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ALCOA/LAVACA BAY SITE NATURAL RESOURCES INJURY ASSESSMENT: 'REASONABLE WORST CASE' APPROACH & INJURY ANALYSES FOR BENTHOS, FINFISH, SURFACE WATER AND GROUNDWATER RESOURCES

This document was prepared pursuant to Section IV of the Memorandum of Agreement (MOA) between the Trustees and Alcoa, effective January 14, 1997, for use as an Attachment to that MOA. It is comprised of five (5) Technical Memoranda prepared by the Trustees and Alcoa. This first memorandum summarizes the 'Reasonable Worst Case' (RWC) approach, which is being used in the cooperative assessment of natural resource injuries and services losses attributable to releases or discharges of hazardous substances from the Alcoa Point Comfort/Lavaca Bay NPL Site (the Site) in Texas. The next four are found in Appendix A and describe the determinations or assessments of injury to Benthos, Finfish, Surface Water, and Groundwater Resources, including the factual and scientific basis therefore, agreed to by the Trustees and Alcoa using the RWC approach. Together, these Technical Memoranda serve to document the consensus of the parties that the RWC approach summarized herein and the specific natural resource injury analyses contained in Appendix A each represent a scientifically sound, appropriate, reliable and cost-effective means of determining and assessing natural resource injuries and losses related to this Site.

Background

The Alcoa Point Comfort/Lavaca Bay Site was added to the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), on March 25, 1994 (59 Fed. Reg. 8794, February 23, 1994). The listing was primarily based on levels of mercury found in several species of finfish and crabs in Lavaca Bay and concentrations of mercury in bay sediments adjacent to the facility. A fisheries closure was established by the Texas Department of Health (TDH) in 1988 due to the elevated mercury levels in fish and crabs. Alcoa, the State of Texas and the U.S. Environmental Protection Agency (EPA) signed an Administrative Order on Consent (AOC) under CERCLA in March 1994 for the conduct of a remedial investigation and feasibility study (RI/FS) for the Site,

As RI/FS planning proceeded under the AOC, the Trustees and Alcoa entered into the MOA. The MOA established objectives and framework procedures for the conduct of a cooperative assessment of natural resource injuries attributable to the Site and of the restoration actions, which would be appropriate to compensate for those injuries. The provisions of the MOA were intended to facilitate an expedited, restoration-focused, cost-effective and efficient injury assessment and restoration planning process.

Cooperative assessment planning pursuant to the MOA proceeded in parallel to the RI/FS underway for the Site. Where appropriate, assessment planning has incorporated and considered data and other information from investigations or analyses undertaken as part of the RI/FS process.

Throughout the assessment process, the Trustees have sought to ensure that its outcome - the identification of appropriate restoration actions - would function to make the public and environment whole for any resource injuries or service losses attributable to Site releases or necessary remedial actions.

During the cooperative planning process for this Site, the Trustees and Alcoa elected to use a "Reasonable Worst Case" (RWC) approach in identifying and quantifying natural resource injuries and services losses. As conceived, this approach first focuses on existing scientific information. Where sufficient to support technically sound and reasoned analyses, the RWC approach allows resource injury determinations to be based on that information, by agreement of the parties. Details regarding the application of the RWC approach in identifying and quantifying particular resource injuries or service losses related to this Site are being outlined in a series of additional Technical Memoranda prepared by the Trustees and Alcoa to describe the methods used to assess each injury or loss. This first memorandum provides an overview of the approach and the general rationale supporting its use in the natural resource damage assessment being conducted for this Site.

Use of RWC Approach in Injury Assessment/Quantification

The first step under the MOA was the identification of the natural resources or resource services with the potential to have been adversely affected by hazardous substances from the Site. This task was performed by the Trustees, who consulted with appropriate experts, reviewed relevant scientific literature, and examined available contaminant concentration data for Lavaca Bay. Next, the Trustees and Alcoa jointly considered the extent of potential injuries or service losses for each resource[1] included on this list.

For resources on this list, the Trustees and Alcoa utilized the RWC concept as a basis for predicting potential injuries and service losses. Under this approach, before proceeding to plan and implement any specific studies to further investigate and/or quantify any resource injury or loss, the participants considered relevant existing data and information bearing on the risk of injury to each resource, including historical data, data collected as part of the RI process, and the results of prior relevant scientific studies or literature reviews. In considering this information, the participants sought to err on the side of conservatism, i.e. in favor of predicting 'resource injury' for an exposure level which at least one data or information source indicated an adverse effect was reasonably likely. Then, consistent with circumstances for exposure at the Site (contaminant distribution and exposure pathways relevant to a given resource), the same conservatism was applied to predict the extent of the potential injury or loss for each resource at that conservative exposure level. For each resource, the results of this analysis were then considered in determining the need for additional data to confirm and/or fully quantify these injuries. Where specific additional information was needed, the Trustees and Alcoa, with

[1] In this context, 'resource' refers to a specific habitat type or group of organisms.

