

**DAMAGE ASSESSMENT AND RESTORATION PLAN AND
ENVIRONMENTAL ASSESSMENT FOR THE POINT
COMFORT/LAVACA BAY NPL SITE**

ECOLOGICAL INJURIES AND SERVICE LOSSES

PREPARED BY

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FINAL

June 21, 2001

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Finding Of No Significant Impact

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Appendix A

Appendix B

This Damage Assessment and Restoration Plan and Environmental Assessment for Ecological Injuries and Service Losses (DARP/EA) has been prepared by state and federal natural resource trustees to address natural resources injured and ecological services lost due to releases of hazardous substances from the Alcoa Point Comfort/Lavaca Bay NPL Site (henceforth 'Lavaca Bay Site' or 'Site'). The designated natural resource trustee agencies involved in the development of this document are the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce, the Texas Natural Resource Conservation Commission (TNRCC), the Texas General Land Office (TGLO), the Texas Parks and Wildlife Department (TPWD), and the Fish and Wildlife Service (USFWS) on behalf of the U.S. Department of the Interior (DOI) (collectively, 'the Trustees'). It is being issued as the Final DARP/EA following the public comment period on the Draft DARP/EA, which began July 14, 2000 and ended August 14, 2000, and the July 27, 2000 public meeting in Port Lavaca, Texas. No written comments were received on the Draft DARP/EA, and reaction to the proposed restoration plan at the July 27, 2000 public meeting was wholly positive. The restoration actions proposed in the Draft DARP/EA are, therefore, selected herein as the means of obtaining compensation for ecological injuries at the Site.

In the assessment process underway for this Site, the Trustees have adopted a staged approach to restoration planning. The first stage was focused on recreational fishing service losses and was covered by a Draft DARP/EA for Recreational Service Losses released on September 28, 1999 and a Revised Draft DARP/EA for Recreational Service Losses released on May 12, 2000, which reflected consideration of public comments received on the initial draft. The present document represents the second stage of restoration planning and is focused on natural resource injuries and service losses of an ecological nature. Chapters 4 through 7 of this document describe the assessment of ecological injuries and service losses (other than for terrestrial resources), including the analysis and scaling of restoration alternatives to address those losses, resulting from Site contamination and response actions initiated through 1999. More specifically, the analyses presented in Chapters 4 through 7 cover the effects of known Site contamination and initiated response actions through the end of 1999 to most natural resources. The remaining ecological injuries and losses, i.e., terrestrial resource injuries and losses after 1999, including their corresponding restoration requirements, are evaluated in Chapter 8 based on the Trustees' understanding of the final remedy that they expect EPA to select. If the final remedy does not differ materially from the remedy anticipated by the Trustees, then the evaluation in Chapter 8 will be definitive of these residual losses and compensation requirements. This information was included for public review in the Draft DARP/EA for Ecological Injuries and Service Losses that was released for public review on July 14, 2000 to allow the Trustees to complete the assessment and restoration planning process for this Site at the earliest possible time¹. In the event the actual final remedy differs materially from that which the Trustees' have anticipated, then the analysis may not be appropriate and a third and final stage Draft DARP/EA may be required.

The second stage Draft DARP/EA was intended to inform members of the public and to solicit their comments on the Trustees' assessment of the natural resource injuries and service losses described therein and on the restoration actions which the Trustees identified to compensate for those losses. The Draft DARP/EA also served as an Environmental Assessment pursuant to the National Environmental Policy Act (NEPA) 42 United States Code (U.S.C.) Section 4321 et seq., and regulations guiding its implementation at 40 Code of Federal Regulations (C.F.R.) Part 1500. Accordingly, the Draft DARP/EA addressed the purpose and need for the proposed restoration actions, the restoration alternatives considered, and the potential impact of restoration actions on the quality of the physical, biological, and cultural environment. Since no written comments were received, the Trustees have selected the restoration actions identified as preferred in the Draft DARP/EA as the means of obtaining compensation for the ecological injuries addressed in that document.

