

Review of the Terry Creek Remedial Investigation/Feasibility Study Workplan, Sampling and Analysis Plan, and Quality Assurance Plan

September 2001

General

The Workplan for the Remedial Investigation/Feasibility Study dated July 2001, Sampling and Analysis Plan, and Quality Assurance Project Plan were received for review. Overall the project is poorly described, lacking in detail and provides no clear goals.

Toxaphene, the principle contaminant found in soils in the Terry/Dupree Creek drainages, is on EPA's list of persistent Bioaccumulative Toxic Pollutants (PBTs). Despite the fact that this chemical is internationally recognized as one of the most environmentally dangerous materials known, this work plan fails to provide any documentation of testing or analytical methodology, ignores entirely subsurface soil contamination, proposes qualitative techniques, and ignores important environmental receptors.

The Terry Creek drainage is one of the largest known reservoirs of toxaphene contamination. The studies described in the RI/FS workplan, SAP and QAPP are inadequate to properly define the borders of contamination and provide the scientific basis of a cleanup.

Comment 1a: Plan Lacks a Methodology for Toxaphene Analytical Quality Assurance.

The Quality Assurance Plan is intended to describe methods for obtaining and testing samples, however, this plan omits all details of toxaphene analysis despite the assertion that toxaphene drives both human and environmental risk assessments. Section 2.4 of the QAPP, Analysis and testing procedures, fails to provide any references to toxaphene testing. Elsewhere in the work plan the Toxaphene Task Force method is mentioned, however all references to toxaphene analysis are omitted from the QAPP.

Comment 1b: Note that on Page 7, Section 2.3.2, third paragraph of Sampling and Analysis Plan states in part: “[there is] some reasonable indication of the presence of organic species similar to some of those found in toxaphene, but there is not enough proof to positively identify this compound as toxaphene in environmental samples (Black and Veatch 1997)[\[1\]](#).” The SAP and QAPP omit all documentation of toxaphene testing methods. **It is essential that both the Sampling and Analysis Plan and Quality Assurance Plan provide documentation of toxaphene methodology.**

Comment 2: Page 20, section 2.4 of the QAPP states in the second paragraph: “...for some COPC's (e.g. toxaphene), it is known that the analytical detection limits typically cannot meet the measurement quality objectives (i.e., higher than the EPA Region IV screening levels).”

2b: How far off are the measurements?

2c: Why are alternative screening methods not provided?

2d: How will the data meet data quality objectives for reproducibility if the screening levels cannot be reliably met?

2e: Does the scientific literature for toxaphene analysis fully support the claim that detection limits cannot be met? Or is the detection limit problem an artifact of Region 4 EPA methodology?

2f: How will the volume estimates in the Feasibility Study be affected?

2g: A section on toxaphene analysis and confounders is required for the QAPP to be complete.

Comment 3: In Section 1.4 pages 5 and 6 of the QAPP, the authors state that accuracy of results are dependent on bias, precision, completeness, representativeness and comparability. **A section needs to be added to the QAPP showing how the Toxaphene Task Force methodology (TTF)meets these criteria relative to alternative methods, literature references to toxaphene analysis; other regions within EPA and International goals for detecting and limiting toxaphene.**

Comment 4: Note on page 7, section 2.3.2 last paragraph: "...100% mortality of amphipods exposed to sediment from Dupree Creek..." in a NOAA amphipod toxicity test. **How are the NOAA studies different from the ones planned for the Hercules RI/FS? Amendments to the QAPP are needed, so that the SOP for toxicity tests can be compared with the literature values.**

Comment 5: Plan omits specific information needed to evaluate quality assurance. Page 21 of the QAPP states "Samples for toxaphene analysis will be subjected to sulfuric acid cleanup (EPA Method 3665A: EnChem SOP, Attachment 1A) to remove interferences." However, a thorough search of Attachment 1A failed to locate either the SOP or the EPA reference.

