



## PROJECT MEMORANDUM

**TO:** David Newton, Project Manager  
Sarah White, New England Community Involvement Coordinator  
United States Environmental Protection Agency (USEPA)

**COPY:** Alice Clemente, Blackstone River Watershed Council/  
Friends of the Blackstone (BRWC/FOB)

**FROM:** Christene Binger, Joel Trifilo, and Michael Webster, GeoInsight, Inc.

**SUBJECT:** Peterson Puritan Superfund Site Operable Unit 2 (OU2)  
Cumberland and Lincoln, Rhode Island  
Remedial Investigation – Comments/Questions

**DATE:** June 4, 2013

### INTRODUCTION

The Blackstone River Watershed Council/Friends of the Blackstone (BRWC/FOB) retained GeoInsight, Inc. (GeoInsight) to provide technical assistance regarding Operable Unit 2 (OU2) at the Peterson/Puritan Inc. Superfund Site located in Cumberland and Lincoln, Rhode Island (the Site).

GeoInsight prepared this memorandum at the request of BRWC/FOB to communicate the comments and questions contained herein which pertain to the OU2 “Final Remedial Investigation (RI) Report” dated August 2012 and released by the United States Environmental Protection Agency (USEPA) in October 2012 (the RI Report). These comments, questions, and expectations were developed by GeoInsight in consultation with BRWC/FOB and in consideration of the information provided by USEPA in a December 3, 2012 conference call and at a December 12, 2012 public meeting. Although a formal opportunity was not provided for public comment on the RI prior to finalization of the RI report, it is the hope of BRWC/FOB that USEPA will consider and address these comments and questions at this time and in future decisions regarding the Site.

BRWC/FOB and GeoInsight appreciate that USEPA has kept us informed and involved us in the process. We offer these comments for your consideration and look forward to obtaining additional information from the USEPA in regard to them.



## GENERAL COMMENTS/QUESTIONS

- The RI Report suggests that impacts at the Site are primarily attributable to upriver and historical sources. However, the general distribution of elevated metals and volatile organic compounds (VOCs) in the environment at OU2 suggests that buried wastes in OU2 are a source of these chemicals in the environment and that detection of these chemicals in OU2 is not entirely attributable to upriver sources.
- Page 97 of the RI Report states “*While a limited number of VOCs have been detected, the VOCs detected in groundwater most frequently or above the USEPA mandated screening criteria consist of benzene, chlorobenzene, chloroform, and 1,4-dichlorobenzene. Benzene has been historically present at SEA-603 above the federal maximum contaminant level (MCL).....*” On page 98 it states “*these data suggest that the VOC impacts to ground water adjacent to the JM Mill Landfill are attenuating over time*”. The three rounds were collected in the October/November time period between 2003 and 2005 and do not appear sufficient to characterize seasonal variability and long term trends for VOCs emanating from the buried waste area. Long term and seasonal trends in VOC concentrations should be assessed as part of the Environmental Monitoring Plan (EMP), established by the Record of Decision (ROD).
- Risks from exposure to landfill gas were evaluated based upon landfill gas samples collected once, in October 2003, from three landfill vents. The representativeness of the single set of landfill gas analytical data from 2003 was not addressed and the potential for variations in landfill gas constituents seasonally and over longer periods of time was not evaluated in the Human Health Risk Assessment (HHRA). The RI Report indicates that the landfill gas evaluation was limited and the condition of the vents was questionable. The RI indicated that additional information will be included in the Feasibility Study (FS). The BRWC/FOB would like to review the updated landfill gas evaluation presented in the FS and anticipates that the risk assessment will be updated and shared with the community as part of the FS or as additional pre-design investigations proceed after the ROD is issued.
- Page 102 of the RI Report states “*Based on a review of Tables 4-2 and 4-9, only sporadic detections of VOCs and inorganics above screening criteria were observed. The only VOCs detected in these wells were low concentrations of chlorinated hydrocarbons in bedrock wells MW-106C and MW-108C. Given the understanding of groundwater movement at the site and the fact that chlorinated VOCs were not detected at notable levels in the shallower wells in these clusters, the chlorinated VOCs in these deeper wells are likely to be from an upgradient source.*” The RI Report does not provide details regarding the rate and direction of groundwater flow in bedrock, the potential for the “upgradient source” of the chlorinated VOCs to be located in OU2, or the potential for denser than water chemical impacts from OU2 to exist in the bedrock.
- Table 5.2 of the HHRA indicates that a chronic inhalation exposure reference-concentration (RfC) of 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) was used for trichloroethylene (TCE) in air. The current RfC for chronic inhalation exposure to TCE



is 2 µg/m<sup>3</sup>. Changes in toxicity information for COCs, such as the change in the RfC for TCE, should be considered and the HHRA updated as necessary.