¹ Chapter 8 discusses the restoration requirements that would be required if the currently anticipated remedy is chosen. If the Trustees' understanding concerning the remedy is correct, and no additional information is received that would affect the restoration alternatives analysis and scaling, a third stage DARP/EA will be unnecessary.

1.1 OVERVIEW OF THE SITE

Alcoa began operations at its Point Comfort, Texas facility (PCO) in 1948 on 3,000 acres of land on the eastern shore of Lavaca Bay. Between 1948 and the present, Alcoa has constructed and operated several types of manufacturing processes at this location, including alumina refining, aluminum smelting, carbon paste and briquette manufacturing, gas processing, and chlor-alkali processing.

The 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, a fisheries closure imposed by the Texas Department of Health (TDH) in 1988 due to mercury levels found in fish, and levels of mercury detected in bay sediments adjacent to the Alcoa facility (TDH, 1988). 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.

The Trustees are responsible for evaluating potential injuries to natural resources and resource service losses resulting from releases of hazardous substances from the PCO facility pursuant to Section 107(f) of CERCLA, the Federal Water Pollution Control Act, 33 U.S.C. Section 1251 et seq., (also known as the Clean Water Act or CWA) and other applicable Federal or State law, including Subpart G of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Sections 300.600 - 300.615, and regulations at 43 C.F.R. Part 11 which are applicable to natural resource damage assessments (NRDA) under CERCLA. The cost of actions appropriate to restore, replace or acquire resources or resource services equivalent to those lost is a primary basis for compensating the public for injuries to natural resources under these authorities.

The Trustees and Alcoa entered into a Memorandum of Agreement (MOA), effective January 14, 1997, which has allowed the evaluation of potential natural resource injuries and service losses attributable to the Site and restoration planning to address those losses to proceed on a focused and expedited basis. The goal of this process is to identify and implement restoration actions that will make the environment and public whole for resource injuries or losses that have been caused by releases of hazardous substances from the PCO facility.

1.2 STAGED APPROACH TO RESTORATION PLANNING

The Trustees adopted a staged approach to restoration planning for this Site. A staged approach allows restoration decisions for particular injury or loss categories to be made as soon as that injury or loss category can be reliably quantified, using available remedial and assessment information. This staged approach will allow the Trustees to seek implementation of restoration actions as quickly as possible following the quantification of specific resources injuries and/or service losses. Where restoration actions can be expedited, restoration services (and public compensation credit) will begin to flow upon implementation, even before completion of the remedial process. Any resource injuries or losses that are dependent upon or residual to the choice of final remedy, if materially different than described in Chapter 8, can be addressed in a final stage damage assessment and restoration plan. The staged approach facilitates early implementation of restoration actions. Absent a staged approach to restoration planning, all restoration actions would be deferred until after final remedial decisions for a particular site had been made.

In the assessment underway for this Site, the first restoration planning stage focused on recreational fishing service losses attributable to releases of hazardous substances from the PCO facility and was covered by the Final DARP/EA for Recreational Service Losses dated June 21, 2001. The present DARP/EA represents the second stage of restoration planning. It considers natural resource injuries and ecological service losses caused by Site contamination through the end of 1999 and natural resource injuries or service losses attributable to response actions initiated before the end of 1999 (excluding injuries/losses to terrestrial resources). The quantification of resource injuries due to these known response actions covers these natural resource losses into the future.

