Enclosure C to letter from EPA to Westates dated 25 September 2003

EPA Comments on Westates' Risk Assessment Workplan

Background

This enclosure provides comments on the Risk Assessment Workplan which Westates submitted to EPA on May 30, 2003. We performed a detailed review of the Workplan and of the response to comments accompanying the Workplan.

General Items

1. Thank you for submitting the Risk Assessment Workplan in electronic form as well as hard copy. As before, please submit the revised Risk Assessment Workplan in both hard copy and electronic form (PDF is acceptable).

Response: The revised Risk Assessment Workplan will be submitted in both hard copy and electronic form.

Also as before, please indicate revisions in the text of the revised Risk Assessment Workplan using annotations such as strike-out of removed text and red-lining of new text, along with a "clean" copy of the revised Workplan. Please also submit a response to comments to accompany the revised Workplan, providing detailed rationale and explanations in response to these comments, and indicating what portions of the Workplan were revised.

Response: The items requested will be provided in these responses to comments. Please note, however, that the redline and revised Workplan documents will be comprised of the text portion only as no changes to figures or appendices were necessary in response to these comments. In addition, the text in Section 1.0 has been revised to reference the submittals of draft Workplans to USEPA and the receipt of USEPA comments on these Workplans.

2. The current review finds this Workplan largely consistent with the methods and principles articulated in the most recent Agency guidance materials regarding combustion source risk analysis. These are:

   - Risk Assessment Guidance for Superfund. Office of Solid Waste & Emergency Response, U.S. EPA 1989

   - Region IX Preliminary Remediation Goals. Pacific Southwest Region IX,

U.S. EPA 2002

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. Office of Solid Waste & Emergency Response. U.S. EPA 1997

- Soil Screening Guidance: Technical Background Document. Office of Solid Waste and Emergency Response. U.S. EPA 1996

- Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Office of Solid Waste. U.S. EPA 1998

- Exposure Factors Handbook - General Factors. Office of Research and Development, National Center for Environmental Assessment. U.S. EPA 1997

Response: Please note that Westates is concerned that the scope of this risk assessment, as requested through USEPA Region IX comments, has become more extensive than other recent risk assessments required by USEPA on other RCRA combustion permitting projects. The risk assessment elements included in this scope, based on current and prior USEPA Region IX comments on the draft Risk Assessment Workplan, consist of: stack emissions, fugitive emissions from RCRA-regulated sources, fugitive emissions from non-RCRA-regulated sources, wastewater releases after treatment and discharge by a downstream permitted POTW facility, human health risks to surrounding populations, human health risks to on-site facility workers and ecological risks to a variety of ecological receptors.

A comparison of elements requested by USEPA Region IX for this specific project, and elements included in other hazardous waste combustion risk assessments (many of which were performed by USEPA) or recommended in the Agency's 1998 Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities suggests that USEPA Region IX is requesting a much more comprehensive analysis for this single facility than Westates is aware of for any other recent RCRA combustion facility analysis. For example, the Agency's 1998 Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities addresses fugitive emissions for RCRA-regulated sources but the guidance does not suggest that non-RCRA-regulated sources (e.g., the reactivated carbon product) should be evaluated in the risk assessment. The 1998 guidance also does not recommend evaluation of facility workers and also acknowledges that facility workers are covered under other guidance and regulations for occupational exposures to hazardous waste and hazardous waste combustion emissions.

A review of nine recently completed risk assessments for hazardous waste combustion facilities shows that not one evaluated as many different elements as is being requested for this facility, notably including five assessments performed by USEPA Region VI.[1] All nine risk assessments evaluated human health risks to surrounding populations, but only one unique facility evaluated potential risks to on-site facility workers (i.e., the chemical munitions treatment facility at the U.S. Army Deseret Chemical Depot in Toole County, Utah, which was to be used for the treatment of two nerve agents and sulfur mustard). Only two of the nine risk assessments evaluated ecological risks (whereas none of the USEPA-conducted assessments evaluated ecological risks). Eight evaluated fugitive emissions from RCRA-regulated sources and none evaluated fugitive emissions from non-RCRA regulated sources. None of the nine risk assessments evaluated wastewater discharges.

