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May 22, 2003

Project 3939/1333

Commander, Southern Division
Naval Facilities Engineering Command
Attn: Mr. Anthony Robinson (ES 31)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order 0154/0295

Subject: Revised Draft Remedial Investigation and Risk Assessment Report and
Response to Illinois EPA Comments
Site 17 Pettibone Creek and Boat Basin
Naval Training Center Great Lakes
Great Lakes, Illinois

Dear Mr. Robinson:

Please find attached three copies of subject report for your review. Copies have also been distributed as indicated below. Please note that this version of the report includes sections, tables, figures, and appendices that changed based on the Illinois EPA comments. This version of the report also includes a new section (Section 8), the Fish Tissue Uncertainty Analysis.

If you have any questions, please call Aaron Bernhardt at 412-921-8433 or me at 412-921-7251.

Sincerely,

A handwritten signature in black ink, appearing to read 'Robert F. Davis'.

Robert F. Davis, P.E.
Task Order Manager

RFD/kf

Enclosure

cc: D. Fleming/M. Schultz, NTC Great Lakes (1 copy)
B. Conrath, IEPA (3 copies)
G. Vlahos, NTC Great Lakes (1 copy)
D. Wroblewski, TtNUS (cover letter only)
Mark Perry/File 1333, TtNUS (1 copy)
A. Bernhardt, TtNUS (cover letter only)
File 3939 (cover letter and response to comments)

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- 1) **Acronyms** – In the definition of CERCLA and other places throughout the report, the word liability has an “s” added that doesn’t belong. Please correct.
The document will be changed in accordance with the comment.

- 2) **Acronyms** – The definition of RAGS should be “Risk Assessment *Guidance* for Superfund.”
The document will be changed in accordance with the comment.

- 3) **Executive Summary, page 2** – The first sentence of the second paragraph states, “VOCs are not significant site-related contaminants for Site 17.” As is mentioned in the comment regarding Section 3.2.3.2 below, the sediment samples analyzed for VOCs may be invalid and might need to be re-collected and analyzed. Therefore, this statement may not be factual. Please re-visit this statement after sediment VOC sampling has been validated or repeated.
The sampling and analysis methodology was discussed with IEPA during preparation of the QAPP for this project and the following general consensus was agreed to - collection of the sediments using Encores would not be possible, samples would be collected in jars. This was not stated in the QAPP as discussed and was not noticed in the review by TtNUS, IEPA and the Navy. In the Site 17 RI/RA report, Section 3.1 Deviations from the QAPP will be modified to indicate the general consensus based on the discussions during preparation of the QAPP and that this consensus was followed. The QAPP was not correct and therefore this deviation from the QAPP occurred.

The USEPA report, “Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual” (EPA-823-B-01-002, October 2001), includes Table 4-1 with recommended sampling containers, holding times, and storage conditions for common types of sediment analyses. For purgables (halocarbons and aromatics) contaminants the table recommends glass containers and a holding time of 14 days.

The following web page also shows the holding times and preservatives for SW 846 Method 8260B http://www.tegenv.com/bottle_guide.htm. SW 846 Method 8260 requires analysis within 14 days of collection for solids. Usually the lab does a direct injection when the extraction is done as part of the analysis that is within 14 days. Soil and sediment samples have several preparation/extraction methods for VOC analysis. These preparation/extraction methods are 5021, 5030, 5032, and 5035 (Encore samplers - Closed-System Purge-And-Trap and Extraction for Volatile Organics in Soil and Waste Samples). The preparation/extraction method used for the sediment samples from the Boat Basin and Pettibone Creek used 5030 which is direct injection with analysis within 14 days.)

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SW 846 Method 5035 requires extraction of Encores within 48 hours. Because the samples are sediments, Encores/Method 5035 could not be used for sample collection. The lab only does an extraction if it is in an Encore sampler because the Encore sampler is not an EPA approved storage container unless extracted within 48 hours.

The TtNUS Project Chemist has reviewed the method and the data received from the laboratory and has indicated that the data for these samples are valid and there is no reason for the data to be unacceptable.

- 4) **Executive Summary, page 3** – In the second line it states, "... in the aforementioned off-site, upstream samples collected during previous environmental investigations." There are no environmental investigations mentioned previously in this document. Please correct.

The document will be changed to remove the word "aforementioned" from the sentence.

- 5) **Executive Summary, page 3** – In the second paragraph it again references the aforementioned off-site, upstream samples collected during previous environmental investigations." There are no environmental investigations mentioned previously in this document. Please correct.

The document will be changed to remove the word "aforementioned" from the sentence.

- 6) **Executive Summary, page 4** – The second paragraph states that the primary sources of the COPCs at this site are probably due to releases upstream of NTC Great Lakes and most of the contamination is likely not related to past activities at NTC Great Lakes. This is a very bold statement to make at this point in the investigation and not necessarily accurate. Is there sufficient evidence to make this statement? Illinois EPA does not think so. The Navy needs to consider all the information at their disposal before making a statement denying the majority of responsibility for contamination in the creek.

This study confirms previous statements made by IEPA and USEPA Region 5 that the R. Lavin facility with 4 NPDES permitted discharge outfalls that have violated the permit limits and the other upstream abandoned facilities are major contributors to the contaminated sediments of Pettibone Creek as mentioned in the USEPA Region 5 Briefings (April and May 2002) and other historical CERCLA documents from the 1980s and 1990s (the Briefings are attached to this response to comments – see highlighted text). Several potential Navy sources will be identified such as the former transformer storage area and the PCE/DCE groundwater plume. Throughout the document the statements about the upstream sources of contamination will be edited or removed and information on potential Navy sources will be added. The background section and the conclusions will tie the upstream sources of contamination and the potential Navy sources into the

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report and how it relates to the analytical data. The potential Navy sources will be stated in a manner such as:

“Surficial runoff or engine exhausts from the roadways at NTC Great Lakes and the roadways in North Chicago are possible contributors of the PAHs to the contaminated sediments of Pettibone Creek and the Boat Basin by way of the many stormwater sewer system outfalls that discharge into the creek and basin. The PAHs are not from operational storage or use at NTC Great Lakes.”

“There is no evidence or records that pesticides were ever stored, mixed, or stored in the general area of Pettibone Creek and the Boat Basin. Historically, pesticides were applied at NTC Great Lakes, in accordance with manufacturer’s directions, by operation and maintenance personnel or contractors who are licensed to apply these products. There is no evidence of a release of such products in excess of the reportable quantities under 40 CFR Part 373 and there is no analytical data available that indicate pesticide applications are a source of the contamination at Pettibone Creek and the Boat Basin.”