Chapter 8 of this second stage DARP/EA focuses on terrestrial resource injuries and losses and all other natural resource injuries and service losses of an ecological nature occurring after 1999 through their recovery to baseline, including those which may result from expected future response actions at the Site. Terrestrial resource injuries are

included in Chapter 8 because they are largely linked to known or anticipated response actions, more so than to Site contamination, and can be definitively assessed only by taking into account all response actions. The Trustees have worked closely with EPA and TNRCC response personnel and, as a result, have anticipated future response actions which may occur under the final remedy. Chapter 8 describes these anticipated actions and evaluates the residual resource losses and corresponding restoration requirements based thereon. Until the final remedy is selected, there will remain some uncertainty about what, if any, further response actions will be required at the Site and, as a result, about the quantification of the remaining resource injuries and losses, and the restoration actions required to compensate for such losses. If future response actions are as anticipated in Chapter 8, however, a third restoration planning stage will be unnecessary. If the actual final remedy differs materially from that which the Trustees have anticipated, then a third and final stage Draft DARP/EA may be developed to describe the additional residual resource injuries and losses and any further restoration actions needed for public compensation.

1.3 NATURAL RESOURCE INJURIES

In evaluating the potential for injuries to natural resources and resource services in Lavaca Bay, the primary contaminants of concern are mercury and polycyclic aromatic hydrocarbons (PAHs). Mercury and PAHs from Alcoa's facility have been detected in Lavaca Bay, primarily in shallow sediments and fauna close to the PCO facility (Alcoa, 1995). Elevated levels of contaminants have also been found in ground water and soils at the facility. Available data and information indicate that surface water, ground water, habitats, and fauna associated with habitats surrounding the PCO facility are the resources likely to be at risk of injury from these hazardous substances. Habitats in this area include tidal flats, salt marshes, oyster reefs, shallow soft-bottom sediments, and terrestrial uplands associated with islands and shorelines.

Mercury has been shown to be directly toxic and to cause injury to benthic fauna at high concentrations. It can also affect animals at higher trophic levels that feed on contaminated prey items. Mercury bioaccumulates through the sediment-based food web in fish species that feed on benthic organisms near the Site (Evans and Engel, 1994). This has resulted in mercury concentrations in the tissues of fishes and crabs sufficient to cause TDH to issue a closure order prohibiting the taking of finfish and crabs for consumption in the portion of Lavaca Bay adjacent to the PCO facility (TDH, 1988). Additional exposure pathways for mercury in sediments exist for shorebirds and wading birds, primarily in tidal mudflats and fringe marsh habitat near the PCO facility.

PAHs have been detected at elevated concentrations in scattered areas in the vicinity of the PCO facility. Although some invertebrates accumulate PAHs, fish metabolize PAHs, which prevents these substances from biomagnifying up the food web. For PAHs, the primary risk of resource injury is from direct exposure to PAHs in the sediments of bay habitats found in scattered locations near the PCO facility. In addition to mercury and PAHs, the Trustees evaluated the potential for other Site contaminants to cause injury to natural resources or resource services, but found no others with sufficient potential to cause resource injury to warrant further analysis in the assessment process.

Using data and other information developed as part of the RI/FS process, the Trustees were able to identify the types of habitats, their component resources, and the habitat or resources services with the greatest potential to have been injured by historic and ongoing releases of mercury and PAHs from the PCO facility. These include subtidal unvegetated soft-bottom benthic habitats, estuarine marsh habitats, oyster reefs, ground water resources, terrestrial habitats, and human uses of these resources. Some animals living in these habitats, such as shellfish, fish, and birds, may have suffered lethal effects (increased mortality) or sublethal effects (reduced growth, reduced fecundity, etc.) as a result of exposure to mercury and/or PAHs. Additionally, some areas of habitat have been adversely affected, temporarily or permanently, by response actions undertaken at the Site through the end of 1999. These impacts to habitats from response actions also constitute natural resource injuries or services losses and are appropriate for the Trustees to consider in this assessment. As indicated above, most resource injuries or losses associated with response actions initiated through the end of 1999, and the restoration actions selected to compensate for these injuries, are addressed in this DARP/EA in Chapters 4 through 7. Injury to terrestrial resources and analysis of restoration requirements for that injury, based on the expected remedy, is covered in Chapter 8 as are post-1999 injuries and restoration requirements for other resources.

