

RESPONSIVENESS SUMMARY

ATTACHMENT 2

**Letters and Oral Comments Submitted During the Public Comment Period,
Including the October 19, 2006 Public Meeting Transcript**

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November 13, 2006

BY US MAIL AND ELECTRONIC MAIL

Mr. Timothy Larson, P.E.
Onondaga Lake Superfund Site - Public Comments
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7016

RE: Explanation of Significant Differences: Onondaga Lake Superfund Site

Dear Mr. Larson:

Enclosed please find the comments of the Onondaga Nation concerning the above.
Please feel free to contact me if you have any questions concerning this submission.

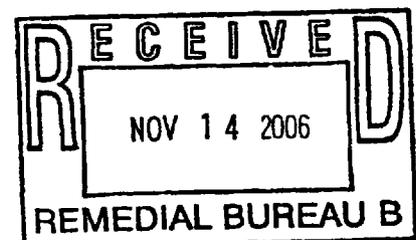
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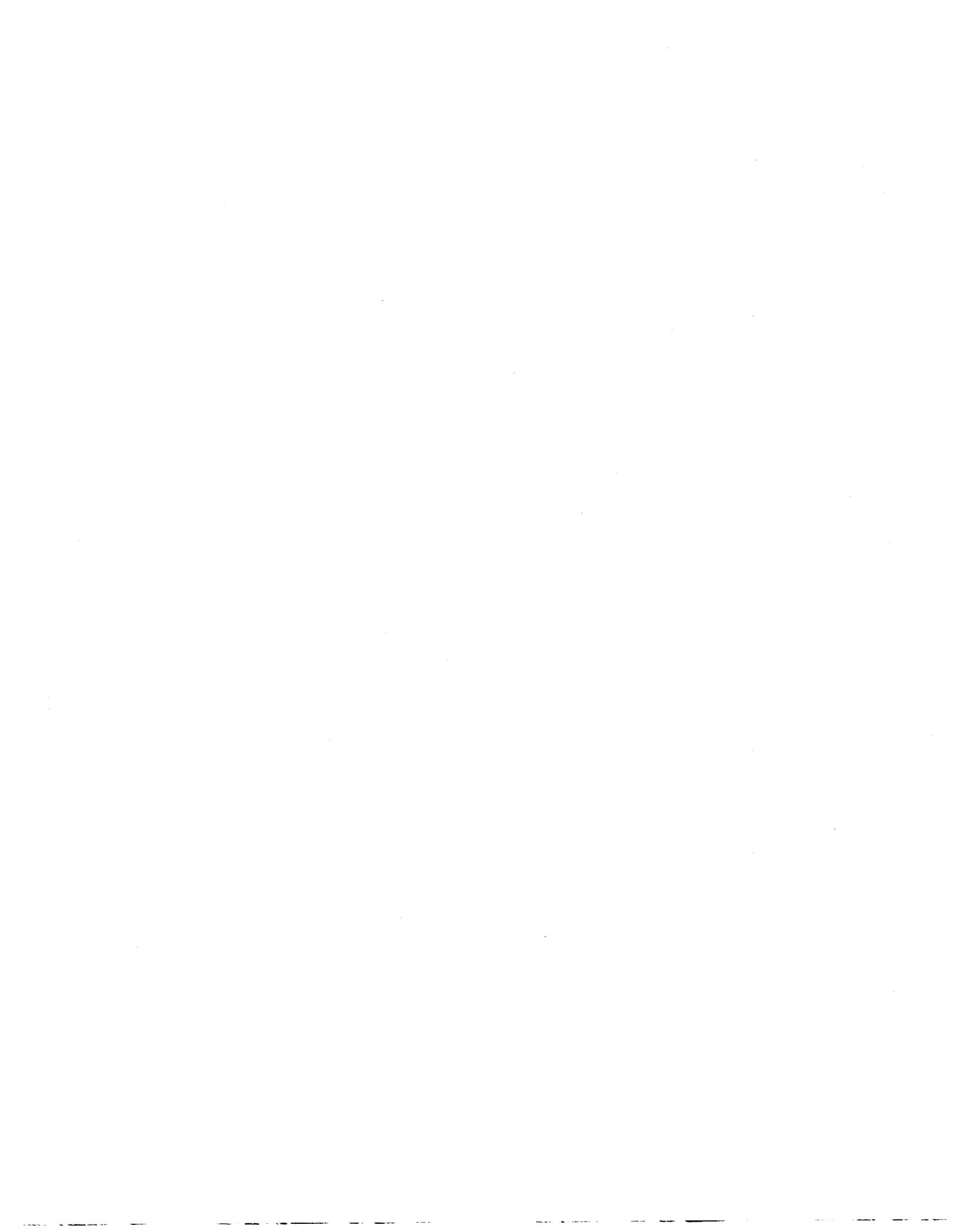
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Christopher A. Amato
Of Counsel

cc: Onondaga Nation Council of Chiefs
Joseph Heath, Esq.





Comments of the Onondaga Nation on the Proposed ESD for the Onondaga Lake Bottom Subsite

The purpose of this document is to submit comments and questions on a proposed Explanation of Significant Differences (ESD) that was issued by the U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) on October 12, 2006. The proposed ESD pertains to the Record of Decision (ROD) for the Onondaga Lake Bottom subsite, specifically, a section of Sediment Management Unit (SMU) 2 and a small part of SMU 1.

On behalf of the Onondaga Nation (the Nation), Stratus Consulting performed a review of documents associated with the proposed ESD that were made available to the Nation in August 2006, and that were subsequently posted at the NYSDEC website for Onondaga Lake (NYSDEC, 2006) at the time of the issuance of the proposed ESD. These include: (1) A technical support document for the proposed ESD prepared by Parsons for Honeywell, with two attachments; Attachment A: Boring logs, and Attachment B: Global Stability Analysis (Parsons, 2006); and (2) A summary of the proposed ESD (U.S. EPA, 2006). Stratus Consulting determined that the documents did not provide sufficient information to allow a complete evaluation of the new remedy described in the proposed ESD. As a result, in consultation with Stratus Consulting, the Nation then requested further information on the proposed ESD, in a letter addressed to the EPA, dated October 19, 2006 (Attachment A). The EPA responded in a letter dated October 31, 2006 (Attachment B). We have attached these letters so that they may become part of the administrative record for the Consent Decree.

We appreciate the EPA's prompt response, as well as the additional documentation pertaining to SMUs 2 and 1 provided in reply to some of the Nation's requests. However, the Nation has further comments and questions about a number of outstanding issues pertaining to the proposed ESD. These comments and questions are addressed here directly to NYSDEC so that they will also become a part of the administrative record for the Consent Decree.

