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NSWC CRANE
5090.3a

DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

IN REPLY REFER TO
5090/S4.7.1
Ser RP3/5300

23 SEP 2005

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Corrective Action Section
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center submits response to comments on the RCRA Facility Investigation Report (RFI) for Solid Waste Management Units (SWMUs) 4, 5, 9, & 10 (McComish Gorge, Old Burn Pit, Pest Control Area-R150 Tank, and Rockeye, respectively) as enclosure (1). Enclosure (2) contains change pages for the RFI Report along with instructions for updating. The permit required Certification Statement is provided as enclosure (3).

If you require any further information, my point of contact is Mr. Thomas J. Brent, Code RP3-TB, at 812-854-6160, email thomas.brent@navy.mil.

Sincerely,

JAMES M. HUNSICKER
Manager, Environmental Protection
By direction of the Commanding Officer

Enclosures:
1. Response to Comments on the SWMUs 4, 5, 9, & 10 RFI Report
2. Change Pages With Instructions
3. Certification Statement

Copy to:
ADMINISTRATIVE RECORD
SOUTHNAVFACENGCOM (Code ES31) (w/o encl)
IDEM (Doug Griffin)
TTNUS (Ralph Basinski) (w/o encl)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE

Manager, Environmental Protection
TITLE

9/23/05
DATE

5090
Ser RP3/5300

23 September 2005

The letter Ser RP3/5300 was for the submittal of response to comments and replacement pages for the Final RCRA Facilities Investigation (RFI) Report for SWMUs 04, 05, 09 and 10. The replacement pages have been incorporated into the previously submitted Draft Report on 5/29/02, making it the final report.

Enclosure (1)

Response to Comments on the SWMUs 4, 5, 9, & 10 RFI Report

RESPONSES TO ADDITIONAL EPA COMMENTS (SPANNING THE DATES AUGUST 23 AND 24, 2005) REGARDING THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION (RFI) REPORT FOR NAVAL SURFACE WARFARE CENTER (NSWC) CRANE FOR SWMUS 4, 5, 9, AND 10

(AUGUST 25, 2005)

Comment 1 (Verbal comment, received August, 23, 2005 restated by Navy):
According to text in Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4, and 4.4.5, for SWMU 4 and in corresponding RFI report sections for SMWUs 5, 9, and 10, the screening values for non-carcinogens that were used to assign human health risk-based criteria exceedance flags were the actual risk-based criteria rather than one-tenth the risk-based criteria. A review of the tag maps for these four SWMUs suggests that the criterion used was one-tenth the risk-based level instead of the actual risk-based level. Which is correct?

Response 1:
The response to EPA comments dated August 1, 2005 acknowledged that RFI text on this topic is vague and clarified this issue by indicating that it was the risk-based criteria that were used as the triggers for assigning human health risk-based flags to tag maps. The original response was:

> "...Regarding discrepancies between COPC selection and risk-based criteria exceedance flags on tag maps, there is a difference. The COPC selection process for non-carcinogens used the risk based screening criterion divided by 10 as the screening level. On the tag maps, only those non-carcinogens exceeding the screening criterion (not one-tenth the criterion) were flagged with labels such as R9PRG..."
>
> That explanation was incorrect. The correct explanation is this: "The COPC selection process for non-carcinogens used the risk-based screening criterion divided by 10 as the screening level. If this value was exceeded, a flag was assigned to tags to indicate an exceedance. For carcinogens, the unadjusted risk-based screening values were used as the triggers for assigning criteria exceedance flags."

To correct the RFI report, the following changes have been made:

> Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4, and 4.4.5 have been revised to more clearly indicate that the flags assigned to results on tag maps are based on one-tenth the risk-based criteria for non-carcinogens and on the unadjusted criteria for carcinogens. Similar changes were made to

Sections 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.4.5, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.4.5, 7.4.1, 7.4.2, 7.4.3, 7.4.4, and 7.4.5. The actual revised text is attached (Attachment 1) to show the final revisions as they will appear in the revised document.

Comment 2 (received via e-mail on August 24, 2005):

Question on SWMU 5 figure vs. COPC for sediment. Figure 5-12, 05SW/SD02 shows Trichloroethene at 700 ppb flagged over R9PRG. Error?

Response 2:

Figure 5-12 is correct. The COPC screening values for trichloroethene in soil, surface water, sediment, and groundwater changed at the same time the RFI report was being compiled. The new trichloroethene screening values were not incorporated into the COPC selection tables of the hard copy report, so the screening values are in error on the COPC selection tables. The risk assessments, however, were based on the updated screening values and COPC selection was based on the updated values, so there are no errors in COPC selection. The COPC selection tables of the CD version of the report also reflect the updated screening values. A review was conducted to determine whether any other chemicals were similarly affected. One other chemical, 1,1-dichloroethene, was affected. To correct these errors, hard copy versions of the COPC selection tables for SWMUs 4, 5, 9, and 10 were corrected. Copies of each of the revised tables are provided in Attachment 2 to these comment responses.

Comment 3 (received via e-mail on August 24, 2005):

- Table 6-18 shows arsenic retained as a COPC and antimony is not.
Perhaps this is just a "swap error" in the text of page 6-30?

- If exceeding upgradient is a trigger for inlcusion as a COPC as stated in the text, then many more inorganics should be retained (e.g. chromium).

Response 3:

Regarding Table 6-18, the table is correct. The second bullet on page 6-30 erroneously identifies antimony instead of arsenic as a COPC. To correct this error, “antimony” has been changed to “arsenic” in that bullet.

A review was conducted to determine whether this error had been propagated to any other sections of the text. The only such error detected was the fifth bullet of page 6-43, which also erroneously identifies antimony, instead of arsenic, as a sediment COPC for human health risk. To correct this error, “antimony” has been changed to “arsenic” in that bullet.

Regarding upgradient concentrations as triggers for COPC selection, a chemical concentration must exceed both the upgradient concentration and a COPC screening value to become a COPC. The text on page 6-30 that appears to be the prompt for this comment is an explanation for why the chemicals in question had been selected as COPCs. The text explains that the COPCs were selected as such because their maximum concentrations exceeded U.S. EPA Region 9 risk-based screening levels for residential soil, IDEM default closure levels for direct contact, and concentrations in the upgradient sample. The text, however, is not a statement of the requirements for COPC selection. The COPC selection process is described in more detail in Section 3.0 of the RFI report. The applicable text is excerpted here:

> **"3.3.1.2 Selection of Chemicals of Potential Concern**
>
> The selection of COPCs is a qualitative screening process used to limit the number of chemicals and exposure routes quantitatively evaluated in the baseline human health risk assessment to those site-related constituents that dominate overall potential risks. Screening by risk-based concentrations and basewide background levels are used to focus the risk assessment on meaningful chemicals and exposure routes.
>
> In general, a chemical is selected as a COPC and retained for further quantitative risk evaluation if the maximum detection in a sampled medium exceeds the lowest risk-based concentration and the chemical is determined to be present at concentrations exceeding background. Note that this second condition applies only to those chemicals for which background comparison is appropriate (e.g., metals). Chemicals eliminated from further evaluation at this time are assumed to present minimal risks to potential human receptors. Medium-specific tables summarizing the selection of COPCs are included in the SWMU-specific risk assessments."

The COPC selection rationale stated on page 6-43 is different than the ecological COPC selection rationale (see page 6-48), which indicates a lack of ecological screening values for antimony and five other chemicals. In that case, the exceedance of the upgradient concentration was the trigger for COPC selection only because screening values were not available. Had they been available, classification as a COPC would have required that the chemical concentrations exceed the applicable ecological screening values and upgradient concentrations.

No change is proposed to address this portion of the comment.

Attachment 1. Revised text for the NSWC Crane SWMUs 4, 5, 9, and 10 RFI Report Regarding Criteria Exceedance Flags on Tag Maps.

The text below shows the RFI report page numbers and sections in which text was changed to explain how risk-based criteria (or one-tenth risk-based) criteria were used to assign criteria exceedance flags on tag maps. The altered text is highlighted yellow. Differences in wording among the indicated changes are designed to allow for making the indicated changes without causing wholesale changes in pagination for the rest of the RFI report.

Pages 4-6 and 4-7:

4.4.1 Surface Soil

As detailed in Table 4-1 and Section 4.2, 14 surface soil samples were collected to evaluate the nature and extent of contamination. All 14 surface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Target Analyte List (TAL) metals (plus tin), and cyanide. Additionally, two surface soil samples were analyzed for cation exchange capacity (CEC), pH, and TOC.

Table 4-2 presents a summary of the results reported for compounds detected in the surface soil samples collected from SWMU 4. Table 4-3 presents a summary of descriptive statistics for surface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Because two different soil groups comprise surface soil at this SWMU, the table displays an exceedance of background concentrations if either soil group exceeded its respective background values. Figures described below indicate background exceedances for soil group-specific background comparisons. Appendix E.1.1 contains a copy of the entire analytical database for SWMU 4 surface soil. Figures 4-6 and 4-7 present a geographical depiction of organic and inorganic detections in surface soil, respectively. If organic/inorganic chemical concentrations exceeded risk-based or applicable regulatory concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R5DQL) appear on the tags at the affected locations on Figure 4-7. If an inorganic chemical was detected at a particular surface soil location and the site data set for that chemical is elevated as compared to the corresponding background data set (Soil Group 1 or 3), the result was flagged with "BACK". If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Page 4-10:

4.4.2 Subsurface Soil

As detailed in Table 4-1 and Section 4.2, 12 subsurface soil samples were collected to evaluate the nature and extent of contamination. All 12 subsurface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, TAL metals (plus tin), and cyanide. Additionally, four subsurface soil samples were analyzed for CEC, pH, and TOC.

Table 4-4 presents a summary of the positive results reported for compounds detected in the subsurface soil samples collected from SWMU 4. Table 4-5 presents a summary of descriptive statistics for positive subsurface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Because two different soil groups comprise subsurface soil at this SWMU, the table displays an exceedance of background concentrations if either soil group exceeded its respective background values. Figures described below indicate background exceedances for soil group-specific background comparisons. Appendix E.1.1 contains a copy of the entire analytical database for SWMU 4 subsurface soil. Figures 4-8 and 4-9 present a geographical depiction of organic and inorganic detections in subsurface soil, respectively. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R9PRG) appear on the tags at the affected sampling locations on Figure 4-7. If an inorganic chemical was detected at a particular surface soil location and the site data set for that chemical is elevated as compared to the corresponding background data set (Soil Group 2 or 9), the result was flagged with "BACK". If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Page 4-15:

4.4.3 Ground Water

As detailed in Table 4-1 and Section 4.2, 8 ground water samples were collected to evaluate the nature and extent of contamination. All ground water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, total TAL metals (plus tin), and cyanide. Sample 04GWT0201 was analyzed for dissolved TAL metals because the turbidity of the groundwater after stabilization was greater than 10 NTU. Sample 04GW0101 is the SWMU 4 upgradient ground water sample.

