mg/Kg	9000	11		9000	58000	0.2
RB-02	Antimony	mg/Kg	ND	2.0	U	1.0	25.0	0.0
RB-02	Arsenic	mg/Kg	2.2	2.0		2.2	33	0.1
RB-02	Barium	mg/Kg	56	2.0		56	60	0.9
RB-02	Beryllium	mg/Kg	ND	0.8	U	0.4	NA	
RB-02	Cadmium	mg/Kg	ND	1.0	U	0.5	5.0	0.1
RB-02	Chromium	mg/Kg	12	2.0		12	111	0.1
RB-02	Cobalt	mg/Kg	6.7	2.0		6.7	50	0.1
RB-02	Copper	mg/Kg	11	2.0		11	149	0.1
RB-02	Iron	mg/Kg	8700	4.0		8700	40000	0.2
RB-02	Lead	mg/Kg	14	2.0		14	128	0.1
RB-02	Manganese	mg/Kg	120	2.0		120	1100	0.1
RB-02	Mercury	mg/Kg	0.073	0.049		0.073	1.1	0.1
RB-02	Nickel	mg/Kg	7.9	2.0		7.9	48.4	0.2
RB-02	Selenium	mg/Kg	ND	4.0	U	2.0	20	0.1
RB-02	Silver	mg/Kg	ND	1.0	U	0.5	2.2	0.2
RB-02	Thallium	mg/Kg	ND	4.0	U	2.0	NA	
RB-02	Vanadium	mg/Kg	21	2.0		21	27.3	0.8
RB-02	Zinc	mg/Kg	80	2.0		80	459	0.2
RB-02	BEHP	mg/Kg	0.31	0.181		0.31	890	0.0
							"total risk"	3.5
RB-03	Aluminum	mg/Kg	13000	14		13000	58000	0.2
RB-03	Antimony	mg/Kg	ND	2.6	U	1.3	25.0	0.1
RB-03	Arsenic	mg/Kg	3.6	2.6		3.6	33	0.1
RB-03	Barium	mg/Kg	77	2.6		77	60	1.3
RB-03	Beryllium	mg/Kg	ND	1.0	U	0.5	NA	
RB-03	Cadmium	mg/Kg	ND	1.3	U	0.65	5.0	0.1
RB-03	Chromium	mg/Kg	14	2.6		14	111	0.1
RB-03	Cobalt	mg/Kg	12	2.6		12	50	0.2
RB-03	Copper	mg/Kg	16	2.6		16	149	0.1
RB-03	Iron	mg/Kg	15000	5.1		15000	40000	0.4
RB-03	Lead	mg/Kg	22	2.6		22	128	0.2
RB-03	Manganese	mg/Kg	500	2.6		500	1100	0.5
RB-03	Mercury	mg/Kg	0.13	0.077		0.13	1.1	0.1
RB-03	Nickel	mg/Kg	12	2.6		12	48.4	0.2
RB-03	Selenium	mg/Kg	ND	5.1	U	2.55	20	0.1
RB-03	Silver	mg/Kg	ND	1.3	U	0.65	2.2	0.3
RB-03	Thallium	mg/Kg	ND	5.1	U	2.55	NA	
RB-03	Vanadium	mg/Kg	28	2.6		28	27.3	1.0
RB-03	Zinc	mg/Kg	84	2.6		84	459	0.2
RB-03	BEHP	mg/Kg	0.24	0.252	L	0.24	890	0.0
							"total rick"	БЭ

	Appendix 2 (cont'd): August 2016 sediment analytical data for the Troy Mills Landfill Superfund site							ite	
Sar	mple ID	Analyte	Units	Result	MDL		Exposure	RSV	HQ
F	RB-04	Aluminum	mg/Kg	11000	14		11000	58000	0.2
F	RB-04	Antimony	mg/Kg	ND	2.6	U	1.3	25.0	0.1
F	RB-04	Arsenic	mg/Kg	3.0	2.6		3.0	33	0.1
F	RB-04	Barium	mg/Kg	50	2.6		50	60	0.8
F	RB-04	Beryllium	mg/Kg	ND	1.0	U	0.5	NA	
F	RB-04	Cadmium	mg/Kg	ND	1.3	U	0.65	5.0	0.1
F	RB-04	Chromium	mg/Kg	11	2.6		11	111	0.1
F	RB-04	Cobalt	mg/Kg	13	2.6		13	50	0.3
F	RB-04	Copper	mg/Kg	11	2.6		11	149	0.1
F	RB-04	Iron	mg/Kg	14000	5.1		14000	40000	0.4
F	RB-04	Lead	mg/Kg	16	2.6		16	128	0.1
F	RB-04	Manganese	mg/Kg	480	2.6		480	1100	0.4
F	RB-04	Mercury	mg/Kg	0.052	0.041		0.052	1.1	0.0
F	RB-04	Nickel	mg/Kg	9.2	2.6		9.2	48.4	0.2
F	RB-04	Selenium	mg/Kg	ND	5.1	U	2.55	20	0.1
F	RB-04	Silver	mg/Kg	ND	1.3	U	0.65	2.2	0.3
F	RB-04	Thallium	mg/Kg	ND	5.1	U	2.55	NA	
F	RB-04	Vanadium	mg/Kg	24	2.6		24	27.3	0.9
F	RB-04	Zinc	mg/Kg	65	2.6		65	459	0.1
F	RB-04	BEHP	mg/Kg	ND	0.201	U	0.1	890	0.0
			0, 0					_	
			0, 0					"total risk"	4.3
F	RB-05	Aluminum	mg/Kg	5300	11		5300	"total risk" 58000	<b>4.3</b> 0.1
F	RB-05 RB-05	Aluminum Antimony	mg/Kg mg/Kg	5300 ND	11 2.1	U	5300 1.05	"total risk" 58000 25.0	<b>4.3</b> 0.1 0.0