“NTC Great Lakes stored transformers at locations within the base. These locations stored out-of-service transformers, including some filled with PCB-containing oil. No PCB-containing transformers or capacitors greater than 3 pounds are known to remain at NTC Great Lakes nor are there any requirements to remove any smaller ballasts associated with lighting fixtures. Investigations for PCB contamination at these transformer locations was conducted in the past and indicated that the some limited soil contamination exceeded the Federal and state cleanup guidelines. Clean-up documentation of the PCB-contaminated soil is not available. The PCB-contaminated soil was reported to be limited and restricted to the transformer storage locations. There is no analytical data available that indicated the transformer storage locations are a source of the contamination at Pettibone Creek and the Boat Basin. The transformer storage locations are no longer used at NTC Great Lakes.”

“Volatile organic chemicals (e.g., tetrachloroethene) were detected in the groundwater samples collected from monitoring wells near Building 105, the Old Dry Cleaner Facility, at concentrations exceeding IEPA screening levels. Groundwater monitoring conducted prior to the RCRA closure of this facility and documented in RCRA closure plan has not indicated contaminant migration beyond the facility boundary.”

These statements will require review by the SouthDiv and NTC Great Lakes attorneys for their concurrence prior to being printed in the final Site 17 RI/RA.

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- 7) **Executive Summary, page 5** – Suggest removing the fourth paragraph on this page. The statement referencing off-site sources may not be completely accurate and the site-specific biological studies have previously been mentioned.
See 6) above

- 8) **Executive Summary** - Several times in this section it states that the majority of the contamination is probably due to upstream sources, but nowhere does it state which contaminants are or could be due to on-site Navy sources. This should be spelled out as well. For example, the transformer storage area (PCBs), the ongoing RCRA investigation for TCE, and the historical coal storage areas (PAHs, arsenic, etc...) should be mentioned and discussed.
See 6) above

- 9) **Section 1.0 Introduction** – In the fourth sentence, suggest wording change to, “... since the 1970s to *investigate* facilities that are located upstream ...”
The document will be changed in accordance with the comment.

- 10) **Section 1.1** – In the second paragraph, the second sentence should state “...from upstream sources, *Navy mission-related activities*, as well as, stormwater outfalls from Navy and local roadways.”
There is no analytical data available that indicate Navy mission-related activities are a source of the contamination at Pettibone Creek and the Boat Basin. See 6) above. The text in this section will be revised based on 6) above.

- 11) **Section 1.4.1** – In the first sentence of the third paragraph, it states that current land use consists of agriculture, industry, and suburbs. Illinois EPA suggests changing suburbs to residential areas.
The document will be changed in accordance with the comment.

- 12) **Section 1.4.5** – The first line of the last paragraph misspells the word *extending*. Please correct.
The document will be changed in accordance with the comment.

- 13) **Section 1.4.6** – In the first line of the third paragraph, please remove the word *thick*.
The document will be changed in accordance with the comment.

- 14) **Section 2.1.1, Pettibone Creek** – In the last paragraph, remove the words *were classified*. They are repetitive.
The document will be changed in accordance with the comment.

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- 15) **Section 2.2** – This section should also mention the historical and on-going sampling and remedial efforts conducted at NTC Great Lakes, as the Pettibone creek watershed includes most of the base and these may have contributed to the contamination of the creek via the storm sewers.
See 6) above
- 16) **Section 2.2** – The table in this section references a figure to show where the samples were collected. It would be helpful to have a very brief description of location in this table. Please add a column for this to the table or else add it to the comments section.
The table in this section will be revised to include the sample names for each of the different investigations if the sample locations are shown on the figure.
- 17) **Section 2.2, page 4** – In the last line of the first paragraph, change the word *attributed* to *contributed*.
The document will be changed in accordance with the comment.
- 18) **Section 3.2.1** – The first paragraph references method 5035 as being used for TCL VOCs for surface water sampling. Method 5035 is used for sampling solid materials. Please verify that the appropriate method was used and correct the reference here.
Method 5035 was not used for the surface water sampling. The document will be changed to correct/remove reference to method 5035.
- 19) **Section 3.2.2.1** – As in the previous comment, the first paragraph references method 5035. However, the sample log sheets do not confirm this as the sediment samples were reported as being collected in 4-ounce jars not in EnCore samplers or hermetically sealed containers. This is not according to method 5035. Table B-10 in the QAPP lists method 5035 for collecting sediment samples for VOCs. However, that table also lists 4-ounce jars as the container to be used. Unfortunately, neither the Navy nor Illinois EPA noticed this upon review of the document. This presents a problem, which will require some discussion. However, as per comment number 21 below, this point is moot, as none of these samples were extracted within the allowable hold time of 48 hours. In every case, the time from receipt at the lab to extraction was a minimum of 3 days.
See 3) above
- 20) **Section 3.2.2.2, page 4, third full paragraph** - See previous comment regarding method 5035.
See 3) above
- 21) **Section 3.2.3.2** – This section references Table B-10 from the QAPP regarding sediment sample preservation requirements. In Table B-10, for sediment VOC samples, it shows that no preservative is required and the hold time is 48 hours from sampling to extraction/preparation. There were 10 sediment samples to be analyzed for VOCs and none of them were extracted within this timeframe. Five of those samples were not even received at the laboratory within 48 hours of the sampling time, as recorded on the

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chain of custody forms. The data for these samples is therefore invalid. Sediment sampling for VOC analysis will need to be repeated.

See 3) above

- 22) **Section 4.1** – See comment number 15.
See 6) above
- 23) **Section 4.3** – Throughout this section, many statements are made as to the possible upstream, off-site sources of the contamination, but there are no statements to identify the possible on-site, Navy mission-related sources. These should be outlined as well. Please include this information also.
See 6) above
- 24) **Section 4.3.1** – What consideration, if any, was given the surface water samples with respect to the rain event that occurred on 9/23/01? The depth of the creek, the flow velocity, and the turbidity of the creek at the time of collection of those three samples, collected during or following that rain event, would have a definite effect on the results. The possible ramifications should be discussed in the report.
The ramifications of the rain event on the results will be discussed in the report. These ramifications will include an increase in the turbidity of the surface water sample, flow increased velocity, increased depth, etc. The effects of these ramifications on the analytical data will also be discussed
- 25) **Section 4.3.1, VOCs** – Other possible sources should also be mentioned in this section. Those possible sources could include the on-going RCRA remedial actions at NTC Great Lakes.
See 6) above
- 26) **Section 4.3.1** – On page 5 it states, the data suggest that NTC Great Lakes is not a major contributor of VOCs to Pettibone Creek. This may not be the case. As per the information received from Mark Schultz during the meeting of June 5, 2002 in Charleston, S.C. This section may need to be revised.
See 6) above
- 27) **Section 4.3.2, Pesticides/PCBs** – On page 12, in the first paragraph, it states that the PCB data suggest a significant possible upstream source was contributing. This does not take into account the previous transformer storage area, which was located on the base. That area could have contributed greatly in the past. This needs to be discussed here.
See 6) above

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- 28) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, VOCs** – Due to the problems associated with the VOC sampling and analysis, these sections may need to be revised if additional VOC sediment samples will be collected and analyzed.

