



DEPARTMENT OF THE NAVY

CRANE DIVISION  
NAVAL SURFACE WARFARE CENTER  
300 HIGHWAY 361  
CRANE INDIANA 47522-5001

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NSWC CRANE  
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IN REPLY REFER TO:

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Ser 095/2263

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U.S. Environmental Protection Agency, Region V  
Waste, Pesticides, & Toxics Division  
Waste Management Branch  
Corrective Action Section  
Attn: Mr. Peter Ramanauskas (DW-8J)  
77 West Jackson Blvd.  
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits, for your review and approval, the Second Quarter 2002 Quarterly Interim Progress Report (IPR) for April 1 through June 30, 2002 dated August 2002. Two copies of the report are provided as enclosure (1). Enclosure (2) is the required certification statement.

NSWC Crane point of contact is Ms. Christine D. Freeman, Code 09511, telephone 812-854-4423.

Sincerely,

JAMES M. HUNSICKER  
Director Environmental Protection  
Department  
By direction  
of the Commander

Encls:

- (1) IPR 2<sup>nd</sup> QUARTER 2002 (APR - JUN 2002)
- (2) Certification Statement

Copy to:

Administrative Record  
IDEM (D. Griffin)  
SOUTHNAVFACENGCOM (Code ES32)  
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TOLTEST Crane (w/o encls)

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.

*Jana M. Hursule*

\_\_\_\_\_  
SIGNATURE

DIRECTOR, ENVIRONMENTAL PROTECTION DEPARTMENT  
BY DIRECTION OF THE COMMANDER  
\_\_\_\_\_  
TITLE

*8/09/02*  
\_\_\_\_\_  
DATE

**QUARTERLY INTERIM PROGRESS REPORT**  
**2<sup>nd</sup> Quarter 2002**  
**April 1 – June 30**

**Revision 0**  
**August 2002**

**FULL-SCALE OPERATIONS**  
**SOILS BIOREMEDIATION FACILITY**  
**NAVAL SURFACE WARFARE CENTER**  
**CRANE, INDIANA**

**ENVIRONMENTAL JOB ORDER CONTRACT**  
**CONTRACT NO. N68950-96-D-0052**  
**TOLTEST PROJECT NUMBER 37324.01**

*Submitted to:*

**OFFICER IN CHARGE OF NAVFAC CONTRACTS**  
**NAVAL SURFACE WARFARE CENTER**  
**CRANE, INDIANA**

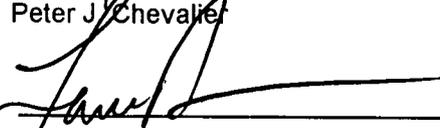
*Submitted by:*

**TOLTEST, INC.**  
**1915 NORTH 12<sup>TH</sup> STREET**  
**P.O. BOX 2186**  
**TOLEDO, OHIO 43603**  
**(419) 241-7175**

**Prepared/Reviewed by:**  
Project Manager/Environmental Specialist

  
Peter J. Chevalier  
8/7/02  
Date

**Reviewed/Approved by:**  
Regional Manager

  
Lance Parsons  
8/7/02  
Date

## EXECUTIVE SUMMARY

This interim progress report has been prepared by ToITest, Inc. (ToITest) for Southern Division, Naval Facilities Engineering Command. This report documents the progress at the Bioremediation Facility (Biofacility) for treatment of explosives-contaminated soil at the Naval Surface Warfare Center (NSWC) Crane, Indiana. On March 27, 1999, ToITest assumed responsibility for the excavation and treatment of contaminated soil at the Biofacility. This report summarizes the work actions performed from April 1 through June 30, 2002 pursuant to the requirements of the approved *Full-Scale Operational Plan* and the *Quality Assurance Project Plan*. Full-scale bioremediation operations started in April 1998. All interim measures work actions have been performed in accordance with approved plans.

The scope of work includes initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment to the Biofacility, process monitoring and confirmatory sampling of the compost windrows, and disposal of treated soil.

All initial characterization soil sampling, post-excavation soil sampling, and contaminated soil excavation at Mine Fill A (MFA), Mine Fill B (MFB), and Rockeye (RKI) has been completed.

All contaminated soil has been processed at the Biofacility and transported back to the Solid Waste Management Unit of origin.

Decontamination of the Biofacility has commenced and all of the Navy equipment and tools have been turned over to the Navy. The retention ponds were cleaned and the sludge from the ponds was placed in the Middle compost building to dry. This sludge was analyzed and subsequently hauled to the MFB Permanent Placement Area for disposal. All three compost buildings have been decontaminated and wipe sampling to test the effectiveness of the decontamination process has been initiated.