F	RB-05 RB-05 RB-05	Aluminum Antimony Arsenic	mg/Kg mg/Kg mg/Kg	5300 ND ND	11 2.1 2.1	U U	5300 1.05 1.05	"total risk" 58000 25.0 33	<b>4.3</b> 0.1 0.0 0.0
F F F	RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium	mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND ND 28	11 2.1 2.1 2.1	U U	5300 1.05 1.05 28	"total risk" 58000 25.0 33 60	<b>4.3</b> 0.1 0.0 0.0 0.5
F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND ND 28 ND	11 2.1 2.1 2.1 0.83	U U U	5300 1.05 1.05 28 0.415	"total risk" 58000 25.0 33 60 NA	<b>4.3</b> 0.1 0.0 0.0 0.5 
1 1 1 1 1 1	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND	11 2.1 2.1 2.1 0.83 1.0	U U U U	5300 1.05 1.05 28 0.415 0.5	"total risk" 58000 25.0 33 60 NA 5.0	<b>4.3</b> 0.1 0.0 0.0 0.5  0.1
F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND 7.2	11 2.1 2.1 0.83 1.0 2.1	U U U U	5300 1.05 1.05 28 0.415 0.5 7.2	"total risk"         "           58000         25.0           33         60           NA         5.0           111         1	4.3         0.1         0.0         0.5            0.1         0.1
F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND 7.2 4.4	11 2.1 2.1 0.83 1.0 2.1 2.1	U U U U	5300 1.05 1.05 28 0.415 0.5 7.2 4.4	"total risk"         "           58000         25.0           33         60           NA         5.0           111         50	4.3 0.1 0.0 0.0 0.5  0.1 0.1 0.1
F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND 7.2 4.4 5.6	11 2.1 2.1 2.1 0.83 1.0 2.1 2.1 2.1	U U U U	5300 1.05 1.05 28 0.415 0.5 7.2 4.4 5.6	"total risk"         58000         25.0         33         60         NA         5.0         111         50         149	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1
F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND 7.2 4.4 5.6 6500	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 4.2	U U U U	5300 1.05 1.05 28 0.415 0.5 7.2 4.4 5.6 6500	"total risk"           58000           25.0           33           60           NA           5.0           111           50           149           40000	4.3         0.1         0.0         0.5            0.1         0.1         0.2
F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 4.2 2.1	U U U U	5300 1.05 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4	"total risk"           58000           25.0           33           60           NA           5.0           111           50           149           40000           128	4.3 0.1 0.0 0.5  0.1 0.1 0.1 0.0 0.2 0.1
F F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 4.2 2.1 2.1 2.1	U U U	5300 1.05 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         1           5.0         111           50         149           40000         128           1100         100	4.3 0.1 0.0 0.5  0.1 0.1 0.1 0.0 0.2 0.1 0.2