See 3) above

- 29) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, SVOCs and PAHs** – The first paragraph states, ...the positive results reported for bis(2-ethylhexyl) phthalate and/or butyl benzyl phthalate may not be site-related. There is no reasoning presented to justify this statement. Please clarify.

*This paragraph can be clarified with the following reasoning provided -
"Phthalates are common laboratory contaminants and therefore may not be site-related." or the statement can be deleted.*

- 30) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, SVOCs and PAHs** – The PAH concentrations are compared to values reported in scientific literature for background concentrations. Illinois EPA does not have generic background values for PAHs nor does it recognize the reported values. If the Navy wants to develop background values for PAHs at this site, Illinois EPA is willing to discuss the sampling strategy to accomplish this. However, without this determination, all of the tables listing background values for PAHs should be removed. Additionally, the historical coal storage areas on the base should be mentioned as possible sources of PAH contamination to the sediments of the creek.

The Site 7 RI/RA used the comparison of PAH concentrations in the soil with background concentrations reported in scientific literature from the federal government agency of ATSDR as well as other scientific literature. This was not commented on for the Site 7 RI/RA. In both the Site 7 and 17 RI/RA reports, the PAH concentrations for the site are compared to the scientific literature as a qualitative evaluation for information (a reality check) in a table within the text of the report and is there for general discussion. The PAH concentrations are compared to the TACO, USEPA Region 9 PRGs, and ecological criteria in Tables 4-2 and 4-4, etc. The chemicals of potential concern are selected in Section 6, the Human Health Risk Assessment, using TACO and USEPA Region 9 PRGs as the screening criteria and the risk assessment is conducted accordingly. No changes will be made to these sections.

- 31) **Section 4.3.4, page 20** – The first paragraph states that the PCB data suggest a significant possible upstream source was contributing. This does not take into account the previous transformer storage area, which was located on the base. That area could have contributed greatly in the past. This needs to be discussed here.

See 6) above

- 32) **Section 4.3.4, page 21** – The eighth line on this page references a sample ID (NTC17PCSD4901) twice. One of these should reference NTC17PCSD4801 instead. Please correct.

The document will be changed in accordance with the comment.

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- 33) **Section 4.5** – In the conclusion for VOCs, it states that VOCs are not significant site-related contaminants for Site 17. Due to the possible unacceptability of the sediment VOC data, this statement may be unsubstantiated. This section may need to be re-written after sediment VOC sampling has been repeated, if necessary.
See 3) above
- 34) **Section 4.5** – In the conclusion for PAHs and SVOCs, a statement is made that the reported concentrations are within the range of concentrations reported as anthropogenic background for soils. Please remove this statement. Illinois EPA does not recognize the generic background concentrations that are being referenced as background concentrations in Illinois.
See 30) above
- 35) **Section 4.5** – It is mentioned in the conclusion section for PCBs that industrial sources upstream have contributed to the contaminant load detected in the Pettibone Creek watershed. It should also mention the possible Navy sources that may have contributed as well. One possible source would be the transformer storage area formerly located on Navy property.
See 6) above
- 36) **Section 5.4.1** – This section may require revision if sediment VOC sampling is repeated.
See 3) above
- 37) **Section 6.1.1** – There are several non-standard data qualifiers listed in the third paragraph. These codes need to be defined and their relevance to the risk assessment discussed.
The document will be changed to remove the non-standard data qualifiers and keep the qualifiers “J” and “UJ”. The non-standard qualifiers (K, L, and UL) listed in Section 6.1.1 do not apply to the Site 17 data and will, therefore, be deleted from this section.
- 38) **Section 6.1.2.1** – In the second paragraph, the discussion of the over-protectiveness of the Region 9 PRG tables should include mention that three exposure pathways (ingestion, dermal, and inhalation) are included in the Region 9 PRG values, when only two pathways are relevant at Site 17.
The following will be added to the 2nd paragraph in Section 6.1.2.1: “Another factor increasing the conservatism in the use of the Region 9 PRGs is the fact that the soil PRGs are based on the combined ingestion, dermal, and inhalation exposure pathways. However, only the ingestion and dermal pathways are applicable to sediment at Site 17.”

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- 39) **Section 6.1.2.1** – The first paragraph on page 6-5 describes the comparison of site contaminant concentrations to the screening values. This paragraph should include a discussion of chemicals that have no corresponding screening or background values.
A discussion describing the evaluation of chemicals that have no screening values is provided in Section 6.1.2.3. In Section 6.1.2.1 the reader will be directed to Section 6.1.2.3 for the discussion of chemicals with no corresponding screening values.
- 40) **Section 6.1.2.1** – The second paragraph on page 6-6 has a brief discussion regarding fish tissue contaminant concentration modeling. This should state that the process included normalization for organic carbon (sediment foc and fish lipid content).
The reader will be directed to Section 7.3 of the ERA for a discussion of the fish tissue contaminant concentration modeling.
- 41) **Section 6.1.3.5** – The first bullet listing PAHs can be eliminated and arsenic can be removed from the fifth bullet, since they are not a concern for bioaccumulation in fish.
PAHs and arsenic will be removed from the list of COPCs for fish in Section 6.1.3.5.
- 42) **Section 6.2.3, bullet #3** – This states that a “best fit” procedure was used to assign a data distribution when it could not be defined empirically. The exact procedure used to determine best fit should be identified and justified. Illinois EPA’s Toxicity Assessment Unit (TAU) presently recommends that a distribution free method be employed in these cases.
The following will be added to the 3rd bullet in Section 6.2.3: “The “best fit” is determined by comparing the W statistic calculated for the log-transformed data in the Shapiro-Wilk W-Test with the W statistic calculated for the untransformed data. If the W statistic for the untransformed data is greater than the W statistic for the log-transformed data, the data are assumed to be normally distributed. If not, a lognormal distribution is assumed. This approach is considered appropriate to the Site 17 data because, as shown in the RAGS Part D tables in Appendix D, the distributions of only a few COPCs were “undefined” and most of the data were found to be lognormally distributed.”
- 43) **Section 6.2.4.1, first bullet** – Illinois EPA is aware of the USEPA recommendation to use 25% of total body surface to estimate the surface area of unclothed skin. If that is the intent of this subject factor, this fact should be clearly stated along with a discussion of any uncertainty associated with it.
The following will be added to the 1st bullet in Section 6.2.4.1: “ 25 Percent of the total body surface area is recommended in the Exposure Factors Handbook (USEPA, August 1997) for outdoor soil contact. The assumption of 25 percent probably results in an overestimate of the exposed skin area, since the feet and lower legs are most likely to be exposed in the wading scenario assumed for Site 17.”