1.4 RESTORATION UNDER CERCLA

In general, restoration actions for natural resource injuries and service losses under CERCLA can be termed as primary or compensatory. Primary restoration is any action taken to enhance the return of injured natural resources and services to their baseline condition, i.e., the condition or level that would have existed had the hazardous substance releases not occurred. Compensatory restoration actions compensate for resource injuries and services losses during the interim period, until recovery to baseline occurs.

Removal and remedial actions (collectively, ‘response actions’) are conducted by EPA or State response agencies and focus on controlling exposure to released hazardous substances, by removing, neutralizing, or isolating them in order to protect human health and the environment from the threat of harm. Although response actions can reduce the need for restoration, the two types of actions are separate and distinct. Trustees may elect to rely on natural recovery as the best alternative for achieving primary restoration in situations where feasible or cost-effective primary restoration actions are not available, where response actions are sufficient to allow for recovery of injured resources, or where the injured resources can otherwise be expected to recover within a reasonable period of time without human intervention.

Under the integrated assessment process for this Site, the Trustees are considering the extent to which actions undertaken as part of the remedial process may be sufficient to allow natural resources and services to return to their baseline condition without further primary restoration actions. The Trustee’s determination of what, if any, primary restoration actions may be appropriate will be based on EPA’s Record of Decision (ROD) for the Site, as the final remedy decision will need to be taken into account in evaluating any further primary restoration needs and action alternatives. Any additional primary restoration determinations (other than those discussed in Chapter 8) will be documented in a DARP/EA for the third and final restoration planning stage, if necessary.

The scale of the required compensatory restoration depends both on the scale of the resource injuries and how quickly each resource and associated service returns to baseline. Remedial actions that facilitate or speed resource recovery reduce interim losses and the compensatory restoration required to offset those losses. Resource injuries and service losses caused by implementation of remedial actions are also losses that may be compensated through appropriate restoration actions. As noted previously, Chapters 4 through 7 of this DARP/EA address compensatory restoration requirements for natural resource injuries and ecological service losses caused by Site contamination through the end of 1999, and also natural resource injuries and service losses attributable to response actions initiated before the end of 1999. For these response actions, compensatory restoration requirements in this DARP/EA address these losses into the future. Chapter 8 discusses primary restoration for all ecological injuries, and compensatory restoration for ecological injuries not covered in earlier chapters, based on the expected remedy.

1.5 PLAN OF THIS DOCUMENT

The remainder of this document presents further information about the natural resource injuries and losses covered in this stage of the assessment and the restoration actions that the Trustees have selected for use to compensate for the interim loss of these resources.

Chapter 2 briefly summarizes the release history associated with this Site, the legal authorities and regulatory requirements of the Trustees, and the role of Alcoa (the Potentially Responsible Party or PRP), and the public in the damage assessment and restoration process.

Chapter 3 provides a brief description of the physical and biological environment potentially affected by the hazardous releases from the PCO facility and describes the cultural environment surrounding natural resources in Lavaca Bay, in accordance with NEPA (42 U.S.C. Section 4321, et seq.).

Chapter 4 describes the potential injuries and ecological service losses caused by hazardous substance releases and the assessment strategies used by the Trustees to address these injuries and losses.

Chapter 5 describes the resource injuries caused by response actions initiated before the end of 1999 and the assessment strategy used to address these losses.

Chapter 6 evaluates restoration options for the various injury and ecological service loss categories outlined in Chapters 4 and 5, and identifies the restoration alternatives selected for use to compensate for these losses.

Chapter 7 describes the method used by the Trustees to determine the scale of each of the restoration actions necessary to compensate for assessed losses.

Chapter 8 describes the anticipated future natural resource injuries and service losses and required restoration for these losses based on the current understanding of the future response actions to be undertaken at the Site.

Appendix A is a list of the documents in the Administrative Record as of the date of issuance of this Final DARP/EA.

Appendix B is a list of Key Statutes, Regulations, and Policies.