The outstanding issues fall into five categories:

- ▶ EPA's and NYSDEC's justification that the proposed ESD constitutes only a significant – and not a fundamental – change to the remedy selected in the ROD
- ▶ Failure to consider adequately remedy alternatives that would not involve the loss of lake surface area
- ▶ The likely lessening of risk reduction provided by the new remedy compared with the remedy selected in the ROD

- ▶ The significant difference in non-aqueous phase liquid (NAPL) volume estimates in the ROD and the proposed ESD
 - ▶ Incomplete provision of relevant documents and data.
1. **EPA's and NYSDEC's justification that the proposed ESD constitutes only a significant – and not a fundamental – change to the remedy selected in the ROD**

The remedy selected in the ROD (NYSDEC and U.S. EPA, 2005) for the relevant portions of SMUs 2 and 1 involves removal of NAPL contamination and source material through dredging, whereas the remedy in the proposed ESD relies primarily upon in-place containment, with comparatively limited NAPL removal via extraction wells. According to the proposed ESD, the ROD remedy was rejected because dredging to the depths necessary to remove the NAPL could cause sediment instability, and the possible collapse of nearby infrastructure. In the letter dated October 19, 2006, the Nation requested that the EPA and NYSDEC justify their conclusion that the new remedy in the proposed ESD is a significant difference and not a fundamental alteration of the remedy selected in the 2005 ROD (Question 1 of Attachments A and B). The EPA responded that the proposed ESD focuses on only a portion of SMUs 2 and 1. The EPA pointed out that the pre-design investigation (PDI) conducted by Parsons for Honeywell determined that the extent of sediment contaminated with NAPL was considerably smaller than assumed in the remedy selected in the ROD, and based on this, the proposed ESD constitutes a change that affects only 6% of the total volume of sediments to be dredged from the Onondaga lake bottom. As a result, the EPA asserted that for the lake bottom as a whole, the principal components of the remedy (dredging, isolation capping, oxygenation in the profundal zone, etc.) were not fundamentally changed as a result of the proposed ESD.

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Comments

The argument that the proposed ESD does not constitute a fundamental change in the remedy selected in the ROD (because it represents a change affecting only 6% of the total volume of sediment to be dredged from the lake) is valid if:

1. The significantly lower volume of NAPL contamination determined in the PDI and reported in the proposed ESD is accurate
2. Remedial design does not continue to significantly alter other portions of the remedy for the rest of the Onondaga Lake Bottom subsite.

However, the proposed ESD could impact a significantly larger proportion of the total sediment volume to be dredged from the lake bottom if the findings of the PDI for SMUs 2 and 1 were not accurate. The ROD specified an area of approximately 4.8 acres to be dredged to a depth of about 30 ft, with a total volume of sediment to be removed of roughly 400,000 cubic yards (cy),

which was estimated to contain 232,000 cy of NAPL. Parsons (2006) states that, based on the PDI, the volume of NAPL in the subsurface is significantly less, only 5,000 cy, and is present mainly in a 1.6 ft thick layer that is 15-25 ft below the lake bottom, and extends a shorter distance into the lake. According to the EPA's response letter, the total volume of impacted sediment based on the PDI is 157,000 cy. This is less than half the volume of sediment estimated in the remedy selected in the ROD.

If the new estimates based on the PDI underestimate the volume of contaminated sediment, and the true extent of NAPL contamination is closer to the value assumed in the ROD, then the proposed ESD would fail to address significant contamination that could affect areas well beyond the immediate area addressed by the proposed ESD, and could affect far more than 6% of the remedy. Logs of the cores, collected during the PDI and indicating where NAPL was detected, were provided to the Nation. However, accompanying technical report(s) summarizing the results of the PDI (beyond the proposed ESD documents) were not provided. This makes an independent evaluation of the lower volume of impacted sediment difficult, despite the EPA's best efforts to answer the Nation's questions on this subject. Therefore, the Nation objects to the proposed ESD because NYSDEC has not provided sufficient documentation that the new NAPL estimates are accurate and reliable enough to justify a remedy less complete than specified in the ROD.

In addition, the justification for issuing an ESD rather than reissuing the ROD, based on relatively small percentages of total sediment dredging volumes is problematic because the rate of changes to the ROD is high even if most of the remedy has not yet been designed. That is, if other portions of the remedy are altered during design as much as the portion addressed in this proposed ESD, then the alterations to the ROD will clearly become fundamental. Therefore, the Nation will evaluate the cumulative effect of future alterations to the ROD caused by design, which may require that NYSDEC and EPA revisit the need to reissue the ROD, based in part on the changes currently handled by the proposed ESD.

2. Failure to consider adequately remedy alternatives that would not involve the loss of lake surface area

The new remedy in the proposed ESD would result in the loss of roughly 2 acres of Onondaga lake surface area. Although the proposed ESD states that this will be compensated by restoration activities in an area near the lake, the loss of any lake surface area is of particular concern to the Nation. Furthermore, EPA and NYSDEC identified prevention of lake surface losses as one of the key elements of the ROD (U.S. EPA, 2006).

3 Comment

Onondaga Lake provides unique and important ecological and recreational services to the general public, and critically important cultural services to the Nation. Therefore, the Nation believes that EPA and NYSDEC should allow changes to the ROD that permanently eliminate parts of the lake only as a last resort and only when public health and welfare cannot otherwise be protected. However, the EPA's response to our questions on this topic suggests that little effort was put into developing and evaluating alternatives that would preserve the lake surface area, and that the new remedy was perhaps chosen based on other factors, such as ease of implementation and cost.

3. The likely lessening of risk reduction provided by the new remedy compared with the remedy selected in the ROD

The remedy selected in the ROD for the relevant portions of SMUs 2 and 1 involves removal of NAPL contamination and source material through dredging, whereas the remedy in the proposed ESD relies primarily upon in-place containment, with comparatively limited NAPL removal via extraction wells.

4 Comment

The ROD-selected remedy is far preferred over the new remedy presented in the proposed ESD because the ROD remedy involves the removal of the NAPL contamination from the site, while the latter is largely based on containment, with comparatively little NAPL removal through extraction wells. Because it leaves NAPL in the subsurface, the new remedy described in the proposed ESD presents a higher risk of further exposure and contamination of the lake bottom.

The Nation's letter of October 19 presented many questions to the EPA on the new remedy, including requests for information regarding:

- ▶ The amount of NAPL that will be removed from the subsurface by the extraction wells, versus the amount that will be left in the subsurface (Question 27 of Attachments A and B)
- ▶ How residual NAPL that cannot be removed via pumping will be treated (Question 25 of Attachments A and B)
- ▶ The ability of the new remedy to successfully contain the NAPL during pumping, and the long-term containment of the residual (Questions 9, 17, 22 of Attachments A and B).

The EPA made an effort to answer these questions; however, not all of their answers were wholly satisfying. For example, they could not quantify the amount of NAPL that would be left in the subsurface as residual material (non-mobile, non-recoverable NAPL). The quantification of how much NAPL can be removed through pumping at any site is generally a difficult and challenging task, and EPA's inability to answer is hence not surprising. However, this illustrates why the new remedy is less favorable than the remedy selected in the ROD. Dredging physically removes the contamination, whereas any remedy that leaves the NAPL (or a portion of the NAPL) in the subsurface also represents a higher risk of further contamination and exposure.

It is also surprising that other alternatives involving NAPL removal/destruction were not considered or evaluated further. These include recent developments of in situ treatment methods, such as enhanced biodegradation or the use of granular iron materials. The concern that such methods may be unproven in the field [according to Parsons (2004) in situ treatment methods were rejected for that reason in the feasibility study (FS)] is insufficient reason for rejection, particularly since pilot studies are being used in other parts of the ROD to test new treatment methods (e.g., oxygenation of the profundal zone) and the remedy proposed in the ESD includes so many negative aspects, including loss of lake area and retainment of NAPL contamination in the subsurface.

4. The significant difference in NAPL volume estimates in the ROD and the proposed ESD

The estimated volume of NAPL in the proposed ESD of 5,000 cy is significantly less than the 232,000 cy estimate of the ROD.