3. A number of site-specific variables which support exposure assessment have not been included in the Risk Assessment Workplan pending collection of sensitive and confidential information retained by CRIT. An information sharing strategy has been proposed among Westates, various stakeholders, CRIT, and EPA. As the Risk Assessment Workplan and report continue to be developed, many of these data gaps will be resolved via the confidential information sharing strategy which has been proposed. At future stages of the Risk Assessment Workplan and Report, risk assessment reviewers will wish to examine a number of these

[1] Risk assessment reports:
U.S. Environmental Protection Agency (USEPA). 2001. Combustion Human Health Risk Assessment for DuPont Dow Elastomers, L.L.C., LaPlace, Louisiana. Prepared by USEPA Region 6. January 2001.
U.S. Environmental Protection Agency (USEPA). 2001. Combustion Human Health Risk Assessment for DSM Copolymer Incorporated, Addis, Louisiana. Prepared by USEPA Region 6. February 2001.
U.S. Environmental Protection Agency (USEPA). 2001. Draft Combustion Human Health Risk Assessment For Dow / Union Carbide Corporation, Hahnville, Louisiana. Prepared by USEPA Region 6. December 2001.
U.S. Environmental Protection Agency (USEPA). 2000. Combustion Human Health Risk Assessment for Angus Chemical Company, Sterlington, Louisiana. Prepared by USEPA Region 6. July 2000.
U.S. Environmental Protection Agency (USEPA). 2002. Draft Combustion Human Health Risk Assessment For Westvaco Corporation, Deridder, Louisiana. Prepared By USEPA Region 6. July 2002.
Utah Department of Environmental Quality, Division of Solid and Hazardous Waste. 2002. Human Health Risk Assessment. Review Draft. Deseret Chemical Depot, Tooele Chemical Agent Disposal Facility (TOCDF). Prepared by Tetra Tech EM, Inc. April 2002.
Essroc Cement Corporation. 2000. Comprehensive Risk Assessment for the Cement Kiln Operations at the Essroc Cement Corporation, Logansport, Indiana. Prepared by Horizon Environmental Corporation. October 2000.
Lone Star Industries. 2001. Risk Assessment for the Evaluation of Kiln Stack Emissions and RCRA Fugitive Emissions from the Lone Star Alternative Fuels Facility, Greencastle, Indiana. Prepared by Cambridge Environmental Inc. July 2001.
Ciba Specialty Chemicals. 2001. Multiple Exposure Pathway Risk Assessment For Hazardous Waste Incinerator No. 2, Ciba Specialty Chemicals Corporation, Mcintosh, Alabama. Prepared by CPF Associates, Inc. February 2001.

site-specific variables (e.g. subsistence ingestion rates, etc.) to confirm their utility and appropriateness for both the human health and the ecological risk assessment.

Response: The text in Section 1.0 has been edited in response to this comment.

Comments on the Human Health Risk Assessment Workplan

4. *Identification of Exposure Pathways (pg 50, section 4.2.4)*. The utility and appropriateness of exposure pathway screening as submitted is not clear. The Risk Assessment Workplan states that a screening-level evaluation of exposure pathways will be performed based upon comparison with non-related combustion source risk assessments. This screening is designed to determine the need for quantitative pathway characterization.

   The rationale and justification for this screening is not clear. Many combustion source risk assessments incorporate a number of site-specific considerations into the development of their conceptual site model. The conceptual site model is a reflection of the exposure assessment's capability to predict potentially complete pathways of exposure. Because of the site-specific nature of combustion source exposure assessments, the appropriateness of screening putative exposure pathways based upon dissimilar site-specificity is not clear. Indeed, the Westates effort will collect a range of site-specific data via the proposed information sharing strategy.

   The locally-raised livestock ingestion exposure pathway comparison with other combustion source risk assessments is illustrative of this confusion. The Risk Assessment Workplan references no supporting data or documentation which confirms the supposition that relative risks associated with different types of livestock ingestion are similar across combustion sources. Please clarify the rationale of this proposed screening, or conduct a pathway-specific analysis which is considerate of the site-specific factors unique to the community surrounding Westates.