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## **FIGURE**

Figure 1 MFB Permanent Placement Area

## **APPENDIX A**

### Field Clarification Requests

- FS035 Disposition of Retention Pond Sludges and Windrow N-216
- FS036 Sampling Protocol for Determining the Effectiveness of Decontamination
- FS037 Sampling Protocol for Determining the Presence of Contamination Outside the Biofacility Boundaries and Sampling of the Sludge in the Middle Compost Building

## **Appendix B**

### Analytical Results

## 1.0 INTRODUCTION

This Interim Progress Report (IPR) has been prepared by TolTest for the Southern Division, Naval Facilities Engineering Command to document the progress of the full-scale bioremediation operation of explosives-contaminated soil at NSWC Crane, Crane, Indiana. It summarizes the work actions performed by TolTest during the period April 1 through June 30, 2002 pursuant to the requirements of the approved *Full-Scale Operational Plan* (FSOP) [MK, 1998a] and the *Quality Assurance Project Plan* (QAPP) [MK, 1998b]. Full-scale bioremediation operations started in April 1998. TolTest assumed responsibility of the project on March 27, 1999 from Morrison Knudsen Corp. (now Washington Group International, WGI) after the completion of their contract.

NSWC Crane, located in southwestern Indiana, provides support for equipment shipboard weapons systems, and ordnance. This site also supports Crane Army Ammunition Activity, which includes production and renovation, storage, shipment, and demilitarization and disposal of conventional ammunition. Explosive-compounds contaminated soils resulting from the above operations have been identified at four solid waste management units (SWMUs): Ammunition Burning Ground (ABG, SWMU-03/10); Rockeye Munitions Facility (RKI, SWMU-10/15); Mine Fill A (MFA, SWMU-12/14); and Mine Fill B (MFB, SWMU-13/14). No work has been performed at ABG pending the outcome of a risk assessment study.

On-site bioremediation of the high-explosives contaminated soil utilizing a windrow composting process was selected as the preferred treatment alternative for the Interim Measures at these four SWMUs.

The scope of work included initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment at the Biofacility, process monitoring, confirmatory sampling, disposal of treated soil, and site restoration. All work at MFA has been completed and has been included in the Interim Measures Report (IMR) for MFA prepared by WGI. All work at MFB has been completed by TolTest and has been included in the IMR for MFB. All work at RKI has been completed by TolTest and has been included in the IMR for RKI.

Subsequent IPRs will discuss only the remaining work to be performed at the Biofacility and production facilities (primarily decontamination and maintenance procedures).

## **2.0 EXCAVATION SITE ACTIVITIES**

Work activities at the excavation site may include in-process sampling and screening, pre and post-excitation sampling, soil excavation, soil screening, and vegetation establishment. Fieldwork activities are performed in accordance with procedures included in the *FSOP* [MK, 1998a] and the *QAPP* [MK, 1998b]. Final drawings showing grid locations, post-excitation sample locations, and extent of excavation are included in the IMRs.

### **2.1 Pre-Excavation Soil Sampling**

Pre-excitation sampling is performed to provide initial site characterization and delineate the extent of contamination. The horizontal boundaries of contamination are influenced by the presence of buildings, roads, railroad tracks, and grids with either no detectable levels of contaminants or levels that are below the cleanup goals.

All pre-excitation sampling at MFA, MFB, and RKI was completed prior to this reporting period.

### **2.2 In-Process Excavation Soil Sampling**

All field screening of in-process excavation soil samples for MFA, MFB, and RKI was completed prior to this reporting period.

### **2.3 Post-Excavation Soil Sampling**

All post-excitation samples for MFA, MFB, and RKI were obtained prior to this reporting period.

### **2.4 Soil Excavation and Screening**

Soil excavation operations at all three SWMUs are now complete and all contaminated soil has been processed in windrows at the Biofacility. A total of 44,451.28 tons of soil were excavated from the three SWMU sites as follows: MFA 21,045.39, MFB 22,115.20, RKI 1,272.68, and MFA Battery 18.01.

### 3.0 BIOFACILITY OPERATIONS

Treatment of high-explosives contaminated soil by composting involves microbial degradation of the explosives by optimizing the availability of organic material, temperature, moisture content, pH, and oxygen. The composting operation process description is provided in Section 5.0 of the approved *FSOP* [MK, 1998a].

#### 3.1 Amendments

The compost mix used in full-scale operations consists of 25% soil, 15% chicken manure, and 60% straw by volume.

#### 3.2 Windrow Construction and Treatment

All windrow-composting operations are complete and all contaminated soil has been processed prior to this reporting period.