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- 44) **Section 6.2.4.1** – The first full paragraph on page 6-19 discusses the basis for the activity-based soil-to-skin adherence values. The literature source states that the adherence values were derived from studies of teens playing soccer in moist conditions. This is inappropriate for Site 17, since soccer fields are typically comprised of heavy turf and do not resemble conditions in a sandy/mucky stream bed. Illinois EPA recommends that the USEPA RAGS Part E, Exhibit 3-3 values for children playing in wet soil (CT = 0.2 mg/cm² and RME = 3.3 mg/cm²) be utilized.
Disagree. Grain size distribution analyses of Site 17 sediment samples indicate that the sediment can be classified mainly as “sandy”. Sandy soil and sediment are not expected to adhere as strongly to the skin as loamy and clay type materials. The soil-to-skin adherence values used in the risk assessment (0.3 mg/cm² for the RME and 0.04 mg/cm² for the CTE) are considered to be appropriate for the type of sediment found at the site.
- 45) **Section 6.2.4.4** – The last sentence lists the incidental surface water ingestion rate for the recreational receptor as 0.5 L/hour. This assumption is too large and probably a typographical error. Illinois EPA recommends a value between 0.05 and 0.025 L/hour.
This was a typographical error in the text and will be corrected. The correct value 0.05 L/hour was used in risk assessment calculations. The document will be changed to 0.05 L/hour to match the rate in Table 6-10.
- 46) **Section 6.3.1** – The bullets in this section present data sources for the toxicological values used in the human health risk assessment. However, the chemical-specific tables (Tables 6-12 and 6-13) never cite two of the sources, HEAST and NCEA. The discussion should be revised to state that the Region 9 data source relies on HEAST and NCEA or the tables should be edited to reflect the primary data sources.
Tables 6-12 and 6-13 will be edited to reflect the primary data sources.
- 47) **Section 6.4.3.1** – The fourth paragraph alleges to summarize the cancer risk to the RME receptor in the north branch of Pettibone Creek. Included in this, and subsequent discussions, is reference to the perceived sources of the contaminants. These discussions are irrelevant to the total risk and hazard at these sites and should be summarized in a separate section.
Agree. The references to the perceived sources of contamination will be removed from this and subsequent sections. The sources will be discussed in the summary and conclusions to the risk assessment. See 6) above
- 48) **Section 6.6, page 6-46** – In the next to last sentence in the third paragraph, the presence of PCBs, PAHs, and pesticides is attributed to activities upstream and offsite. Unless it can be determined that no electrical transformer has ever leaked at the center and that pesticides were never used for insect control around the creek, this statement should be removed or modified.
Agree. This sentence will be removed from this paragraph. See 6) above

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- 49) **Table 6-12** – The origins of the adult and child RfD values for iron could not be located in the reported source. Two RfDs are available for manganese; one for food sources, and a second for non-food sources. The non-food RfD includes ingestion of contaminated soil and water and is the RfD that is relevant to this project. Applying safety factors of 3 to protect children and 2 to focus on the environmental sources of manganese further refines the RfD for non-food sources. The relevant RfD for manganese is 0.02 mg/kg-day.

The adult RfD for iron (0.6 mg/kg/day) was an update issued by NCEA in 2001 and reported in the USEPA Region 3 RBC tables (October 2001).

The child RfD for iron (1.1 mg/kg/day) used in the risk assessment was based on an NCEA document titled Risk Assessment Issue Paper for Derivation of a Provisional RfD for Iron (CASRN-7439-89-6), July 23, 1996.

These references for iron will be clarified in Table 6-12, as indicated in the response to Comment 46.

Manganese was identified as a COPC for surface water for Site 17. The RfD used in the risk assessment (0.046 mg/kg/day) reflects the recommendation in IRIS that a modifying factor of 3 be applied when assessing risk from manganese in drinking water or soil. The Navy understands the reviewer's comment regarding an additional factor of 2. However, recalculating the risk assessment using an RfD of 0.02 mg/kg/day does not result in a significant change in the total HI and the results and conclusions of the risk assessment would not change. 0.02 mg/kg/day will be used in future risk assessments for NTC Great Lakes.

- 50) **Table 6-13** – This table presents cancer toxicity values for the contaminants of concern. The entries for beta-BHC and delta-BHC can be removed. Illinois EPA's TAU does not require that contaminants with cancer rankings of "C" (beta-BHC) and "D" (delta-BHC) be evaluated for cancer potential.

Agreed. Beta-BHC and delta-BHC will be removed from this table and from the carcinogenic risk calculations. The total lifetime cancer risk does not change when these chemicals are removed.

- 51) **Section 7.0** – The second sentence in the second paragraph refers to Figure 1-1 as being the Navy's Ecological Risk Assessment tiered Approach. Figure 1-1 is an aerial photograph of the site and the Navy's ERA Approach figure could not be located. Please correct.

The document will be changed in accordance with the comment. The reference to Figure 1-1 will be changed to Figure 7-1 and this figure will be added to the report. This figure will be the same figure that was in the QAPP, Appendix II Ecological Risk Assessment Work Plan, Site 17 Pettibone Creek and Boat Basin Ecological Risk Assessment, Figure 1-1.

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- 52) **Section 7.1.1, page 7-4** – The third paragraph should list the threatened or endangered species present or observed at this site and their locations in relation to the areas of concern should also be given.

The “Implementation on an Integrated Natural Resources Management Plan at Naval Training Center, Great Lakes, Illinois” dated February 2001 contains a more detailed discussion of protected species at NTC Great Lakes. Therefore, the applicable pages of text and tables from this document (or the most recent update) will be copied added to the appendix of the ERA for the reader to review.

- 53) **Section 7.1.2** – The last sentence in this section references Appendix E.1. Review of this appendix generated several comments.

- The page 7-5 text states that the conservative food chain model utilized the 90th percentile sediment-to-fish bioaccumulation factors and that the average food chain model used the median (50th percentile) bioaccumulation factors. However, the Appendix E.1 table of sediment uptake factors shows the conservative and average factors to be the same. Please clarify or correct.