Response: The screening method described in the Workplan was presented in response to a suggestion by USEPA at an open house in Parker, AZ that such an approach would provide a reasonable method for focusing on the most important exposure pathways while also semi-quantitatively addressing other similar pathways (e.g., ingestion of various animal meat products). In response to this comment, however, the discussion of the pathway screening analysis in Section 4.2.4 has been removed from the risk assessment Workplan. Instead, applicable exposure pathways identified based on site-specific information will be addressed in the risk assessment.

5. *Calculation of Environmental Concentrations (pg 52, section 4.2.5).* A facility emission period of 30 years is proposed as an exposure duration when performing calculations in support of the exposure assessment. Please specify the degree to which this exposure duration will be applied to the range of constituents emitted from the combustion source. That is, will this duration of exposure be applied for those compounds considered volatile and therefore subject to the direct pathway of inhalation exposure, or solely for those compounds subject to the indirect pathways of exposure from depositional impacts to water and soil?

Response: The text in section 4.2.5 has been edited in response to this comment. A 30 year emission period will be applied to the compounds evaluated in the risk assessment. The equations presented in the USEPA (1998) risk assessment guidance will be used to calculate environmental concentrations for both the inhalation and indirect pathways of exposure, and where these equations rely on the total time period of emissions, a value of 30 years will be used.

6. *Acute Short-Term Risks (pg 61, section 4.4.1.4).* The narrative supporting characterization of short-term or acute risk is not clear. Will the predicted short-term or *one-hour average air concentration* be used for comparison with acute reference (risk-based) concentration, or will acute reference concentrations be compared to the *maximum one-hour average air concentration* predicted beyond the facility boundary? Please reconcile or clarify this inconsistency.

Response: The text in section 4.4.1.4 has been edited in response to this comment to clarify that the maximum one-hour air concentrations modeled beyond the facility boundary will be evaluated in the risk assessment.

7. *Chronic Long-Term Risks (pg 61, section 4.4.2.1)*. EPA recommends that the risk estimate derived from chronic stack emissions be combined with the risk estimate from chronic fugitive releases to characterize a comprehensive, facility-wide chronic risk. Please specify the degree to which the risk characterization will remain inclusive of chronic risks originating from various facility releases and facility activities.

Response: Potential chronic inhalation risks from stack emissions and fugitive emissions will be evaluated for the same set of receptor locations and thus potential risks associated with both types of releases combined will be able to be evaluated. Section 4.4.2.1 has been edited to reflect this clarification and states that the same receptor locations will be evaluated for both stack and fugitive emissions. Should the location of maximum modeling results in residential areas differ between stack and fugitive emissions, potential risks will be calculated at the location where potential inhalation risks would be higher (based on both stack and fugitive emissions combined).

8. *Worker Health and Safety (pg 63, section 4.4.4)*. The Risk Assessment Workplan details a number of specific and deliberate operational procedures which serve to minimize both acute and chronic worker exposure to toxic compounds, while also reducing the magnitude of hazard and risk to the workforce. Consistent with the Risk Assessment Guidance for Superfund (RAGS) guidance document and the National Research Council's review (NRC 1994, "Science and Judgement in Risk Assessment") of Agency risk assessment practice, these procedures generally fall under the rubric of risk management practices rather than risk assessment methods or strategies. The management of a potential risk via compliance with Occupational Safety and Health Administration (OSHA) regulations, and the use of personal protective equipment (PPE) is dissimilar to the assessment of that risk. The assessment of risk involves an evaluation of compound hazard, chemical exposure concentration, and those conditions of human or ecological exposure which are ultimately characterized into a risk estimate. Impacts to workers should be assessed in this risk assessment rather than an articulation of the detailed management strategies used to obviate said risk.

Response: The risk assessment Workplan has been revised to address this comment. A risk analysis consistent with OSHA and NIOSH methods will be performed for workers in which workplace air concentrations will be compared to workplace permissible exposure limits. Based on the discussion of potential fugitive emissions provided in Section 4.3.2.1, the worker risk analysis will focus on spent carbon unloading, the activity where potential impacts, if any, associated with dust and volatile organic compounds (VOCs) from spent carbon are expected to be highest. For this activity, both modeled air concentrations and available employee industrial hygiene air measurements will be evaluated. Section 4.4.4 has been edited to reflect this addition.