Comment

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The accuracy of the lower estimate is critical, as it is central to the EPA and NYSDEC's justification that the changes to the remedy remain protective and constitute an ESD rather than an amendment to the ROD. The Nation's October 19, 2006 letter to the EPA asked questions about how these volumes were determined, and requested detailed technical documentation from Honeywell, NYSDEC, and the EPA regarding the estimates of NAPL volumes in the sediments and subsurface at SMU 2 and SMU 1. The EPA provided answers to these questions, and referred to reports, which the Nation had already acquired, including the FS, the ROD, and proposed ESD. However, (a) technical report(s) detailing the results of the PDI and other relevant studies performed for Honeywell in the area were not provided. Copies of such reports should be made available to the Nation. While the Nation appreciates the EPA's responsiveness to questions on these topics, the Nation should be provided the opportunity to independently review all relevant documents.

6 **5. Incomplete provision of relevant documents and data**

The EPA and NYSDEC have made many documents pertaining to the Onondaga Lake Bottom subsite available to the Nation. However, it is also clear that, as mentioned in (1) and (4), copies of many of the technical reports produced by Honeywell and its subcontractors have not been provided to the Nation. The Nation should have direct access to the full contents of all reports pertaining to the site so that a complete evaluation is practical.

References

NYSDEC. 2006. Consent Decree: Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site, Syracuse, New York. New York State Department of Environmental Conservation. Available: <http://www.dec.state.ny.us/website/der/projects/ondlake/>. Accessed 10/13/2006.

NYSDEC and U.S. EPA. 2005. Record of Decision – Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site Towns of Geddes and Salina, Villages of Solvay and Liverpool, and City of Syracuse, Onondaga County, New York. New York State Department of Environmental Conservation and U.S. Environmental Protection Agency, Region 2. July.

Parsons. 2004. Onondaga Lake Feasibility Study Report – Volume I. Prepared for Honeywell, Morristown, NJ. November.

Parsons. 2006. Onondaga Lake: Technical Report Document for Proposed Explanation of Significant Differences. Prepared for Honeywell, Morristown, NY.

U.S. EPA. 2006. Summary of Proposed Explanation of Significant Differences – Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site. Towns of Geddes and Salina, Villages of Solvay and Liverpool, and City of Syracuse, Onondaga County, NY.

**Attachment A. October 19, 2006 Letter from the Onondaga Nation's Legal
Counsel to the EPA**

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October 19, 2006

Via Email and Overnight Mail

George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007

RE: Proposed Explanation of Significant Differences for SMU-1 and SMU-2

Dear Mr. Shanahan:

As you know, this firm is environmental counsel to the Onondaga Nation ("Nation"). At a meeting held on August 23, 2006, the Nation was informed that EPA and DEC were considering a proposed Explanation of Significant Differences ("ESD") for the Record of Decision (ROD) Remedy selected for the Onondaga Lake Bottom subsite. The proposed ESD concerned Sediment Management Unit ("SMU") 2 and a small part of SMU 1. Unfortunately, the Nation was provided with little specific information at the August 23 meeting concerning the technical and scientific justification for the proposed ESD.

The proposed ESD was formally issued by EPA and DEC on October 12, 2006. EPA has informed the Nation that it will be given sixty (60) days in which to submit comments on the proposed ESD. We have reviewed the proposed ESD with our consultants, Stratus Consulting, Inc., and it is our conclusion that the Nation cannot provide meaningful comments on the proposed ESD unless substantial additional information is provided as set forth below. Given the rapidly approaching deadline for submission of comments, the Nation requests that EPA provide its response to the questions and document requests below as expeditiously as possible.

Development of the Proposed New Remedy

In the proposed new remedy, the barrier wall would be placed just beyond the furthest delineation of the subsurface NAPL contamination (somewhere closer to shore than 50 ft, which is the extent of NAPL estimated in the ROD). The barrier wall would be tied into an underlying clay layer. The proposed new remedy does not include any dredging to remove NAPL. Instead,

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NAPL would be removed through pumping with extraction wells placed between the barrier wall and the current shoreline. The remedy selected in the ROD was removal of contamination and source material through dredging, whereas the remedy in the proposed ESD is primarily in-place containment (with comparatively limited NAPL removal via extraction wells). However, in the recent public release (NYSDEC, 2006) of the proposed ESD, the EPA stated that it has been "determined that the revision to the remedy does not constitute a fundamental alteration of the remedy selected in the 2005 ROD" (U.S. EPA, 2006).

Questions

1. How do the EPA and DEC justify their conclusion that the new remedy in the proposed ESD is not a fundamental alteration of the remedy selected in the 2005 ROD?
2. What was the process for developing the proposed new remedy?
3. Was an analysis of the proposed new remedy conducted at the same level of detail as the alternatives in the FS?
4. How does the proposed new remedy compare to the other remedial alternatives that were evaluated in the FS in terms of remedial action evaluation criteria (*i.e.*, protectiveness of human health and environment, compliance with ARARs, implementability, long-term effectiveness, short-term effectiveness, reduction of toxicity, mobility or volume, cost, and community acceptance)?
5. Were other remedial alternatives considered for the proposed ESD, and if so, what were they and why were they rejected?

Requests

1. Please provide all documentation that led to the conclusion that the new remedy in the proposed ESD does not constitute a fundamental alteration to the remedy selected in the 2005 ROD.
2. Please provide all of the supporting technical data, documentation, reports, correspondence, and evaluations that were conducted to determine that the proposed new remedy is the appropriate remedy for SMU 2 and SMU 1.

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Office of Regional Counsel
U.S. Environmental Protection Agency
October 19, 2006

In addition, the proposed new remedy also calls for backfilling in front of (*i.e.*, shoreward of) the barrier wall, effectively extending the shoreline out to the wall (resulting in a loss of lake surface area) to isolate the NAPL from contact with the lake. The other dredging and capping and related remedial activities required in the ROD for SMU 2 and SMU 1 would be implemented as specified in the ROD. However, the proposed new remedy is not one of the options presented in the 2004 Feasibility Study for the Lake bottom, nor does it appear that other dredging options (such as partial dredging) were considered. Moreover, the proposed alternative will leave NAPL in the subsurface and does not address the removal of residual NAPL in the sediments. Similarly, the proposed ESD does not consider NAPL contamination of groundwater through residual or dissolved phase NAPL.

Questions

6. Prior to the development of the ESD-proposed new remedy, were the other options in the FS considered after it was determined that the ROD remedy could not be implemented? If not, why?
7. What is the maximum amount of sediment and NAPL dredging that can be conducted without causing instability in the barrier wall?
8. What other construction or dredging operations that would cause less instability than the operations as defined in the ROD were considered before the ROD remedy was rejected?
9. What is the evidence that the clay unit is fully confining? The rejection of the option of building a stronger barrier wall was rejected in part because of the assumption that the clay unit is in fact fully confining under current and future conditions. In addition, the long-term effectiveness of the in-place containment remedy that is proposed in the ESD is dependent on a fully confining clay unit. Justification should be provided demonstrating that the clay unit is fully confining and has no fractures or pinches.
10. How will the proposed new remedy address contamination in the dissolved phase?

Requests

3. Please provide copies of any technical documents (*e.g.*, reports, memoranda, etc.) that accompanied such a re-evaluation of FS alternatives if it occurred.

Letter to George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
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4. The geotechnical document provided to the Nation appears to be a summary report (Parsons, 2006, Attachment B). If there are more detailed technical reports on the stability analysis and accompanying data, they should be made available to the Nation.
5. Please provide all documents, memoranda, reports, data, etc. pertaining to analysis of the confining clay layer and predictions of the volume of residual NAPL left in the subsurface after completion of pumping.
6. Please provide data and technical documentation related to how the proposed new remedy will address contamination in the dissolved phase.

