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NSWC CRANE
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DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 381
CRANE, INDIANA 47522-5000

IN REPLY REFER TO:

5090
Ser 095/1184

18 JUN 2001

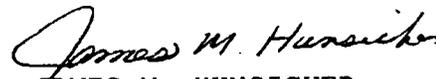
U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Corrective Action Section
Attn: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits, for your review and approval, two copies of the draft First Quarter 2001 Quarterly Interim Progress Report (IPR) for January 1 through March 31, 2001 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 1ST QUARTER 2001 (JAN - MAR 2001)
- (2) Certification Statement

Copy to: (w/o encls)
Administrative Record
IDEM (D. Griffin)
SOUTHNAVFACENGCOM (Code 1864)
SOUTHNAVFACENGCOM ROICC
TOLTEST Crane

**Naval Facilities Engineering Command
Naval Surface Warfare Center
Crane, Indiana**

**Full-Scale Operations
Soils Bioremediation Facility**

**Quarterly Interim Progress Report
1st Quarter 2001
January 1 – March 31**

Revision 0

TOLTEST, INC.

QUARTERLY INTERIM PROGRESS REPORT

1st Quarter 2001

January 1 – March 31

Revision 0

**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 12TH STREET
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Date

Reviewed/Approved by:

General Manager

Lance Parsons

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 October 1 through December 31, 2000 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 sampling at Mine Fill A (MFA) and Mine Fill B (MFB) is complete. No in-process field screening or post-excavation grid sampling was conducted during this reporting period. No contaminated soil was excavated, screened, or hauled during this reporting period.

One windrow (M-199) was re-processed during this reporting period and achieved residential cleanup goals and one new windrow (S-201) was constructed during this reporting period which achieved industrial cleanup goals.

A total of 348.1 tons of contaminated soil was treated during this time period: 232.1 tons to residential cleanup levels, and 116 to industrial clean up levels (windrows 199 and 201 respectively). Windrow N-200, which failed to reach industrial cleanup goals in the previous reporting period, was used as the contaminated soil source for Windrow S-201.

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Table 5.0	Average Staged Windrow Re-Sampling Analytical Data

FIGURES

Windrow Location Maps:

MFA;

B-154 (1 page)

MFB;

B-166 (1 page)

1.0 INTRODUCTION

This interim progress report has been prepared by ToITest 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 ToITest during the period January 1 through March 31, 2001 pursuant to the requirements of the approved *Full-Scale Operational Plan (OP)* [MK, 1998a] and the *Quality Assurance Project Plan (QAPP)* [MK, 1998b]. Full-scale bioremediation operations started in April 1998. ToITest assumed responsibility on March 27, 1999 from Morrison Knudsen Corp. 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 (RKY, SWMU-10/15); Mine Fill A (MFA, SWMU-12/14); and Mine Fill B (MFB, SWMU-13/14).

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

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 at the Biofacility, process monitoring, confirmatory sampling, disposal of treated soil, and site restoration. All of this work at MFA has been completed and has been included in the Interim Measures Report for MFA prepared by Washington Group International (formerly Morrison Knudsen, Corp.).

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 *Full-Scale OP* [MK, 1998a] and the *QAPP* [MK, 1998b]. Final drawings showing grid locations, post-excitation sample locations, and extent of excavation will be included in the Interim Measures Report for Bioremediation.

2.1 Pre-Excavation Soil Sampling

Pre-excitation sampling is performed to provide initial site characterization and delineate the extent of contamination. Pre-excitation samples are analyzed for SWMU-specific compounds by an off-site analytical laboratory.

A minimum of three soil samples are normally obtained from each grid for characterization of the soil prior to excavation. Explosive compounds and metals analyses are completed on composite samples obtained from zero to 12-inches in depth and 24 to 36-inches in depth. On occasion, the presence of rock or other obstacles prohibit the deeper composite sample from being obtained. Analysis for volatile organic compounds (VOCs) is completed on grab samples obtained at 12-inches.

The horizontal boundaries of explosive constituents are influenced by the presence of buildings, roads, railroad tracks, and grids with either no detectable levels of the respective constituent or levels that are below the cleanup goals. To date, no metals or VOCs have been detected above clean-up action levels in any sample.

2.1.1 MFB

Pre-excitation soil sampling at MFB is complete.

2.1.2 RKY

No pre-excavation sampling was completed at RKY during this time period.

2.2 In-Process Excavation Soil Sampling

No field screening of in-process excavation soil samples occurred during this reporting period.