However, it should be noted that Westates Carbon remains confused about USEPA's focus on worker exposure questions. Worker exposure in the workplace is clearly governed by the Occupational Safety and Health Act (OSHA), and is not within the jurisdictional scope of USEPA under RCRA. In addition, the Agency's 1998 Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities acknowledges that facility workers are covered under other guidance and regulations for occupational exposures to hazardous waste and hazardous waste combustion emissions.

9. *Conceptual Site Model & On-Site Worker Exposure to Reactivated Carbon Fugitive Releases (pgs 26, 53, 58).* The Risk Assessment Workplan details a site conceptual model which specifies human and ecological receptors, as well as those pathways of exposure which link potential receptors with completed

exposure pathways. The discussion of the reactivated carbon product details the operational fate and transport of the carbon product following reactivation.

In other submittals, Westates has provided EPA with analytical results which detail concentrations of various compounds in the product following carbon reactivation, showing the reactivated carbon to contain several heavy metals. The Risk Assessment Workplan claims that fugitive dust emissions from handling reactivated carbon are likely negligible because of the highly-localized emissions control systems at the point of dust generation. EPA has identified a potentially complete pathway of human exposure linking on-site worker activity with product fugitive releases associated with vehicular loading (loading of carbon product into transport tanker trucks). This putative pathway of exposure should be considered in the exposure assessment, and a determination of on-site worker risk should be included to more comprehensively characterize facility impacts.

Response: Westates Carbon remains confused about USEPA's focus on worker exposure questions, particularly those related to the handling of reactivated carbon during bulk loading operations. As Westates has described previously, reactivated carbon is a product, not a solid waste, and is not subject to regulation by USEPA under the Resource Conservation and Recovery Act (RCRA). In addition, worker exposure to products in the workplace is clearly governed by the Occupational Safety and Health Act (OSHA), and is not within the jurisdictional scope of USEPA under RCRA. We are aware of not a single instance where USEPA has taken the position that a RCRA permitting action requires the assessment of worker exposures to products in the stream of commerce, and we know of no guidance that would suggest USEPA should consider proceeding in this manner.

In addition, the putative pathway noted in this comment does not warrant an evaluation of worker risk based on its infrequency and the negligible level of dust associated with bulk product loading. Bulk loading of reactivated carbon product occurs rarely at the facility. From January 1, 2002 through September 18, 2003, bulk loading occurred during less than 0.3% of the facility's operating time.

The bulk product unloading operation also generates little to no dust. The bulk unloading of product is accomplished outdoors where a forklift is used to center the product-filled bag immediately over a 20" bulk tank opening. Once centered, a worker reaches under the bag and pulls a string that unties the bag spout (18" by 14" in dimension). The forklift operator then lowers the bag further into the trailer tank opening, and the reactivated carbon falls into the trailer. Once the bag has been opened, the worker moves back from the tank opening during the remaining unloading process. There is minimal ambient dust generated during this loading process.

Based on the information provided above, Westates respectfully requests the Agency to reconsider its call for an evaluation of this putative pathway of exposure in the RCRA risk assessment. No change to the Workplan has been made in response to this comment.

10. *Tentatively Identified Compounds* (pg 68, section 4.5.4). The narrative in support of this section is not clear. The Risk Assessment Workplan suggests that many TICs do not have readily available toxicological data suitable for use in risk analysis; while also suggesting that compound-specific factors like emission rate and toxicity will be used to support risk characterization. Please clarify this methodological inconsistency.

Response: Text in Section 4.5.4 has been clarified.

11. *Monte Carlo Simulation (pg 68, section 4.5.5)*. To support Monte Carlo simulations, please provide all parameter-specific distributions, in addition to the source of those distributions for quality control purposes.

Response: Text in Section 4.5.5 has been edited to indicate that input parameter distributions and sources for distributions will be provided.

12. *Averaging of Emissions Rates (pg 43, section 4.2.1).* Please provide more detail (e.g., equations to be used and sample calculations) regarding the protocol proposed for averaging the emissions rates for use in the risk assessment. Also, please make any changes to Section 5.5 of the Test Plan that are necessary in light of changes to Section 4.2.1 of the Risk Assessment Workplan.