Reported Lower Volume of NAPL Contamination

The proposed ESD states that there are approximately 5,000 cy of NAPL in the subsurface instead of the 232,000 cy estimated in the ROD. According to Parsons (2006), the NAPL underneath the lake is mainly in an approximately 1.6 ft thick layer that is 15-25 ft below the lake bottom and extends a shorter distance into the lake than assumed in the ROD. During the investigation, NAPL was also discovered to extend approximately 300 ft into SMU 1, where previously it had been estimated that NAPL was not present. In another significant deviation from the ROD, the proposed ESD estimates that NAPL covers an area of 2 acres, whereas the ROD estimated it to cover an area of 4.8 acres.

Questions

11. What methods were used to estimate the two different NAPL volumes?
12. What assumptions were used in each of the two estimates, and what is the evidence that the assumptions used for the ROD are incorrect and those used in the proposed ESD are correct?
13. The proposed ESD documents state that the cores were analyzed for NAPL by "visual analysis." What does this mean? Were analytical techniques used to analyze the cores, and if so, what techniques?
14. Was only "free phase" NAPL in the pores of the sediments identified, or were tests performed to identify NAPL contaminants adsorbed to the soil/sediment?

Letter to George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
October 19, 2006

15. What method was used to determine the presence of NAPL for the ROD estimate of 232,000 cy of NAPL?
16. How was it determined that contamination does not extend beyond the maximum core depth of 42 ft (the maximum depth of the cores)?
17. Was there any evidence for cracks/fractures in the clay, and NAPL migration through the clay?

Requests

7. Please provide detailed technical documentation regarding the estimates of NAPL and NAPL contaminants in the sediments and subsurface at SMU 2 and SMU 1.
8. Please provide all documentation describing how the NAPL extent was delineated.

The significantly smaller volume of the revised NAPL volume estimate was attributed to the lower-than-expected permeability of the fine silt layer, commonly referred to as the marl unit. The proposed ESD also states that "non-pooled NAPL," which is described as discontinuous thin layers of NAPL between 0.5 to 5cm thick, is present in some of the sediment cores. If true, these more localized areas of NAPL can be harder to detect and quantify, and the ESD estimate of NAPL volume may underestimate the true volume.

Questions

18. How did the low permeability cause a reduction in the NAPL volume estimates?
19. How was permeability of the marl unit estimated for the proposed ESD? How was it estimated for the ROD?
20. What is the definition of the terms "pooled NAPL" and "non-pooled NAPL" as used throughout the proposed ESD, and how are the two types of NAPL identified and distinguished from each other? How is the distinction used in the revised estimate of NAPL volume?

Letter to George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
October 19, 2006

21. What assumptions are made as to the extractability of "pooled" and "non-pooled" NAPL by extraction wells in the proposed new remedy?

Requests

9. Please provide the technical documentation and data used to make these determinations.
10. Please provide copies of all data collected during the pre-design stage pertaining to the permeability of the marl unit. Pumping data, or the technical reasoning to proceed with the pre-design stage without it, should also be provided.

Extraction Wells

As discussed *supra*, the proposed new remedy utilizes extraction wells to remove NAPL from the subsurface. In addition to the Nation's concerns about possible residual and groundwater contamination, we also question the efficacy and feasibility of the wells and the pumps used by the wells.

Questions

22. What kinds of studies/data will be collected in order to delineate the hydrology of the site, and the placement of wells in order to adequately capture all of the contamination, including any dissolved phase plume?
23. What will be the criteria for turning off pumps?
24. What criteria will be used to determine when all the mobile NAPL in the sediments *and* whatever remains in the upland source and pathway has been extracted?
25. How will residual NAPL (non-mobile NAPL that can not be removed through pumping) be treated?
26. What kind of monitoring will be employed to ensure that the NAPL and any dissolved plume is being captured, and that the wells are functioning properly?

Letter to George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
October 19, 2006

27. How much residual NAPL will be left in the subsurface after the extraction wells are shut down?

Requests

11. Please provide all documents concerning or relating to the effectiveness of the extraction wells and an explanation of the design of the extraction well system.

Please give me a call if you have any questions concerning this request for additional information.

Very truly yours,

DREYER BOYAJIAN LLP



Christopher A. Amato
Of Counsel

CAA/kmc

cc: Onondaga Nation Council of Chiefs

Joseph J. Heath, Esq.
716 East Washington Street
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Robert Nunes, P.E. (Via Email and Overnight Mail)
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Letter to George Shanahan, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
October 19, 2006

Kenneth Lynch (Via Email and Overnight Mail)
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Timothy Larson, P.E. (Via Overnight Mail)
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625 Broadway
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**Attachment B. October 31, 2006 Response Letter from the EPA to the
Onondaga Nation's Legal Counsel**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

N-1

By Fax and 1st Class Mail

October 31, 2006

Christopher A. Amato, Esq.
Dreyer Boyajian LLP
75 Columbia Street
Albany, NY 12210

Re: Proposed Explanation of Significant Differences ("ESD") for SMU 1 and SMU 2
Onondaga Lake Bottom Subsite, Onondaga Lake Superfund Site, Onondaga County,
New York

Dear Mr. Amato:

This letter is written in response to your letter to the Environmental Protection Agency ("EPA") dated October 19, 2006. In your letter you set forth a series of questions and requests for information concerning the above-referenced matter. I have enclosed with this letter responses to your questions and requests.

While EPA discussed these responses with the New York State Department of Environmental Conservation ("DEC"), it should be noted that these responses are EPA's responses, not DEC's. EPA's responses were prepared in the context established during our ongoing consultation with the Onondaga Nation and the meeting held on August 23, 2006 concerning this matter. At that meeting, EPA representatives informed counsel for the Onondaga Nation that EPA would receive comments from the Nation concerning the proposed Explanation of Significant Differences ("ESD") for a period of 30 days, in addition to the public comment period of 30 days that the State of New York intended to establish pursuant to its notice of the Consent Decree between the State and Honeywell International, Inc. ("Honeywell"), before EPA would make its final decision concerning the proposed ESD.

As we have discussed on numerous occasions, EPA is not a party to the legal proceedings concerning the Consent Decree between the State and Honeywell, and EPA's ongoing discussions with representatives of the Nation concerning the proposed ESD is independent of the Consent Decree proceedings. For this reason, if the Nation wishes that your October 19, 2006 letter on its behalf be made part of the administrative record with respect to the Consent Decree, that intent should be communicated directly by the Nation to Carol Conyers of DEC or Assistant New York State Attorney General Norman Spiegel. It should also be clear that EPA's responses below to your October 19, 2006 letter will not be part of the record before the U.S.

District Court concerning the Consent Decree. Any comments that the Nation has with respect to the Consent Decree, or the proposed ESD as it relates to the Consent Decree, that it wants to become part of the record for the Consent Decree must be separately submitted to the State in the context of the procedures set forth for the Consent Decree, and in accordance with the schedule for submission of comments by November 13, 2006.

EPA will remain available to discuss these matters with the Nation and its representatives for a period of 30 days beyond the State comment period (*i.e.*, until December 13, 2006) before it will make a final decision concerning the proposed ESD. EPA will, of course, continue its consultation with the Nation concerning Onondaga Lake matters even after a final decision is made with respect to the proposed ESD.

As referenced in the enclosure, many of the documents requested by the Nation have previously been submitted to the Nation. This afternoon, Robert Nunes sent an e-mail attaching a document referenced in the enclosure in electronic file format to you and your consultant. There are other documents available only in hard copy or on CD. Copies of these documents have been sent to you and to your consultant (at the name and address you provided) by overnight delivery.