Table 4-6 presents a summary of the positive results reported for compounds detected in the ground water samples collected from SWMU 4. Table 4-7 presents a summary of descriptive statistics for positive ground water detections including range of detections, frequency of detection, location of

maximum, and comparison to upgradient sample concentrations. Appendix E.1.1 contains a copy of the entire analytical database for SWMU 4 ground water. Figure 4-10 presents a geographical depiction of organic and inorganic detections in ground water.

If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9TAP) appears on the tag map at the affected sampling location. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Pages 4-16 and 4-17:

4.4.4 Surface Water

As detailed in Table 4-1 and Section 4.2, 4 surface water samples were collected to evaluate the nature and extent of contamination. All surface water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, total and dissolved TAL metals (plus tin), cyanide, hardness, and total suspended solids. Sample 04SW0101 is the SWMU 4 upgradient surface water sample. The surface water sample that was to have been collected from location of 04SW/SD06 was not collected because there was no standing surface water at the time of sample collection.

Table 4-8 presents a summary of the positive results reported for compounds detected in the surface water samples collected from SWMU 4. Table 4-9 presents a summary of descriptive statistics for positive surface water detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient sample concentrations. Appendix E.1.1 contains a copy of the entire analytical database for SWMU 4 surface water. Figure 4-11 presents a geographical depiction of organic and inorganic detections in surface water.

If the concentration of an organic or inorganic chemical exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9TAP) on the tag map at the affected sampling location is shown on the figure. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Page 4-19:

4.4.5 Sediment

As detailed in Table 4-1 and Section 4.2, 5 sediment samples were collected to evaluate the nature and extent of contamination. All sediment samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, TAL metals (plus tin), TOC, and cyanide. Sample 04SD010006 is the SWMU 4 upgradient sediment sample.

Table 4-10 presents a summary of the positive results reported for compounds detected in the sediment samples collected from SWMU 4. Table 4-11 presents a summary of descriptive statistics for positive sediment detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient sample concentrations. Appendix E.1.1 contains a copy of the entire analytical database for SWMU 4 sediment. Figure 4-12 presents a geographical depiction of organic and inorganic detections in sediment, respectively.

If the concentration of an organic or inorganic chemical exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9PRG) on the tag map at the affected sampling location is shown on the figure. If a detected inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Page 5-5:

5.4.1 Surface Soil

As explained in Table 5-1 and Section 5.2, eight surface soil samples were collected to evaluate the nature and extent of contamination. All eight surface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Appendix IX dioxins/furans, TAL metals (plus tin), and cyanide. Additionally, one surface soil sample was analyzed for CEC, pH, and TOC.

Table 5-2 presents a summary of the results reported for compounds detected in the surface soil samples collected from SWMU 5. Table 5-3 presents a summary of descriptive statistics for surface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Appendix E-1.2 contains a copy of the entire analytical database for SWMU 5 surface soil. Figures 5-6 and 5-7 present a geographical depiction of organic and inorganic detections in surface soil, respectively. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory

concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R5DQL) appear on the tags at the affected locations on Figure 5-7. If an inorganic chemical was detected at a particular surface soil location and the site data set for that chemical is elevated as compared to the corresponding background data set (Soil Group 3), the result was flagged with "BACK" at all locations where samples from Soil Group 3 were collected. If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Pages 5-10 and 5-11:

5.4.2 Subsurface Soil

As detailed in Table 5-1 and Section 5.2, 14 subsurface soil samples were collected at seven locations to evaluate the nature and extent of contamination. All seven subsurface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Appendix IX dioxin/furans, TAL Metals (plus tin), and cyanide. Additionally, three subsurface soil samples were analyzed for CEC, pH, and TOC.

Table 5-4 presents a summary of the positive results reported for compounds detected in the subsurface soil samples collected from SWMU 5. Table 5-5 presents a summary of descriptive statistics for positive subsurface soil detections including: range of detections, frequency of detection, location of maximum, and comparison to background. Because two different soil groups comprise subsurface soil at this SWMU, the table displays an exceedance of background concentrations if either soil group exceeded its respective background values. Figures described below indicate background exceedances for soil group-specific background comparisons. Appendix E-1.2 contains a copy of the entire analytical database for SWMU 5 subsurface soil. Figures 5-8 and 5-9 present a geographical depiction of organic and inorganic detections in subsurface soil, respectively. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R9PRG) appear on the tags at the affected sampling locations on the figure. If an inorganic chemical was detected at a particular location and the site data set is elevated compared to the corresponding background data set (Soil Group 8 or 9), the result was flagged with "BACK" " at all locations where samples from that soil group were collected. If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Pages 5-16 and 5-17:

5.4.3 Ground Water

As detailed in Table 5-1 and Section 5.2, 14 ground water samples were collected to evaluate the nature and extent of contamination. All ground water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Appendix IX dioxin/furans, total TAL metals (plus tin), and cyanide. Samples 05GW0301 and 05GW1301 were analyzed for dissolved TAL Metals. Sample 05GW0101 was collected and it is the SWMU 5 upgradient ground water sample.

Table 5-6 presents a summary of the positive results reported for compounds detected in the ground water samples collected from SWMU 5. Table 5-7 presents a summary of descriptive statistics for

positive ground water detections, including range of detections, frequency of detection, location of maximum, and comparison to upgradient concentrations. Appendix E.1.2 includes a copy of the entire analytical database for SWMU 5 ground water. Figure 5-10 presents a geographical depiction of organic and inorganic detections in ground water. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9TAP) appears on the tag map at the affected sampling location. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Page 5-19:

5.4.4 Surface water

As detailed in Table 5-1 and Section 5.2, four surface water samples were collected to evaluate the nature and extent of contamination. All surface water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Appendix IX dioxin/furans, total and dissolved TAL metals (plus tin), cyanide, hardness, and total suspended solids. Sample 05SW0101 was selected to represent the SWMU 5 upgradient surface water sample.

Table 5-8 presents a summary of the positive results reported for compounds detected in the surface water samples collected from SWMU 5. Table 5-9 presents a summary of descriptive statistics for positive surface water, detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient sample concentrations. Appendix E.1-2 contains a copy of the entire analytical database for SWMU 5 surface water. Figure 5-11 presents a geographical depiction of organic and inorganic detections in surface water. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory criteria (criteria/10 for non-carcinogens), a flag (e.g., R9TAP) on the tag map at the affected sampling location is shown on the figure. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Page 5-22:

5.4.5 Sediment

As detailed in Tables 5-1 and 5-2, four sediment samples were collected to evaluate the nature and extent of contamination. All sediment samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, Appendix IX dioxin/furans, TAL metals (plus tin), cyanide, and TOC. Sample 05SD010006 was collected as the SWMU 5 upgradient sediment sample.

Table 5-10 presents a summary of the positive results reported for compounds detected in the sediment samples collected from SWMU 5. Table 5-11 presents a summary of descriptive statistics for positive sediment detections, including range of detections, frequency of detection, location of maximum, and comparison to upgradient sample location. Appendix E.1-2 contains a copy of the entire analytical database for SWMU 5 sediment. Figure 5-12 presents a geographical depiction of organic and inorganic detections in sediment, respectively. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R5DQL) on the tag map at the affected sampling location is shown on the figure. If a detected inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Pages 6-5 and 6-6:

6.4.1 Surface Soil

As detailed in Table 6-1 and Section 6.2, 11 surface soil samples were collected to evaluate the nature and extent of contamination. All 11 surface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, TAL metals (plus tin), and cyanide. Additionally, three surface soil samples were analyzed for CEC, pH, and TOC.

Table 6-2 presents a summary of the reported results for compounds detected in the surface soil samples collected from SWMU 9. Table 6-3 presents a summary of descriptive statistics for surface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background concentrations. Appendix E.1.3 contains a copy of the entire analytical database for SWMU 9 surface soil. Figures 6-7 and 6-8 present a geographical depiction of organic and inorganic detections in surface soil, respectively. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R5DQL) appear on the tags at the affected locations on Figure 6-8. If an inorganic chemical was detected at a particular surface soil location and the site data set for that chemical is elevated as compared to the corresponding

background data set (Soil Group 3), the result was flagged with "BACK" at all locations where samples from Soil Group 3 were collected. If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Pages 6-8 and 6-9:

6.4.2 Subsurface Soil

As detailed in Table 6-1 and Section 6.2, 11 subsurface soil samples were collected to evaluate the nature and extent of contamination. All 11 subsurface soil samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, TAL metals (plus tin), and cyanide. Additionally, five subsurface soil samples were analyzed for CEC, pH, and TOC.

Table 6-4 presents a summary of the positive results reported for compounds detected in the subsurface soil samples collected from SWMU 9. Table 6-5 presents a summary of descriptive statistics for positive subsurface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Because two different soil groups comprise subsurface soil at this SWMU, the table displays an exceedance of background concentrations if either soil group exceeded its respective background values. Figures described below indicate background exceedances for soil group-specific background comparisons. Appendix E.1.3 contains a copy of the entire analytical database for SWMU 9 subsurface soil. Figures 6-9 and 6-10 present a geographical depiction of organic and inorganic detections in subsurface soil, respectively. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory concentration criteria (criteria/10 for non-carcinogens), flags (e.g., R9PRG) appear on the tags at the affected sampling locations on the figure. If an inorganic chemical was detected at a particular location and the site data set is elevated compared to the corresponding background data set (Soil Group 8 or 9), the result was flagged with "BACK" " at all locations where samples from that soil group were collected. If "BACK" does not appear next to the result for an inorganic chemical, it means that the chemical was detected at that location but the site chemical concentrations for that soil group are not elevated relative to background concentrations.

Page 6-11:

6.4.3 Ground Water

As detailed in Table 6-1 and Section 6.2, 12 ground water samples and one upgradient ground water sample (09GWTP0601) were collected to evaluate the nature and extent of contamination. All ground water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, total TAL metals (plus tin), and cyanide. None of the samples were analyzed for dissolved TAL metals.

Table 6-6 presents a summary of the positive results reported for compounds detected in the ground water samples collected from SWMU 9. Table 6-7 presents a summary of descriptive statistics for positive ground water detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient concentration. Appendix E.1.3 contains a copy of the entire analytical database for SWMU 9 ground water. Figure 6-11 presents a geographical depiction of organic and inorganic detection in ground water. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9TAP) appears on the tag map at the affected sampling location. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Pages 6-14 and 6-15:

6.4.4 Surface water

As detailed in Table 6-1 and Section 6.2, four surface water samples and one upgradient surface water sample (09SW0101) were collected to evaluate the nature and extent of contamination. The surface water samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, total and dissolved TAL metals (plus tin), cyanide, hardness, and total suspended solids. The upgradient sample was 09SW0101.