EPA's concurrence, were often able to influence the design of RI studies[2] so that the results of these studies would serve both RI and assessment data needs, including to improve RWC analyses. Where a further specific assessment study was indicated, this process allowed the Trustees and Alcoa to weigh the added precision or certainty to be gained from a potential further study against the likely cost of obtaining that additional information.

Under the RWC approach, where this conservative review of the available data and literature indicated that there was little or no reasonable likelihood of an injury occurring, the assessment process concluded with a finding that no further consideration of that resource injury category was required[3]. However, where the information obtained from the RI studies, the historical data reviews, and/or the scientific literature indicated a significant potential for injury to a resource, the assessment process continued for that resource. The Trustees and Alcoa then sought to reach agreement on resource injury determinations in the assessment process which could appropriately be based on the available information, using conservative scientific assumptions in the RWC approach. Where agreements are reached, the resulting injury determination is then used to quantify the injuries to that resource. If agreement could not be reached, then specific NRDA injury studies were jointly developed to address the data gaps critical to determining and/or quantifying that resource injury. Each resource injury determination agreed to by the Trustees and Alcoa using the RWC approach is being documented in a Technical Memorandum. Each such memorandum was developed jointly and describes the method and information on which the agreed assessment of injury is based.

For all resources considered, the Trustees and Alcoa are agreeing to base the determination and/or quantification of injuries on analyses utilizing, in whole or in part, the RWC approach[4]. The

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[2] No RI study was changed in ways which affected its use or otherwise reduced its value to the RI process.

[3] For example, in considering plankton (largely microscopic, non-swimming organisms) within Lavaca Bay surface waters, RI data on mercury concentrations in Lavaca Bay surface waters did not show any exceedances of the Texas chronic ambient water criteria for protection of aquatic life. Historic water quality data were reviewed and found to be consistent with the data from the RI. Since the criterion is itself derived from conservative assumptions about risk to aquatic resources, the participants RWC analysis found little to no potential for injury to these organisms from exposure to mercury. Therefore, using the RWC approach, the assessment process for the surface water resource concluded with a finding that no restoration action was required, due to a lack of evidence of injury.

[4] One resource injury or loss for which a specific study was implemented was the lost use or access to fish for consumption due to the closure of a portion of Lavaca Bay, first established by the Texas Department of Health in 1988. Data specific to this loss was gathered through an angler survey, implemented in conjunction with an RI study. Data from that work has been used in modeling the recreational service losses as well as the ability of potential restoration actions to compensate for these losses. Even though the assessment of recreational fishing service losses used specific data collection and modeling efforts, the RWC strategy is still reflected in that assessment, such as in conservative choices in model formulations. The use of the RWC approach in assessing recreational fishing service losses is outlined in the Draft Damage Assessment and Restoration Plan for Lavaca Bay Recreational Fishing Service Losses, which was released for public comment on September 28, 1999.

following table lists the resources considered in the assessment process and, by resource, indicates whether site specific studies or RWC analyses have been used and the injury determinations which result:

Natural Resource	RWC Analysis	Site-Specific NRDA Study	Finding of Injury or Loss
Benthos	Y	Y (limited)	Y
Birds	Y (pending)	N	??
Finfish	Y	N	
Terrestrial Resources	Y (pending)	N	
Fishing Closure (lost Recreational use)	Y (limited)	Y	Y
Groundwater	Y	N	N
Surface Waters	Y	N	N

Rationale Supporting RWC Approach

The RWC approach facilitates a conservative, rapid evaluation of the resource injuries which may be attributable to a site as well as the potential extent of such injuries. It is allowing determinations of natural resource injuries and service losses in this assessment to take advantage of the considerable amount of relevant, existing data and information, including from historic sources, remedial investigations and other relevant scientific reports or investigations. Where credible scientific information exists and provides a sound technical foundation for conservative (favoring the public's interests) but reasoned judgments about resource injuries attributable to the Site, the RWC approach allows the assessment process to proceed without pursuing specific injury studies. Minimizing the need for specific injury

studies to complete the assessment saves time and results in a more efficient and cost-effective process. It serves to accelerate the Trustees' ability to identify and scale appropriate restoration actions to compensate for natural resource injuries and services losses. In a cooperative assessment, this can also expedite the Trustees' ability to obtain the restoration actions found to be appropriate to make the public and the environment whole.

Upon execution by all parties, each of the five (5) Technical Memoranda comprising this document is incorporated into the January 14, 1997 MOA as an Attachment, and is subject to the terms of the MOA. Acknowledged and agreed:

For ALCOA: _____ ____

Ron Weddell Date

For TGLO: _____ ____

Diane Hyatt Date

For TNRCC: _____ ____

Richard Seiler Date

For TPWD: _____ ____

David Sager Date

For DOI: _____ ____

Tom Schultz Date

For NOAA: _____ ____

Ron Gouguet Date