- Based upon information presented by USEPA in the December 2012 public meeting, samples of leachate, soil, and organisms have been collected and analyzed subsequent to the issuance of the RI Report, and additional evaluation of landfill gas was planned. GeoInsight anticipates that these additional data will be made available to the public. At this time the TAG Group received copies of two memoranda prepared by the PRP related to supplemental data collection efforts. How will this additional information be incorporated into the existing risk assessments? The BRWC/FOB anticipates that the findings will be incorporated into the FS to support the evaluation of the remedy.
- The RI Report indicates that a Presumptive Remedy, consisting of a cap, landfill gas collection, and leachate control will be implemented as part of the Proposed Plan, and therefore, assessment activities were not required to be performed in the JM Mills Landfill area. The TAG Group is aware that the PRP is attempting to gain approval for an alternative cap type. It is our opinion, that if alternatives to the Presumptive Remedy are being contemplated, then investigation of the content of the landfill and groundwater quality below the landfill is warranted before alternatives to the Presumptive Remedy are approved by USEPA.

### **COMMENTS RELATED TO LEACHATE EVALUATION**

Text Excerpt: Page 98 of the RI Report states (underlined text is referenced in comments below this excerpt) “*Several inorganics (most frequently detected were arsenic, iron, and manganese) exceeded relative screening criteria. Upgradient or background groundwater contains detections of some of the same inorganics above screening criteria, indicating that inorganics are ubiquitous to the region and may not be completely attributable to OU2 sources. The dissolved metals concentrations in the 2009 Unnamed Island groundwater samples were generally much lower in concentration than the corresponding total metals concentrations, suggesting groundwater metals detections could also potentially be affected by entrained particulate and acidification in the samples collected..... In addition, reducing conditions that occur in groundwater beneath and near-buried waste tend to solubilize inorganics; therefore, elevated inorganics at the site are not unexpected. While no direct correlation was shown between groundwater containing inorganics and buried waste, such contamination, if present, is expected to remain relatively shallow and also migrate toward and discharge into the Blackstone River. As the distance from the buried waste increases, reducing conditions in groundwater can be expected to dissipate. Under such conditions, many inorganics would precipitate. Furthermore, as groundwater discharges to the highly oxygenated Blackstone River water, precipitation reactions are also likely.*”

- The RI Report makes several generalized statements about reducing conditions (including the excerpt above), that do not appear substantiated by a technical evaluation of leachate conditions. It appears that a focused Landfill Indicator Parameter (LIPs) study would be beneficial to the overall understanding of the presence and quality of leachate.



- The text excerpt indicates that dissolved “*inorganics are ubiquitous*”. However, there appears to be a direct correlation between the occurrence of higher arsenic and manganese concentrations in groundwater in areas hydraulically downgradient of areas of waste disposal. This is likely indicative of the *reducing conditions* caused by the waste decomposition and not a natural or background condition.
- The text excerpt above indicates that reducing conditions “*tend to solubilize inorganics*”. The presence of the “reducing condition” is the result of landfilling activities and therefore, the responsibility of the PRPs to address. The tone of this statement appears to purposely deemphasize the reason that inorganics are becoming soluble. This “effect” is still part of the Superfund Site. .
- The text excerpt above indicates that inorganics are likely to *remain relatively shallow and also migrate toward and discharge into the Blackstone River*. Because the landfill directly abuts the Blackstone River the precipitation of metals is most likely to occur within the Blackstone River, increasing the mass loading of metals to the river.
- MIP data collected along the toe of the JM Mills Landfill indicate that impacts are very shallow, within the top 10 feet of the saturated groundwater profile. However, most “shallow” monitoring wells at the toe of the JM Mills Landfill are reportedly screened from 10 to 20 feet below ground surface. It is possible that the screen interval, and likely sample depth of 15 feet, may not be representative of the most impacted shallow groundwater that discharges to nearby surface water. It is noted that several shallower wells are located at the toe of the Landfill, such as wells MW-B2 (6.5 to 16.5 feet) and MW-C2 (5 to 15 feet). Further assessment of shallow groundwater between 0 and 10 feet should be conducted in the area of SEA-603 and GLF-706. If the Presumptive Remedy is implemented and leachate migration is controlled, then additional assessment may not be warranted. However, if modifications to the Presumptive Remedy are proposed, then evaluation of shallow groundwater and leachate migration needs additional assessment to identify the extent of potential impacts along the toe of the Landfill.
- The RI Report indicated that leachate “seeps” were not observed and could not be sampled. The RI Report also indicates that impacts to groundwater are shallow. Leachate is not typically defined as only the water that seeps from the Landfill, above the water table. Leachate plumes can extend 10s of feet into the water table. In the preceding bullet point, concerns were raised about the depth of sampling adjacent to the Landfill, and that most sample intervals may be below the area of highest impacts. Further investigation of impacts to shallow groundwater are warranted to properly assess the requirement for leachate control as part of the Presumptive Remedy.