Table 6-8 presents a summary of the positive results reported for compounds detected in the surface water samples collected from SWMU 9. Table 6-9 presents a summary of descriptive statistics for positive surface water detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient concentration. Appendix E.1.3 contains a copy of the entire analytical database for SWMU 9 surface water. Figure 6-12 presents a geographical depiction of organic and inorganic detections in surface water. If organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory criteria (criteria/10 for non-carcinogens), a flag (e.g., R9TAP) on the tag

map at the affected sampling location is shown on the figure. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Pages 6-16 and 6-17:

6.4.5 Sediment

As detailed in Table 6-1 and Section 6.2, four sediment samples and one upgradient sediment sample 09SD010006 were collected to evaluate the nature and extent of contamination. All sediment samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs, Appendix IX pesticides, Appendix IX PCBs, Appendix IX herbicides, TAL metals (plus tin), cyanide, and total organic carbon.

Table 6-10 presents a summary of the positive results reported for compounds detected in the sediment samples collected from SWMU 9. Table 6-11 presents a summary of descriptive statistics for positive sediment detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient concentrations. Appendix E1.3 contains a copy of the entire analytical database for SWMU 9 sediment. Figure 6-13 presents a geographical depiction of organic and inorganic detections in sediment. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R5DQL) on the tag map at the affected sampling location is shown on the figure. If a detected inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Page 7-9:

7.4.1 Surface Soil

As detailed in Table 7-1 and Section 7.2, 10 surface soil samples were collected to evaluate the nature and extent of contamination. All 10 surface soil samples were analyzed for Appendix IX explosives, TAL metals (plus tin), and cyanide. One surface soil sample was analyzed for Appendix IX SVOCs. Additionally, one surface soil samples was analyzed for CEC, pH, and TOC.

Table 7-2 presents a summary of the results reported for compounds detected in the surface soil samples collected from SWMU 10. Table 7-3 presents a summary of descriptive statistics for surface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Appendix E.1.4 contains a copy of the entire analytical database for SWMU 10 surface soil. Figures 7-10 and 7-11 present a geographical depiction of organic and inorganic detections in surface

soil, respectively. If the concentration of an organic or inorganic chemical exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9PRG) on the tag at the affected sampling location shows this on the figures. If an inorganic chemical whose data set exceeded the surface soil background concentration was detected at a particular location, this is indicated with a "BACK" flag on the tag at all locations where soil from the same soil group was collected. If "BACK" does not appear on a tag it means that the chemical was detected at that location but the concentration of the chemical was less than the background concentration.

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7.4.2 Subsurface Soil

As detailed in Table 7-1 and Section 7.2, 10 subsurface soil samples were collected at 10 locations to evaluate the nature and extent of contamination. All 10 subsurface soil samples were analyzed for explosives, TAL metals (plus tin), and cyanide. One surface soil sample was analyzed for Appendix IX SVOCs. Additionally, five subsurface soil samples were analyzed for CEC, pH, and TOC.

Table 7-4 presents a summary of the positive results reported for compounds detected in the subsurface soil samples collected from SWMU 10. Table 7-5 presents a summary of descriptive statistics for positive subsurface soil detections including range of detections, frequency of detection, location of maximum, and comparison to background. Because two different soil groups comprise subsurface soil at this SWMU, the table displays an exceedance of background concentrations if either soil group exceeded its respective background values. Figures described below indicate background exceedances for soil group-specific comparisons. Appendix E1.4 contains a copy of the entire analytical database for SWMU 10 subsurface soil. Figures 7-12 and 7-13 present a geographical depiction of organic and inorganic detections in subsurface soil, respectively. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory criterion (criterion/10 for non-carcinogens), a flag (e.g., R9PRG) on the tag at the affected sampling location shows this on the figures. If an inorganic chemical whose data set exceeded the subsurface soil background concentration was detected at a particular location, this is indicated with a "BACK" flag on the tag at all locations where subsurface soil from the same soil group was collected. If "BACK" does not appear on a tag it means that the chemical was detected at that location but the concentration of the chemical was less than the background concentration.

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7.4.3 Ground Water

As detailed in Table 7-1 and Section 7.2, 18 ground water samples and one upgradient ground water (10GWC5201) sample were collected to evaluate the nature and extent of contamination. Sample 10GWC5201 was analyzed for Appendix IX VOCs, Appendix IX explosives, TAL metals (plus tin), cyanide, nitrate, and nitrate/nitrite. Nine ground water samples were analyzed for Appendix IX VOCs. Seventeen ground water samples were analyzed for Appendix IX explosives, total TAL metals (plus tin), and cyanide. Eighteen ground water samples were analyzed for nitrate/nitrite. One of the samples was also analyzed for dissolved TAL metals (plus) tin.

Table 7-6 presents a summary of the positive results reported for compounds detected in the ground water samples collected from SWMU 10. Table 7-7 presents a summary of descriptive statistics for positive ground water detections including range of detections, frequency of detection, location of maximum, and comparison to upgradient concentration. Appendix E.1.4 contains a copy of the entire analytical database for SWMU 10 ground water. Figure 7-14 presents a geographical depiction of organic and inorganic detections in ground water. If the concentration of an organic or inorganic chemical exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R9TAP) on the tag at the affected sampling location shows this on the figure. If an inorganic chemical whose data set exceeded the upgradient ground water concentration was detected at a particular location, this is indicated with a "UP" flag on the tag at the affected location. If "UP" does not appear on the tag it means that the chemical was detected at that location but the concentration of the chemical was less than the upgradient concentration.

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7.4.4 Surface water

As detailed in Table 7-1 and Section 7.2, 12 surface water samples were collected to evaluate the nature and extent of contamination. All surface water samples were analyzed for Appendix IX explosives, total and dissolved TAL metals (plus tin), cyanide, hardness, nitrate/nitrite, and total suspended solids. No upgradient surface water samples were collected at SWMU 10.

Table 7-8 presents a summary of the positive results reported for compounds detected in the surface water samples collected from SWMU 10. Table 7-9 presents a summary of descriptive statistics for positive surface water detections including range of detections, frequency of detection, and location of maximum. Appendix E.1.4 contains a copy of the entire analytical database for SWMU 10 surface water. Figure 7-15 presents a geographical depiction of organic and inorganic detections in surface water. If

organic or inorganic chemical concentrations exceeded risk-based or applicable regulatory criteria (criteria/10 for non-carcinogens), a flag (e.g., R9TAP) on the tag map at the affected sampling location is shown on the figure. If a detected organic or inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

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7.4.5 Sediment

As detailed in Table 7-1 and Section 7.2, 12 sediment samples were collected to evaluate the nature and extent of contamination. All sediment samples were analyzed for Appendix IX explosives, TAL metals (plus tin), cyanide, and TOC. No upgradient sediment samples were collected at SWMU 10.

Table 7-10 presents a summary of the positive results reported for compounds detected in the sediment samples collected from SWMU 10. Table 7-11 presents a summary of descriptive statistics for positive sediment detections including range of detections, frequency of detection, and location of maximum. Appendix E.1.4 contains a copy of the entire analytical database for SWMU 10 sediment. Figure 7-16 presents a geographical depiction of organic and inorganic detections in sediment. If organic or inorganic chemical concentrations exceeded a risk-based or applicable regulatory concentration criterion (criterion/10 for non-carcinogens), a flag (e.g., R5DQL) on the tag map at the affected sampling location is shown on the figure. If a detected inorganic chemical concentration at a particular location exceeded the upgradient concentration, this was indicated with a "UP" flag at the affected location. If "UP" does not appear on the tag map it means the chemical was detected at that location, but the concentration was less than the upgradient concentration.

Attachment 2

(Revised Tables 5-14, 5-17, 5-18, 6-14, and 6-16 of the RCRA RFI for SWMUs 4, 5, 9, and 10)

TABLE 5-14

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE/SUBSURFACE SOIL
SWMU 5, OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Surface/Subsurface Soil

