September 10, 2010

Mr. Dion Novak
Remedial Project Manager
United States Environmental Protection Agency
Region V
Superfund Division, Mail Code SR-65
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: North Alcoa Site, East St. Louis, IL,
Draft Response to Comments, Revised Baseline Ecological Risk Assessment

Dear Mr. Novak:

On August 5, 2010, we received by email the agency comments on the revised Baseline Ecological Risk Assessment for the North Alcoa Site in East St. Louis, IL (the Site). The revised risk assessment was submitted to the Agency on April 15, 2010. During a conference call between the City of East St. Louis, Alcoa, and EPA, a one-week extension to the deadline was requested for formal submission of our responses to the agency comments on the Revised Risk Assessments for the East St. Louis site. This extension was agreed upon on September 1, 2010 by US EPA. To facilitate the review and discussion process, we have replicated the agency comment in bold italics, followed by our draft response in normal font.

On page ES-1, paragraph 4, and again in section 5.0, it is stated that no herons or egrets have been observed at the site. Please provide evidence over some period of time that justifies this conclusion.

Response: The text states that “a breeding colony of black-crowned night heron, little blue heron and snowy egret is reportedly located within one mile of the Site; however, none of these species have been observed on-Site”. The observation period was during conduct of the Remedial Investigation. There was no ongoing wildlife monitoring program in the approved RIFS Work Plan.

Also, please see text on page 5 of Appendix D of the approved RIFS Work Plan, first paragraph:

“The Zambrana report indicates; “No evidence was found during the Site visits or during correspondence with IDNR personnel to indicate that any threatened or endangered species are utilizing the Alcoa site. Great egret, little blue heron, and black-crowned night herons were observed flying over the site but were not observed to utilize the site for foraging or nesting”.”

To be clear, the Zambrana report was commissioned by the US Army Corps of Engineers, not Alcoa.

The second paragraph on page ES-1 should state that the document was prepared in accordance with ERAGS 1997.

Response: The second paragraph on page ES-1 states “The risk assessment methodology used in this report is based on the approach described by the USEPA in several guidance documents (USEPA, 1997 and 1998).” The full reference for “USEPA 1997” is provided on page 6-5 and is “USEPA, 1997, Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final, June.” We assume this document is identical to the document referenced in the agency comment (“ERAGS 1997”). Additionally, please see page 1 of Appendix D of the RIFS Work Plan, second paragraph, which indicates that the Statement of Work for the Site states that the ERA process should follow USEPA 1997. We propose to change the phrase “is based on” to “in accordance with”.

Page ES-2 par 1 and 2. The temporary cover over the SPL area is 12 inches. This was not designed to be a final cover over this area and Alcoa was to characterize the soils under the removed material and use this for risk analysis. Plant roots, burrowing animals and earthworms all go much deeper than 12 inches, so it is not appropriate to not assess risk due to the presence of the temporary cover placed after the removal was completed. Please provide any correspondence from the Agencies directing Alcoa to only evaluate occasional receptors in IB-2. This is inconsistent with the Ecological Risk Assessment Guidance for Superfund (ERAGS).

SPL comment
US EPA-approved Technical Memorandum 9 (Field Sampling Plan Addendum for Former Spent Pot Lining Stockpiling Area) p. 2, 2nd paragraph describes how the former SPL Stockpiling Area was covered with geotextile fabric and clean soil after SPL removal, and that the “only potentially complete exposure pathways for human health are with subsurface soils in the SPL area”, and “nor are there potential ecological exposure pathways”.

US EPA-approved Technical Memorandum 10 (Investigation of the Former Spent Pot Lining Stockpiling Area) restated the human health-related objectives of the post-removal soil sampling (p. 2), and states that “these results are used in the Draft Revised Baseline Human Health Risk Assessment” (p. 4).

IB-2 comment
In the limited time available to respond to these comments, we have not been able to complete a comprehensive review of project files to determine the precise origin of this statement. We believe that the consideration of occasional receptors was requested by the agency in response to the RIFS Work Plan, Appendix D discussion of lack of habitat in IB-2, and thus, no further consideration of IB-2 in the BERA. As stated in the response to agency comments (August 16, 2004, p. 3) on the Phase 1 Ecological Risk Assessment: “Again, since no completed exposure pathway exists in the gypsum berm areas due to a lack of habitat, no adverse effects are predicted ...”. In other words, the agency requested that we consider occasional receptors in lieu of no further
assessment. The physical nature of the gypsum and the lack of ecological habitat in and on the gypsum are discussed further below.