#### 3.3 Retention Pond Maintenance

Retention pond monitoring and water control is an ongoing maintenance item at the Biofacility. Both retention ponds overflowed during this reporting period due to exceptionally high rainfall. Pond 2 overflowed on May 8 and no water from the pond could be pumped into the sewer system due to the full level of the NSWC Crane landfill leachate pond. Consequently the discharge valve on Pond 2 was opened and water was allowed to flow into the adjacent drainage ditch for 2.5 hours to lower the water level in the pond. A sample of the pond water could not be obtained from the discharge pipe since the discharge pipe outflow in the adjacent drainage ditch was under water. Therefore a pond water sample was obtained from the surface of the pond and analyzed for NSWC Crane discharge parameters. Results of the analysis indicated that all parameters except Carbonaceous Biological Oxygen Demand (CBOD) met surface discharge limits. The CBOD result of 23.6 mg/L exceeded the surface discharge limit of 15 mg/L.

Both retention ponds were overflowing on May 13 and again no water could be pumped into the sewer system. Both pond discharge valves were opened for 3.5 hours to lower the water level in the pond. A sample of the water in Pond 1 was obtained from the surface of the pond and analyzed for NSWC Crane discharge parameters. Results of the analysis indicated that all parameters except CBOD met surface discharge limits. The CBOD result was 27.1 mg/L.

Personnel from NSWC Crane Environmental Protection Department (EPD) gave TolTest the approval to open both retention pond discharge valves and completely drain the ponds. This action was based on: 1) the most recent pond water analyses indicated the CBOD was the only parameter that exceeded surface discharge limits; and 2) there was no activity at the Biofacility since the last pond water sampling event that would have contaminated the asphalt area that drains into the retention ponds. Both pond valves were opened on May 13<sup>th</sup> and closed two days later. Both releases were noted in the NSWC Crane Monthly Storm Water Reports.

### **3.4 Facility Decontamination**

In the previous reporting period, sediment, sludge, and compost from cleaning the retention ponds and sumps, the North and South compost buildings, and the asphalt area were placed in the Middle compost building along with approximately 10,000 gallons of water generated during the decontamination process. This mixture was periodically mixed and pushed around with a backhoe until all the water had evaporated. The sludge was then pushed together to form one pile of approximately 10 cubic yards. One composite sample (from five sub-samples) was obtained from this pile and sent to an off-site lab for explosives analysis in accordance with Field Clarification Request (FCR) FS035 and FS037 (see Appendix A). The results were non-detect for all explosive compounds (see Appendix B). The sludge was subsequently hauled to and put to grade at the Permanent Placement Area (PPA) at Mine Fill B (see Figure 1).

The Middle compost building was then decontaminated by spraying the ceiling, walls, and floor with a power washer. The water from this process was pumped into the sewer system.

The water in the sump of the North compost building was sampled and analyzed for NSWC Crane discharge parameters. Results indicated that CBOD, reported at 26.4 mg/L, exceeded the 15 mg/L surface discharge limit. The explosive compound RDX was detected at 1.94 ug/L, which is below the surface discharge limit. However, the RDX compound was qualified with a "P" code indicating that there was a greater than 25% difference between the primary and secondary columns. All other parameters met surface discharge limits.

### **3.5 Wipe Sampling**

On June 13<sup>th</sup>, 15 wipe samples were obtained in accordance with Phase one of FCR-FS036 (see Appendix A) to determine the effectiveness of the decontamination process on the compost buildings. The floor of the North compost building and the walls and ceiling of the South compost building were sampled and analyzed for explosives. All Phase one results (included in

Appendix B) were non-detect. The remaining sampling listed in FCR-FS036 will be conducted during the next reporting period.

Wipe sample locations were spaced throughout the building and were biased to areas that were stained or showed potential surface contamination. Each compost building is constructed with 13 steel columns numbered 1 through 13, with column 1 on the east-end of the building, column 13 on the west-end. Two horizontal steel beams divide each wall section between columns into three subsections (identified as top, middle, and bottom). Samples were taken between columns as identified in Table 1. Floor samples were taken either on the north or south side of the building, and wall samples were taken either in the bottom, middle, or top section of the wall. Samples were identified as follows: BIO-N-WXX where BIO indicates the Biofacility; N (or S) identifies the building; W indicates a wipe sample; and XX is the sample number.