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Site Above Background ? (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
VOLATILE ORGANICS																	
75-34-3	1,1-DICHLOROETHANE	0.14		0.14		mg/kg	05SB030507	1/15	0.003 - 0.004	0.14	NA	51	N	1300	IDEM	No	BSL
75-35-4	1,1-DICHLOROETHENE	0.013	J	0.013	J	mg/kg	05SB060102	1/15	0.003 - 0.004	0.013	NA	12	N	0.67	IDEM	No	BSL
67-64-1	ACETONE	0.048		0.054		mg/kg	05SB030507	2/15	0.014 - 0.018	0.054	NA	160	N	3900	IDEM	No	BSL
71-43-2	BENZENE	0.003		0.017		mg/kg	05SB030507	3/15	0.003 - 0.004	0.017	NA	0.6	C	8.2	IDEM	No	BSL
75-00-3	CHLOROETHANE	0.048		0.048		mg/kg	05SB030507	1/15	0.003 - 0.004	0.048	NA	3	C	46	IDEM	No	BSL
156-59-2	CIS-1,2-DICHLOROETHENE	0.005		2.8	J	mg/kg	05SB060102	6/15	0.003 - 0.004	2.8	NA	4.3	N	110	IDEM	No	BSL
100-41-4	ETHYLBENZENE	0.019		0.019		mg/kg	05SB030507	1/15	0.003 - 0.004	0.019	NA	8.9	C	4600	IDEM	No	BSL
75-09-2	METHYLENE CHLORIDE	0.004	J	0.042		mg/kg	05SB030507	5/15	0.003 - 0.004	0.042	NA	9.1	C	120	IDEM	No	BSL
127-18-4	TETRACHLOROETHENE	0.003		0.007	J	mg/kg	05SB060102	2/15	0.003 - 0.004	0.007	NA	1.5	C	48	IDEM	No	BSL
108-88-3	TOLUENE	0.027		0.027		mg/kg	05SB030507	1/15	0.003 - 0.004	0.027	NA	520	sat	1700	IDEM	No	BSL
156-60-5	TRANS-1,2-DICHLOROETHENE	0.007		0.029	J	mg/kg	05SB060102	2/15	0.003 - 0.004	0.029	NA	6.9	N	180	IDEM	No	BSL
79-01-6	TRICHLOROETHENE	0.004		5.1	J	mg/kg	05SB060102	8/15	0.003 - 0.004	5.1	NA	0.053	C	45	IDEM	Yes	ASL
75-01-4	VINYL CHLORIDE	0.005	J	0.16		mg/kg	05SB060608	5/15	0.003 - 0.004	0.16	NA	0.079	C	0.28	IDEM	Yes	ASL
1330-20-7	XYLENES, TOTAL	0.01		0.061		mg/kg	05SB030507	2/15	0.003 - 0.004	0.061	NA	27	N	4800	IDEM	No	BSL
SEMIVOLATILE ORGANICS																	
91-57-6	2-METHYLNAPHTHALENE	0.012		2.5	J	mg/kg	05SB030507	10/15	0.007 - 0.033	2.5	NA	5.6(7)	N	3200(7)	IDEM	No	BSL
106-44-5	4-METHYLPHENOL	0.46		0.77	J	mg/kg	05SB060608	2/15	0.36 - 5.9	0.77	NA	31	N	910	IDEM	No	BSL
83-32-9	ACENAPHTHENE	0.01		0.12		mg/kg	05SB010002	6/15	0.007 - 5.9	0.12	NA	370	N	9500	IDEM	No	BSL
208-96-8	ACENAPHTHYLENE	0.009		0.052	J	mg/kg	05SB050608	5/15	0.007 - 5.9	0.052	NA	370(8)	N	9500(8)	IDEM	No	BSL
120-12-7	ANTHRACENE	0.009		0.34	J	mg/kg	05SB050002	9/15	0.007 - 5.9	0.34	NA	2200	N	47000	IDEM	No	BSL
56-55-3	BENZO(A)ANTHRACENE	0.031		0.95	J	mg/kg	05SB050002	10/15	0.007 - 5.9	0.95	NA	0.62	C	5	IDEM	Yes	ASL
50-32-8	BENZO(A)PYRENE	0.031		0.82	J	mg/kg	05SB050002	10/15	0.007 - 5.9	0.82	NA	0.062	C	0.5	IDEM	Yes	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.008		0.96		mg/kg	05SB070608	12/15	0.008 - 5.9	0.96	NA	0.62	C	5	IDEM	Yes	ASL
191-24-2	BENZO(G,H,I)PERYLENE	0.017		0.35	J	mg/kg	05SB050002	10/15	0.007 - 5.9	0.35	NA	230(9)	N	5500(9)	IDEM	No	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.028		0.67	J	mg/kg	05SB050002	8/15	0.007 - 5.9	0.67	NA	6.2	C	50	IDEM	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.93		3.4		mg/kg	05SB050002	6/15	0.36 - 0.43	3.4	NA	35	C	300	IDEM	No	BSL
218-01-9	CHRYSENE	0.035		1.5	J	mg/kg	05SB030507	11/15	0.007 - 0.008	1.5	NA	62	C	500	IDEM	No	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.008		0.18	J	mg/kg	05SB050002	7/15	0.007 - 5.9	0.18	NA	0.062	C	0.5	IDEM	Yes	ASL
206-44-0	FLUORANTHENE	0.01		2.2	J	mg/kg	05SB050002	12/15	0.008 - 5.9	2.2	NA	230	N	6300	IDEM	No	BSL
86-73-7	FLUORENE	0.02		0.11	J	mg/kg	05SB050002	6/15	0.007 - 5.9	0.11	NA	260	N	6300	IDEM	No	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.015		0.36	J	mg/kg	05SB050002	10/15	0.007 - 5.9	0.36	NA	0.62	C	5	IDEM	No	BSL
91-20-3	NAPHTHALENE	0.023		1.2	J	mg/kg	05SB030507	10/15	0.007 - 0.033	1.2	NA	5.6	N	3200	IDEM	No	BSL
85-01-8	PHENANTHRENE	0.012		2.8	J	mg/kg	05SB030507	12/15	0.008 - 0.008	2.8	NA	230(9)	N	5500(9)	IDEM	No	BSL
129-00-0	PYRENE	0.009		3.1	J	mg/kg	05SB030507	13/15	0.008 - 0.008	3.1	NA	230	N	5500	IDEM	No	BSL
PESTICIDES/PCBs																	
72-54-8	4,4'-DDD	0.008		0.008		mg/kg	05SB020406	1/14	0.0035 - 0.058	0.008	NA	2.4	C	28	IDEM	No	BSL
72-55-9	4,4'-DDE	0.0067		0.0067		mg/kg	05SB080002	1/12	0.0035 - 0.058	0.0067	NA	1.7	C	20	IDEM	No	BSL
11097-69-1	AROCLOR-1254	0.1	J	0.67		mg/kg	05SB060608	6/15	0.035 - 0.58	0.67	NA	0.22	C	1.8	IDEM	Yes	ASL
11096-82-5	AROCLOR-1260	0.64		0.64		mg/kg	05SB050608	1/15	0.035 - 0.58	0.64	NA	0.22	C	1.8	IDEM	Yes	ASL
60-57-1	DIELDRIN	0.0074		0.0074		mg/kg	05SB050608	1/15	0.0035 - 0.058	0.0074	NA	0.03	C	0.27	IDEM	No	BSL
72-43-5	METHOXYCHLOR	0.028	J	0.049	J	mg/kg	05SB070608	2/15	0.018 - 0.3	0.049	NA	31	N	910	IDEM	No	BSL
HERBICIDES																	
93-76-5	2,4,5-T	0.01	J	0.016	J	mg/kg	05SB080002	2/15	0.0029 - 0.047	0.016	NA	61	N	NA	IDEM	No	BSL
87-86-5	PENTACHLOROPHENOL	0.0015	J	0.012		mg/kg	05SB050002	10/14	0.0008 - 0.012	0.012	NA	3	C	20	IDEM	No	BSL

TABLE 5-14

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE/SUBSURFACE SOIL
SWMU 5, OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Surface/Subsurface Soil

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Site Above Background ? (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
DIOXINS/FURANS																	
3268-87-9	1,2,3,4,6,7,8,9-OCDD	0.0000581	J	0.00505	J	mg/kg	05SB080002	15/15	---	0.00505	NA	0.039	C	NA	IDEM	No	BSL
39001-02-0	1,2,3,4,6,7,8,9-OCDF	0.00000026	J	0.000477	J	mg/kg	05SB070608	14/15	0.0000004 - 0.0000004	0.000477	NA	0.039	C	NA	IDEM	No	BSL
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.0000072		0.000736	J	mg/kg	05SB030507	13/15	0.0000057 - 0.000009	0.000736	NA	0.00039	C	NA	IDEM	Yes	ASL
67562-39-4	1,2,3,4,6,7,8-HPCDF	0.0000121		0.00159	J	mg/kg	05SB030507	12/15	0.00000054 - 0.0000024	0.00159	NA	0.00039	C	NA	IDEM	Yes	ASL
55673-89-7	1,2,3,4,7,8,9-HPCDF	0.00000049	J	0.0000686		mg/kg	05SB070608	9/15	0.0000001 - 0.0000077	0.0000686	NA	0.00039	C	NA	IDEM	No	BSL
39227-28-6	1,2,3,4,7,8-HXCDD	0.00000026	J	0.0000849	J	mg/kg	05SB030507	8/15	0.00000013 - 0.000005	0.0000849	NA	0.000039	C	NA	IDEM	Yes	ASL
70648-26-9	1,2,3,4,7,8-HXCDF	0.0000037		0.00101	J	mg/kg	05SB030507	12/15	0.00000055 - 0.0000011	0.00101	NA	0.000039	C	NA	IDEM	Yes	ASL
57653-85-7	1,2,3,6,7,8-HXCDD	0.0000019	J	0.000192	J	mg/kg	05SB030507	12/15	0.00000014 - 0.00000062	0.000192	NA	0.000039	C	NA	IDEM	Yes	ASL
57117-44-9	1,2,3,6,7,8-HXCDF	0.00000028	J	0.000447	J	mg/kg	05SB030507	14/15	0.0000024 - 0.0000024	0.000447	NA	0.000039	C	NA	IDEM	Yes	ASL
19408-74-3	1,2,3,7,8,9-HXCDD	0.00000036	J	0.0000934	J	mg/kg	05SB070608	12/15	0.00000065 - 0.000022	0.0000934	NA	0.000039	C	NA	IDEM	Yes	ASL
72918-21-9	1,2,3,7,8,9-HXCDF	0.00000041	J	0.0000098	J	mg/kg	05SB060002	5/15	0.0000001 - 0.0000038	0.0000098	NA	0.000039	C	NA	IDEM	No	BSL
40321-76-4	1,2,3,7,8-PECDD	0.0000014	J	0.0000977	J	mg/kg	05SB030507	9/15	0.0000001 - 0.0000024	0.0000977	NA	0.0000039	C	NA	IDEM	Yes	ASL
57117-41-6	1,2,3,7,8-PECDF	0.00000032	J	0.000378	J	mg/kg	05SB030507	8/15	0.0000002 - 0.0000304	0.000378	NA	0.000078	C	NA	IDEM	Yes	ASL
60851-34-5	2,3,4,6,7,8-HXCDF	0.0000024	J	0.000191		mg/kg	05SB070608	11/15	0.00000014 - 0.0000026	0.000191	NA	0.000039	C	NA	IDEM	Yes	ASL
57117-31-4	2,3,4,7,8-PECDF	0.00000022	J	0.000189		mg/kg	05SB070608	13/15	0.0000002 - 0.0000017	0.000189	NA	0.0000078	C	NA	IDEM	Yes	ASL
1746-01-6	2,3,7,8-TCDD	0.00000049	J	0.0000335	J	mg/kg	05SB030507	8/15	0.00000006 - 0.0000013	0.0000335	NA	0.0000039	C	NA	IDEM	Yes	ASL
51207-31-9	2,3,7,8-TCDF	0.00000036	J	0.000453	J	mg/kg	05SB030507	13/15	0.0000002 - 0.0000031	0.000453	NA	0.000039	C	NA	IDEM	Yes	ASL
1746-01-6	2,3,7,8-TCDD TEQ	0.00000068		0.000464		mg/kg	05SB030507	15/15	-	0.000464	NA	0.0000039	C	NA	IDEM	Yes	ASL
37871-00-4	TOTAL HPCDD	0.0000151		0.00169	J	mg/kg	05SB030507	13/15	0.0000102 - 0.0000174	0.00169	NA	NA	C	NA	IDEM	No	NTX
38998-75-3	TOTAL HPCDF	0.0000219	J	0.00185	J	mg/kg	05SB030507	11/15	0.00000054 - 0.000106	0.00185	NA	NA	C	NA	IDEM	No	NTX
34465-46-8	TOTAL HXCDD	0.000005	J	0.00304	J	mg/kg	05SB030507	8/15	0.00000065 - 0.0000686	0.00304	NA	NA	C	NA	IDEM	No	NTX
55684-94-1	TOTAL HXCDF	0.0000254	J	0.00394	J	mg/kg	05SB030507	4/15	0.0000015 - 0.00201	0.00394	NA	NA	C	NA	IDEM	No	NTX
36088-22-9	TOTAL PECDD	0.00228	J	0.00228	J	mg/kg	05SB030507	1/15	0.0000003 - 0.00084	0.00228	NA	NA	C	NA	IDEM	No	NTX
30402-15-4	TOTAL PECDF	0.0000013	J	0.00574	J	mg/kg	05SB030507	3/15	0.0000027 - 0.00291	0.00574	NA	NA	C	NA	IDEM	No	NTX
41903-57-5	TOTAL TCDD	0.000133		0.000404		mg/kg	05SB060002	2/15	0.00000028 - 0.00176	0.000404	NA	NA	C	NA	IDEM	No	NTX
55722-27-5	TOTAL TCDF	0.0000524		0.03684	J	mg/kg	05SB030507	2/15	0.0000002 - 0.00304	0.03684	NA	NA	C	NA	IDEM	No	NTX
INORGANICS																	
7429-90-5	ALUMINUM	3580	J	15700	J	mg/kg	05SB040204	15/15	---	15700	No	7600	N	NA	IDEM	No	BKG
7440-36-0	ANTIMONY	0.9	J	301	J	mg/kg	05SB060002	13/15	0.84 - 0.9	301	Yes	3.1	N	140	IDEM	Yes	ASL
7440-38-2	ARSENIC	2.9	J	26.8	J	mg/kg	05SB060002	15/15	---	26.8	Yes	0.39	C	3.9	IDEM	Yes	ASL
7440-39-3	BARIUM	30.3		2020		mg/kg	05SB060002	15/15	---	2020	Yes	540	N	23000	IDEM	Yes	ASL
7440-43-9	CADMIUM	1.6	J	31.1	J	mg/kg	05SB060002	11/15	0.8 - 0.9	31.1	Yes	3.7	N	12	IDEM	Yes	ASL
7440-70-2	CALCIUM	685	J	241000	J	mg/kg	05SB050002	12/15	399 - 449	241000	Yes	NA		NA	IDEM	No	NUT
7440-47-3	CHROMIUM	5.7	J	112	J	mg/kg	05SB060002	15/15	---	112	Yes	30(10)	C	430(10)	IDEM	Yes	ASL
7440-48-4	COBALT	5.5		35.8		mg/kg	05SB060002	15/15	---	35.8	No	140	N	NA	IDEM	No	BSL,BKG
7440-50-8	COPPER	8.1	J	6370	J	mg/kg	05SB060608	15/15	---	6370	Yes	310	N	13000	IDEM	Yes	ASL
7439-89-6	IRON	11400	J	105000	J	mg/kg	05SB060002	15/15	---	105000	Yes	2300	N	NA	IDEM	Yes	ASL
7439-92-1	LEAD	8.2	J	16900	J	mg/kg	05SB060002	15/15	---	16900	Yes	400(11)	N	400	IDEM	Yes	ASL
7439-95-4	MAGNESIUM	496	J	4900	J	mg/kg	05SB050002	15/15	---	4900	No	NA		NA	IDEM	No	NUT
7439-96-5	MANGANESE	157	J	1170		mg/kg	05SB040002	15/15	---	1170	Yes	180	N	NA	IDEM	Yes	ASL
7439-97-6	MERCURY	0.04	J	93.2		mg/kg	05SB050608	13/15	0.04 - 0.04	93.2	Yes	2.3(12)	N	55	IDEM	Yes	ASL
7440-02-0	NICKEL	8.8		62.6		mg/kg	05SB060002	15/15	---	62.6	Yes	160	N	6900	IDEM	No	BSL
7440-09-7	POTASSIUM	464	J	1520	J	mg/kg	05SB060608	10/15	399 - 462	1520	No	NA		NA	IDEM	No	NUT, BKG
7440-22-4	SILVER	1.7	J	16.1	J	mg/kg	05SB030507	7/15	0.8 - 0.92	16.1	Yes	39	N	1700	IDEM	No	BSL
7440-23-5	SODIUM	500		1300	J	mg/kg	05SB030507	3/15	399 - 478	1300	Yes	NA		NA	IDEM	No	NUT, BKG
7440-31-5	TIN	13.2	J	849		mg/kg	05SB080002	12/15	4.1 - 4.5	849	Yes	4700	N	NA	IDEM	No	BSL
7440-62-2	VANADIUM	9.6		22.9		mg/kg	05SB040002	15/15	---	22.9	No	55	N	NA	IDEM	No	BSL,BKG
7440-66-6	ZINC	25.9		5110	J	mg/kg	05SB060002	15/15	—	5110	Yes	2300	N	100000	IDEM	Yes	ASL