Contents of Attachment 1A provided for review:

Biota Prep

Lipid Analysis

Guidance for Assessing Chemical Contaminant Data for use in Fish Advisories, Volume 1 EPA 823-B

Pesticides and PCBs (Semi-volatile Organics)

Extraction of Biological Samples; EnChem SVO-60

Extraction of Soil Samples; EnChem 3-SVO-10

Analysis of Organochlorine Pesticides by Gas Chromatography; EnChem SVO-51

Analysis of PCBs by Gas Chromatography; EnChem SVO-52

Extraction of Soil Samples for Analysis by GC/MS-SIM; EnChem SVO-67

Extraction of Biological Samples for PAHs for Methods 8310 and 8270; EnChem SVO-61

Analysis of Polynuclear Aromatic Hydrocarbons by GC/MS-SIM; EnChem SVO-63

Volatile Organics; EnChem 3-VOA-9

Semi-Volatile Organics

Extraction of biota Samples for Base/Neutral/Acids; EnChem 3-SVO-70

Analysis of Semi-volatile (BNA) Compounds by GC/MS; SV)-73

Extraction of Soil Samples for BNA; 3-SVO-4

Analysis of BNA by GC/MS; 3-SVO-37

Metals

Acid Digestion of Biota Samples; EnChem MET-59

Acid digestion of soil samples for Silver, Antimony, and Mercury; EnChem Met-7

ICP Mass Spectroscopy; EnChem Met-58

Both Toxaphene analytical methodology and sulfuric acid treatment are specifically omitted from this plan. The QAPP should be modified to provide complete documentation of the processing of toxaphene samples.

Comment 6: Plan provides conflicting toxaphene analytical specification.

Under Attachment 1A SVO-51 we note the following:

- 1) Peak retention times for multi-component analytes are selected to three decimal places (retention time windows, number 1)
- 2) “The analyst will pick a minimum of three of the largest peaks for Toxaphene...” based on minimal co-elution (Initial Calibration, last paragraph).
- 3) There are no exceptions to SW-846 Method 8081A (Exceptions to Methods section).

Comment 6a: How does the Toxaphene Task Force methodology meet the requirements of peak window retention time selection criteria stated above?

Comment 6b: Is the TTF method an “exception” as disallowed above?

Comment 7: Plan fails to provide information needed for safety of subsurface soils. Section 2.1 of the QAPP fails to provide a regimen for further testing of subsurface soils. Section 4.2 of the Sampling and Analysis Plan fails to provide a receptor for subsurface soil impact. Further, page 5, response to comment 7 in the RI/FS workplan states in part: “...subsurface soil (>3 feet) collected from the Terry Creek Site area will not be considered, as direct exposure pathways between these media and ecological receptors are lacking.” This statement is unscientific. Burrowing invertebrates ranging from worms to arthropods can utilize the marsh subsurface soils at these subsurface depths and comprise a significant source of prey. **Failure to test the subsurface soils and analyze for effects on the ecosystem is a significant failure of this plan. Either the plan must provide a testing regimen for the subsurface soils, or provide scientific documentation that subsurface biota do not naturally occur.**

Comment 8: QAPP omits information needed for evaluation of bird, reptile and mammal investigations. Section 7.5.4 of the SAP describes goals and locations for small mammals. Corresponding documentation of the investigation are omitted from the QAPP. Both the SAP and the QAPP appear to omit a discussion of birds and reptiles, although they are discussed in the work plan as receptors for this site.

Comment 9: Page 24, Section 4.1.1.3 of the Sampling and Analysis Plan contains a discussion of background that is extremely vague. Statements that “anthropogenic, ubiquitous chemicals” can be excluded from analysis, or chemicals may be excluded if they are less than twice the “background” concentration needs to be fully defined and explained. **We could locate no corresponding sections in the QAPP defining “anthropogenic and ubiquitous chemicals.” A section needs to be added to the QAPP for both anthropogenic and ubiquitous chemicals, and COPC “background” calculations should be defined and the appropriate EPA guidelines cited.**

Comment 10: Page 51, Section 4.5.3.4. of the Sampling and Analysis Plan describes modification to the bio-availability assumptions. The possible bio-availability modifications are not just vague; they are actually completely lacking. The authors make an unconvincing argument for less than 100% availability but fail to cite literature resources or explain how they may calculate uptake. We could locate no corresponding section in the QAPP discussing algorithms for modifying bio-availability. **A section in the QAPP needs to be added for modifications to the 100% factor for bio-availability, especially for toxaphene, including all relevant scientific citations and appropriate EPA guidelines.**