2.3 Post-Excavation Soil Sampling

No post-excavation soil samples were obtained during this reporting period.

2.4 Soil Excavation and Screening

No soil was excavated or screened during this reporting period. Full-scale operations soil excavation quantities can be found in Table 1.0.

3.0 COMPOSTING 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 *Full-Scale OP* [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. A sufficient volume of straw has been delivered to satisfy the straw requirements for processing the remaining soil from MFB and RKY. Chicken manure continues to be trucked to the Biofacility on an as-needed basis in quantities sufficient to support operations.

3.2 Windrow Construction and Treatment

Field screening is performed at least weekly to monitor RDX levels within each windrow. Field screening of treated compost for TNT is not completed since RDX is a better indicator of contaminant degradation than TNT. Final compost samples are collected once the field test kits indicated RDX levels are below industrial clean-up goals. The day that final compost samples are collected for off-site laboratory confirmation analysis is referred to as Day Last.

Windrow 199 was processed in the previous reporting period but Day 22 samples (obtained on 12/21/00) failed to meet industrial cleanup goals. To re-process this windrow, 20 batches of amendments were mixed into the windrow on January 18, 2001 and processing proceeded as usual for the next few weeks. Day 69 samples were obtained on February 6, 2001 and results of these analyses were below residential cleanup goals.

Similarly, Day Last samples from windrow N-200 (processed in the previous quarter), which contained reject rock, gravel and soil from the screener at MFB, failed to meet industrial cleanup goals. To process this soil, a new windrow, S-201, was formed using

N-200 as the source for contaminated soil. This windrow was constructed on January 26, 2001 and processed for 20 days. Day Last samples were obtained on February 15, 2001 and results met industrial cleanup goals.

The total amount of soil processed in this reporting period was 348 tons: 232 tons to residential cleanup levels (Windrow M-199) and 116 tons to industrial clean up levels (Windrow S-201). The process schedule for these windrows is included as Table 2.0.

3.3 Analytical Data Interpretation and Validation

Table 3.0 provides this quarter's average laboratory analytical results for HMX, RDX, and TNT, and the regulatory cleanup goals. All windrow results represent an average of 15 individual data points (five cross sections, three sample locations per cross section). Day Last results are given for each windrow, demonstrating the effectiveness of the bio-degradation process. Day Zero samples are no longer collected on compost with soil from MFB.

All data associated with windrow monitoring was verified, and 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, more than 10% of the data was validated using the validation procedures specified in Section 9.2.2 of the QAPP.

Analytical results for the trip blanks, field blanks, equipment rinsates, and field duplicates were evaluated to identify potential sources of error introduced during sampling, transportation and storage. Field QC performed with the monitoring of windrows has been performed according to the requirements defined in the QAPP.

Laboratory QC consists of method blank, sample matrix spike (MS), sample matrix spike duplicate (MSD), surrogate, 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, LCSD, and surrogates were acceptable in every analytical batch. Day Last data did not show interference with spiking solutions because initial concentrations were low in comparison to the concentration of spiking solution added to the sample. 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. Table 4.0 provides the average Day Last explosive compound levels for the windrows listed in Table 3.0.

4.0 DISPOSITION OF TREATED SOIL AND SITE RESTORATION

Treated soil (compost) is transported back to the SWMU of origination either to the temporary staging area, the permanent storage areas, or used as backfill in the open excavations. Disposal activity is shown in Table 2.0. Site restoration (seeding, mulching, and watering) has been or will be implemented at all areas where ToITest has backfilled treated soil.

Three of the six windrows staged at MFB (windrows 132, 133, & 134) were sampled in this reporting period, in accordance with Field Change Request FS-029 (ToITest 2001), to determine if degradation had occurred over time such that residential cleanup goals had been achieved (these windrows originally met industrial cleanup goals). The sampling event for windrows 132, 133, and 134 occurred on March 27, 28, and 29 respectively but the analytical results were not received until the next reporting period. Table 5.0 lists the analytical results of these sampling activities.

Windrow M-198, which contained both MFA and MFB soil and was processed in the previous quarter, was moved from the Biofacility to the old screener site at MFA B-154 in this reporting period. Windrow M-199 was placed at B-166 at MFB. Figures 1 and 2 illustrate the location of these windrows. Windrow S-201 had not been moved from the Biofacility at the end of this reporting period.