F F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 4.2 2.1 2.1 0.038	U U U U	5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039	"total risk"           58000           25.0           33           60           NA           5.0           111           50           149           40000           128           1100           1.1	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.2         0.1         0.2         0.0
F F F F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 0.038 2.1		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1	"total risk"           58000           25.0           33           60           NA           5.0           111           50           149           40000           128           1100           1.1           48.4	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.2         0.1         0.2         0.1         0.2         0.1
F F F F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 4.2 2.1 2.1 0.038 2.1 4.2	U U U U	$5300 \\ 1.05 \\ 1.05 \\ 28 \\ 0.415 \\ 0.5 \\ 7.2 \\ 4.4 \\ 5.6 \\ 6500 \\ 7.4 \\ 210 \\ 0.039 \\ 5.1 \\ 2.1$	"total risk"           58000           25.0           33           60           NA           5.0           111           50           149           400000           128           1100           1.1           48.4           20	4.3 0.1 0.0 0.5  0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.0 0.1 0.1 0.2
F F F F F F F F F F F F F	RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND ND	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 0.038 2.1 4.2 1.0		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 2.1 0.5	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         1           5.0         111           50         149           40000         128           1100         1.1           48.4         20           2.2         2.2	4.3 0.1 0.0 0.5  0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.0 0.1 0.1 0.2 0.0 0.1 0.2 0.1 0.2 0.0 0.2 0.1 0.2 0.0 0.2 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2
F F F F F F F F F F F F F F F F F F	RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND ND ND	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 2.1 0.5 2.1	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         1           5.0         111           50         149           40000         128           1100         1.1           48.4         20           2.2         NA	4.3 0.1 0.0 0.5  0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2
F F F F F F F F F F F F F F F F F	RB-05 RB-05	Aluminum Antimony Arsenic Barium Beryllium Cadmium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND ND ND ND ND	11 2.1 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 0.038 2.1 4.2 1.0 4.2 1.0 4.2 2.1		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 2.1 0.5 2.1 12	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         14           50         149           400000         128           1100         1.1           48.4         20           2.2         NA           27.3         27.3	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.4