The statement that the 90th percentile bioaccumulation factors were used for the conservative food chain model and the median bioaccumulation factors were used in the average food chain model refers to the bulleted item under which it exists; the sediment to invertebrate BSAFs. Only one sediment to fish BSAF was available and so it was used in both food chain model scenarios. The last sentence in the second bulleted item in Section 7.1.2 will be revised to:

“The 90% sediment to invertebrate BSAF is used for the conservative food chain model while the median sediment to invertebrate value is used for the average food chain model. For this document, the BSAFs for the inorganic chemicals are referred to as BAFs because that is the common terminology used for inorganic chemicals.”

- The bottom of the page explanation for note #2 has no corresponding reference within Table E.1. The literature citation for note #2 is incorrect.
The footnotes on Table E-1 will be corrected.
- In note #4, the inclusion of a literature citation and a conversion factor for plants should be removed. This note also states that a dry to wet weight conversion factor of 0.16 was applied to the invertebrate sediment/soil uptake factors. It appears that a factor of 0.3448 was actually used. Furthermore, it is unclear whether conversion to wet weight is appropriate at this point. Typically this conversion is done following application of the uptake factor. If the conversion is made to the uptake factors, they should be renamed to indicate this adjustment.
A factor of 0.29 was actually used to convert the dry-weight BAF to a wet-weight BAF. This will be reflected in the revised footnotes. It is appropriate to apply the conversion factor at this point because the calculated food concentration will then be in the correct units (wet-weight vs. dry weight). The uptake factors do

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not need renamed but the footnote will clearly indicate that they are wet-weight uptake factors.

- It should be stated in the Appendix E.1 table that the BASF values for organics have been normalized for percent organic carbon.
The BSAF values in Table E.1 have not yet been normalized for site-specific organic carbon. That step in the process does not occur until the dose equation is used because there are different organic carbon concentrations for the North Branch of Pettibone Creek, the South Branch of Pettibone Creek, and the Boat Basin.
- 54) **Section 7.1.4.3** – The last sentence refers to Appendix E.2 and the receptor profiles for the food chain modeling. Several comments were also generated for this appendix.
- An explanation should be provided at the bottom of the page for note #3.
Footnote #3 is not needed for the referenced table and it will be removed.
 - The ingestion rate calculations following note #2 should be separated from note #2.
The document will be changed in accordance with the comment.
 - The body weight data for the raccoon cannot be completely attributed to the given reference. The additional reference(s) should be provided.
The body weight data for the raccoon was taken from Volume 2 of the given reference (USEPA, 1993). The available data from Illinois studies were included in the calculation of the minimum, maximum, and average body weights. No additional references were used.
 - The regression equation for food consumption presented in note #1 does not yield the Table E.2-1 values for the raccoon.
*The values in the table are correct and are calculated as described in the footnote. The conservative food ingestion rate for the raccoon = $(0.0687) * (8.86^{0.822}) / 0.25$. The key is that the body weight must be in kg and the value is divided by 0.25 to convert the dry weight ingestion rate to a wet-weight ingestion rate.*
 - The soil/sediment ingestion rates and their literature sources should be included in Table E.2-1.
The document will be changed in accordance with the comment.
- 55) **Section 7.3, page 7-12, equations** – The two subject equations were used to calculate the raccoon's chronic daily contaminant intake values, organics, and inorganics. In both equations, the purpose of the first component of the calculation is to estimate the contaminant intake from ingestion of soil/sediment invertebrates. As is, the equation

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states that one-half of the food intake will be equal to the contaminant concentration in the sediment. This is incorrect. The sediment-to-invertebrate bioaccumulation rates will mediate the invertebrate contaminant concentrations. The BAF factor should be added to the first component of both equations.

The equations are confusing. Because there are sediment to invertebrate BAFs for the organic chemicals, and no sediment to fish BSAFs for the organic chemicals, they were not included in the equation because the values would be 1.0, indicating that the tissue concentrations are the same as the sediment concentrations. The one-half factor is included because it is assumed that the raccoon diet consists of 50% invertebrates and 50% fish. The text will be modified to clarify this.

The second component (for intake of contaminants from fish ingestion) of the first equation (inorganic intake) is incorrect. The ratio of the fish lipid content to the sediment fraction organic carbon should be removed. This ratio is only used for calculating intake of organic contaminants in fish.

The reference to the fish lipids and sediment organic carbon in the inorganic equation will be deleted.

In the definitions section following the subject equations, the definition for the fish lipid content (%L) should be revised. The %L of 3.56% is acceptable for human ingestion of filleted fish, but wildlife are expected to ingest whole fish and a corresponding %L should be used.

The %L of 3.56% was calculated as an average of whole fish %lipid content of representative fish species. The fish used for this calculation were smaller fish such as sunfish that would be consumed by mammals and birds. Therefore, it is lower than the whole-body percent lipid values for larger fish such as carp and catfish which will not be a primary food item for the piscivorous receptors selected for this ERA. The same value was used for the humans because this percent lipids represents the lipids related to fillets in larger fish. Values were taken from Appendix C of "The Incidence and Severity of Sediment Contamination in Surface Waters of the United States" (USEPA, 1997). The calculation will be included in the final document.

- 56) **Section 7.3, 3rd bullet** – This bullet states that the “conservative” body weight was used. Body weights were classified as maximum, minimum, and average. The conservative value must be defined or the subject text must be revised.

The 3rd bullet will be revised to indicate “Minimum receptor body weight for CDI equation”.

- 57) **Section 7.5.1.1** – This section may require revision if sediment VOC sampling will be repeated.

See 3) above.

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- 58) **Section 7.5.2** – In the first sentence, the acronym should be given as LOAEL.
The document will be changed in accordance with the comment.
- 59) **Section 7.6.1.1** – This section discusses risks to aquatic receptors from sediment contamination. This discussion includes comparisons to several agreed to benchmarks plus comparisons to additional “alternate” benchmarks. For this discussion to have increased relevance, the benchmark endpoints should be discussed. Some sediment benchmarks examine water column receptor toxicity, some examine benthic receptor toxicity, and others examine both. Additionally, it is inappropriate to compare average sediment concentrations to severe or lethal effects levels.
The endpoints for the alternate sediment benchmarks are discussed in Appendix E.4. The comparisons of average concentrations to the severe and lethal effects levels will be removed from the text.
- 60) **Section 7.6.1.1.3** – The section titled “PCBS” should be “PCBs.” Please correct.
The document will be changed in accordance with the comment.
- 61) **Section 7.6.1.2** – In the section titled “metals”, aluminum is stated as not retained as a COC because it is not known to be related to site activities. Illinois EPA does not agree with this. Whether or not it was related to known site activities has no effect on whether a contaminant poses risk. Aluminum should be retained as a COC. Please make this correction.
The statement that aluminum was not retained as a COC because it is not known to be related to site activities will be removed from the ERA. However, aluminum will not be retained as a COC for other reasons. The average concentration is a good indicator of actual exposure concentration to aquatic receptors in surface water due to the flow of Pettibone Creek. Aquatic receptors are exposed to a range of concentrations, represented by the comparison of the AWQC to the average concentration. Additionally, the average concentration only slightly exceeds the chronic SSV. Risks from aluminum to aquatic receptors are likely negligible and low at best. Therefore it would not be appropriate to retain aluminum as a COC.
- 62) **Table 2** – It is inappropriate to list statewide background levels for organic constituents. Organic contaminants are not expected to be present in natural sediments. Furthermore, the background concentrations for organics presented in the IEPA reference are analytical detection limits and not true background concentrations of these chemicals.
The background levels for organic constituents will be removed from Table 2 and all discussion related to them will be removed from the text.