Please feel free to call me to discuss this matter if you have any questions.

Sincerely,



George A. Shanahan
Assistant Regional Counsel
New York/Caribbean Superfund Branch

Enclosure

cc: Joseph Heath, Esq.
Kenneth Lynch, NYSDEC
Donald Hesler, NYSDEC
Carol Conyers, Esq, NYSDEC
Kaylene Ritter, PhD.

Questions

1. How do the EPA and DEC justify their conclusion that the new remedy in the proposed ESD is not a fundamental alteration of the remedy selected in the 2005 ROD?

Response: DEC and EPA determined that the revision to the selected remedy in the July 1, 2005 Lake Bottom ROD is a significant, rather than a fundamental change for the following two reasons.

First, the principal components of the remedy (*i.e.*, dredging and isolation capping in the littoral zone to prevent loss of lake surface area, for erosion protection and to reestablish habitat, and to remove sediments and/or wastes from the portion of the in-lake-waste-deposit ["ILWD"], and thin-layer capping and the performance of an oxygenation pilot in the profundal zone to reduce contaminant concentrations in the upper layer of sediments and to reduce the formation of methylmercury in the water column) have not been fundamentally changed. As a remedy progresses from the selection of the remedy in a Record of Decision ("ROD") to the design of the remedy, changes to the remedy are often made to reflect additional information obtained as part of the design process. Here, the remedy as proposed to be modified by the Explanation of Significant Differences ("ESD") still focuses on dredging and isolation capping in the littoral zone, but also responds to pre-design data indicating that the extent of pooled non-aqueous phase liquids ("NAPLs") is significantly less than had been estimated in the ROD. While, as proposed in the draft ESD, there would be the loss of approximately two acres of aquatic habitat in the lake in the Sediment Management Unit ("SMU") 2 causeway area and a small adjacent area of SMU 1 due to the isolation of contamination behind a barrier wall coupled with NAPL removal by extraction wells, as opposed to the dredging in this area as was envisioned in the ROD; under the proposed ESD, replacement of the lost aquatic habitat would be investigated and implemented in an upland area adjacent to the lake to mitigate for the loss. The remedy, as proposed to be modified with the proposed ESD would still require the capture and treatment of the pooled NAPLs as a significant component of the remedy. Pursuant to the proposed ESD, pooled NAPLs would be collected by extraction wells as opposed to dredging. The treatment of collected NAPLs off-site would not change under the proposed ESD.

Secondly, based on information obtained during the preliminary design investigation on the extent of pooled NAPLs present in the lake, the change in the volume of sediments to be dredged from the lake is a small percentage relative to the total volume (*i.e.*, approximately 6 percent¹). It should also be noted that while the change to the remedy would be addressed via an ESD rather than an amended ROD, the principal administrative and public participation requirements associated with the issuance of an amended ROD (*e.g.*, 30-day public comment period following the release of the notice of the change, the holding of a public meeting, and the generation of a responsiveness summary following receipt and review of public comments) are being conducted.

¹ The total volume of sediment originally to be dredged, pursuant to the ROD, was an estimated 2,653,000 cubic yards (cy). The volume behind the proposed barrier wall location, which would no longer be dredged pursuant to the proposed ESD, is an estimated 157,000 cy or approximately 6 percent of the total ROD volume.

2. What was the process for developing the proposed new remedy?

Response: DEC and Honeywell entered into an administrative order on consent ("AOC") on April 16, 2002 for Honeywell to construct a barrier wall and groundwater collection system at the shore of the lake downgradient of the Semet Residue Ponds and Willis Avenue Subsites. During the design, it was determined that, due to the presence of utilities, the barrier wall would need to be constructed on the lake side (and within 15 to 20 feet) of the causeway. In addition, on August 19, 2005, DEC and Honeywell entered into another AOC for Honeywell to conduct a pre-design investigation ("PDI") to develop technical information for the implementation of the Lake Bottom remedy set forth in the ROD. After Honeywell had taken lake sediment cores pursuant to the PDI, Honeywell and DEC evaluated the data from this investigation. Based upon this review, DEC requested that additional data be collected to delineate the extent of NAPLs in the shallow geologic units (above the clay layer) and to determine the presence or absence of pooled NAPLs in the deep geologic units (beneath the clay) in the lake in the vicinity of the causeway. This investigation showed that no pooled NAPLs were found below the clay unit which acts as a confining layer. The investigation identified the presence of pooled NAPLs above the clay unit in a portion of SMU 1 as well as near the causeway in SMU 2. As will be discussed in the response to question # 4, below, the results of recent geotechnical stability evaluations indicate that the barrier wall in the vicinity of the causeway would have to be installed in the lake at a distance greater than 20 feet from the shoreline. As a result of the geotechnical stability concerns and the PDI data, the alignment of the causeway component of the barrier wall was modified (as propounded in the proposed ESD) to address the stability concerns and to contain the areas of pooled NAPLs in SMU 2 and a portion of SMU 1 where pooled NAPLs were found. The modification also included additional pooled NAPLs collection wells between the existing shoreline and the proposed barrier alignment, and on the northwestern area of the Wastedbed B/Harbor Brook to enhance the recovery of pooled NAPLs present in the subsurface.

3. Was an analysis of the proposed new remedy conducted at the same level of detail as the alternatives in the FS?

Response: No. The candidate remedies in the feasibility study ("FS") that were carried through to the final analysis of alternatives for the ROD all have the same implementability problem associated with geotechnical stability concerns (where the remedies include deep dredging in the proximity of the causeway, etc.) in the causeway area of SMU 2. The proposed modified remedy was determined to be protective of human health and the environment, implementable, and capable of meeting State and federal regulatory requirements, as described in the response to Question #4, below.

4. How does the proposed new remedy compare to the other remedial alternatives that were evaluated in the FS in terms of remedial action evaluation criteria (i.e., protectiveness of human health and the environment, compliance with ARARs, implementability, long-term effectiveness, short-term effectiveness, reduction of toxicity, mobility or volume, cost,

and community acceptance)?

Response: Based upon the results of the PDI, it has been determined that there would be implementability problems associated with all of the alternatives in the FS report with respect to the alignment of the barrier wall, with the exception of Lakewide Alternative B, "Cap with Targeted Dredging." Lakewide Alternative B includes no dredging to address pooled NAPLs. Implementation of this alternative would leave pooled NAPLs remaining in the lake beneath the isolation cap. This alternative was not carried forward into the Proposed Plan and ROD, as it was not considered to be sufficiently protective of human health and the environment and it would not comply with ARARs. All the other alternatives in the FS report included targeted dredging at depths ranging from 4 to 9 meters in SMU 2 to address pooled NAPLs. Slope stability evaluations indicated that dredging beyond 2 meters in SMU 2 would not meet acceptable safety factors with the barrier wall aligned only 20 feet offshore. Therefore, all of the remedial alternatives that were carried forward into the Proposed Plan and ROD would require modification such that the installation of the barrier wall would be at a distance greater than 20 feet offshore.

The ROD determined (at p. 61) that Alternatives 2 through 6 would be equally protective of human health and the environment. The modification of the selected remedy (Alternative 4), as proposed by the proposed ESD, would not alter the analysis of this criterion in the ROD.