Page ES-3 par 2. This risk assessment is for the site, not nearby habitat. The presence of better habitat nearby likely increases the amount of exposure that occurs at the site. Individual birds from the regional rookeries and other breeding or roosting areas can have high feeding site fidelity. Birds from a colony or rookery spread out over the landscape, but individuals of the colony will tend to use the same spots over and over. Contaminated feeding sites can easily support 100% of individual bird daily intake/dose because of individual bird preferences to use the same site throughout the season. Individual bird daily dose should not be diluted by area use factors, seasonal use factors, percent of suitable habitat present, or other natural exposure mitigation measures without a more detailed study. Migratory birds and many resident wildlife species are protected by law on an individual basis.

The occasional receptor analysis is not contemplated by the guidance. The site is sufficiently large to justify assuming that receptors can feed exclusively at the site. Barren areas are attractive to certain receptors. For example, birds will visit these areas to collect grit or dust themselves.

Response: Appendix D of the approved RIFS Work Plan states:

The management goals are to “not result in significant adverse effects on local wildlife populations, including state-endangered bird species from the nearby Alorton Rookery. Adverse effects are defined as those that result in Site-related stress to local communities of ecological receptors that utilize the Site on an occasional basis. ... The prediction of local community risk will take the habitat available at the Site into consideration. Several large areas of the Site are either currently used for industrial purposes or of low enough quality that they do nor represent even a short stopover habitat (i.e., gypsum berms)(p.24).

The objectives of the BERA are to “evaluate the potential that elevated levels of risk have occurred or are likely to occur for wildlife receptors utilizing the habitats of the Site....The baseline analysis will provide a full range of potential risk estimates taking into account a range of potential Site usage to more accurately reflect exposure and potential risks to local populations of wildlife receptors.” (p. 29).

The approved RIFS Work Plan states: “Exposures will be estimated for populations within the boundaries of the Site. For those receptors that have home ranges larger than the Site, an Area Use Factor (AUF) will be used to modify the exposure estimate.”

Additionally, the June 9, 2005 agency comments on the initial draft BERA asked questions about the formulas used to calculate area use factors (Specific Comment 7.e) and representations of the amount of wetland habitat available for heron foraging, and did not question the concept of area use factors (AUFs) and areal percent of habitat, etc. These prior agency questions indicated to us that use of AUFs and percent of habitat in the BERA is appropriate, but that the derivation and basis of the factors needed to be
further explained. We have provided this information in the revised BERA. US EPA (1997) does state that the BERA can use realistic exposure assumptions.

We do not believe that the approved RIFS Work Plan mandates inclusion of the unreasonable scenario that 100% of the diet of a wide-ranging receptor is only from contaminated sites. The fact that some species may be protected on an individual basis does not mean that realistic exposure assumptions, such as AUFs, cannot be used to determine whether those species are actually at risk.

Page ES-4 top par. Please see previous comment regarding offsite habitat not limiting onsite exposures.

Response: Please see prior response.

Page 3-13 last par. Phase 2 site specific plant and invertebrate tissue data should be used to calculate site specific BAFs.

Response: Section 3.2.1, 4th paragraph, states that: "In general, very little correlation is evident in the data between bulk soil concentrations and either plant or invertebrate tissue concentrations (Appendix C). Therefore, rather than using the Phase 2 data to calculate Site-specific BAFs, the data are used to provide IB-specific estimates of the food item concentration to be used in the Intake food portion of the Intake equations. In general, BAFs used in Phase 1 have the overall effect of over-predicting tissue concentrations and thereby increasing the estimated intake. Figure 3-2 shows an example of the change in intake estimation using the Phase 2 tissue data versus the tissue concentration estimated using BAFs. Summary statistics for terrestrial vegetation and invertebrate tissues are presented in Tables 3-8 through 3-10."

Therefore, site-specific BAFs were not used because of the poor correlation. However, the site-specific tissue data were used to re-calculate risks to the robin and mouse, as discussed in the Phase 2 Risk Characterization sections of the BERA. Use of Site-specific tissue data provides the most representative input for the intake calculation, as it does not include the uncertainty of a poorly-correlated BAF value.

