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NSWC CRANE
5090.3a

Voluntary Interim Measure Letter Report for TNT Contamination Removal at Solid Waste Management Unit 7 (Old Rifle Range)

Naval Surface Warfare Center Crane Division

Crane, Indiana

Southern Division Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0160

October 2003

TETRA TECH NUS, INC.

TABLE OF CONTENTS

SECTION		PAGE NO.
1.0	INTRODUCTION	1
2.0	PHASE 1 DELINEATION SAMPLING	2
3.0	PHASE 2 SOIL EXCAVATION AND CONFIRMATORY SAMPLING	3
4.0	CONFIRMATORY SAMPLING RESULTS	4
5.0	STATISTICAL ANALYSIS AND REVISED RISK CALCULATIONS	5
6.0	CONCLUSIONS	6
	LETTER REPORT ATTACHMENTS AND APPENDICES	7

ATTACHMENTS

Risk Tables (Tables 4-9A through 4-15A)

Figures 1 through 3

Photographs of Remedial Action (1 through 4)

APPENDICES

A Field Logbook Notes; Sample Log Sheets; and Chain of Custody Sheets
B Data Validation Letters
C Bootstrap Methodology Summary
D Voluntary Interim Measures Work Plan and After Action Report

1.0 Introduction

In the summer of 2003, the Navy conducted a Voluntary Interim Measure (VIM) to excavate localized high concentrations of 2,4,6-trinitrotoluene (TNT) at soil borings (SB)16 and SB47 previously investigated as part of the RCRA Phase III Soils RFI (Tetra Tech NUS, Inc., November 2002). The high concentrations observed at these two locations (9,900 and 940 ppm respectively) represented approximately 95% of the calculated risk for the site. Completion of the VIM resulted in significantly lower TNT concentrations and associated reductions in risk for the site. This letter report provides an overview of the VIM activities conducted so that future risk management decisions can be put in context with the actions taken and resulting lower site risks.

2.0 Phase 1 Delineation Sampling

Phase 1 delineation soil sampling was conducted at a localized area contaminated with TNT near SB16 and SB47 at the northern end of the ORR as part of the VIM (see Figure 1). Fieldwork was conducted May 29 and 30, 2003, at which time samples were collected and analyzed for TNT using both field test kits and a fixed-base laboratory (refer to Appendix A for Field Logbook Notes, Sample Log Sheets and Chain-of-Custody sheets). The Phase 1 sample results were used to delineate the area of contamination and to calculate the volume of soil required to be excavated in order to achieve the voluntary cleanup objectives. Figure 2 shows the laboratory results of Phase 1 sampling and the kidney-bean shape of the proposed excavation. Nearby previous sampling results are also shown in this figure. The following table lists the sample IDs for samples analyzed at the laboratory, dates collected, depths collected and analytical results (see Appendix B for Data Validation letters).

Sample ID	Date Collected	Sample Depth (Feet)	Results (ppm)	Comments
07SS62	5/30/03	0-1	11	Grab sample
07SS63	5/30/03	0-1	32	Grab sample
07SS64	5/30/03	0-1	79	Grab sample
07SS65	5/30/03	0-1	1.5	Grab sample

3.0 Phase 2 – Soil Excavation and Confirmatory Sampling

Toltest, Inc. (the current remedial action contractor [RAC] contractor) was contracted by the Navy to excavate and dispose the contaminated soil. A backhoe and two dump trucks were used to perform the excavation and disposal. One truck was loaded on July 22, 2003. This load represented approximately 70% of the total soil removal needed to accomplish the VIM. After this first truck was loaded, four field-test confirmatory soil samples were collected (one composite from the bottom of the excavation & three side-wall grabs). These samples were analyzed on site using a D TECH™ TNT Explosives Test Kit. Two of the sample results were above the proposed risk-based excavation criteria of 16 ppm. These two samples were located on the NW and N side of the excavation (see attached figures). On the morning of July 23, discussions were held among Navy and Tetra Tech NUS, Inc. personnel and it was decided to remove additional soil from the two areas with the elevated test kits results. The additional soil was excavated and confirmatory samples were collected as described in the next section.

4.0 Confirmatory Sampling Results

At the completion of the VIM excavation, six confirmatory soil samples were collected and sent to Laucks Testing Laboratory for TNT analysis.