5.0 STATUS OF VARIOUS REPORTS

The Supplemental Toxicity Report for toxicity sampling carried out in November of 2000 was submitted to the Navy ECOTR for review in April of 2001.

6.0 QUALITY CONTROL

Quality control inspections included excavation site operations, composting operations, sampling activities, field test kit analyses, and facility maintenance. Quality control checks were performed at required intervals using the field inspection checklists provided in Appendix F of the approved *Full-Scale OP* [MK, 1998a]. Copies of all inspection records are maintained at the Biofacility office.

During this period, 118 individual items were verified and no deficiencies were identified. Immediate actions were taken to correct any minor findings observed.

7.0 SAFETY AND INDUSTRIAL HYGIENE

7.1 General Safety

During this period 3,283.5 man-hours were expended by ToITest. There were no OSHA recordable injuries. The project has a cumulative total of 57,283.5 man-hours by the end of this reporting period.

Thirteen formal safety inspections were performed during this quarter. No significant findings of an imminent or serious nature were found. Immediate actions were taken to correct any minor findings observed. Daily informal walk-around safety inspections reinforced and improved the workers safety performance.

7.2 Industrial Hygiene Sampling

No airborne monitoring for ammonia or explosives was performed during this reporting period due to the low volume of work performed at the facility. Previous sampling events have indicated that elevated ammonia levels are encountered during the early stages of a windrows' life cycle. The chicken manure amendment is the primary contributor to ammonia concentrations. Full-face air purifying respirators with ammonia cartridges are typically worn during windrow formation when ammonia levels are 25 ppm (TLV) or above. Ammonia is typically localized near each pile and is significantly affected by natural ventilation of the building, moisture in the windrow, and turning of the windrow.

Previous sampling events have indicated that airborne explosives compounds do not pose a significant health hazard.

No wipe sampling for explosive residues was performed at the Biofacility during this reporting period due to the low volume of work performed at the facility. Previous sampling events have indicated that explosives contamination is not detected outside the exclusion zone when the proper decontamination procedures are followed.

No noise monitoring was performed during this quarter. Prior monitoring has concluded that associates are required to wear hearing protection while working

around heavy equipment, which is when noise levels are likely to exceed 85 dBa during a weighted network steady state, or 140 dBa impulse, regardless of the duration of exposure.

8.0 FACILITY MAINTENANCE AND REPAIRS

- Replaced two tires on the skid-steer loader.
 - Replaced the water pump belt, batteries, starter, and starter switch on the SCARAB.
 - Both Sterling dump trucks were taken to Ruxer Ford for maintenance.
 - Replaced the thermostat in the backhoe.
 - Covered the stacks of straw bales in the storage field with reinforced, UV-resistant tarps.
 - Sealed cracks in the concrete floor of the Middle compost building.
 - Repaired the pressure washer hoses in the decontamination bay.
-

9.0 REFERENCES

MK, 1998a. *Full-Scale Operational Plan for Soils Bioremediation Facility, NSWC Crane, Crane, Indiana*. Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation, Environmental Services Group. Revision 2, March 12, 1998.

MK, 1998b. *Quality Assurance Project Plan for Full-Scale Operations, Soils Bioremediation Facility, NSWC Crane, Crane, Indiana*. Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation, Environmental Services Group. Revision 2, March 12, 1998.

TolTest, 2001. *Quarterly Interim Progress Report 4th Quarter 2000 October 1 - December 31 Full-Scale Operations Soils Bioremediation Facility, NSWC Crane, Crane, Indiana*. Revision 1, April 10, 2001.

TABLES

TABLE 1.0
FULL-SCALE OPERATIONS SOIL EXCAVATION QUANTITIES
January through March 2001
Quantity (Tons)

Period	Mine Fill A	Mine Fill B	Rockeye	Cumulative
Previously reported	21,045.39	20,317.17	16.45	41,379.01
January	0.00	0.00	0.00	41,379.01
February	0.00	0.00	0.00	41,379.01
March	0.00	0.00	0.00	41,379.01
Reporting Period Total	0.00	0.00	0.00	0.00
Site Total	21,045.39	20,317.17	16.45	