F F F F F F F F F F F F F F F F F F	RB-05 RB	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium Vanadium Zinc	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND ND ND 12 28	11 2.1 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 0.038 2.1 4.2 1.0 4.2 2.1 2.1 2.1 2.1		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 2.1 0.5 2.1 12 28	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         14           50         149           400000         128           1100         1.1           48.4         20           2.2         NA           27.3         459	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1
F F F F F F F F F F F F F F F F F F F	RB-05 RB	Aluminum Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Silver Thallium Vanadium Zinc BEHP	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	5300 ND 28 ND ND 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 ND ND ND ND ND 12 28 ND	11 2.1 2.1 0.83 1.0 2.1 2.1 2.1 2.1 2.1 2.1 0.038 2.1 4.2 1.0 4.2 2.1 2.1 2.1 0.142		5300 1.05 28 0.415 0.5 7.2 4.4 5.6 6500 7.4 210 0.039 5.1 2.1 0.5 2.1 12 28 0.071	"total risk"         "           58000         25.0           25.0         33           60         NA           5.0         1           5.0         111           50         149           40000         128           1100         1.1           48.4         20           2.2         NA           27.3         459           890         890	4.3         0.1         0.0         0.5            0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.1         0.2         0.4         0.1         0.0

## **APPENDIX 3**

ANALYTICAL CHEMISTRY DATA, HAZARD QUOTIENTS, AND "TOTAL RISKS" FOR THE SEDIMENT SAMPLES COLLECTED IN <u>OCTOBER 2016</u> FROM THE TROY MILL LANDFILL SUPERFUND SITE, TROY MILLS, NH

Appendix 3: C	Appendix 3: October 2016 sediment analytical data from the Troy Mills Landfill Superfund site								
Sample location	Analytes	Units	Results	MDL	Exposure	:	RSV	HQ	
FW-ref	Aluminum	mg/Kg	6100	15	6100		58000	0.1	
FW-ref	Antimony	mg/Kg	ND	5.3	2.65	U	25.0	0.1	
FW-ref	Arsenic	mg/Kg	3.0	2.6	3.0		33	0.1	
FW-ref	Barium	mg/Kg	50	2.6	50		60	0.8	
FW-ref	Beryllium	mg/Kg	ND	1.1	0.55	U	NA		
FW-ref	Cadmium	mg/Kg	ND	1.3	0.65	U	5.0	0.1	
FW-ref	Chromium	mg/Kg	7.3	2.6	7.3		111	0.1	
FW-ref	Cobalt	mg/Kg	6.6	2.6	6.6		50	0.1	
FW-ref	Copper	mg/Kg	8.7	2.6	8.7		149	0.1	
FW-ref	Iron	mg/Kg	9100	5.3	9100		40000	0.2	
FW-ref	Lead	mg/Kg	16	2.6	16		128	0.1	
FW-ref	Manganese	mg/Kg	270	2.6	270		1100	0.2	
FW-ref	Mercury <sup>a</sup>	mg/Kg					1.1		
FW-ref	Nickel	mg/Kg	6.8	2.6	6.8		48.4	0.1	
FW-ref	Selenium	mg/Kg	ND	5.3	2.65	U	20	0.1	
FW-ref	Silver	mg/Kg	ND	1.3	0.65	U	2.2	0.3	
FW-ref	Thallium	mg/Kg	ND	5.3	2.65	U	NA		
FW-ref	Vanadium	mg/Kg	14	2.6	14		27.3	0.5	
FW-ref	Zinc	mg/Kg	54	2.6	54		459	0.1	
FW-ref	BEHP	mg/Kg	0.402	0.206	0.402		890	0.0	
							"total risk"	3.3	
RB-ref	Aluminum	mg/Kg	11000	14	11000		58000	0.2	
RB-ref	Antimony	mg/Kg	ND	5.0	2.5	U	25.0	0.1	