All samples were collected using disposable plastic trowels and placed directly into 8oz., wide-mouth glass jars and held/shipped on ice to the laboratory. Excavation side-wall samples were collected at the midpoint in the excavation wall at a depth ½ foot below ground surface (bgs). Excavation floor samples were collected at 1 foot bgs, which was the bottom of the excavation. Figure 3 shows the laboratory results of Phase 2 confirmatory sampling and the expanded kidney-bean shape of the completed excavation. Nearby previous sampling results are also shown in this figure.

The following table lists the sample IDs for samples analyzed at the laboratory, dates collected, depths collected and analytical results (see Appendix B for Data Validation letters).

Sample ID	Date Collected	Sample Depth (Feet)	Results (ppm)	Comments
07EX70	7/23/03	1	27	Grab sample
07EX71	7/23/03	1	250	Grab sample
07EX72	7/23/03	0.5	Non-detected	Grab sample
07EX73	7/23/03	0.5	5.5	Grab sample
07EX74	7/23/03	0.5	0.94	Grab sample
07EX75	7/23/03	0.5	Non-detected	Grab sample

5.0 Statistical Analysis and Revised Risk Calculations

Based on EPA guidance, the Standard Bootstrap Procedure (see Appendix C) was used for calculating the 95 % UCL because the distribution of the data was determined to be undefined. Because previous soil sampling locations were excavated as part of the VIM, the new 95% UCL for TNT was calculated after eliminating the original "hot spots" (SB16 & SB47) and the Delineation Phase 1 sample locations (07SS62 through 07SS65). The post-excavation 95% UCL for TNT was calculated at 17.9 ppm. This reduced the UCL concentration used in risk assessment to within 2 ppm of the residential criteria. The value previously used in the RFI was 9900 ppm. Recalculations of risk are presented in Tables 4-9A through 4-15A (attached). These tables are labeled as such so they can be inserted into the appropriate locations within the RCRA Phase III Soils RFI Report currently under EPA review. In addition to reevaluating the TNT risk, these tables now provide an updated view of the overall site risk from all contaminants evaluated.

6.0 Conclusions

VIM activities were successful in greatly reducing the overall risk at the site. Over 90 percent of the carcinogenic risk estimated for the surface soils at the ORR was attributable to TNT. Because the risks associated with remaining contamination are within the range of background, the need for remediation of these constituents should be deferred until closure of the unit. Additionally, it should be noted that the ORR will continue to be used for ammunition burning (treatment) and that additional contaminants may be added to the soils as a result of these RCRA Subpart X permitted operations. Risks associated with any additional contamination will also be evaluated during the closure of the unit.

Letter Report Attachments and Appendices:

Attachments

Risk Tables (Tables 4-9A through 4-15A)

Figures 1 through 3

Photographs of Remedial Action (1 through 4)

Appendices

A Field Logbook Notes; Sample Log Sheets; and Chain of Custody Sheets

B Data Validation Letters

C Bootstrap Methodology Summary

D Voluntary Interim Measures Work Plan and After Action Report

Table 4-9A

SUMMARY OF INDUSTRIAL HUMAN HEALTH RISKS AND HAZARDS FOR SURFACE SOIL (0' - 1') - EPC = 95% UCL
OLD RIFLE RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3,4]	PRG - Industrial[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Industrial[1]	Estimated HQ	
Surface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Energetics							
2,4,6-TRINITROTOLUENE	17.9	5.7E+01	3.1E-07	Liver	3.1E+02	5.8E-02	NA
Inorganics							
ARSENIC	9.26	1.6E+00	5.8E-06	Skin	2.6E+02	3.6E-02	10.2
		Total Carcinogenic Risk	6.1E-06		**Total HI**	9.4E-02	

Target Organ HIs

Total Liver HI =	5.8E-02
Total Skin HI =	3.6E-02

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value for arsenic is Lognormal 95% UCL.
4 - The 95% UCL presented for TNT is based on Bootstrap calculation method (EPA, December 2002). The 95% UCL presented for TNT also reflects soil conditions post the soil removal action conducted by the Navy during the summer of 2003.