Response: A footnote has been added with an example equation to both Section 4.2.1 of the Risk Assessment Workplan and also to Section 5.5 of the Test Plan. A sample calculation will be provided in the risk assessment once emissions data from the performance demonstration test are available.

<u>Comments on the Ecological Risk Assessment Workplan</u>

13. *Environmental Transport (pg 71, section 5.1.2*). The narrative in support of the statement regarding low precipitation frequency in the study area is not clear. Though seasonal precipitation may occur on a relatively infrequent basis, it is likely that rainfall events, especially those associated with monsoon activity, may be locally intense. Please address this aspect of meteorology in the study area during the evaluation of environmental fate and transport.

Response: The USEPA algorithms for surface water and sediment modeling included in the 1998 combustion risk assessment guidance will be used in this risk assessment;

however, the potential impacts of infrequent monsoon activity (i.e., short periods with high rainfall) during the evaluation of environmental fate and transport will be discussed in the ecological risk assessment. The text in Section 4.2.5 and Section 5.2.5 has been edited in response to this comment.

14. *Terrestrial Wildlife (pg 72, section 5.1.3.1)*. This section indicates that surface water ingestion pathways will not be considered for deer, sheep and coyote. However, page 16, Section 2.3.2.3 identifies that local canals may be important regional sources of drinking water for these types of ecological receptors. This assessment should represent a conservative screening of potential risk to ecological receptors. Please explain why this pathway is not proposed for evaluation for these types of receptors.

Response: Surface water ingestion by ecological receptors will be evaluated in the risk assessment. Section 5.1.3.1 and Table 10 of the Workplan have been modified to indicate this.

15. *Terrestrial Plants (pg 73, section 5.1.3.2)*. The second and third paragraphs in this section indicate that several potential exposure pathways will be excluded from assessment due to lack of toxicity data. As was mentioned in previous EPA comments, if toxicity data is lacking then these exposure pathways should be handled as potential data gaps, and uncertainty associated with these pathways should be addressed in the uncertainty analysis. Please address these topics in the revised Workplan.

Response: In the event a potential exposure pathway is excluded from assessment due to lack of toxicity data, the pathway will be handled as a potential data gap and discussed in the uncertainty analysis. Section 5.2.5 has been modified to reflect this.

16. *Aquatic Life (page 74, section 5.1.3.3)*. Please explain the rationale for excluding evaluation of sediments in local aqueducts, canals, and the Main Drain, given that Section 2.3.2.3 indicates these water bodies may be used by ecological receptors.

Response: Sediments in the Main Drain, a representative local aqueduct or a representative canal will be addressed in the risk assessment. Sediment concentrations will be calculated using equations provided in USEPA (1998) guidance. The specific type of waterbody selected for modeling (Main Drain, aqueduct or canal) will be based on the waterbody likely to have the highest sediment concentrations (e.g., based on water flow conditions, source of water and sediment in the waterbody, and drainage and cleaning activities). Section 5.1.3.3 and Table 10 have been modified to reflect that sediment will be addressed.

17. *Selection of Chemicals for Evaluation (page 75, section 5.2.1).* The selection of COPCs is proposed to occur after the completion of the performance demonstration test. Therefore, EPA reserves the right to make additional comments on the risk assessment when the COPC list is generated.

Response: We understand that EPA reserves the right to make additional comments on the risk assessment when the COPC list is generated since the selection of COPCs is proposed to occur after the completion of the performance demonstration test. No change to the Workplan has been made in response to this comment.

18. *Selection of Chemicals for Evaluation (page 75, section 5.2.1).* Screening ecological benchmarks will be compiled from existing sources. Please explain how the screening benchmark will be selected if there are multiple sources for a particular COPC. Please explain how acute toxicity data will be used to represent chronic toxicity data.

Response: We will use the hierarchy of data sources listed in the draft Workplan to identify benchmarks for ecological receptors. If a benchmark is available from multiple sources, we will use the benchmark listed in the preferred data source, unless our review of the benchmark reveals data quality concerns.

Acute data will be used to derive chronic toxicity values based on USEPA (1999) combustion ecological risk assessment guidance. Under USEPA's approach, acute toxicity values are divided by 100 to estimate safe chronic doses.

Section 5.2.1 of the Workplan has been modified to clarify these procedures.