Page 4-9 last par. An ephemeral pond can support amphibians, invertebrates and vegetation that are consumed by receptors. Over time, plants will continue to colonize the pond, improve the habitat and attract more receptors. The conclusions presented here regarding heron and surface water bodies in IB-1a should be modified. Individual birds from the regional rookeries and other breeding or roosting areas can have high feeding site fidelity. Birds from a colony or rookery spread out over the landscape, but individuals of the colony will tend to use the same spots over and over. Contaminated feeding sites can easily support 100% of individual bird daily intake/dose because of individual bird preferences to use the same site throughout the season. Individual bird daily dose should not be diluted by area use factors, seasonal use factors, percent of suitable habitat present, or other natural exposure mitigation measures without a more detailed study. Migratory birds and many resident wildlife species are protected by law on an individual basis.
Response: As discussed in our response to the comment on p. ES-3, par. 2 (which appears to contain much of the same comment language), it is appropriate to use Area Use Factors to calculate risks related to a site, especially when the home range of the receptor species is much larger than the site, as is the case for the heron and muskrat. The approved RIFS Work Plan states: "Exposures will be estimated for populations within the boundaries of the Site. For those receptors that have home ranges larger than the Site, an Area Use Factor (AUF) will be used to modify the exposure estimate." The pond in IB-1a was created in the 1930s when residue was mined for use in making cement (RIFS Work Plan p. 1-9). The current pond represents the extent of natural revegetation in the intervening 80 years. We believe that the current configuration represents a stable baseline condition for use in the BERA.

Page 4-13 last par. Since there is some vegetation onsite, there is potential for more exposure than just incidental ingestion. Over time, plants will continue to colonize the pond, improve the habitat and attract more receptors. An area use factor of 1% does not adequately model this future use scenario-an area use factor of 1 should be used.

Response: The text on page 4-13, last paragraph, concerns only Investigative Block 2 - the Gypsum Area, not a pond. The Gypsum Area consists of steeply sloping barren gypsum and contains no ponds. No receptor could survive by foraging only in the Gypsum Area. The AUF of 1% applies only to the Gypsum Area, not other parts of the Site. As discussed in the approved RIFS Work Plan (Appendix D, p. 23), the Gypsum Area was not to be considered in the BERA due to lack of habitat. No changes to the text are proposed.

Page 4-24 Section 4.6.3. Additional uncertainty discussion should be included on the following:

- Potential for additive, synergistic and/or antagonistic effects from COPECs to receptors. A literature search should have been done to determine if interactions are likely.

Response: The approved RIFS Work Plan (Appendix D) did not include a requirement to perform a literature search for potential additive, synergistic and/or antagonistic effects from COPECs. USEPA (1997) also does not set out that specific requirement. We propose to add the following paragraph after the second paragraph on p. 4-26 (Toxicity Section).

"Furthermore, additive, synergistic and/or antagonistic effects from COPECs may result in either an overestimate or underestimate of risk, as well."

- The possibility that the areas and/or depths of highest contamination have not been sampled.

Response: We propose to insert the following phrase to the end of the first sentence of the first full paragraph on p. 4-25:

"Uncertainties applicable to all chemical measurement data are related to the measurement of representative field concentrations of chemical, including the
possibility that the areas and/or depths of highest contamination have not been sampled."

- The importance of modeling for the most sensitive life stage of each receptor. If most sensitive life stage information is not available or is not used in the models then risk is likely to be underestimated. For example, in this risk assessment the American robin is modeled as an herbivore and omnivore, yet the diet of the most sensitive life stage (chicks) consists almost entirely of worms and other invertebrates. This does not follow ERAGS and underestimates risk.

Response: The approved RIFS Work Plan, Appendix D (p. 34) states that "SHQs will be calculated for each Investigative Block using the screening-level assessment endpoints and receptors", and did not discuss using different life stages of each receptor. We propose to insert the following phrase to the second bullet on p. 4-25:

"One life stage to an entire life cycle and differences in sensitivity between life stages;

Although US EPA (1997) states that for screening-level assessments, it should be assumed that the most sensitive life states are present, but also states that for vertebrate populations, it is likely that most of the population is not in the most sensitive life stage most of the time. The comment implies that because the diets of robin chicks consist almost entirely of invertebrates, they will have higher HQs than robins modeled as an omnivore or herbivore. Although this may be true if the literature BAFs are used, based on Site-specific tissue data, this is not always the case. For example, by comparing the HQs between Tables 4-1 and 4-2, it is noted that the HQs for several metals are lower for the omnivore than they are for the herbivore so the HQs for a strict insectivore would be even lower for those metals. The reasons are that the ingestion rate for the robin as a herbivore is greater than the ingestion rate for the robin as an insectivore (see Appendix Table A-2), and the concentrations of several of the metals in the plant tissue samples were greater that their concentrations in the invertebrate tissue samples. A discussion of this could be added to the uncertainty analysis section of the report if desired. Also, note that the sensitive life stage is accounted for in the wildlife TRVs, most of which are based on studies conducted during the sensitive life stages of the test species.