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
NA - Not available
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

Table 4-10A

SUMMARY OF RESIDENTIAL HUMAN HEALTH RISKS AND HAZARDS FOR SURFACE SOIL (0' - 1') - EPC = 95% UCL
OLD RIFLE RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3,4]	PRG - Residential[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Residential[1]	Estimated HQ	
Surface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Semivolatile Organics							
BENZO(A)PYRENE	0.0085	6.2E-02	1.4E-07		NA	---	NA
Energetics							
2,4,6-TRINITROTOLUENE	17.9	1.6E+01	1.1E-06	Liver	3.1E+01	5.8E-01	NA
Inorganics							
ARSENIC	9.26	3.9E-01	2.4E-05	Skin	2.2E+01	4.2E-01	10.2
		Total Carcinogenic Risk	2.5E-05		Total HI	1.0E+00	

Target Organ HIs

Total Liver HI =	5.8E-01
Total Skin HI =	4.2E-01

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value for arsenic is Lognormal 95% UCL.
4 - The 95% UCLs presented for BaP and TNT are based on Bootstrap calculation method (EPA, December 2002).

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
NA - Not available
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

Table 4-11A

SUMMARY OF RESIDENTIAL HUMAN HEALTH RISKS AND HAZARDS FOR SUBSURFACE SOIL (2' - 4') - EPC = 95% UCL
OLD RIFLE RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3]	PRG - Residential[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Residential[1]	Estimated HQ	
Subsurface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Semivolatile Organics							
BENZO(A)PYRENE	0.18	6.2E-02	2.9E-06		NA	---	NA
Energetics							
2,4,6-TRINITROTOLUENE	3.8	1.6E+01	2.4E-07	Liver	3.1E+01	1.2E-01	NA
		Total Carcinogenic Risk	3.1E-06		Total HI	1.2E-01	

Target Organ HIs

Total Liver HI = 1.2E-01

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - 95% UCL could not be calculated using parametric or non-parametric methods presented in EPA December 2002 guidance. Consequently, the maximum concentration is selected as the UCL. Only one positive detection was reported for the analytes.

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
NA - Not available
PRG - Preliminary Remediation Goal

Table 4-12A

SUMMARY OF INDUSTRIAL HUMAN HEALTH RISKS AND HAZARDS FOR SURFACE SOIL (0' - 1') - EPC = 95% UCL
OLD PISTOL RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3]	PRG - Industrial[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Industrial[1]	Estimated HQ	
Surface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Inorganics							
ARSENIC	9.69	1.6E+00	6.1E-06	Skin	2.6E+02	3.7E-02	10.2
		Total Carcinogenic Risk	6.1E-06		Total HI	3.7E-02	

Target Organ HIs

Total Skin HI = 3.7E-02

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value is Lognormal 95% UCL.

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

Table 4-13A

SUMMARY OF INDUSTRIAL HUMAN HEALTH RISKS AND HAZARDS FOR SUBSURFACE SOIL (2' - 4') - EPC = 95% UCL
OLD PISTOL RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3]	PRG - Industrial[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Industrial[1]	Estimated HQ	
Subsurface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Inorganics							
ARSENIC	15.4	1.6E+00	9.6E-06	Skin	2.6E+02	5.9E-02	9
		Total Carcinogenic Risk	9.6E-06		Total HI	5.9E-02	

Target Organ HIs

Total Skin HI = 5.9E-02

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value is Lognormal 95% UCL.

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

Table 4-14A

SUMMARY OF RESIDENTIAL HUMAN HEALTH RISKS AND HAZARDS FOR SURFACE SOIL (0' - 1') - EPC = 95% UCL
OLD PISTOL RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3]	PRG - Residential[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Residential[1]	Estimated HQ	
Surface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Inorganics							
ARSENIC	9.69	3.9E-01	2.5E-05	Skin	2.2E+01	4.4E-01	10.2
		Total Carcinogenic Risk	2.5E-05		Total HI	4.4E-01	

Target Organ HIs

Total Skin HI = 4.4E-01

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value is Lognormal 95% UCL

Abbreviations:
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

Table 4-15A

SUMMARY OF RESIDENTIAL HUMAN HEALTH RISKS AND HAZARDS FOR SUBSURFACE SOIL (2' - 4') - EPC = 95% UCL
OLD PISTOL RANGE
NSWC CRANE, INDIANA

Parameter	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)			Maximum Background Concentration
	UCL[3]	PRG - Residential[1]	Estimated ILCR	Primary Target Organs[2]	PRG - Residential[1]	Estimated HQ	
Subsurface	(mg/kg)	(mg/kg)			(mg/kg)		(mg/kg)
Inorganics							
ARSENIC	15.4	3.9E-01	3.9E-05	Skin	2.2E+01	7.0E-01	9
MANGANESE	1543	NA	---	CNS	1.8E+03	8.6E-01	1410
		Total Carcinogenic Risk	3.9E-05		Total HI	1.6E+00	

Target Organ HIs

Total Skin HI =	7.0E-01
Total Neurological HI =	8.6E-01

Footnotes:
1 - Region IX - Preliminary Remediation Goals (PRGs) Tables, October 1, 2002.
2 - Primary Target Organs - Integrated Risk Information System (IRIS).
3 - Value for arsenic is Lognormal 95% UCL, value for manganese is Normal 95% UCL.