With respect to compliance with ARARs, the modified remedy would not significantly affect the analysis provided in the ROD (at pp. 62-64). All of the action alternatives in the FS report would provide protection of human health and the environment and would require some degree of dredging and capping of sediments. All of the action alternatives would have effects on navigable waters and floodplains. There is no practicable alternative to the installation of the barrier wall into the lake waters. As stated in Appendix V to the ROD (Appendix V, at p.4), the sediments and the lake bottom that will be addressed by the remediation are already compromised by the existing contamination. This is particularly the case in SMUs 1 and 2. The lakewide habitat restoration plan will address replacement resources for the two acres of aquatic habitat that would be lost as a result of the proposed modification to the remedy. Habitat replacement (compensatory mitigation) in an upland area adjacent to the lake would offset the two acres that would be lost with the modified remedy. The isolation of contaminated sediments behind the barrier wall coupled with extraction of NAPL would remediate the landward area behind the wall and obviate potential impacts to other parts of the lake.

The remedy as modified in the proposed ESD would not have the same implementability problems (discussed above) associated with the other alternatives considered in the ROD.

With respect to long-term effectiveness and permanence, the conclusion in the ROD that Alternatives 6 and 7 would provide the greatest long-term effectiveness and permanence would not be changed. The selected remedy, as proposed to be modified in the proposed ESD, would still require the removal and treatment of NAPLs and the contaminated groundwater contained

by the barrier wall. The containment of contaminated sediments behind the barrier wall would ensure the long-term chemical isolation of contaminants from the lake waters coupled with removal of the contaminants by extraction wells.

With respect to short-term effectiveness, the proposed modified remedy would present less short-term impacts due to a decrease in the amount of traffic associated with dredging, but would present additional impacts associated with backfilling behind the barrier wall. Short-term impacts can be mitigated through various engineering means that would be evaluated and selected during the remedial design. The time to implement the modified alternative is expected to be the same as the time to implement the selected alternative in the ROD without modification (four years).

The proposed modified remedy would significantly reduce toxicity, mobility, and volume through the collection and treatment of NAPLs. The potential for mobility of contaminants to be encapsulated behind the barrier wall would also be reduced, but this reduction in mobility would not be accomplished through treatment.

It is anticipated that the cost of the proposed modified remedy would be reduced due to the reduction in volume of sediments to be dredged. The anticipated cost reductions have not been calculated at this time since there would also be cost increases attributable to the construction of the barrier wall further into the lake waters, the construction, operation and maintenance of additional NAPL collection wells, and the need for increased backfilling behind the barrier wall. There would also be increased costs associated with the need for mitigation (replacement) of aquatic habitat that would be lost behind the barrier wall.

Community acceptance will be assessed by evaluating the comments received at the October 19, 2006 public meeting and written comments received during the comment period which ends on November 13, 2006.

5. Were other remedial alternatives considered for the proposed ESD, and if so, what were they and why were they rejected?

Response: As other viable remedial alternatives were not identified, none were considered for the proposed ESD. Also, see response to Question # 8.

6. Prior to the development of the draft ESD-proposed new remedy, were the other options in the FS considered after it was determined that the ROD remedy could not be implemented? If not, why not?

Response: See response to Question # 4.

7. What is the maximum amount of sediment and NAPL dredging that can be conducted without causing instability in the barrier wall?

Response: As discussed in the Global Stability Analysis (MRCE), August 8, 2006, which is Attachment B of the Technical Support Document (TSD), the stability analysis predicts that the causeway Profile A can sustain about 2 meters of dredging in SMU 2 with the barrier wall located 20 feet off-shore of the causeway and Profile B just east of the causeway can sustain about 4 meters of dredging in SMU 1 with the barrier wall located at the shoreline. It is predicted that dredging to greater depths would result in unacceptable global factors of safety below 1.3. Figure 5 of the Global Stability Analysis illustrates the change in factor of safety with increasing dredge depths. Thus, as indicated in the proposed ESD, the stability evaluation indicated that the barrier wall and adjacent upland area would be potentially unstable and could collapse during dredging to the depth required to remove the NAPLs as called for in the ROD. These predicted maximum amounts of dredging are much less than the depths of dredging required to remove pooled NAPLs in SMU 2 (7.5 meters) and SMU 1 (6.7 meters).

8. What other construction or dredging operations that would cause less instability than the operations as defined in the ROD were considered before the ROD remedy was rejected?

Response: Initial consideration was given to a dredging technology developed by Seaway Environmental Technologies, Inc. referred to as the Mobile Containment Technology ("MCT"). MCT is based on the concept of controlled dredging within the confines of a specially-fabricated mobile containment vessel. The containment vessel, which can be deployed at a cleanup site, contains vertical barrier walls in the form of sheet piles that can be lowered from the vessel to set up a secure containment area in which sediment dispersed during the dredging process is contained. This technology appears to offer some advantages over conventional mechanical dredging techniques, including the ability to dredge sediments near in-water structures, such as bridges, dams, and cofferdams, where slope stability issues may be a concern.

While the MCT is potentially appropriate for a number of applications, the technology was not considered suitable to address the removal of NAPLs in the lake in accordance with the ROD. MCT is an innovative method, which has never been employed in an environmental dredging project. Therefore, there is very little information available to assess its implementability and effectiveness for any sediment remediation projects, let alone one as challenging as dredging in the conditions and at the depths needed to remove NAPLs in the portion of the lake addressed by the proposed ESD. Since MCT is untested in conditions like those in the lake, it would be imperative to conduct a pilot project to determine its practicability for adaptation to the Lake Bottom remediation. Such a pilot project would delay the installation of the barrier wall and the containment of groundwater contamination from the upgradient Semet Residue Ponds and Willis Avenue Subsites. The containment of the contaminated groundwater from these subsites is essential to eliminate an ongoing source of contaminants to the lake. Groundwater containment from the upland sources is also a prerequisite for the remediation of the Lake Bottom in SMU 1 and SMU 2. In addition, the slope stability analysis conducted for the southwestern area of the lake determined that factors-of-safety for slope stability acceptable to the Federal Highway Administration would not be achieved

if one were to dredge to a depth beyond two meters in the causeway area with a barrier wall alignment at 20 feet offshore, or four meters in the adjacent area in SMU 1 with a barrier wall aligned at the shoreline. In order to implement the required dredging for the removal of NAPLs, while maintaining the current barrier wall alignment, Honeywell, DEC, and EPA would need to commit to undertaking this dredging with the MCT approach. DEC and EPA believe that making such a commitment to this untested technology to dredge for NAPLs at this time would impose severe limitations on the flexibility of the dredging operations which have yet to be designed and could result in the inability to implement the remedy in this area of the lake. As a result of these implementability and feasibility concerns, MCT was not further considered to address dredging requirements for NAPLs as called for in the ROD.

9. What is the evidence that the clay unit is fully confining? The rejection of the option of building a stronger barrier wall was rejected in part because of the assumption that the clay unit is in fact fully confining under current and future conditions. In addition, the long-term effectiveness of the in-place containment remedy that is proposed in the draft ESD is dependent upon a fully confining clay unit. Justification should be provided demonstrating that the clay unit is fully confining and has no fractures or pinches.