TABLE 5-14

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE/SUBSURFACE SOIL
SWMU 5, OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Surface/Subsurface Soil

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Site Above Background ? (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
MISCELLANEOUS PARAMETERS																	
	CATION EXCHANGE CAPACITY	3.2		13	J	meq/100 g	05SB040002	4/4	---	13	NA	NA		NA	IDEM	No	NTX
	pH	5.1	J	7.6	J	S.U.	05SB030507	4/4	---	7.6	NA	NA		NA	IDEM	No	NTX
	TOTAL ORGANIC CARBON	1500		72000		mg/kg	05SB030507	4/4	---	72000	NA	NA		NA	IDEM	No	NTX

Footnotes:
1 Only the original of duplicate sample was used for COPC selection. The duplicate was used for quality control purposes only.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to Base-wide background data presented in the Basewide Background Soil Investigation Report (TINUS, Inc., January 2001) by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a COPC.
5 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target Hazard Quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (U.S. EPA, Region 9, October 2002).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Naphthalene is used as a surrogate for 2-methylnaphthalene.
8 Acenaphthene is used as a surrogate for acenaphthylene.
9 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
10 Hexavalent chromium.
11 OSWER soil screening level for residential land use (U.S. EPA, July 1994).
12 Value is for mercuric chloride (U.S. EPA, Region 3, October 2001).

Associated Samples:

05SB010002	05SB050002	05SB010810	05SB050608
05SB010102	05SB050102	05SB020406	05SB060608
05SB020002	05SB060002	05SB030507	05SB070608
05SB020102	05SB060102	05SB040204	
05SB030002	05SB070002		
05SB030102	05SB070102		
05SB040002	05SB080002		
05SB040102	05SB080102		

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/to be considered.
C = Carcinogen.
COPC = Chemical of potential concern.
IDEM = Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential levels for direct contact with soil (IDEM, July 2001).
J = Estimated value.
N = Nocarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level/ARAR/TBC.

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level/ARAR/TBC.
NTX = No toxicity information.
NUT = Essential nutrient.

ASL = Above screening level.
BSL = Below screening level.
CAS = Chemical abstract services.

Shaded cells indicate that the specified criteriono r background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 5-17

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE WATER
SWMU 5 - OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
VOLATILE ORGANICS																	
75-35-4	1,1-DICHLOROETHENE	2		2		µg/L	05SW0201	1/4	1	2	NA	34	N	7 7	FED-MCL IDEM	No	BSL
156-59-2	CIS-1,2-DICHLOROETHENE	1		290		µg/L	05SW0201	3/4	1	290	NA	6.1	N	70 70	FED-MCL IDEM	Yes	ASL
156-60-5	TRANS-1,2-DICHLOROETHENE	3		9		µg/L	05SW0201	2/4	1	9	NA	12	N	100 100	FED-MCL IDEM	No	BSL
79-01-6	TRICHLOROETHENE	48		120		µg/L	05SW0201	2/4	1	120	NA	0.028	C	5 5	FED-MCL IDEM	Yes	ASL
75-01-4	VINYL CHLORIDE	18		85		µg/L	05SW0201	2/4	1	85	NA	0.02	C	2 2	FED-MCL IDEM	Yes	ASL
SEMIVOLATILE ORGANICS																	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2		2		µg/L	05SW0201	1/4	2	2	NA	4.8	C	6 6	FED-MCL IDEM	No	BSL
DIOXINS / FURANS																	
36088-22-9	TOTAL PECDD	9.4		9.4		pg/L	05SW0401	1/4	6.7 - 7.2	9.4	NA	NA	C	NA NA	FED-MCL IDEM	No	BSL
INORGANICS																	
7429-90-5	ALUMINUM	204	J	204	J	µg/L	05SW0401	1/4	200	204	ND	3600	N	50 to 200(7) NA	FED-AL IDEM	Yes	ASL
7440-36-0	ANTIMONY	1.3		1.3		µg/L	05SW0501	1/4	1	1.3	ND	1.5	N	6 NA	FED-MCL IDEM	No	NUT
7440-38-2	ARSENIC	0.34		0.64		µg/L	05SW0401	4/4	---	0.64	0.55	0.045	C	50 50	FED-MCL IDEM	Yes	ASL
7440-39-3	BARIUM	68.3	J	184	J	µg/L	05SW0501	4/4	---	184	67.7	260	N	2000 2000	FED-MCL IDEM	No	BSL
7440-70-2	CALCIUM	7570		72600		µg/L	05SW0501	4/4	---	72600	29200	NA		NA NA	FED-MCL IDEM	No	NUT
7440-50-8	COPPER	2.4		2.7		µg/L	05SW0201	2/4	2	2.7	ND	150	N	1000(7) 1300	FED-MCL IDEM	No	BSL
7439-89-6	IRON	337	J	1520	J	µg/L	05SW0401	4/4	---	1520	284	1100	N	300(7) NA	FED-MCL IDEM	Yes	ASL
7439-95-4	MAGNESIUM	9880	J	11900	J	µg/L	05SW0301	3/4	5000	11900	6490	NA		NA NA	FED-MCL IDEM	No	NUT
7439-96-5	MANGANESE	105		315		µg/L	05SW0301	3/4	15	315	41.4	88	N	50(7) NA	FED-MCL IDEM	Yes	ASL
7440-23-5	SODIUM	9330		22800		µg/L	05SW0401	4/4	---	22800	30700	NA		NA NA	FED-MCL IDEM	No	NUT, BKG
7440-66-6	ZINC	19.5		19.9		µg/L	05SW0301	2/4	10	19.9	ND	1100	N	5000(7) 11000	FED-MCL IDEM	No	BSL
FILTERED METALS																	
7440-36-0	ANTIMONY, FILTERED	1.3		1.3		µg/L	05SW0501-F	1/4	1	1.3	ND	1.5	N	6 NA	FED-MCL IDEM	No	BSL
7440-38-2	ARSENIC, FILTERED	0.29		0.56		µg/L	05SW0401-F	4/4	---	0.56	0.51	0.045	C	50 50	FED-MCL IDEM	Yes	ASL
7440-39-3	BARIUM, FILTERED	66.1	J	174	J	µg/L	05SW0501-F	4/4	---	174	68	260	N	2000 2000	FED-MCL IDEM	No	BSL
7440-70-2	CALCIUM, FILTERED	7920		74900		µg/L	05SW0501-F	4/4	---	74900	29500	NA		NA NA	FED-MCL IDEM	No	NUT
7440-50-8	COPPER, FILTERED	2.1		2.1		µg/L	05SW0501-F	1/4	2	2.1	ND	150	N	1000(7) 1300	FED-MCL IDEM	No	BSL
7439-89-6	IRON, FILTERED	209	J	594	J	µg/L	05SW0401-F	4/4	---	594	103	1100	N	300(7) NA	FED-MCL IDEM	Yes	ASL
7439-95-4	MAGNESIUM, FILTERED	5140	J	12500	J	µg/L	05SW0301-F	4/4	---	12500	6960	NA		NA NA	FED-MCL IDEM	No	NUT

TABLE 5-17

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE WATER
SWMU 5 - OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-96-5	MANGANESE, FILTERED	85.8		304		µg/L	05SW0301-F	3/4	15	304	33.9	88 N	50(7) NA	FED-MCL IDEM	Yes	ASL
7440-23-5	SODIUM, FILTERED	9150		22800		µg/L	05SW0401-F	4/4	---	22800	27900	NA	NA NA	FED-MCL IDEM	No	NUT, BKG
7440-66-6	ZINC, FILTERED	16.9		20		µg/L	05SW0301-F	2/4	10	20	ND	1100 N	5000(7) 11000	FED-MCL IDEM	No	BSL
MISCELLANEOUS PARAMETERS																
	HARDNESS	38000		230000		µg/L	05SW0501	4/4	—	230000	99000	NA	NA NA	FED-MCL IDEM	No	NTX
	TOTAL SUSPENDED SOLIDS	2000		52000		µg/L	05SW0201	3/4	2000	52000	5000	NA	NA NA	FED-MCL IDEM	No	NTX

Footnotes:

1 Only the original of duplicate sample was used for COPC selection. The duplicate was used for quality control purposes only.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, maximum surface water concentrations were compared to concentrations in upgradient surface water sample 05SW0101. If the concentration in the site surface water concentration was less than the upgradient concentration, that metal was not selcted as a COPC.
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target Hazard Quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region 9, October 2002).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Secondary MCL, based on aesthetic water quality (i.e., color, odor, taste, etc.).