The subject table also shows that four inorganic constituents have benchmark screening concentrations less than the Illinois background levels. This situation should be discussed in the text of the report.

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The four inorganic constituents that have benchmark screening concentrations less than the Illinois background levels will be discussed in the uncertainty analysis section of the report.

- 63) **Tables 7-8 through 7-10 and 7-12 through 7-14** – The fraction of risk in the ecological effects quotient attributed to polynuclear hydrocarbon contamination from fish ingestion can be removed.
The PAHs will be removed from the kingfisher food chain model and a discussion will be added to the text to indicate that PAHs do not accumulate in fish because they are metabolized. The PAHs will remain in the raccoon model because it is assumed that 50 percent of the raccoon diet consists of invertebrates, which may not metabolize the PAHs.
- 64) **Section 8.0** - This section may require revision if sediment VOC sampling will be repeated.
See 3) above
- 65) **Section 8.0, page 2** – Following the second bullet, there is a statement regarding the range of concentrations reported as anthropogenic background for PAHs. This statement should be removed.
See 30) above
- 66) **Section 8.0, page 2** – The last sentence following the third bullet, mentions industrial sources upstream of Site 17. Some discussion of the previous transformer storage area on NTC Great Lakes property should be included here.
See 6) above
- 67) **Section 8.0, page 3** – Regarding VOCs, see comment number 25.
See 3) above
- 68) **Section 8.0, page 3** – The last sentence on this page lists upstream industrial sources as a primary source of the contamination. This may well be true, however, the contribution by NTC Great Lakes should not be overlooked. Please include some discussion of this in this section.
See 6) above
- 69) **Section 8.0, page 5, first bullet** – Again, it is stated that the primary sources of the COPCs are probably due to upstream sources. This may be true, however, the possible contribution by NTC Great Lakes should not be overlooked. Please include some discussion of this in this section.
See 6) above

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- 70) **Appendix E.3** – The table of NOAEL and LOAEL sources and endpoints should include the polynuclear hydrocarbon values and the open literature reference for their source. This information can be added to the footnote already in place.

As the footnote indicates, the NOAELs and LOAELs for most of the PAHs were based on the value for benzo(a)pyrene that was used as a surrogate. That reference for the mammal values is in the table. The reference for the values for birds is in the footnote (except the date should be 1994 not 1995). The endpoint information for 7,12-Dimethylbenz(a)anthracene will be added to the text. Also, the references for the NOAELs and LOAELs will be added to this appendix.

Several calculations were checked as part of this review. During this exercise it was noted that some BASF values specified in the ecological effects quotient tables do not agree with the specified literature source. This includes the Arochlors and several of the pesticides. Please correct.

The BASF values were checked. Please note that the PCB BASF values for sediment to invertebrates are different from the literature values because the literature values are based on dry weight and the values used in the food chain models were based on wet weight. The sediment to fish BASFs that are used is as they appear in the literature.

- 71) **Appendix E.4** – Use of the Florida sediment screening levels criteria as alternate benchmarks is inappropriate since they are based on marine and estuarine habitats.

The Florida sediment screening values will be removed from the Appendix and references to them in the text will be removed as well.

- 72) **General** – The document has a significant amount of typographical errors in the text. Please conduct a more thorough proof/review prior to submittal.

The document will be proofed/reviewed in accordance with the comment.

FANSTEEL, INC. SITE
One Tantalum Place
North Chicago, Lake County, Illinois

OPERABLE UNIT 01 - SITE SPILL ID# B5H7
Vulcan Louisville Smelting Company (a.k.a. "The Vacant Lot Site")
CERCLIS ID # ILD097271563

IL, 10th Congressional District
Mark Steven Kirk (R)
<http://www.house.gov/kirk/>

RPM:

John J. O'Grady
Telephone: 312.886.1477
Facsimile: 312.886.4071
E-mail: Ogrady.Johnj@epa.gov

DESCRIPTION:

- **~9-acre site** located on north side of 22nd street between Commonwealth Avenue and Sheridan Road (SW 1/4 of NW 1/4 of Section 4, Township 44 N, Range 12 E).
 - Bordered to north by residential area.
 - Bordered to east (R. Lavin & Sons).
 - Bordered to south by industrial sites.
 - Bordered to west by Vacant Lot Site.
- **Three Aquifers Utilized in this Region** - sand and gravel aquifer (of glacial till), Silurian Dolomite, and the Glenwood-St. Peter Sandstone.
- **Nearest Known Well** - located ~1.5 miles south-southeast of Site.
 - ~15 private wells within 1 to 2 miles of Site serving a total of ~115 people.
 - ~41 private wells within 2 to 3 miles of Site (4 public wells, 5 non-community wells, and ~32 private wells) serving 5,720 people.
 - ~170 wells within 3 and 4 miles of Site (2 non-community wells and ~168 private wells) serving 1,820 people;
 - Others residing within 4 miles of Site obtain water from Lake Michigan.
 - Within 15-mile surface water route, there are eleven documented, public surface water intakes (all from Lake Michigan) serving ~235,000 people.
- **State Endangered or Threatened Species** - within 15-miles adjacent to Lake Michigan.
 - 20 different state endangered or threatened species.
 - 8 state designated natural areas.
 - 2 state-designated nature preserves.

BACKGROUND:

- **1942:** U.S. Government authorized and financed its construction.
 - Actually an expansion of already-existing Fansteel facility, located south of 22nd Street.
 - Facility utilized upgraded and mechanized equipment for production of tantalum (important in production of munitions).