**TABLE 2.0
 WINDROW PROCESS SCHEDULE**

Windrow #	Start Date	Day Zero	Day Last	Lab Results Received	Complete Unload	Ton Processed	Soil Qty Ton Processed	Processed to Residential or Industrial Levels	Compost Disposal Location	Grid Disposal Locations
M-198*	11/13/00	11/15/00	12/6/00	12/6/00	2/7/01	232.1	32679.28	Residential	B-154, MFA	27, 28, 39, 40
M-199	11/27/00	11/29/00	2/6/01	2/12/00	2/22/01	232.1	32911.4	Residential	B-166	103,227,228,244, 256
N-200**	11/30/00	12/1/00	12/18/00	12/24/00				Failed		
S-201	1/25/01	1/26/01	2/15/01	2/21/01		116	33,027.4	Industrial	Nm	Nm

*M-198 was processed in the previous reporting period but moved to the field in this reporting period

**N-200 failed to meet industrial cleanup goals and was used as the source of contaminated soil for windrow S-201

PPA = Permanent Placement Area

TSA = Temporary Storage Area

Nm = not moved from the Biofacility in this reporting period

TABLE 3.0
AVERAGE EXPLOSIVE COMPOUNDS DAY LAST ANALYTICAL DATA (ppm)

WINDROW #	DAY #	HMX	RDX	TNT
M-199	69	0.7	1.9	0.4
N-200	18	29	133.3	1.2
S-201	20	1.8	5.2	0.5
CLEANUP GOALS*	Residential	3,300	4	15
	Industrial	34,000	17	64

*Average of windrows M-199 and S-201

TABLE 4.0
AVERAGE DAY LAST EXPLOSIVE COMPOUNDS LEVELS

	ppm
HMX	1.3
RDX	3.6
TNT	0.5

Day 0 samples are no longer collected for compost containing MFA or MFB soil.

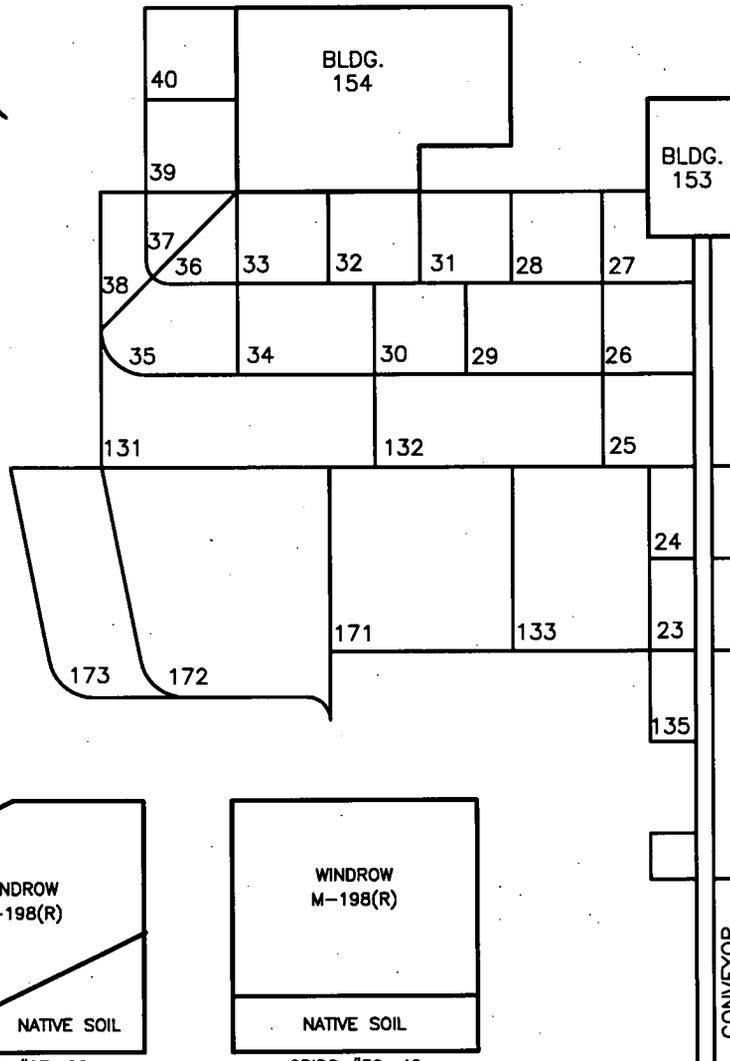
TABLE 5.0
AVERAGE STAGED WINDROW RE-SAMPLING ANALYTICAL DATA (ppm)*

WINDROW #	DAY #	HMX	RDX	TNT
132	455	0.4	0.4	0.8
133	455	0.5	1.6	0.6
134	455	0.3	0.6	0.6

*These windrows were sampled in this reporting period but results were not received until the next reporting period.