19. *Selection of Chemicals for Evaluation (page 82, section 5.2.1).* The Risk Assessment Workplan should have included the proposed ecological screening benchmarks in an appendix, and the preferred benchmark values should have been identified upfront. EPA reserves the right to make additional comment on the ecological screening benchmark values after the completion of the performance demonstration test and the proposal of COPCs.

Response: We understand that EPA reserves the right to make additional comment on the ecological screening benchmark values after the completion of the performance demonstration test and the selection of COPCs. No change to the Workplan has been made in response to this comment.

20. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Creosote Bush Scrub, Great Horned Owl (page 76).* Please provide rationale for exclusion of soil ingestion by great horned owl. How will incidental ingestion of soil via preening be addressed?

Response: Soil ingestion by the great horned owl will be addressed in the risk assessment. The magnitude of potential soil ingestion will be identified based on relevant and available published data (e.g., for owls or other similar receptors). Table 10 has been modified to reflect the inclusion of this pathway.

21. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Riparian Corridors (page 78).* Please identify whether or not the working definition of "riparian corridor" includes land that is submerged at any time. If so, please identify how the sediment ingesting bird pathway will be evaluated.

Response: Riparian corridors are narrow strips of lush vegetation along rivers, streams and washes. These areas contain sufficient **soil** moisture year-round to support the growth of trees, but do not include areas that are submerged at anytime. These areas are, therefore, terrestrial, not aquatic/sediment habitats, and so are distinct from what is termed "riparian backwater" in the Workplan. Riparian backwaters are defined as the pools and canals that occur within the riparian zone.

"Soil" ingestion will be evaluated for riparian corridors, using Gambel's quail as a receptor. "Sediment" ingestion will be evaluated for riparian backwaters using the Yuma clapper rail as a receptor.

No changes to the Workplan are made in response to this comment.

22. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Colorado River, Double-crested Cormorant (page 79).* Please provide rationale for not also evaluating an avian receptor that may ingest sediment. Please provide additional information on the determination that "surface water ingestion is minimal" for the cormorant.

Response: In response to this comment, both sediment and surface water ingestion will be assumed to occur for a bird receptor in the Colorado River. Table 10 of the Workplan has been modified to include this.

23. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Colorado River, Aquatic Community (page 79).* Please provide rationale for not including depositional areas and associated sediment pathways in this Risk Assessment Workplan.

Response: Sediment exposures in the river will be evaluated. Section 5.1.3.3 and Table 10 of the Workplan have been modified to reflect this.

24. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Riparian Backwaters, Yuma Clapper Rail (page 80).* Please explain why surface water is not evaluated for this species.

Response: Surface water will be evaluated for this species. Table 10 of the Workplan has been modified to reflect this.

25. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Canals, Aqueducts, Main Drain, Double-crested Cormorant (page 81).* Please identify how the sediment ingesting bird pathway will be evaluated. Please provide additional information on the determination that "surface water ingestion is minimal" for the cormorant.

Response: Surface water and sediment will be evaluated in the cormorant. Table 10 of the Workplan has been modified to indicate this.

26. *Table 10, Ecological Receptors and Exposure Pathways to be Evaluated in the Ecological Risk Assessment, Canals, Aqueducts, Main Drain, Aquatic Community (page 81).* Please provide rationale for not including depositional areas and associated sediment pathways in this Risk Assessment Workplan.

Response: Sediments in the Main Drain, a representative local aqueduct or a representative local canal, will be addressed in the risk assessment. Table 10 of the Workplan has been modified to reflect this.

27. *Selection of Chemicals for Evaluation (page 82, section 5.2.1).* Please explain the rationale for not including the NOAA Effects Range Low and Effects Range Median as potential screening benchmarks for sediments.

Response: NOAA values will be used if no sediment screening benchmark is available from USEPA's (1999) combustion ecological risk assessment guidance document. ERLs, ERMs, and other sediment screening values will be obtained from the NOAA Screening Quick Reference Tables (SQuiRTs) available through the NOAA website. Section 5.2.1 of the Workplan has been modified to reflect this.

28. *Toxicity Assessment (page 83, section 5.2.3).* Please provide the proposed criteria and methodology for developing toxicity reference values.