- Facility owned by Tantalum Defense Corporation; subsidiary of Fansteel.
- **Early 1970's:** Illinois EPA involved with facility regarding various operating permits and routine inspections.
- **1972:** Illinois Pollution Control Board (the Board) opinion stating that discharges from Fansteel facility into nearby Pettibone Creek were detrimental to stream.
 - Board ordered Fansteel to pretreat effluent; discharge to North Shore San. Dist.
- **11/1980:** Fansteel filed RCRA Part-A Permit; applied for RCRA Part-B permit.
- **12/1986:** Facility located south of 22nd Street sold to Federal Chicago Corporation.
- **Spring 1987:** Completed RCRA closure.
- **Summer 1990:** Two 13,500 gallon tanks were removed.
 - Various sampling events have revealed soil contamination in tank area.
- **08/1990:** Analytical results from sampling event reveal contamination to a depth of 20 ft.
- **11/1990:** North facility continued operations, producing tantalum mill products and forming non-ferrous metals.
- **01/1991:** Facility operated under interim status from 11/1980 until RCRA Part-B application was withdrawn.
- **01/17/1991:** Site investigation conducted by Illinois EPA personnel.
 - Facility inactive; many areas found vacant; other areas contained idle machinery.
 - Drums of waste (non-hazardous) observed in manufacturing bldg and warehouse.
 - Waste oil storage area undergoing closure was metal building with dirt floor.
 - West wall of building removed to allow access of equipment to collect samples.
 - Building found empty except for concrete saddles where tank used to rest.
 - Site enclosed by fence; guardhouse (occupied) near main gate, along 22nd Street.
 - Facility remains corporate headquarters; several offices continue at Site.
- **Two Sources of Possible Contamination Identified:**
 - **Waste Oil Storage Area** - contaminated soil.
 - Contaminants identified to depth of 20 feet (28,800 ft³).
 - **Drum Storage Area**
 - 2 drums of F001 waste (spent halogenated solvent)
 - 9 drums of other non-hazardous waste.
 - Drums located in manufacturing building stored on a concrete floor.
- **06/17/1997:** General Notice of Potential Liability Letter.
- **08/25/1997:** Meeting at U.S. EPA Region 5 Office regarding General Notice Letter.
- **11/06/1997:** Letter committing to submittal of Work Plan to U.S. EPA by 12/08/1997.
- **04/15/1998:** Revised Site Investigation Work Plan submitted by Fansteel.
- **07/23/1999:** Fansteel submitted Work Plan (Revised Version 2.1), CEI's QAPP (Version 1.2) dated 07/1999, and Great Lakes Analytical's QAPP (revision 5.7), dated 02/18/1998.
- **02/23/2000:** Meeting with Fansteel, Legal Counsel, and Consultant, and U.S. EPA.
- **February 25, 2000:** Notice of Approval of Site Investigation Work Plan by U.S. EPA.
- **04/2000:** Initial Field Sampling Effort Undertaken by Fansteel's consultant.
 - TN & Associates, Inc. (Raghu Nagam) on board as U.S. EPA oversight consultant.
 - Mr. Nagam had previously performed EE/CA for Vacant Lot property while a member of Ecology & Environment, Inc. (U.S. EPA START Contractor).

- **11/14/2000:** Unilateral Administrative Order (UAO) issued to Fansteel for EE/CA.
- **11/03/2000:** Draft Site Investigation Report submitted to U.S. EPA.
- **12/05/2000:** Meeting with Fansteel, legal counsel, consultants and U.S. EPA.
- **12/07/2000:** U.S. EPA letter to Fansteel with agreements from meeting.
- **12/26/2000:** U.S. EPA comments on draft Site Investigation Report to Fansteel.
- **01/26/2001:** Final Site Investigation Report to be submitted.
- **07/12/2001:** Draft EE/CA Report to be submitted to U.S. EPA.
- **01/2002:** Fansteel and most of its U.S. subsidiaries filed voluntary petitions for reorganization under Chapter 11 of U.S. Bankruptcy Code in Federal Court in Delaware.

ACTIONS NEEDED/ANTICIPATED:

- Fansteel still awaiting Debtor in Possession (DIP) financing to restart EE/CA.
- **??/??/????:** Final EE/CA Approval by U.S. EPA

R. LAVIN & SONS, INC.
(a.k.a. North Chicago Refiners & Smelters)
North Chicago, Lake County, Illinois 60064
CERCLIS ID# ; SITE SPILL #

IL, 10th Congressional District
Mark Steven Kirk (R)
<http://www.house.gov/kirk/>

RPM:

John J. O'Grady
Telephone: 312.886.1477
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DESCRIPTION:

- Surface run-off flowed into one of two interconnected surface impoundments (SE & SW impoundments) on south end of operations area located NE of south warehouse.
- Water discharged into storm sewer tributary of Pettibone Creek.
- Slag piles noted on site in past.
- Former settling pond, North impoundment, is located on NW side of property, north of large on-site building and west of water tanks.
- According to Illinois EPA reports, R. Lavin has installed eleven onsite monitoring wells.
 - Site has 8 shallow wells and 3 deep monitoring wells.
- Site regulated by RCRA in regards to fill material covering site.
- Water was pumped from SW impoundment to North impoundment.
- SW impoundment had no liner or leachate collection system.
- Virtually entire parking lot of facility is paved in asphalt and considered by Illinois EPA to be RCRA-compliant hazardous waste cap.
- According to Illinois EPA documents this facility violated its NPDES permit limits.
 - Maybe due to site runoff and/or contaminated groundwater.
 - Contaminated groundwater maybe infiltrating on-site stormwater ditch.
 - Ditch discharges to stormwater outfall that discharges to Pettibone Creek.R. Lavin is major contributor to contaminated sediments to creek per Illinois EPA.

BACKGROUND:

- **1941:** North Chicago Refiners and Smelters (NCRS) site was leased by R. Lavin & Sons.
 - Operated smelting/refining business of non-ferrous scrap metals and manufactured bronze and brass ingots.
- **1973:** NCRS received operating permits for air emission control equipment from IEPA.
- **1990:** Consent Order issued included groundwater monitoring and paving most of site.
- **1990:** NPDES permit expired (allowed discharge from two outlets into Pettibone Creek).
- **1991:** Screening Site Inspection indicated Cd, Ca, Chr, Cu, Pb, Mg, Ni, Ag, and Zn at concentrations at least 3 times above background in SW surface impoundments.
- **1991:** Sediment samples analyzed from SW impoundment indicated 2-methylnaphthalene, Be, Ca, Chr, Cu, Pb, Ni, Ag, and Zn at levels at or above 3 times background.
- **1991:** North impoundment previously used as a settling pond for wastewater (no liner or groundwater monitoring) was backfilled and paved.