FIGURES:

**WINDROW PLACEMENT SITE MAPS
MFA and MFB**



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

WINDROW LOCATION MAP
BACKFILL OPERATIONS
GRIDS: #27, 28, 39, 40
WINDROW: #198(R)
BUILDING 154, MINE FILL A
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC\05-21-01 CHECKED

REVISED APPROVED

JOB NO.: 37324.01

SHEET NUMBER

1 of 1



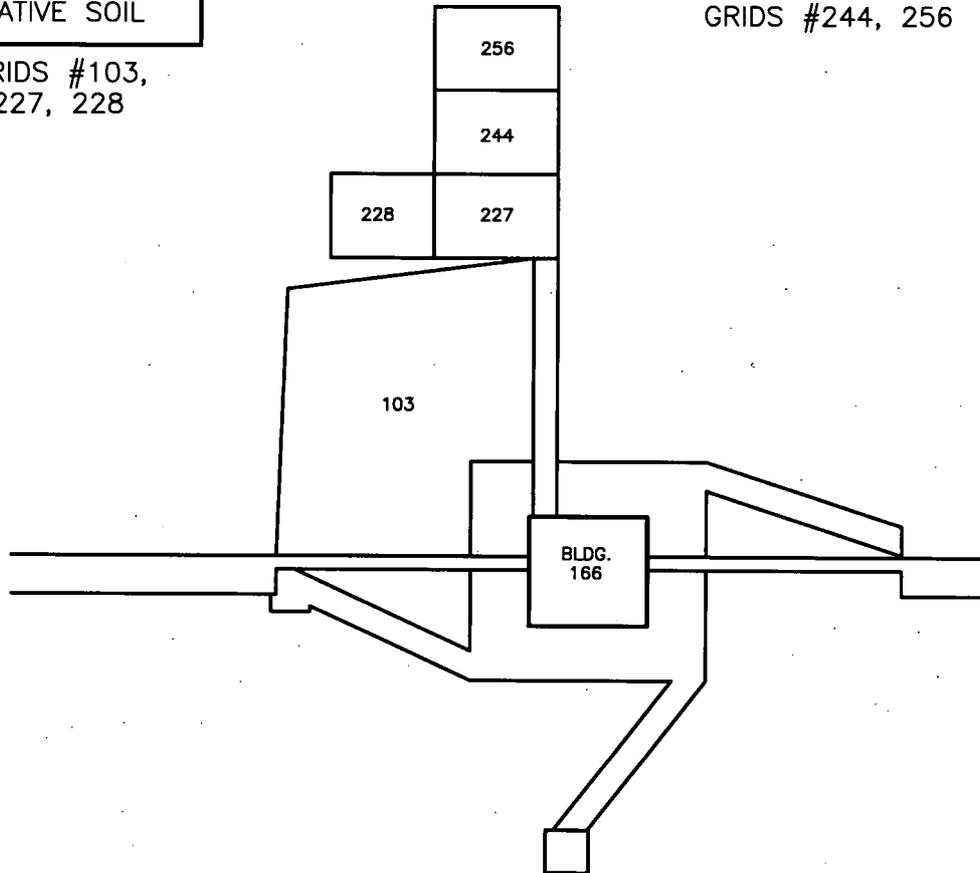
SOUTHWEST CORNER OF BUILDING 166

WINDROW 199(R)
179(R)
169(I)
NATIVE SOIL

GRIDS #103,
227, 228

WINDROW 199(R)
NATIVE SOIL

GRIDS #244, 256



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

R = RESIDENTIAL
I = INDUSTRIAL



010101-033101 QUARTERLY REPORT

WINDROW LOCATION MAP

BACKFILL OPERATIONS
GRIDS: #103, 227, 228, 244, 256
WINDROWS: #199(R)
NAVAL SURFACE WARFARE CENTER
SOUTHWEST CORNER OF BUILDING 166, MINE FILL B
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\05-21-01

CHECKED

REVISED

APPROVED

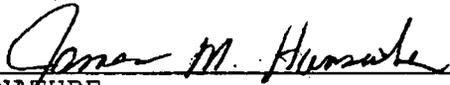
JOB NO.: 37324.01

SHEET NUMBER

1 of 1

TOQUEST, INC.

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

DIRECTOR, ENVIRONMENTAL PROTECTION DEPARTMENT
BY DIRECTION OF THE COMMANDER

TITLE

6/18/01

DATE