Associated Samples:

05SW0201	05SW0201-F
05SW0301	05SW0301-F
05SW0401	05SW0401-F
05SW0501	05SW0501-F

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/to be considered.
C = Carcinogen.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not analyzed / not applicable.
ND = Not detected.
FED-AL = Federal action level (U.S. EPA, 2000).
FED-MCL = Federal Maximum Contaminant Level (U.S. EPA, 2000).
IDEM = Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential closure levels for ground water (IDEM, July 2001).

Rationale Codes:

For Selection as a COPC:
ASL = Above COPC screening level/ARAR/TBC.
For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level/ARAR/TBC.
NTX = No toxicity information.
NUT = Essential nutrient.

CAS = Chemical abstract services.

TABLE 5-18

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SEDIMENT
SWMU 5, OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Sediment
Exposure Point: Sediment

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
VOLATILE ORGANICS																	
156-59-2	CIS-1,2-DICHLOROETHENE	1		1		mg/kg	05SD020006	1/4	0.004 -0.008	1	NA	4.3	N	110	IDEM	No	BSL
75-09-2	METHYLENE CHLORIDE	0.005	J	0.008	J	mg/kg	05SD040006	4/4	---	0.008	NA	9.1	C	120	IDEM	No	BSL
79-01-6	TRICHLOROETHENE	0.7		0.7		mg/kg	05SD020006	1/4	0.004 -0.008	0.7	NA	0.053	C	45	IDEM	Yes	ASL
SEMIVOLATILE ORGANICS																	
91-57-6	2-METHYLNAPHTHALENE	0.024		0.024		mg/kg	05SD050006	1/4	0.010 - 0.014	0.024	NA	5.6(7)	N	3200(7)	IDEM	No	BSL
56-55-3	BENZO(A)ANTHRACENE	0.019		0.026		mg/kg	05SD020006	3/4	0.014	0.026	NA	0.62	C	5	IDEM	No	BSL
50-32-8	BENZO(A)PYRENE	0.022		0.03		mg/kg	05SD050006	3/4	0.014	0.03	NA	0.062	C	0.5	IDEM	No	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.025		0.045		mg/kg	05SD050006	3/4	0.014	0.045	NA	0.62	C	5	IDEM	No	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.014		0.045		mg/kg	05SD050006	3/4	0.014	0.045	NA	230(8)	N	5500(8)	IDEM	No	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.018		0.033		mg/kg	05SD050006	3/4	0.014	0.033	NA	6.2	C	50	IDEM	No	BSL
218-01-9	CHRYSENE	0.025		0.039		mg/kg	05SD050006	3/4	0.014	0.039	NA	62	C	500	IDEM	No	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.016		0.016		mg/kg	05SD050006	1/4	0.010 - 0.014	0.016	NA	0.062	C	0.5	IDEM	No	BSL
206-44-0	FLUORANTHENE	0.016		0.055		mg/kg	05SD020006	4/4	---	0.055	NA	230	N	6300	IDEM	No	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.012		0.027		mg/kg	05SD050006	3/4	0.014	0.027	NA	0.62	C	5	IDEM	No	BSL
91-20-3	NAPHTHALENE	0.016		0.016		mg/kg	05SD050006	1/4	0.010 - 0.014	0.016	NA	5.6	N	3200	IDEM	No	BSL
85-01-8	PHENANTHRENE	0.022		0.031		mg/kg	05SD020006	3/4	0.014	0.031	NA	230(8)	N	5500(8)	IDEM	No	BSL
129-00-0	PYRENE	0.034		0.047		mg/kg	05SD020006	3/4	0.014	0.047	NA	230	N	5500	IDEM	No	BSL
PESTICIDES/PCBs																	
11096-82-5	AROCLOR-1260	0.17		0.17		mg/kg	05SD050006	1/4	0.049 -0.067	0.17	NA	0.22	C	1.8	IDEM	No	BSL
HERBICIDES																	
70-30-4	HEXACHLOROPHENE	0.0031	J	0.0031	J	mg/kg	05SD040006	1/4	0.00096 -0.001	0.0031	NA	1.8	N	NA	IDEM	No	BSL
87-86-5	PENTACHLOROPHENOL	0.006	J	0.006	J	mg/kg	05SD050006	1/4	1 - 1.4	0.006	NA	3	C	20	IDEM	No	BSL
DIOXINS/FURANS																	
3268-87-9	1,2,3,4,6,7,8,9-OCDD	0.00116	J	0.00611	J	mg/kg	05SD020006	4/4	---	0.00611	NA	0.039	C	NA	IDEM	No	BSL
39001-02-0	1,2,3,4,6,7,8,9-OCDF	0.0000022	J	0.000223	J	mg/kg	05SD020006	4/4	---	0.000223	NA	0.039	C	NA	IDEM	No	BSL
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.0000355	J	0.000203	J	mg/kg	05SD020006	4/4	---	0.000203	NA	0.00039	C	NA	IDEM	No	BSL
67562-39-4	1,2,3,4,6,7,8-HPCDF	0.0000045		0.0000861	J	mg/kg	05SD020006	4/4	---	0.0000861	NA	0.00039	C	NA	IDEM	No	BSL
55673-89-7	1,2,3,4,7,8,9-HPCDF	0.0000016	J	0.0000065	J	mg/kg	05SD020006	3/4	0.00000032	0.0000065	NA	0.00039	C	NA	IDEM	No	BSL
39227-28-6	1,2,3,4,7,8-HXCDD	0.0000005	J	0.0000027	J	mg/kg	05SD020006	4/4	---	0.0000027	NA	0.000039	C	NA	IDEM	No	BSL
70648-26-9	1,2,3,4,7,8-HXCDF	0.0000032		0.000021	J	mg/kg	05SD020006	4/4	---	0.000021	NA	0.000039	C	NA	IDEM	No	BSL
57653-85-7	1,2,3,6,7,8-HXCDD	0.00000092	J	0.0000072		mg/kg	05SD020006	4/4	---	0.0000072	NA	0.000039	C	NA	IDEM	No	BSL
57117-44-9	1,2,3,6,7,8-HXCDF	0.0000014	J	0.0000083		mg/kg	05SD020006	4/4	---	0.0000083	NA	0.000039	C	NA	IDEM	No	BSL
19408-74-3	1,2,3,7,8,9-HXCDD	0.0000015	J	0.0000077		mg/kg	05SD020006	4/4	---	0.0000077	NA	0.000039	C	NA	IDEM	No	BSL
72918-21-9	1,2,3,7,8,9-HXCDF	0.00000056	J	0.0000014	J	mg/kg	05SD020006	3/4	0.0000001	0.0000014	NA	0.000039	C	NA	IDEM	No	BSL
40321-76-4	1,2,3,7,8-PECDD	0.00000067	J	0.0000022	J	mg/kg	05SD020006	3/4	0.00000029	0.0000022	NA	0.0000039	C	NA	IDEM	No	BSL
57117-41-6	1,2,3,7,8-PECDF	0.0000016	J	0.0000059	J	mg/kg	05SD020006	3/4	0.000002	0.0000059	NA	0.000078	C	NA	IDEM	No	BSL
60851-34-5	2,3,4,6,7,8-HXCDF	0.000001	J	0.0000107	J	mg/kg	05SD020006	4/4	---	0.0000107	NA	0.000039	C	NA	IDEM	No	BSL
57117-31-4	2,3,4,7,8-PECDF	0.0000013	J	0.0000093	J	mg/kg	05SD020006	4/4	---	0.0000093	NA	0.0000078	C	NA	IDEM	Yes	ASL
1746-01-6	2,3,7,8-TCDD	0.00000026	J	0.0000037		mg/kg	05SD050006	4/4	---	0.0000037	NA	0.0000039	C	NA	IDEM	No	BSL
51207-31-9	2,3,7,8-TCDF	0.0000022	J	0.000007		mg/kg	05SD020006	4/4	---	0.000007	NA	0.000039	C	NA	IDEM	No	BSL
1746-01-6	2,3,7,8-TCDD TEQ	0.0000025		0.0000183		mg/kg	05SD020006	4/4	-	0.0000183	NA	0.0000039	C	NA	IDEM	Yes	ASL
37871-00-4	TOTAL HPCDD	0.000084	J	0.000422		mg/kg	05SD020006	4/4	---	0.000422	NA	NA	C	NA	IDEM	No	NTX
38998-75-3	TOTAL HPCDF	0.000107	J	0.000107	J	mg/kg	05SD050006	1/4	0.0000068 - 0.000259	0.000107	NA	NA	C	NA	IDEM	No	NTX

TABLE 5-18

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SEDIMENT
SWMU 5, OLD BURN PIT
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Sediment
Exposure Point: Sediment