R. Lavin & Sons Briefing Paper (Continued)

- **1991:** Backfilled north impoundment sampled and PCBs, Ba, Cd, Ca, Chr, Cu, Pb, Mg, Ni, Ag, and Zn found in excess of three times background levels.
- **1991 to 1992:** Based on a cursory review of lead contamination only, analytical results indicate that groundwater is heavily contaminated with Lead.
 - **11/1991:** sampling event lead levels in groundwater range 17.8 parts per billion (ppb) to 8,920J ppb (600 times MCL).
 - **01/1992:** sampling event lead levels in groundwater range from 72.7J ppb to 20,100J ppb (1250 times the MCL).
- **1994:** SW impoundment dredged and lined. Dredged sediments put in furnace.
- **1994:** Analysis of background and residential samples N/NW of NCRS Site showed di-n-butyl phthalate, pyrene, bis(2-ethylhexyl) phthalate, benzo(b)fluoranthene, Cd, Chr, Cu, Pb, Ag, Zn, and CN in excess of three times of background results.
- Sediment samples collected along Pettibone Creek during Extended Site Investigation showed Cd, Chr, Cu, Pb, Ni, and Zn in the sample downstream of the NCRS outfall.
- **2002:** Rough estimate of potential costs for R. Lavin (Table G-7, "Superfunds Future" published in 2001 by RFF Press, Katherine N. Probst and David M. Konisky).

	<u>Ave. Extramural Costs</u>	<u>Ave. Intramural Costs</u>
		RI/FS
		\$1,040,000
		\$ 57,000
		RD
		\$1,198,000
		\$ 27,000
		RA (includes O&M)
		<u>\$4,418,000</u>
		<u>\$ 43,000</u>
Subtotal		\$6,656,000
		\$127,000
Total Average Costs =	\$6,783,000	

ACTIONS NEEDED/ANTICIPATED:

- Facility warrants further investigation because lead levels greatly exceed MCL of 15 ppb.
- Additional groundwater and Pettibone Creek investigation necessary due to NPDES violations and contaminated sediments in Pettibone Creek.
- RI necessary to determine extent of groundwater contamination including offsite areas, identification of contaminant pathways, identification of current and future contaminant receptors and current and potential risks to those receptors.

VULCAN LOUISVILLE SMELTING COMPANY (aka The Vacant Lot)

North Chicago, Lake County, Illinois
CERCLIS ID # ILD-097-271-563; Site Spill ID# A527

IL, 10th Congressional District

Mark Steven Kirk (R)

<http://www.house.gov/kirk/>

RPM:

John J. O'Grady

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E-mail: Ogrady.Johnj@epa.gov

DESCRIPTION:

- 6.4-acre parcel of land located at NE corner of Commonwealth Avenue & 22nd St.
- Site transected by Pettibone Creek (intermittent creek) that originates at Site NW boundary.
 - Creek flows south Site, then east into Lake Michigan (1.5 miles from Site)
- Historical sources indicate that only development of Site was for use as parking lot.
- Local residents/authorities indicate property may have been utilized by nearby industrial for waste disposal.
 - Source, quantity, and nature of materials brought to Site not well documented.
 - Reports of foundry sand and tailings deposition at Site consistent with descriptions of materials observed on Site.
- Site located in area consisting of industrial, commercial, and residential properties.
 - Bordered to north by the elevated Elgin, Joliet and Eastern Railroad, with residences beyond.
 - Bordered to east by Fansteel, Inc. (currently used for office space only).
 - Bordered to south across Martin Luther King Jr. Drive by parking area.
 - Bordered to west across Commonwealth Street by EMCO Chemical Distributors.

BACKGROUND:

- 1921: Land now occupied by Vacant Lot, Fansteel, and R. Lavin & Sons owned by Vulcan-Louisville Smelting Company.
- 1929: Information gathered from various plat maps, Sanborn maps, and local residents indicates that Vulcan-Louisville owned Site.
- 1936: property transferred to C.N.S. & M. Railroad Company.
- 1936 to 1954: Vacant Lot property sold to individual who developed it as a parking lot.
 - Owner solicited for fill material to be brought to Site.
 - Not known what type of fill material was accepted.
- 1984 *et seq.*: Numerous sampling events conducted at Site by State and local officials.
 - Elevated levels of heavy metals, chlorinated solvents, PAHs, pesticides, and PCBs detected in on-site soil samples.
- 06/15/1989: Illinois EPA involved with Site when a fire reported to Illinois EPA Emergency Response Unit.
 - North Chicago Fire Department responded to fire.

VACANT LOT STATUS UPDATE (Continued)

- . Determination that fill material at Site had become heated, igniting nearby brush.
- . Illinois EPA collected 3 soil samples; analyzed for RCRA EP Tox Metals.
- 08/1989: Site added to CERCLIS by Illinois EPA.
- 09/1990: Initial CERCLA Preliminary Assessment (PA).
- 11/22/1992: Illinois EPA's Site Assessment Program tasked by U.S. EPA to conduct CERCLA Integrated Assessment of Site.
- 05/1993: Sampling conducted by Illinois EPA (11 soil samples, 5 sediment samples, and 4 groundwater samples).
- 04/1994: An additional sediment sample added to sampling data.
- 09/1994: U.S. EPA conducted a Site assessment at request of Illinois EPA.
 - Several soil and sediment samples were collected, including samples from location of previous underground fire incident.
 - Elevated levels of arsenic, beryllium, lead, TCE, and PCBs detected at Site.

NON-TIME CRITICAL (NTC) REMOVAL ACTION:

- 08/01/1996: U.S. EPA initiated EE/CA.
- 10/30/1997: U.S. EPA completes EE/CA.
- 05/06/1998: Action Memorandum Signed.
- 09/15/1998: Action Memorandum Amendment to include Pettibone Creek cleanup.
- 12/08/1998: Ceiling Increase Memorandum.
- 08/04/1998: Non-Time Critical (NTC) Removal Start Date.
- 05/25/1999: NTC Demobilization and Completion Date.
 - . 6,742 tons of non-hazardous lead soils excavated.
 - . 36,052 tons of TCLP lead soil excavated and stabilized.
 - . 2,042 tons of PCB/lead soil excavated.
 - . ~9,810 yards of backfill dirt and stone delivered to Site.
- 06/07/2000: U.S. EPA Comfort Letter issued to EMCO Chemical Distributors (want to purchase property).
- 07/19/2000: Public comment period on PPA and *de minimis* landowner settlement ended.
- 08/01/2000: Prospective Purchase Agreement (PPA) with EMCO Chemical Distributors.
- 08/01/2000: AOC for *de minimis* settlement.
 - . Approval letter from William E. Muno signed 08/01/2000.
 - . Both AOC and PPA effective.
 - . EMCO completes purchase and submits payment of \$35,000 to U.S. EPA.