Comment 11: Page 61, Section 6.1, last paragraph: The authors state that values that cannot be quantified will be reported as “unlikely,” “possible,” or “probable,” but do not explain how these semi-quantitative reporting qualifiers will be determined. **This is unscientific and unacceptable. There are no “pass-fail” parameters in risk estimation. A section needs to be added to the QAPP defining these parameters, citing relevant EPA guidelines, and explaining the relationship of each of the qualitative factors affect on risk estimation.**

Comment 12: Section 7.4 of the Sampling and Analysis Plan, inclusive. It is not clear if there are sufficient test samples since a rationale for choosing sites is not included. Merely stating that non-

dredged areas will be used is unscientific. **Appropriate sampling formulation must be used, referenced and described in the SAP and QAPP. 100-foot grids are too coarse.**

Comment 13: Page 71, Section 7.4.3 of the Sampling and Analysis Plan. This section on qualitative sediment deposition studies describes a scientifically unmeritorious set of experiments. **Of what value are “qualitatively evaluated” transport mechanisms? Where is the description of the proposed laboratory studies on fate? How will the data be plotted and analyzed?** We agree with EPA’s assertion that these studies are needed. We disagree with the authors proposed plans as stated. **This entire section needs to be revised and resubmitted as a *bona fide* quantitatively modeled fate and transport study.** The SAP describes an investigation of toxaphene transport in Section 7.4.3. This section lists a “qualitative” evaluation in line 2 last paragraph. However, the QAPP lacks any discussion of qualitative evaluation, objectives or data treatment. Clearly the plan is deficient in this regard. In Section 7.5 of the RI/FS Workplan, the Sediment Deposition studies are defined as either empirical or qualitative. “Potential” deposition sites are identified, but not tested. Inferential data for undefined “natural attenuation indicator parameters” are mentioned but not defined. **The QAPP requires modification to list the techniques to be used and expected results.**

Comment 14: On page 7 of the RI/FS Workplan in response to Comment 5, the authors state that toxaphene exposure during dredging is a significant health threat: “It [a draft Public Health Assessment] mentions that only during periods of toxaphene production and remedial activities (e.g., dredging) would exposures to toxaphene occur through the air. *We agree with this conclusion.*” [Emphasis added]. **The workplan and QAPP need to be modified to include testing on toxaphene release from dredged soils in order to evaluate feasibility options for short-term effectiveness.**

Comment 15: Page 91 of the RI/FS discusses the lack of abundance of oysters in Terry/Dupree Creeks. The authors blame the lack of abundance on “little hard substrate on which to set.” However, prolific oyster beds are known to occur on similar areas and the region was historically known for oyster production. **Toxaphene effects cannot be ruled out and should be noted or the paragraph struck from the document.**

Comment 16: Page 24 of the RI/FS Workplan, Section 5.2.2, defines monitored natural attenuation (MNA) as a potential remedial alternative. **How can MNA be considered when the workplan provides only for a qualitative sediment transport study and complete omission of the subsurface soils impact? How can MNA meet standards for short-term and long-term effectiveness when all data collected is only inferential?**

Comment 17: Page 26, section 5.3.1 of the RI/FS Workplan indicates remedial alternatives included for the Main Dredge spoil areas are No action, Institutional Controls and MNA. **Why are these considered three different options when they are all the exact same level of technology? How do these meet the EPA requirements of treating toxaphene contamination under international considerations as a PBT?**

Without a description of toxaphene analysis, without a subsurface investigation, with only a qualitative sediment transport study, with appropriate environmental receptors disregarded, and with no rationale for sampling locations given these work plans fail nearly every test for completeness. No meaningful quantitative data can be obtained from the studies described in the Work plan, Sampling and Analysis plan and Quality Assurance Plan.

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11 Black and Veatch. 10997. Expanded Site inspection. Document No. 68-W9-0055.