RB-ref	Arsenic	mg/Kg	3.6	2.5	3.6		33	0.1	
RB-ref	Barium	mg/Kg	66	2.5	66		60	1.1	
RB-ref	Beryllium	mg/Kg	ND	1.0	0.5	U	NA		
RB-ref	Cadmium	mg/Kg	ND	1.2	0.6	U	5.0	0.1	
RB-ref	Chromium	mg/Kg	13	2.5	13		111	0.1	
RB-ref	Cobalt	mg/Kg	7.0	2.5	7.0		50	0.1	
RB-ref	Copper	mg/Kg	11	2.5	11		149	0.1	
RB-ref	Iron	mg/Kg	14000	5.0	14000		40000	0.4	
RB-ref	Lead	mg/Kg	16	2.5	16		128	0.1	
RB-ref	Manganese	mg/Kg	300	2.5	300		1100	0.3	
RB-ref	Mercury <sup>a</sup>	mg/Kg					1.1		
RB-ref	Nickel	mg/Kg	10	2.5	10		48.4	0.2	
RB-ref	Selenium	mg/Kg	ND	5.0	2.5	U	20	0.1	
RB-ref	Silver	mg/Kg	ND	1.2	0.6	U	2.2	0.3	
RB-ref	Thallium	mg/Kg	ND	5.0	2.5	U	NA		
RB-ref	Vanadium	mg/Kg	24	2.5	24		27.3	0.9	
RB-ref	Zinc	mg/Kg	45	2.5	45		459	0.1	
RB-ref	BEHP	mg/Kg	ND	0.275	0.138	U	890	0.0	
							"total risk"	4.3	

Appendix 3 (cont	Appendix 3 (cont'd): October 2016 sediment analytical data from the Troy Mills Landfill Superfund site								
Sample location	Analytes	Units	Results	MDL	Exposure	9	RSV	HQ	
FW-01	Aluminum	mg/Kg	11000	16	11000		58000	0.2	
FW-01	Antimony	mg/Kg	ND	5.7	2.85	U	25.0	0.1	
FW-01	Arsenic	mg/Kg	4.8	2.9	4.8		33	0.1	
FW-01	Barium	mg/Kg	74	2.9	74		60	1.2	
FW-01	Beryllium	mg/Kg	ND	1.1	0.55	U	NA		
FW-01	Cadmium	mg/Kg	ND	1.4	0.7	U	5.0	0.1	
FW-01	Chromium	mg/Kg	13	2.9	13		111	0.1	
FW-01	Cobalt	mg/Kg	9.5	2.9	9.5		50	0.2	
FW-01	Copper	mg/Kg	14	2.9	14		149	0.1	
FW-01	Iron	mg/Kg	19000	5.7	19000		40000	0.5	
FW-01	Lead	mg/Kg	28	2.9	28		128	0.2	
FW-01	Manganese	mg/Kg	530	2.9	530		1100	0.5	
FW-01	Mercury <sup>a</sup>	mg/Kg					1.1		
FW-01	Nickel	mg/Kg	12	2.9	12		48.4	0.2	
FW-01	Selenium	mg/Kg	ND	5.7	2.85	U	20	0.1	
FW-01	Silver	mg/Kg	ND	1.4	0.7	U	2.2	0.3	
FW-01	Thallium	mg/Kg	ND	5.7	2.85	U	NA		
FW-01	Vanadium	mg/Kg	26	2.9	26		27.3	1.0	
FW-01	Zinc	mg/Kg	73	2.9	73		459	0.2	
FW-01	BHEP	mg/Kg	ND	0.278	0.139	U	890	0.0	
							"total risk"	5.2	
RB-02	Aluminum	mg/Kg	9600	12	9600		58000	0.2	
RB-02	Antimony	mg/Kg	ND	4.2	2.1	U	25.0	0.1	
RB-02	Arsenic	mg/Kg	3.0	2.1	3.0		33	0.1	
RB-02	Barium	mg/Kg	59	2.1	59		60	1.0	
RB-02	Beryllium	mg/Kg	ND	0.85	0.425	U	NA		
RB-02	Cadmium	mg/Kg	ND	1.1	0.55	U	5.0	0.1	
RB-02	Chromium	mg/Kg	13	2.1	13		111	0.1	
RB-02	Cobalt	mg/Kg	6.5	2.1	6.5		50	0.1	
RB-02	Copper	mg/Kg	12	2.1	12		149	0.1	
RB-02	Iron	mg/Kg	9500	4.2	9500		40000	0.2	
RB-02	Lead	mg/Kg	14	2.1	14		128	0.1	
RB-02	Manganese	mg/Kg	94	2.1	94		1100	0.1	
RB-02	Mercury <sup>a</sup>	mg/Kg					1.1		
RB-02	Nickel	mg/Kg	11	2.1	11		48.4	0.2	
RB-02	Selenium	mg/Kg	ND	4.2	2.1	U	20	0.1	
RB-02	Silver	mg/Kg	ND	1.1	0.55	U	2.2	0.3	
RB-02	Thallium	mg/Kg	ND	4.2	2.1	U	NA		
RB-02	Vanadium	mg/Kg	23	2.1	23		27.3	0.8	
RB-02	Zinc	mg/Kg	390	2.1	390		459	0.8	
RB-02	BEHP	mg/Kg	1.47	0.0025	1.47		890	0.0	
1							"total risk"	4.5	

Appendix 3 (cont'	d): October 2016	sediment a	nalytical da	ta from t	he Troy Mil	ls Landfill Superfu	nd site
Sample location	Analytes	Units	Results	MDL	Exposure	RSV	HQ
RB-03	Aluminum	mg/Kg	15000	16	15000	58000	0.3
RB-03	Antimony	mg/Kg	ND	5.7	2.85	25.0	0.1