<b>TABLE 1 WIPE SAMPLE LOCATIONS</b>					
<b>Building South, Wall Samples</b>			<b>Building North, Floor Samples</b>		
<b>Sample #</b>	<b>Between Columns:</b>	<b>Sample Location:</b>	<b>Sample #</b>	<b>Between Columns:</b>	<b>Building Side:</b>
01	1 & 2	South Wall, Middle Section	01	3 & 4	South
02	6 & 7	South Wall, Top Section	02	4 & 5	South
03	11 & 12	South Wall, Middle Section	03	9 & 10	South
04	10 & 11	North Wall, Bottom Section	04	12 & 13	South
05	8 & 9	North Wall, Top Section	05	11 & 12	North
06	4 & 5	North Wall, Bottom Section	06	8 & 9	North
07	7 & 8	Ceiling	07	4 & 5	North
-	-	-	08	2 & 3	North

### 3.6 Confirmation Sampling

The potential for contamination outside the boundaries of the Biofacility exists since: 1) the retention ponds have overflowed and the pond discharge valves were intentionally opened on several occasions; and 2) several holes and rips have been identified in the pond liners.

Overflows of the ponds and deliberate releases of pond water through the discharge valves have potentially contaminated the adjacent drainage ditch. To determine if explosive's contamination exists in the ditch, grids will be established along the length of the ditch and the soil will be sampled and analyzed in accordance with FCR-FS037.

The rips in the liners have potentially allowed pond water to contaminate the groundwater that has accumulated under the liners. To determine this, the groundwater will be sampled and analyzed in accordance with FCR-FS037.

The ditch and groundwater sampling is scheduled to be completed in the next reporting period.

#### **4.0 ANALYTICAL DATA INTERPRETATION AND VALIDATION**

All data associated with the sampling events identified in sections 3.3 and 3.4 of this report were verified. At least 10% of the samples were validated and compared with field and laboratory quality control (QC) sample data to assess the data's usability for supporting full-scale operations. Data was verified by reviewing chain-of-custody forms, sample preservation records, analytical holding times, requested turnaround times, sample data in comparison to QC data, and reporting requirements. In addition, 10% of the data was validated using the validation procedures specified in Section 9.2.2 of the *QAPP*.

Laboratory QC consists of method blank, sample matrix spike (MS), sample matrix spike duplicate (MSD), laboratory control sample (LCS), and laboratory control sample duplicate (LCSD) analyses to evaluate laboratory accuracy and precision. Laboratory quality control was performed consistent with the requirements of the *QAPP*. Method blanks, LCS, and LCSD were acceptable in every analytical batch. The MS/MSD results were acceptable for most analytical batches. In each instance where the MS/MSD recoveries were outside laboratory control limits, the LCS/LCSD recoveries were within control limits. Comparing the analytical reporting limits to the industrial and residential clean-up levels, the data is determined to be acceptable to show that clean-up goals have been successfully met.

Based on technical review of the field and laboratory QC data, analyses were performed within acceptable accuracy and precision requirements specified in the *QAPP*. The confirmation data meets the project's data quality objectives and are therefore considered usable to support full-scale operations.

#### **5.0 DISPOSITION OF TREATED SOIL AND SITE RESTORATION**

All treated soil (compost) has been transported back to the SWMU of origination. The compost was placed either in the PPA or used as backfill in the open excavations. The sludge generated from the Biofacility decontamination was placed and graded at the MFB PPA. Site restoration (seeding, mulching, and watering) is complete at RKI. The screener site and the PPA at MFB were seeded, mulched with straw, and a sprinkler system was set up and watering was commenced in this reporting period. Disposal activity discussed in previous quarterly progress reports has been summarized in the IMRs for MFA, MFB, and RKI.

## 6.0 STATUS OF VARIOUS REPORTS

The Supplemental Toxicity Report for MFA and MFB, the RKI Toxicity Report, and the RKI IMR are under review by U.S. EPA Region V personnel. The MFB IMR will be submitted to EPD in early July for review and comment. Revised pages for the MFA Addendum will be submitted to EPD for incorporation and submittal for final approval by the U.S.EPA.

## 7.0 QUALITY CONTROL

No quality control inspections were conducted during this reporting period since all excavation and production associated with the Biofacility has been completed. Work completed during this reporting period were mainly maintenance items and sampling events.

## **8.0 SAFETY AND INDUSTRIAL HYGIENE**

### **8.1 General Safety**

During this reporting period, TolTest expended 761 hours. There were no OSHA recordable injuries. The project has a cumulative total of 72,782 man-hours by the end of this reporting period.

No formal safety inspections were performed during this quarter, outside of the regular daily safety meetings when work was performed.

### **8.2 Industrial Hygiene Sampling**

No airborne monitoring for ammonia was performed during this reporting period and no explosives monitoring was conducted since composting operations were concluded prior to this reporting period.

No noise monitoring was performed during this reporting period. By the end of the reporting period, all equipment had been decontaminated and parked in the North compost building.