- The purpose of a risk assessment is to determine the impact of COPECs on receptors that utilize this site. Spreading the impact over a large area enough area would eliminate population level risk at any site. This approach is not acceptable and should be removed.

Response: The issue of foraging range was discussed in response to the first set of agency comments, and the resolution of those issues based on discussions with the agency were memorialized in the letter of June 9, 2005 to US EPA (Responses to Comments, Baseline Ecological Risk Assessment). Reasonable foraging ranges for these receptors were included in the revised risk assessment. It is not reasonable to assume that a community of birds will fly from roosting sites to feed exclusively at the North Alcoa Site.

- The lack of a known source for PAHs has no bearing on the risk.
Response: The referenced sentence on page 4-28 of the BERA will be changed to: “The potential for risk to birds from by these COPECs is uncertain. However, given the very low levels of risk to mammalian receptors and the lack of a known source of PAHs at the Site, no risk is expected from the list of COPECs above.”

- The ball fields (IB-4c) can be expected to receive regular, not occasional, use from receptors. Receptors that would regularly feed there include American robin, red-tailed hawk, whitetail deer and deer mouse.

Response: As stated on p. 4-19, “Neither IB-4c, the ball field area, nor IB-4e, the current industrial properties, represent ecological habitat nor were either evaluated in the BERA.” As further stated on p. 23 of Appendix D in the approved RIFS Work Plan, “…the ball fields … do not represent areas of potential ecological habitat. Therefore these areas will not be considered further in the BERA”. In response to earlier US EPA comments on the draft BERA (Specific Comment No. 11), a qualitative discussion based on comparisons of IB-4c soil concentrations to other IBs was added to the uncertainty section. This discussion is found on page 4-28 of the Draft Revised BERA, dated April 15, 2010. The section is entitled: Qualitative Risk Evaluation of Ball fields (IB-4c).

Page 5-1 par 3. This explanation about using more realistic total cyanide TRVs does not adequately explain or justify the conclusions presented here.

Response: Section 5.0 is the conclusions section and only presents a brief summary of information that is discussed in more detail in earlier sections of the BERA. The detailed discussion regarding the forms of cyanide is presented on pages 4-3 and 4-4, and then referenced throughout the BERA, as necessary. All of the discussion presented on pages 4-3 and 4-4 are not repeated each time cyanide is discussed, however. For example, the BERA states on p. 4-17 that “cyanide risks to bird receptors in IB-3b may be overstated by the HQ calculations. When total cyanide TRVs (derived from cyanide concentrations in food items) are used to calculated HQs for birds, no HQs greater than 1.0 are calculated.” (emphasis added). We believe that the food item-based calculations are more representative of actual risk than estimates of risk using soil samples data.

Page 5-2. The conclusions are not acceptable. The risk assessment is for this site - not for the surrounding area. The presence of better habitat nearby likely increases the amount of exposure that occurs at the site. It is not appropriate to expand the receptor population of the site "eastward to the Mississippi River" in order to dilute the impact of exposure from this site. Individual birds from the regional rookeries and other breeding or roosting areas can have high feeding site fidelity. Birds from a colony or rookery spread out over the landscape, but individuals of the colony will tend to use the same spots over and over. Contaminated feeding sites can easily support 100% of individual bird daily intake/dose because of individual bird preferences to use the same site throughout the season. Individual bird daily dose should not be diluted by area use factors, seasonal use factors, percent of suitable habitat present, or other natural exposure mitigation measures without a more detailed study. Migratory birds and many resident wildlife species are protected by law on an individual basis.
Response: As discussed above, the issue of foraging range was discussed in response to the first set of agency comments, and the resolution of those issues based on discussions with the agency were memorialized in the letter of June 9, 2005 to US EPA (Responses to Comments, Baseline Ecological Risk Assessment). Reasonable foraging ranges for these receptors were included in the revised risk assessment.

As discussed in US EPA (1999), "Superfund remedial actions generally should not be designed to protect organisms on an individual basis (the exception being designated protected status resources, such as listed or candidate threatened and endangered species or treaty-protected species that could be exposed to site releases), but to protect local populations and communities of biota." The issue of protected status species is discussed in response to the first comment of this letter.

Much of the text of this comment is presented in prior comments. Please see prior responses for further discussion.

The site specific plant and invertebrate tissue data should be used to calculate risk at all of the sites, not just IB-1 and IB-3.