RB-03	Arsenic	mg/Kg	4.3	2.9	4.3	33	0.1
RB-03	Barium	mg/Kg	81	2.9	81	60	1.4
RB-03	Beryllium	mg/Kg	ND	1.1	0.55	NA	
RB-03	Cadmium	mg/Kg	ND	1.4	0.7	5.0	0.1
RB-03	Chromium	mg/Kg	17	2.9	17	111	0.2
RB-03	Cobalt	mg/Kg	13	2.9	13	50	0.3
RB-03	Copper	mg/Kg	18	2.9	18	149	0.1
RB-03	Iron	mg/Kg	15000	5.7	15000	40000	0.4
RB-03	Lead	mg/Kg	25	2.9	25	128	0.2
RB-03	Manganese	mg/Kg	580	2.9	580	1100	0.5
RB-03	Mercury <sup>a</sup>	mg/Kg				1.1	
RB-03	Nickel	mg/Kg	14	2.9	14	48.4	0.3
RB-03	Selenium	mg/Kg	ND	5.7	2.85	20	0.1
RB-03	Silver	mg/Kg	ND	1.4	0.7	2.2	0.3
RB-03	Thallium	mg/Kg	ND	5.7	2.85	NA	
RB-03	Vanadium	mg/Kg	31	2.9	31	27.3	1.1
RB-03	Zinc	mg/Kg	110	2.9	110	459	0.2
RB-03	BEHP	mg/Kg	ND	0.272	0.136	890	0.0
						"total risk"	5.7
SW-Leach A-01	Aluminum	mg/Kg	12000	58	12000	58000	0.2
SW-Leach A-01	Antimony	mg/Kg	ND	21	10.5	U 25.0	0.4
SW-Leach A-01	Arsenic	mg/Kg	ND	11	5.5	U 33	0.2
SW-Leach A-01	Barium	mg/Kg	110	11	110	60	1.8
SW-Leach A-01	Beryllium	mg/Kg	ND	4.2	2.1	U NA	
SW-Leach A-01	Cadmium	mg/Kg	ND	5.3	2.65	U 5.0	0.5
SW-Leach A-01	Chromium	mg/Kg	19	11	19	111	0.2
SW-Leach A-01	Cobalt	mg/Kg	ND	11	5.5	U 50	0.1
SW-Leach A-01	Copper	mg/Kg	26	11	26	149	0.2
SW-Leach A-01	Iron	mg/Kg	72000	21	72000	40000	1.8
SW-Leach A-01	Lead	mg/Kg	ND	11	5.5	U 128	0.0
SW-Leach A-01	Manganese	mg/Kg	930	11	930	1100	0.8
SW-Leach A-01	Mercury <sup>a</sup>	mg/Kg				1.1	
SW-Leach A-01	Nickel	mg/Kg	16	11	16	48.4	0.3
SW-Leach A-01	Selenium	mg/Kg	ND	21	10.5	U 20	0.5
SW-Leach A-01	Silver	mg/Kg	ND	5.3	2.65	U 2.2	1.2
SW-Leach A-01	Thallium	mg/Kg	ND	21	10.5	U NA	
SW-Leach A-01	Vanadium	mg/Kg	39	11	39	27.3	1.4
SW-Leach A-01	Zinc	mg/Kg	70	11	70	459	0.2
SW-Leach A-01	BEHP	mg/Kg	59	1.66	59	890	0.1
						"total risk"	10.0

Appendix 3 (cont'	Appendix 3 (cont'd): October 2016 sediment analytical data from the Troy Mills Landfill Superfund site									
Sample location	Analytes	Units	Results	MDL	Exposure	е	RSV	HQ		
SW-Leach A-02	Aluminum	mg/Kg	12000	11	12000		58000	0.2		
SW-Leach A-02	Antimony	mg/Kg	ND	4.0	2.0	U	25.0	0.1		
SW-Leach A-02	Arsenic	mg/Kg	4.4	2.0	4.4		33	0.1		
SW-Leach A-02	Barium	mg/Kg	70	2.0	70		60	1.2		
SW-Leach A-02	Beryllium	mg/Kg	ND	0.8	0.4	U	NA			
SW-Leach A-02	Cadmium	mg/Kg	ND	1.0	0.5	U	5.0	0.1		
SW-Leach A-02	Chromium	mg/Kg	13	2.0	13		111	0.1		
SW-Leach A-02	Cobalt	mg/Kg	53	2.0	53		50	1.1		
SW-Leach A-02	Copper	mg/Kg	15	2.0	15		149	0.1		
SW-Leach A-02	Iron	mg/Kg	26000	4.0	26000		40000	0.7		
SW-Leach A-02	Lead	mg/Kg	18	2.0	18		128	0.1		
SW-Leach A-02	Manganese	mg/Kg	1200	2.0	1200		1100	1.1		
SW-Leach A-02	Mercury <sup>a</sup>	mg/Kg					1.1			
SW-Leach A-02	Nickel	mg/Kg	12	2.0	12		48.4	0.2		
SW-Leach A-02	Selenium	mg/Kg	ND	4.0	2.0	U	20	0.1		
SW-Leach A-02	Silver	mg/Kg	ND	1.0	0.5	U	2.2	0.2		
SW-Leach A-02	Thallium	mg/Kg	ND	4.0	2.0	U	NA			
SW-Leach A-02	Vanadium	mg/Kg	25	2.0	25		27.3	0.9		
SW-Leach A-02	Zinc	mg/Kg	51	2.0	51		459	0.1		
SW-Leach A-02	BEHP	mg/Kg	1.1	0.205	1.1		890	0.0		
							"total risk"	6.4		