Response: A two-tiered approach will be used for the toxicity assessment. Initially, toxicity benchmarks from the published sources listed in Workplan Section 5.2.1 will be used directly in the risk assessment. No independent derivation of toxicity reference values (TRVs) is proposed at this initial stage. Low effect or no-effect chronic toxicity benchmarks will be used. If chronic benchmarks are not available, acute toxicity data

will be used to derive a chronic criterion by dividing the acute value by 100, as specified in USEPA's combustion ecological risk assessment guidance.

If risks are predicted using these screening benchmarks, a more detailed analysis will be conducted consisting of a data quality review of the benchmarks and a literature search to identify additional toxicological literature. Any TRVs derived from the additional data will be derived based on the methods of Sample et al. 1996[2] for terrestrial wildlife, and Efroymson and Suter 1997 for plants. Chronic low-effect or no-effect concentrations (for surface water exposures) and threshold and probable effect levels (for sediment exposures) will be identified for aquatic life. In all cases, efforts will be made to identify toxicity literature for species taxonomically similar to the receptor species selected for the risk assessment.

Section 5.2.3 of the Workplan has been modified to reflect this.

29. *Toxicity Assessment (page 83, section 5.2.3) and Table 11, Toxic Equivalency Factors for PCDDs/PCDFs for the Ecological Risk Assessment (page 84).* Please describe how the evaluation of PCDDs/PCDFs will be conducted.

Response: The TRV for dioxin/furans will be based on 2,3,7,8-TCDD. The TEFs listed in Table 11 of the Workplan will be applied to the predicted dose for each receptor to express dose in 2,3,7,8-TCDD equivalents. These will then be summed to calculate the total dose of 2,3,7,8-TCDD equivalents in the receptor. Then, the TRV for 2,3,7,8,-TCDD will be used to assess risk. Section 5.2.3 of the Workplan has been modified to reflect this.

30. *Risk Estimation and Description (page 85, section 5.2.4).* Please provide expanded detail on the process that "will be explored" should the proposed hazard quotients/hazard indices be exceeded.

Response: The text referred to in this comment has been removed from Section 5.2.4.

31. *Uncertainty Analysis (page 85, section 5.2.5).* Please expand on the text explanation of how uncertainty related to the ecological risk assessment will be addressed. As one example, please identify whether or not Monte Carlo simulation will also be performed in the ecological risk assessment. This section references methods outlined in section 4.5.2 for the human health risk assessment.

Response: A Monte Carlo risk assessment will not be performed for the ecological risk assessment. Uncertainty in the ecological risk assessment will be addressed

2 Citations for all references are provided in the Workplan.

qualitatively and possibly quantitatively through the use of sensitivity analyses. The text has been edited to reflect this in Section 5.2.5.

32. *Uncertainty Analysis (page 85, section 5.2.5).* Please explain how coplanar PCBs will be evaluated in the ecological risk assessment.

Response: Coplanar PCBs will be assessed as outlined in comment response 29 for dioxins/furans, except that the TEFs used will be those developed by the World Health Organization for coplanar PCBs and that risks will be calculated only for the risk driving pathways. This is parallel to the approach adopted in the human health risk assessment, as described in Section 4.5.2 of the draft Workplan. The text in Section 5.2.5 has been edited to reflect this.

33. *Uncertainty Analysis (page 85, section 5.2.5).* Please describe how unidentified organic compounds and tentatively identified compounds will be evaluated in the ecological risk assessment.

Response: Tentatively identified compounds (TICs) and unidentified organic compounds will be addressed in the uncertainty section of the ecological risk assessment (Section 5.2.5). A description of the methods that will be used to identify TICs is provided in the Performance Demonstration Test Plan. In general, these methods will focus on identifying those TICs present in the largest amounts in the collected stack samples and for which a chemical-specific identification can be made with confidence. In the uncertainty section of the ecological risk assessment, the potential impact of these compounds on the risk assessment results will be evaluated. In addition, in this section of the risk assessment, the potential effect of unidentified organic compounds on the risk assessment results will be addressed. Unidentified organic compounds will be addressed using a total organics emissions (TOE) factor, as described in Section 4.5.3 of the Workplan. The text in Section 5.2.5 has been modified to include a discussion of how TICs and unidentified organic compounds will be addressed in the ecological risk assessment.