Response: Tissue samples were only collected in IB-1, IB-2, and IB-3b. The barren gypsum dikes of IB-2 do not support stands of vegetation. The gypsum forms an indurated material and does not contain organic material or detritus, therefore invertebrates could not feed in this mineral environment. As stated in Section 3.2.1: "Opportunistic data were also collected in Phase 2 from small patches of vegetation in IB-2, for use in the feasibility study, to provide a worst case estimate of lead uptake by plants and invertebrates that are growing or living in close contact with the lead-containing gypsum materials. Data were not collected in IB-4a since considerable amounts of contouring and earth moving are likely to occur in that area." Therefore, the tissue data from IB-2 were not used to calculate risks and no tissue data were collected from IB-4. Surficial material in IB-1 and IB-2 are industrial by-products (bauxite residue and gypsum), and samples of volunteer vegetation growing in those materials would not be expected to be representative of vegetation that might grow in much of IB-4.

If LOAEL based HQs are above one then adverse impacts are predicted to receptors that utilize the site, this should be clearly stated. It is important to identify which HQs are greater than one.

Response: LOAEL-based HQs are presented in the text of the BERA as summarized below, and the text does indicate which HQs are greater than one.

- IB-1 p. 4-7 – 4-9
- IB-2 Table 4.4 (see prior comment responses concerning lack of habitat)
- IB-3 p. 4-15
- IB-4 pp. 4-19 – 4-21.

This summary guide will be added to Section 5.0 to assist the reader in identification of HQs greater than one.

A discussion of the significance of HQs greater than one is provided on p. 38 of Appendix D of the approved RIFS Work Plan.
The lack of modeling for the most sensitive life stage has underestimated risk. This is evident in the last paragraph on page 5-1. Mallard ducklings that hatch on site would feed exclusively in the site ponds during their most sensitive life stage. This is also evident in the lack of a vermivorous pathway for the American robin nestlings.

Response: It does not appear that the lack of modeling for the most sensitive life stage has underestimated risk based on the response to the similar comment listed above. Although ducklings' diets during the first two weeks consist almost entirely of aquatic invertebrates, they quickly begin consuming greater amounts of plant matter as they age. Although a strict insectivorous diet was not evaluated for the mallard, the diet for the night heron consisted of 10 percent invertebrates and 90 percent amphibians. The BCFs for the amphibian were equal to or greater than the BCFs for the invertebrates (see Table 3-11). The ingestion rate for the heron (0.06 mg/kg BW-day) was the same as the mallard (see Table A-2) so risks to the sensitive life stage for the ducklings for that two week period would be equal to or lower than risks to the heron. This is because the intake for the heron is equal to or greater than (depending on the chemical) than the intake would be for an insectivorous mallard. A discussion of this issue will be added to the uncertainty analysis section of the BERA.

A proper closure should eliminate or reduce receptor exposure to an acceptable level.

Response: The purpose of the BERA is to provide risk-based information to risk managers in order to support scientifically defensible decisions regarding the future administration of the Site. Evaluations of closure options are not provided in the BERA.

An explanation is needed for why there are no endpoints for plant or invertebrate toxicity in soil or sediment.

Response: The rationale for selection of assessment endpoints is provided in Section 4.3.2 of the approved Ecological Work Plan (RIFS Work Plan, Appendix D). These assessment endpoints address wildlife potentially exposed to contaminated soil and sediment, surface water, prey items. These endpoints were selected to address the management goal of the Site (Section 4.3.1.1), which is: "The post-remedy condition for the Site will not result in significant adverse effects on local wildlife populations, including state-endangered bird species form the nearby Alorton Rookery". Additionally, that section further memorializes the risk assessment approach in that "adverse effects are defined as those that result in Site-related stress to local communities of ecologic receptors that utilize the Site on an occasional basis".

The Site is an industrial property that is not managed for ecological services. Therefore, risk was assessed for the site as an attractive nuisance not as wildlife habitat. The surface material of IB-1 and IB-2 are industrial by-products, not natural soils or sediments. Therefore, the assessment of plant or invertebrate toxicity as stand-alone endpoints is not relevant for this industrial property. However, while the abundance of plants and invertebrates is not relevant, the BERA does assess whether the plants and invertebrates that do occur at the Site are potentially toxic for the wildlife ecological receptors consuming those items.
Please do not hesitate to contact me at 361-532-8678 if you have any questions about these responses.

Sincerely,

Ron Weddell
Ronald W. Weddell
Remediation Project Manager
Alcoa Inc.

cc: Stuart Hersh, USEPA
    Rick Lanham, Illinois EPA
    Tom Miller, Illinois EPA
    Greg Pfeifer, Legal Counsel, Alcoa Inc.
    Michael Wagner, Hinshaw and Culbertson
    City Manager, City of East St. Louis