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
INORGANICS																	
7429-90-5	ALUMINUM	3790	J	7660	J	mg/kg	05SD050006	4/4	---	7660	5610	7600	N	NA	IDEM	Yes	ASL
7440-36-0	ANTIMONY	1.6		5.8		mg/kg	05SD050006	3/4	1.6	5.8	ND	3.1	N	140	IDEM	Yes	ASL
7440-38-2	ARSENIC	1.9		5.3		mg/kg	05SD050006	4/4	---	5.3	6.1	0.39	C	3.9	IDEM	No	BKG
7440-39-3	BARIUM	76.6	J	148	J	mg/kg	05SD050006	4/4	---	148	54.5	540	N	23000	IDEM	No	BSL
7440-43-9	CADMIUM	2.5	J	2.5	J	mg/kg	05SD050006	1/4	1.1 - 1.6	2.5	ND	3.7	N	12	IDEM	No	BSL
7440-70-2	CALCIUM	1540	J	57300	J	mg/kg	05SD050006	4/4	---	57300	12400	NA		NA	IDEM	No	NUT
7440-47-3	CHROMIUM	6.9	J	17.4	J	mg/kg	05SD050006	4/4	---	17.4	13.4	30(9)	C	430(9)	IDEM	No	BSL
7440-48-4	COBALT	4		5.9		mg/kg	05SD020006	4/4	---	5.9	9.5	140	N	NA	IDEM	No	BSL,BKG
7440-50-8	COPPER	9.5	J	37.1	J	mg/kg	05SD050006	4/4	---	37.1	12	310	N	13000	IDEM	No	BSL
7439-89-6	IRON	5030	J	14000	J	mg/kg	05SD050006	4/4	---	14000	24400	2300	N	NA	IDEM	No	BKG
7439-92-1	LEAD	15.1		130		mg/kg	05SD050006	4/4	---	130	20.9	400(10)	N	400	IDEM	No	BSL
7439-95-4	MAGNESIUM	734		4010	J	mg/kg	05SD050006	3/4	788	4010	1540	NA		NA	IDEM	No	NUT
7439-96-5	MANGANESE	109	J	812	J	mg/kg	05SD030006	4/4	---	812	346	180	N	NA	IDEM	Yes	ASL
7439-97-6	MERCURY	0.04		0.09	J	mg/kg	05SD050006	2/4	0.05 - 0.08	0.09	0.03	2.3(11)	N	55	IDEM	No	BSL
7440-02-0	NICKEL	9.2		14.5		mg/kg	05SD030006	4/4	---	14.5	22.5	160	N	6900	IDEM	No	BSL,BKG
7440-09-7	POTASSIUM	648		648		mg/kg	05SD050006	1/4	544 - 788	648	464	NA		NA	IDEM	No	NUT
7440-62-2	VANADIUM	10.2		16.7		mg/kg	05SD050006	4/4	---	16.7	15.1	55	N	NA	IDEM	No	BSL
7440-66-6	ZINC	31.7		243		mg/kg	05SD050006	4/4	---	243	53.2	2300	N	100000	IDEM	No	BSL
MISCELLANEOUS PARAMETERS																	
	TOTAL ORGANIC CARBON	2600		11000		mg/kg	05SD040006	4/4	---	11000	NA	NA		NA	IDEM	No	NTX

Footnotes:
1 Only the original of duplicate sample was used for COPC selection. The duplicate was used for quality control purposes only.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, maximum sediment concentrations were compared to concentrations in upgradient sediment sample 05SD01. If the concentration in the site sediment concentration was less than the upgradient concentration, that metal was not selcted as a COPC.
5 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target Hazard Quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (U.S. EPA, Region 9, October 2002).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Naphthalene is used as a surrogate for 2-methylnaphthalene.
8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
9 Hexavalent chromium.
10 OSWER soil screening level for residential land use (U.S. EPA, July 1994)
11 Value is for mercuric chloride (U.S. EPA, Region 3, October 2001)

Associated Samples:

05SD020006	05SD040006
05SD030006	05SD050006

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/to be considered.
C = Carcinogen.
COPC = Chemical of potential concern.
IDEM = Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential levels for direct contact with soil (IDEM, July 2001).
J = Estimated value.
N = Nocarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level/ARAR/TBC.

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level/ARAR/TBC.
NTX = No toxicity information.
NUT = Essential nutrient.

ASL = Above screening level.
BSL = Below screening level.
CAS = Chemical abstract services.

TABLE 6-14

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE/SUBSURFACE SOIL
SWMU 9 - PESTICIDE CONTROL/R-150 TANK AREA
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Surface/Subsurface Soil

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Site Above Background ? (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
VOLATILE ORGANICS																	
75-09-2	METHYLENE CHLORIDE	0.003	J	0.006	J	mg/kg	09SB100204, 09SB090102, 09SB080102	11/22	0.003 - 0.004	0.006	NA	9.1	C	120	IDEM	No	BSL
127-18-4	TETRACHLOROETHENE	0.004		0.004		mg/kg	09SB070709	1/22	0.003 - 0.004	0.004	NA	1.5	C	48	IDEM	No	BSL
79-01-6	TRICHLOROETHENE	0.018		0.018		mg/kg	09SB070709	1/22	0.003 - 0.004	0.018	NA	0.053	C	45	IDEM	No	BSL
SEMIVOLATILE ORGANICS																	
91-57-6	2-METHYLNAPHTHALENE	0.04		1.8		mg/kg	09SB090002	2/22	0.008 - 0.009	1.8	NA	5.6(7)	N	3200(7)	IDEM	No	BSL
83-32-9	ACENAPHTHENE	0.02		0.02		mg/kg	09SB030002	1/22	0.008 - 0.009	0.02	NA	370	N	9500	IDEM	No	BSL
208-96-8	ACENAPHTHYLENE	0.018		0.018		mg/kg	09SB030002	1/22	0.008 - 0.009	0.018	NA	370(8)	N	9500(8)	IDEM	No	BSL
120-12-7	ANTHRACENE	0.052		0.052		mg/kg	09SB030002	1/22	0.008 - 0.009	0.052	NA	2200	N	47000	IDEM	No	BSL
56-55-3	BENZO(A)ANTHRACENE	0.018		0.15		mg/kg	09SB030002	4/22	0.008 - 0.009	0.15	NA	0.62	C	5	IDEM	No	BSL
50-32-8	BENZO(A)PYRENE	0.022	J	0.13		mg/kg	09SB030002	4/22	0.008 - 0.009	0.13	NA	0.062	C	0.5	IDEM	Yes	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.009		0.12		mg/kg	09SB030002	5/22	0.008 - 0.009	0.12	NA	0.62	C	5	IDEM	No	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.009		0.057		mg/kg	09SB030002	5/22	0.008 - 0.009	0.057	NA	230(9)	N	5500(9)	IDEM	No	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.018	J	0.11	J	mg/kg	09SB030002	4/22	0.008 - 0.009	0.11	NA	6.2	C	50	IDEM	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.66		0.66		mg/kg	09SB070709	1/22	0.37 - 0.44	0.66	NA	35	C	300	IDEM	No	BSL
218-01-9	CHRYSENE	0.01		0.14		mg/kg	09SB030002	5/22	0.008 - 0.009	0.14	NA	62	C	500	IDEM	No	BSL
84-74-2	DI-N-BUTYL PHTHALATE	1.2		1.2		mg/kg	09SB020002	1/22	0.37 - 0.44	1.2	NA	610	N	18000	IDEM	No	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.01	J	0.029		mg/kg	09SB030002	3/22	0.008 - 0.009	0.029	NA	0.062	C	0.5	IDEM	No	BSL
206-44-0	FLUORANTHENE	0.008		0.3	J	mg/kg	09SB030002	5/22	0.008 - 0.009	0.3	NA	230	N	6300	IDEM	No	BSL
86-73-7	FLUORENE	0.029		0.029		mg/kg	09SB030002	1/22	0.008 - 0.009	0.029	NA	260	N	6300	IDEM	No	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.014	J	0.058		mg/kg	09SB030002	4/22	0.008 - 0.009	0.058	NA	0.62	C	5	IDEM	No	BSL
91-20-3	NAPHTHALENE	0.03		0.93		mg/kg	09SB090002	2/22	0.008 - 0.009	0.93	NA	5.6	N	3200	IDEM	No	BSL
85-01-8	PHENANTHRENE	0.013		0.63		mg/kg	09SB090002	4/22	0.008 - 0.009	0.63	NA	230(9)	N	5500(9)	IDEM	No	BSL
129-00-0	PYRENE	0.013		0.23	J	mg/kg	09SB030002	5/22	0.008 - 0.009	0.23	NA	230	N	5500	IDEM	No	BSL
PESTICIDES/PCBs																	
50-29-3	4,4'-DDT	0.0047		0.0047		mg/kg	09SB090002	1/22	0.0037 - 0.0043	0.0047	NA	1.7	C	20	IDEM	No	BSL
11097-69-1	AROCLOR-1254	0.46		0.46		mg/kg	09SB070709	1/22	0.037 - 0.043	0.46	NA	0.22	C	1.8	IDEM	Yes	ASL
72-43-5	METHOXYCHLOR	0.025	J	0.025	J	mg/kg	09SB090002	1/22	0.019 - 0.022	0.025	NA	31	N	910	IDEM	No	BSL
HERBICIDES																	
94-75-7	2,4-D	0.02	J	0.02	J	mg/kg	09SB040002	1/16	0.003 - 0.0033	0.02	NA	69	N	NA	IDEM	No	BSL
88-85-7	DINOSEB	0.014	J	0.014	J	mg/kg	09SB080002	1/19	0.003 - 0.0035	0.014	NA	6.1	N	NA	IDEM	No	BSL
87-86-5	PENTACHLOROPHENOL	0.0012	J	0.0035		mg/kg	09SB020002	4/20	0.00075 - 0.00088	0.0035	NA	3	C	20	IDEM	No	BSL
INORGANICS																	
7429-90-5	ALUMINUM	3280		12900		mg/kg	09SB080002	22/22	---	12900	Yes	7600	N	NA	IDEM	Yes	ASL
7440-36-0	ANTIMONY	0.97		3.1	J	mg/kg	09SB060002	4/22	0.83 - 1	3.1	Yes	3.1	N	140	IDEM	No	BSL
7440-38-2	ARSENIC	0.26	J	9.6	J	mg/kg	09SB090002	22/22	---	9.6	No	0.39	C	3.9	IDEM	No	BKG
7440-39-3	BARIUM	15.8	J	108	J	mg/kg	09SB030406	22/22	---	108	Yes	540	N	23000	IDEM	No	BSL
7440-41-7	BERYLLIUM	1	J	1	J	mg/kg	09SB020608, 09SB070709	2/22	0.82 - 1	1	Yes	15	N	680	IDEM	No	BSL
7440-43-9	CADMIUM	0.96	J	0.96	J	mg/kg	09SB100002	1/22	0.82 - 1	0.96	No	3.7	N	12	IDEM	No	BSL,BKG
7440-70-2	CALCIUM	480	J	175000	J	mg/kg	09SB110002	18/22	409 - 472	175000	Yes	NA		NA	IDEM	No	NUT
7440-47-3	CHROMIUM	3	J	13.9		mg/kg	09SB030406	22/22	---	13.9	Yes	30(10)	C	430(10)	IDEM	No	BSL
7440-48-4	COBALT	1.4		37		mg/kg	09SB070709	22/22	---	37	Yes	140	N	NA	IDEM	No	BSL
7440-50-8	COPPER	2.3	J	20.1	J	mg/kg	09SB100002	22/22	---	20.1	Yes	310	N	13000	IDEM	No	BSL
7439-89-6	IRON	2610		31900		mg/kg	09SB020608	22/22	---	31900	Yes	2300	N	NA	IDEM	Yes	ASL
7439-92-1	LEAD	6.7	J	34.9	J	mg/kg	09SB100002	22/22	---	34.9	Yes	400(11)	N	400	IDEM	No	BSL
7439-95-4	MAGNESIUM	731	J	32500	J	mg/kg	09SB110002	21/22	409 - 409	32500	Yes	NA		NA	IDEM	No	NUT
7439-96-5	MANGANESE	4.4	J	1060	J	mg/kg	09SB040002	22/22	---	1060	No	180	N	NA	IDEM	No	BKG
7439-97-6	MERCURY	0.03		0.06		mg/kg	09SB090002, 09SB040002	7/22	0.04 - 0.05	0.06	Yes	2.3(12)	N	55	IDEM	No	BSL
7440-02-0	NICKEL	2.7		24.3	J	mg/kg	09SB020608	22/22	---	24.3	No	160	N	6900	IDEM	No	BSL,BKG