- The RI Report noted that wastes were buried at the JM Mills Landfill, the Unnamed Island, and the Nunes parcel below the water table and are in constant direct contact with groundwater. There is concern that fluctuating Blackstone River surface water elevations, especially during flood events, poses an increased threat of chemical discharge to the surface water from the wastes. The RI Report does not include information related to the waste material burial depth below the water table. If the Presumptive Remedy is implemented and leachate migration is controlled, then additional assessment may not be warranted. However, if modifications to the Presumptive Remedy are proposed, then evaluation of the impact of waste burial below the water table needs additional assessment to identify the extent of potential impacts along the toe of the Landfill, Unnamed Island, and Nunes Parcel.

### **RI REPORT POTENTIAL DISCREPANCIES**

GeoInsight reviewed the RI Report to evaluate the general level of assessment and focused on environmental conditions and key conclusions. The review was not exhaustive and did not attempt to verify all information presented in the RI Report. During the course of our review, several apparent discrepancies were identified. A representative list of the apparent discrepancies identified by BRWC/FOB and GeoInsight is included in Attachment A.

### **EXPECTATION OF BRWC/FOB**

BRWC/FOB expects that USEPA will continue to evaluate “realistic” options for long-term protectiveness and risk reduction, and that the comments, questions, and concerns of BRWC/FOB expressed herein and in other communications will be considered in the evaluation of Site conditions, the selection of an appropriate remedy, and in the long term care and maintenance of the Site.

The BRWC/FOB holds the following expectations:

- that supplemental Site investigation and monitoring data not presented in the RI Report, be incorporated into the FS and included in the evaluation of the Proposed Plan prior to issuance of a Record of Decision (ROD);
- that the potential presence of current or future impacts from emerging contaminants of concern, for which reliable toxicity data are not yet available, be considered in the selection of the Site remedy and long-term monitoring program;
- that the Environmental Monitoring Plan (EMP) include the following:
  - focused evaluation of leachate indicator parameter (LIPs) to assess the presence and distribution of leachate so that the extent and impact of leachate can be distinguished from regional historical ubiquitous environmental impacts;



- quarterly sampling (for several years) of monitoring wells at the toe of the Landfill and adjacent to buried wastes to establish trends in COC concentrations with seasonal variability and at different water table elevations; and
- quarterly gauging of monitoring wells (for several years) at the toe of the Landfill and adjacent to buried wastes to establish trends in groundwater levels to evaluate the affect of the saturation and seasonal flushing of waste materials.
- that the selected Site remedy will preserve to the extent feasible ecological habitat and public access to the Blackstone River.



**ATTACHMENT A**  
**SUMMARY OF APPARENT DISCREPANCIES**  
**PETERSON PURITAN SUPERFUND SITE**  
**OU2 REMEDIAL INVESTIATION**

A list of the apparent discrepancies identified by BRWC/FOB and GeoInsight are listed below.

- Different Project Action Levels (PALs) were noted on figures and in tables for the same chemicals:
  - Figure 4-25 indicates the PAL for dieldrin in sediment is 33 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ); however sediment data (4-26) tables indicate the PAL for dieldrin is 1.9  $\mu\text{g}/\text{kg}$ , only data above the PAL of 33  $\mu\text{g}/\text{kg}$  is shown on Figure 4-25, and other data points are listed as “BSC”(below screening criteria) which makes it difficult to assess where PAL exceedences actually exist. It would be more informative if these figures included all of the data, and the BSC term was not used.
  - Figure 4-12 indicates the PAL for anthracene in sediment is 57  $\mu\text{g}/\text{kg}$ ; however sediment data table (4-23) indicates the PAL for anthracene is 27  $\mu\text{g}/\text{kg}$ .
  - Figure 4-13 indicates the PAL for Aroclor 1254 in sediment is 110  $\mu\text{g}/\text{kg}$ ; however sediment data table (4-26) indicates the PAL for Aroclor 1254 is 23  $\mu\text{g}/\text{kg}$ .
  - Figure 4-14 indicates the PAL for Aroclor 1260 in sediment is 110  $\mu\text{g}/\text{kg}$ ; however sediment data table (4-26) indicates the PAL for Aroclor 1260 is 23  $\mu\text{g}/\text{kg}$ .
  - Figure 4-15 indicates the PAL for arsenic in sediment is 0.39 milligrams per kilogram ( $\text{mg}/\text{kg}$ ); however sediment data table (4-27) indicate the PAL for arsenic is 6  $\text{mg}/\text{kg}$ .
- Table 4-13 “SOIL RESULTS FOR PAHs ( $\mu\text{g}/\text{kg}$  dry wt),” does not include PAH data and appears to list SVOCs;
- Table 4-14 “SOIL RESULTS FOR NON-PAH SVOCs ( $\mu\text{g}/\text{kg}$  dry wt),” appears to include only PAH data; and
- Figure 4-1 – Maximum Groundwater VOC Results ( $\mu\text{g}/\text{L}$ ) - does not include the detections of trichloroethylene (TCE).