Response: As part of the PDI, eight borings were advanced (seven in the lake along the causeway and one on land, just west of the causeway) through the clay into till to evaluate the potential for NAPL migration through the clay as a result of the concrete-filled pilings that support the causeway. Observations made of the clay in split-spoons collected during this work and from cores in the vicinity as part of the PDI (see work plans noted in response to Request #5) indicate that the clay is relatively plastic, and would therefore not be expected to be fractured. Additionally, as indicated in the boring logs, the clay is relatively thick (on the order of 20 to 30 feet) near the causeway and lakeshore area. A summary of the deep boring results provided in Attachment A of the TSD are highlighted as follows:

- OL-STA-20025: NAPL saturated lenses were observed at about a depth of 20 feet at the base of the Solvay waste and top of marl (a corresponding photoionization detector ["PID"] reading of 3,000 ppm); NAPL was not observed and PID readings were 0 ppm (with the exception of readings of 0.4 and 0.3 ppm at depths of 60 to 64 feet) through the clay and silt down to till at a depth of 84 feet.
- OL-STA-20026: A NAPL-saturated zone was observed at about a depth of 18 feet at the base of the Solvay waste and top of marl (a corresponding PID reading of 1,500 ppm); NAPL was not observed and PID readings were 0 ppm through the clay, silt, and sand-gravel down to till at a depth of 91 feet.
- OL-STA-20027: Pooled or saturated NAPLs were not observed in the silts, Solvay waste, and marl; isolated NAPL stringers and globules were observed in Solvay waste from depths of 8 to 15 feet; NAPL was not observed and PID readings were 0 ppm through the clay, silt, and sand-gravel down to till at a depth of 94 feet.

- OL-STA-20028: Pooled (saturated) or isolated NAPLs were not observed in the silts, Solvay waste, and marl; NAPL was also not observed and PID readings were 0 ppm through the clay, silt, and sand-gravel down to till at a depth of 99 feet.
- OL-STA-20029: Pooled (saturated) or isolated NAPLs were not observed in the silts and marl; NAPL was also not observed through the clay, silt, and sand-gravel down to till at a depth of 100 feet.
- OL-STA-20030: A NAPL seam was observed in marl at a depth of about 32 feet; NAPL was not observed and PID readings below the NAPL seam were 0 ppm (with the exception of a reading of 2.2 ppm at a depth of 85 feet) through the clay, silt, and sand-gravel down to till at a depth of 101 feet.
- OL-STA-20031 (on land, just west of the causeway): Pooled (saturated) or isolated NAPLs were not observed and PID readings were 0 ppm in the marl, clay, and sand-gravel down to till at a depth of 113 feet.
- OL-STA-20032: Pooled (saturated) or isolated NAPLs were not observed and PID readings were 0 ppm in the marl, clay, and sand-gravel down to till at a depth of 101 feet.

Geotechnical test results from Phase 1 of the PDI indicate that there is a high clay content and that the clay unit has a high plasticity index. Geotechnical results of samples collected during Phase 2 of the PDI are expected to agree with these Phase 1 results, as visual observations made during Phase 2 were consistent with those made during Phase 1.

10. How will the proposed remedy address contamination in the dissolved phase?

Response: Under the proposed ESD, there is essentially no change in how contaminated groundwater and NAPLs would be contained by the barrier wall and groundwater collection system, which continues to form part of the Willis Avenue/Semet Tar Beds Interim Remedial Measure. In other words, although the proposed ESD contemplates a new location or alignment of the Willis Avenue portion of the barrier wall along SMU 2 and part of SMU 1, a barrier wall coupled with a groundwater collection system remains the mechanism for addressing dissolved contamination. Groundwater would be collected (to maintain the appropriate "inward" hydraulic gradient) in sumps and pumped to the groundwater treatment plant. The treatment plant, which will treat the collected groundwater, was approved for the Semet portion of the barrier wall and constructed in 2005 and is located at the Willis Avenue Site. The plant will treat the collected groundwater to discharge limits specified by the DEC. The treated water will be discharged to Onondaga Lake. *See generally, Administrative Consent Order D7-0004-01-09 (Willis Ave./Semet Tar Beds IRM), including Appendix B Scope of Work; and IRM Work Plan for the Willis Avenue/Semet Tar Beds Site (January 2003), Revised May 2003****.*

Note that the Semet portion (located to the west of the causeway) of the barrier wall/collection system is not the subject of the proposed ESD. Construction of this portion of the system commenced in October 2006 pursuant to the Final Request for Proposal (RFP) Package Willis Avenue/Semet Tar Beds Sites IRM, Syracuse, NY****; *Work Plan, Semet Tar Beds Site Interim Remedial Measure (IRM)*****; and *Record and IFC Drawings and Specifications, Willis Avenue/Semet Tar Beds Site Groundwater Pump Station and Groundwater Treatment Plant, Town of Geddes, New York*, each dated October 2006****.

11. What methods were used to estimate the two different [ROD and ESD] NAPL volumes?

See the response to Question 12.

12. What assumptions were used in each of the two estimates, and what is the evidence that the assumptions used for the ROD are incorrect and those in the proposed ESD are correct?

The ROD estimate (as developed in the FS) was based on the approximate extent of the NAPL recovery system on shore along the SMU 2 shoreline (length of 873 feet and depth of 30 feet). Based on in-lake data at that time, the geometry of the geologic layers was extrapolated offshore based on the onshore configurations of these layers or stratigraphic units (which were relatively well known due to the numerous borings along the lakeshore). It was assumed this on-shore NAPL plume would extend out into the lake a distance of approximately 240 feet from the causeway. The extent of the pooled NAPL removal area assumed in the FS and ROD (about 4.8 acres) is indicated by the purple dashed line in ESD Figure 3 and TSD Figure 1. See also Section E.2.5, Table E.10, and Figure E.5 in Appendix E of the Onondaga Lake FS (Parsons, 2004).

The revised NAPL volume estimate is based on field data collected as part of the pre-design investigation to more accurately define the extent of NAPLs in this area. These new data show that the Site conditions and contaminant distribution are significantly different than were previously thought in SMU 2 along the causeway, and an adjacent area in SMU 1. Based on data collected during the Spring 2006 investigation, it was determined that the pooled NAPLs extend over an area of approximately 2 acres which includes the causeway area in SMU 2, and an adjacent portion of SMU 1. It was also determined that the average thickness of the pooled NAPLs was less than 2 feet, significantly less than the 30-foot thickness of NAPLs conservatively assumed in the FS/ROD. The NAPL volume in the proposed ESD is a more realistic estimate as it is based on the results of the extensive NAPL delineation program that was performed since the issuance of the ROD.

13. The proposed ESD documents state that the cores were analyzed for NAPL by "visual analysis." What does this mean? Were analytical techniques used to analyze the cores, and if so, what techniques?

Response: Both visual and sediment chemical analyses (volatile organic compounds) were conducted on the borings collected in PDI Phase 1. Consistent with the approved work plan for the

2006 work², chemical analyses were not conducted during the Phase 2 borings in this area as there was no evidence of NAPL beneath or within the clay layer. The visual analyses conducted by the project geologists (with DEC oversight) during both phases, along with the PID readings, are documented in the boring logs.

14. Was only "free phase" NAPL in the pores of the sediment identified or were tests performed to identify NAPL contaminants adsorbed to the soil/sediment?

Response: See response to Question 13.

15. What method was used to determine the presence of NAPL for the ROD estimate of 232,000 cy of NAPL?

Response: The ROD estimate was based on the approximate extent of NAPL recovery onshore along the SMU 2 shoreline (length of 873 feet and depth of 30 feet) at the time of the FS, as documented in the FS report (see below). Based on in-lake data at that time, the geometry of stratigraphic units was extrapolated offshore during the FS based on their onshore configurations (which were relatively well known due to the numerous borings along the lakeshore). It was then assumed in the FS that this on-shore NAPL plume would extend out into the lake a distance of approximately 240 feet from the causeway. The resulting extent of the pooled NAPL removal area assumed in the FS and ROD (about 4.8 acres) is indicated by the purple dashed line in ESD Figure 3 and TSD Figure 1. See also Section E.2.5, Table E.10, and Figure E.5 in Appendix E of the Onondaga Lake FS (Parsons, 2004).