TABLE 6-14

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE/SUBSURFACE SOIL
SWMU 9 - PESTICIDE CONTROL/R-150 TANK AREA
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Surface/Subsurface Soil

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects (2)	Concentration Used for Screening (3)	Site Above Background ? (4)	Risk-Based COPC Screening Level (5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
7440-09-7	POTASSIUM	464	J	630	J	mg/kg	09SB060810	7/22	409 - 472	630	No	NA		NA	IDEM	No	NUT, BKG
7440-62-2	VANADIUM	2.4	J	29.3	J	mg/kg	09SB090002	22/22	---	29.3	No	55	N	NA	IDEM	No	BSL,BKG
7440-66-6	ZINC	9.9	J	120	J	mg/kg	09SB060002	22/22	---	120	Yes	2300	N	100000	IDEM	No	BSL
MISCELLANEOUS PARAMETERS																	
	CATION EXCHANGE CAPACITY	7.4	J	13	J	meq/100 g	09SB080406	8/8	---	13	NA	NA		NA	IDEM	No	NTX
	pH	4.3	J	8	J	S.U.	09SB070002	8/8	---	8	NA	NA		NA	IDEM	No	NTX
	TOTAL ORGANIC CARBON	1200		8500		mg/kg	09SB040002	7/8	1000 - 1000	8500	NA	NA		NA	IDEM	No	NTX

Footnotes:
1 Only the original of duplicate sample was used for COPC selection. The duplicate was used for quality control purposes only.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to base-wide background data presented in the Basewide Background Soil Investigation Report (TtNUS, Inc., January 2001) by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a COPC.
5 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target Hazard Quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (U.S. EPA, Region 9, October 2002).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Naphthalene is used as a surrogate for 2-methylnaphthalene.
8 Acenaphthene is used as a surrogate for acenaphthylene.
9 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
10 Hexavalent chromium.
11 OSWER soil screening level for residential land use (U.S. EPA, July 1994).
12 Value is for mercuric chloride (U.S. EPA, Region 3, October 2001).

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/to be considered.
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of Potential Concern
IDEM = Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential levels for direct contact with soil (IDEM, July 2001).
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
meq = milliequivalent.
S.U. = Standard unts.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level/ARAR/TBC.

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level/ARAR/TBC.
NTX = No toxicity information.
NUT = Essential nutrient.

Associated Samples:

09SB010002	09SB040002	09SB070002	09SB100002	09SB030406	09SB090810
09SB010102	09SB040102	09SB070102	09SB100102	09SB040406	09SB100204
09SB020002	09SB050002	09SB080002	09SB110002	09SB050406	09SB110406
09SB020102	09SB050102	09SB080102	09SB110102	09SB060810	
09SB030002	09SB060002	09SB090002	09SB010810	09SB070709	
09SB030102	09SB060102	09SB090102	09SB020608	09SB080406	

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 6-16

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUND WATER
SWMU 9 - PESTICIDE CONTROL/R-150 TANK AREA
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
VOLATILE ORGANICS																
71-55-6	1,1,1-TRICHLOROETHANE	26		26		µg/L	09GW0301	1/12	1 - 50	26	NA	320 N	200 200	FED-MCL IDEM	No	BSL
75-34-3	1,1-DICHLOROETHANE	14		14		µg/L	09GW0301	1/12	1 - 50	14	NA	81 C	NA 990	FED-MCL IDEM	No	BSL
75-35-4	1,1-DICHLOROETHENE	6.4		6.4		µg/L	09GW0301	1/12	0.5 - 25	6.4	NA	34 N	7 7	FED-MCL IDEM	No	BSL
156-59-2	CIS-1,2-DICHLOROETHENI	1.7		130		µg/L	09GW0401	3/12	1	130	NA	6.1 N	70 70	FED-MCL IDEM	Yes	ASL
75-09-2	METHYLENE CHLORIDE	58	J	58	J	µg/L	09GW0401	1/12	1	58	NA	4.3 C	5 5	FED-MCL IDEM	Yes	ASL
79-01-6	TRICHLOROETHENE	1		55		µg/L	09GW0301	2/12	1 - 50	55	NA	0.028 C	5 5	FED-MCL IDEM	Yes	ASL
PESTICIDE/PCBS																
60-57-1	DIELDRIN	0.03		0.03		µg/L	09GWT0101	1/12	0.019 - 0.022	0.03	NA	0.0042 N	NA 0.053	FED-MCL IDEM	Yes	ASL
HERBIDICES																
93-76-5	2,4,5-T	0.13		0.13		µg/L	09GWT0101	1/12	0.08	0.13	NA	36 C	NA NA	FED-MCL IDEM	No	BSL
93-72-1	2,4,5-TP (SILVEX)	0.17	J	0.17	J	µg/L	09GW1201	1/12	0.08	0.17	NA	29 N	50 NA	FED-MCL IDEM	No	BSL
INORGANICS																
7429-90-5	ALUMINUM	364	J	1290	J	µg/L	09GWT0201	2/12	200	1290	ND	3600 N	NA	FED-MCL IDEM	Yes	ASL
7440-38-2	ARSENIC	0.29		4.3		µg/L	09GW0201	12/12	---	4.3	ND	0.045 N	50 50	FED-MCL IDEM	Yes	ASL
7440-39-3	BARIUM	6.6		323		µg/L	09GW0201	12/12	---	323	19.3	260	2000 2000	FED-MCL IDEM	Yes	ASL
7440-41-7	BERYLLIUM	1		4.4		µg/L	09GWT0201	2/12	1	4.4	ND	7.3 N	4 4	FED-AL IDEM	Yes	ASL
7440-70-2	CALCIUM	7950		118000		µg/L	09GW0701	12/12	---	118000	59300	NA N	NA NA	FED-MCL IDEM	No	NUT
7440-48-4	COBALT	11.6		109		µg/L	09GWT0201	7/12	3	109	ND	73 N	NA NA	FED-MCL IDEM	Yes	ASL
7440-50-8	COPPER	2		8.4		µg/L	09GWT0201	4/12	2	8.4	ND	150 N	1000(7) 1300	FED-MCL IDEM	No	BSL
7439-89-6	IRON	136		37300		µg/L	09GW0201	11/12	100	37300	149	1100 N	300(7) NA	FED-MCL IDEM	Yes	ASL
7439-92-1	LEAD	1.1		1.1		µg/L	09GW0401	1/12	1	1.1	ND	15 N	15 NA	FED-AL IDEM	No	BSL
7439-95-4	MAGNESIUM	8360	J	81500	J	µg/L	09GW0701	12/12	---	81500	19800	NA	NA NA	FED-MCL IDEM	No	NUT
7439-96-5	MANGANESE	34.8		7920		µg/L	09GW0201	12/12	---	7920	15	88 N	50(7) NA	FED-MCL IDEM	Yes	ASL
7440-02-0	NICKEL	16.3		279		µg/L	09GWT0201	6/12	10	279	10	73 N	NA 730	FED-MCL IDEM	Yes	ASL
7782-49-2	SELENIUM	1.2		1.7		µg/L	09GWT0201	3/12	1	1.7	1.1	18 N	50 50	FED-MCL IDEM	No	BSL
7440-23-5	SODIUM	6730	J	134000	J	µg/L	09GWT0101	11/12	5000	134000	48900	NA	NA NA	FED-MCL IDEM	No	NUT
7440-62-2	VANADIUM	2.1		2.1		µg/L	09GWT0101	1/12	2	2.1	ND	26 N	NA NA	FED-MCL IDEM	No	BSL
7440-66-6	ZINC	12.1		186		µg/L	09GWT0201	6/12	10	166	13.2	1100 N	5000(7) 11000	FED-MCL IDEM	No	BSL

TABLE 6-16

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUND WATER
SWMU 9 - PESTICIDE CONTROL/R-150 TANK AREA
NSWC CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Upgradient Sample Concentration (4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

Footnotes:

1 Only the original of duplicate sample was used for COPC selection. The duplicate was used for quality control purposes only.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, maximum groundwater concentrations were compared to concentrations in upgradient groundwater sample 09GWTP0601. If the concentration in the site groundwater concentration was less than the upgradient concentration, that metal was not selected as a COPC.
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target Hazard Quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (U.S. EPA, Region 9, October 2002).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Secondary MCL, based on aesthetic water quality (i.e., color, odor, taste, etc.).

Associated Samples:

09GW0201	09GWT0101
09GW0301	09GWT0201
09GW0401	09GWT0301
09GW0701	09GWT0401
09GW1001	09GWT0501
09GW1201	09GWTP0501

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/to be considered.
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not analyzed / not applicable.
ND = Not detected.
FED-AL = Federal action level (U.S. EPA, 2000).
FED-MCL = Federal Maximum Contaminant Level (USEPA, 2000).
IDEM = Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential closure levels for ground water (IDEM, July 2001).

Rationale Codes:

For Selection as a COPC:
ASL = Above COPC screening level/ARAR/TBC.

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level/ARAR/TBC.
NTX = No toxicity information.
NUT = Essential nutrient.

Enclosure (2)

Change Pages with Instructions for Replacement

TABLE I

SECTION	REPLACEMENT PAGES	REPLACEMENT TABLES
4.0	4-5/4-6 4-7/4-8 4-9/4-10 4-15/4-16 4-17/4-18 4-19/4-20	NA
5.0	5-5/5-6 5-11/5-12 5-17/5-18 5-19/5-20 5-21/5-22	5-14 (including page 1 of Table 5-15), 5-17, 5-18
6.0	6-5/6-6 6-9/6-10 6-11/6-12 6-13/6-14 6-17/6-18 6-29/6-30 6-43/6-44	6-14, 6-16
7.0	7-9/7-10 7-11/7-12 7-13/7-14 7-17/7-18 7-19/7-20	NA