16. How was it determined that contamination does not extend beyond the maximum core depth of 42 feet (the maximum depth of the cores)?

Response: As indicated in the response to Question 9, eight deep borings were advanced (seven in the lake along the causeway and one on land, just west of the causeway) to till at a depth of about 100 feet. There were no observations of NAPLs below a depth of 42 feet in these eight deep borings. Another key factor in that determination was observations of fine-grained material (*i.e.*, clay or silty clay) in the bottom sections of the 35 to 40 foot borings (collected using a Vibracore to further delineate the extent of NAPL in the marl unit), indicating that the top of the clay confining unit had been reached.

² With regard to the deep borings, the April 2006 Causeway DNAPL Investigation Work Plan (Parsons, 2006) states that "Based on visual, field screening (*i.e.*, PID), and odor observations, up to three sediment samples will be collected at each deep boring to characterize areas suspected of containing DNAPL. Samples to be submitted for laboratory analysis will be determined by the Honeywell and DEC representatives. All samples will be analyzed for the same compounds as the Phase I PDI samples in SMU 2 (see Table 1). No analytical samples will be collected below the clay layer if evidence of DNAPL is not present."

17. Was there any evidence of cracks/fractures in the clay, and NAPL migration through the clay?

Response: Based on the deep borings, there was no evidence of cracks/fractures in the clay nor NAPL migration through the clay. See response to Question 9 for further clarification.

18. How did the low permeability cause a reduction in the NAPL volume estimates?

Response: Based on data collected during the spring 2006 investigation, it was determined that the pooled NAPLs extended out into the lake up to a distance of about 50 feet in SMU 2, as compared with a distance of about 240 feet that was assumed in the FS/ROD (refer to response to Question 15 for further detail). It was also determined that the average thickness of the pooled NAPL-impacted material was only about 1.6 feet, significantly less than the 30-ft thickness of NAPL-impacted material conservatively assumed in the FS/ROD.

Data collected during the spring 2006 investigation revealed that there was a major facies change within the marl, changing from a coarser-grained sand and silt unit at the shoreline to a fine-grained clay-silt offshore. This property change in the marl likely prevented the extensive offshore migration of NAPL.

19. How was the permeability of the marl unit estimated for the proposed ESD? How was it estimated in the ROD?

Response: Permeability of the marl unit was not estimated for the proposed ESD or ROD.

The results of the coring program indicate that the NAPLs did not migrate as far as was assumed in the FS and the ROD. Based on field observations, this is likely due to the marl beneath the lake being finer grained (and presumably less permeable). The grain size of the marl was determined on a visual basis by qualified geologists that had done descriptions during both Phases 1 and 2 of the investigation. These observations were concurred by on-site DEC and Earth Tech senior geologists who were also involved in both phases of the PDI. These visual descriptions were generally consistent with geotechnical testing of select sediment samples which included grain size analysis.

20. What is the definition of the terms "pooled NAPL" and "non-pooled NAPL" as used throughout the proposed ESD, and how are the two types of NAPL identified and distinguished from each other? How is the distinction used in the revised estimate of NAPL volume?

Response: The "pooled NAPLs" are believed to be a continuation of the on-shore NAPL plume and were observed by the on-site geologists as "saturated" layers or continuous seams which could be found at similar depths and/or horizons (e.g., the contact between Solvay waste and marl) in adjacent cores. This "pooled NAPL" in the causeway area is in contrast to the NAPLs in the in-lake waste deposit (ILWD) in SMUs 1 and 2 that are primarily distributed weathered NAPLs, consisting of

disconnected globules and/or isolated stringers.

This distinction was used to classify each boring location as shown by the yellow and white symbols on ESD Figure 3 and TSD Figure 1. The line depicting the extent of pooled NAPL was drawn based on this classification. The area in SMU 1 and SMU 2 behind this line and the proposed barrier wall is approximately 2 acres. Based on an average thickness of NAPL-impacted material of 1.6 feet, the NAPL volume was estimated to be approximately 5,000 cy. This is a conservative estimate as it assumes that NAPLs are present across the entire 2-acre area that would be contained by the barrier wall.

21. What assumptions are made as to the extractability of "pooled" and "non-pooled" NAPL by extraction wells in the proposed new remedy?

The proposed use of recovery wells to collect the "pooled" NAPLs in this area is based on the progress from the ongoing operation of the NAPL recovery system (immediately adjacent to the causeway). To date, in excess of 31,000 gallons of NAPLs have been removed and sent offsite for treatment/disposal. To the extent that "non-pooled" NAPLs are not collected by the recovery wells, they would be isolated from the lake and contained by the subsurface barrier wall and groundwater collection system.

22. What kinds of studies/data will be collected in order to delineate the hydrology of the site, and the placement of wells in order to adequately capture all of the contamination, including any dissolved phase plume?

Response: The identification of the appropriate well locations will include an evaluation of the existing NAPL recovery system as well as the NAPL delineation data that were collected during the Fall of 2005 and the Spring of 2006.

Whether any additional data are needed to support the design will be determined during the design of the expanded NAPL recovery system and the groundwater collection system. The design will be developed in line with applicable guidance.

23. What will be the criteria for turning off the pumps?

Response: The termination criteria will be developed as part of the operation, maintenance, and monitoring program in line with applicable DEC and EPA guidance. See also the response to Question 24.

24. What criteria will be used to determine when all the mobile NAPL in the sediments and whatever remains in the upland source and pathway has been extracted?

Response: The criteria for evaluating the effectiveness of the removal of mobile NAPLs will be identified during the development of the operation, maintenance, and monitoring programs in line

with applicable guidance. The criteria will likely be based on a number of site-specific factors, including changes in the NAPL production rate, the effectiveness of changing the pumping duration and pumping frequency.

25. How will residual NAPL (non-mobile NAPL that cannot be removed through pumping) be treated?

Response: Any residual NAPL (non-mobile NAPL that may not be removed through pumping) would be contained by the subsurface barrier wall and groundwater collection system and isolated from the lake. Also see Response to Question 10, above.

26. What kind of monitoring will be employed to ensure that the NAPL and any dissolved plume is being captured, and that the wells are functioning properly?

Response: The types and extent of monitoring will be identified as part of the development of the operation, maintenance, and monitoring program in line with applicable guidance and will include, at a minimum, the collection of groundwater elevation data and water quality data.

27. How much residual NAPL will be left in the subsurface after the extraction wells are shut down?

Response: The volume of residual NAPL cannot be determined at this time. Any residual NAPL would be effectively contained by the barrier wall and groundwater collection system. See also the responses to Questions 10 and 25, above.

Requests for Information (Note: Document Status with respect to the Nation is as follows:

- * Electronic copy provided separately by R. Nunes
- ** Previously provided in hard copy
- *** Previously provided electronically
- **** Hard copy or CD copy submitted via overnight mail

1. Please provide all documentation that led to the conclusion that the new remedy in the proposed ESD does not constitute a fundamental alteration to the remedy selected in the 2005 ROD.

These documents include the following:

- NAPLs Removal Volume Estimates in Excel*
- EPA's "A Guide to Preparing Proposed Plans, Record of Decisions, and Other Remedy Selection Decision Documents," July 1999, at <http://www.epa.gov/superfund/resources/remedy/rods/>