Abbreviations:
CNS - Central Nervous System
HI - Hazard Index
HQ - Hazard Quotient
ILCR - Incremental Lifetime Carcinogenic Risk
NA - Not available
PRG - Preliminary Remediation Goal
UCL - Upper Confidence Limit

GIS\NSWC_CRANE\APR\ORR.APR AREA OF INTEREST FOR THE VOLUNTARY INTERIM MEASURE 10/9/03 JAL

FIGURE 1

OLD RIFLE RANGE SHOWING THE AREA OF INTEREST FOR THE VOLUNTARY INTERIM MEASURE

OLD RIFLE RANGE
NSWC CRANE, INDIANA

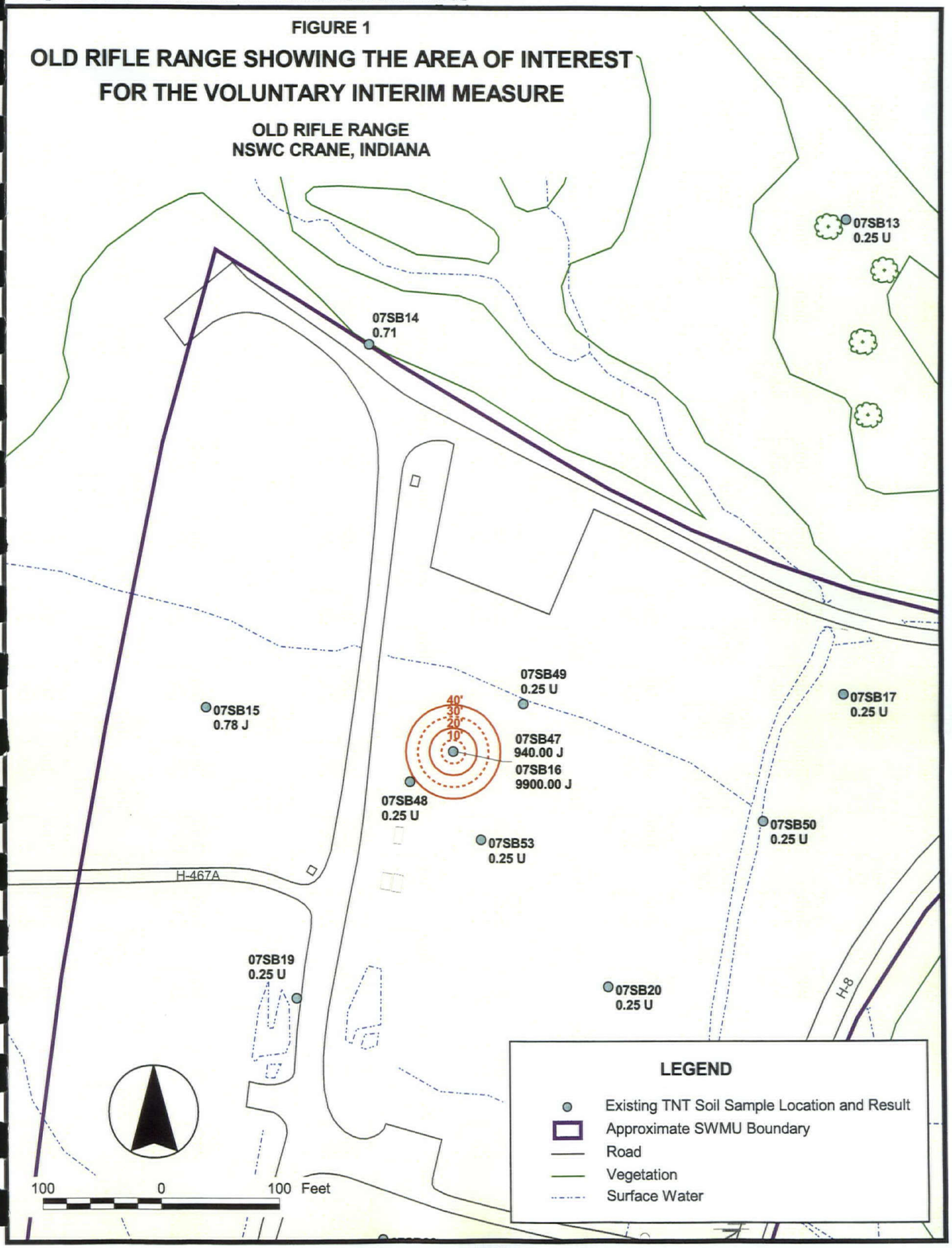


FIGURE 2

DELINEATION SAMPLE RESULTS AND PROPOSED EXCAVATION AREA

OLD RIFLE RANGE
NSWC CRANE, INDIANA

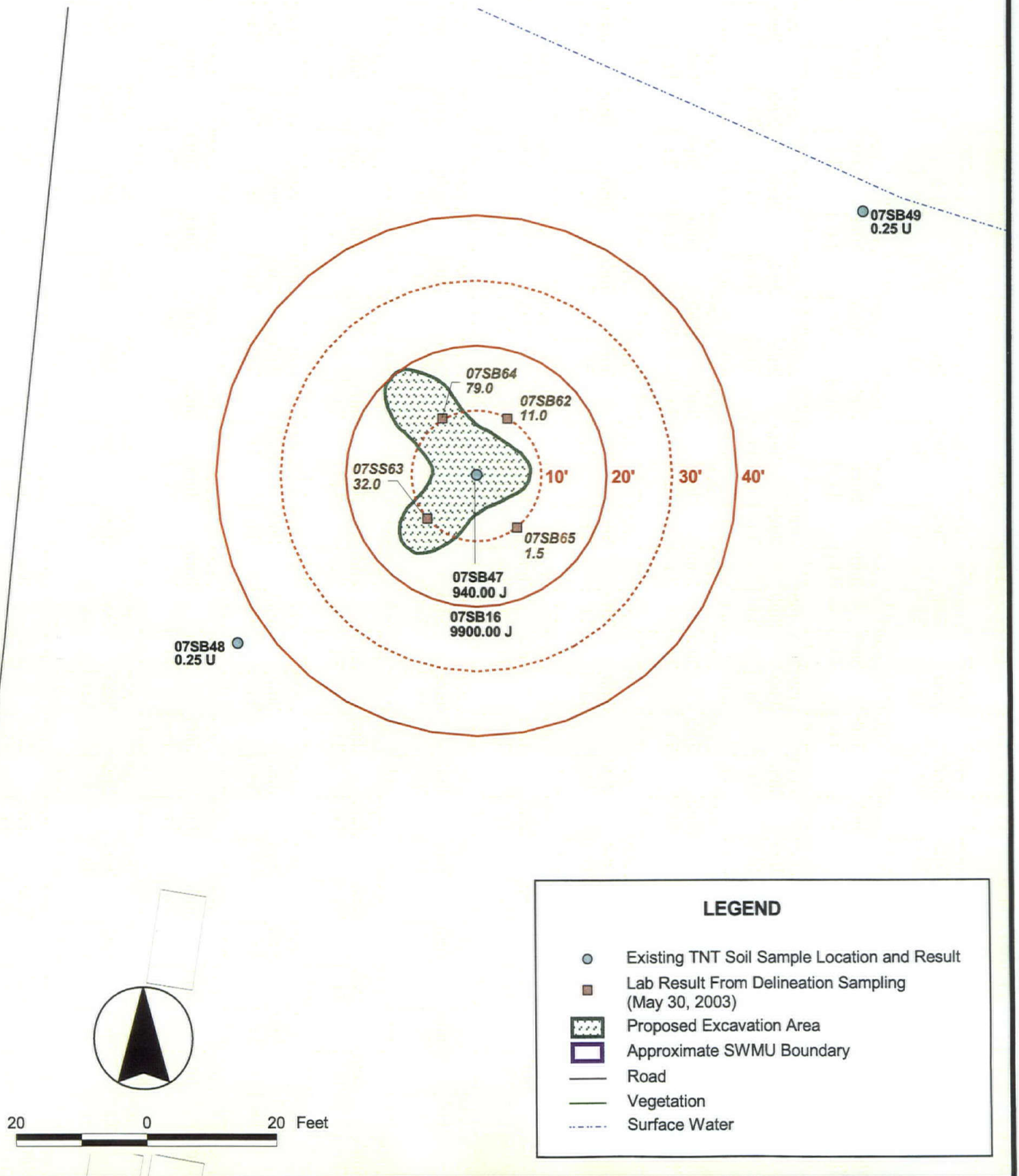
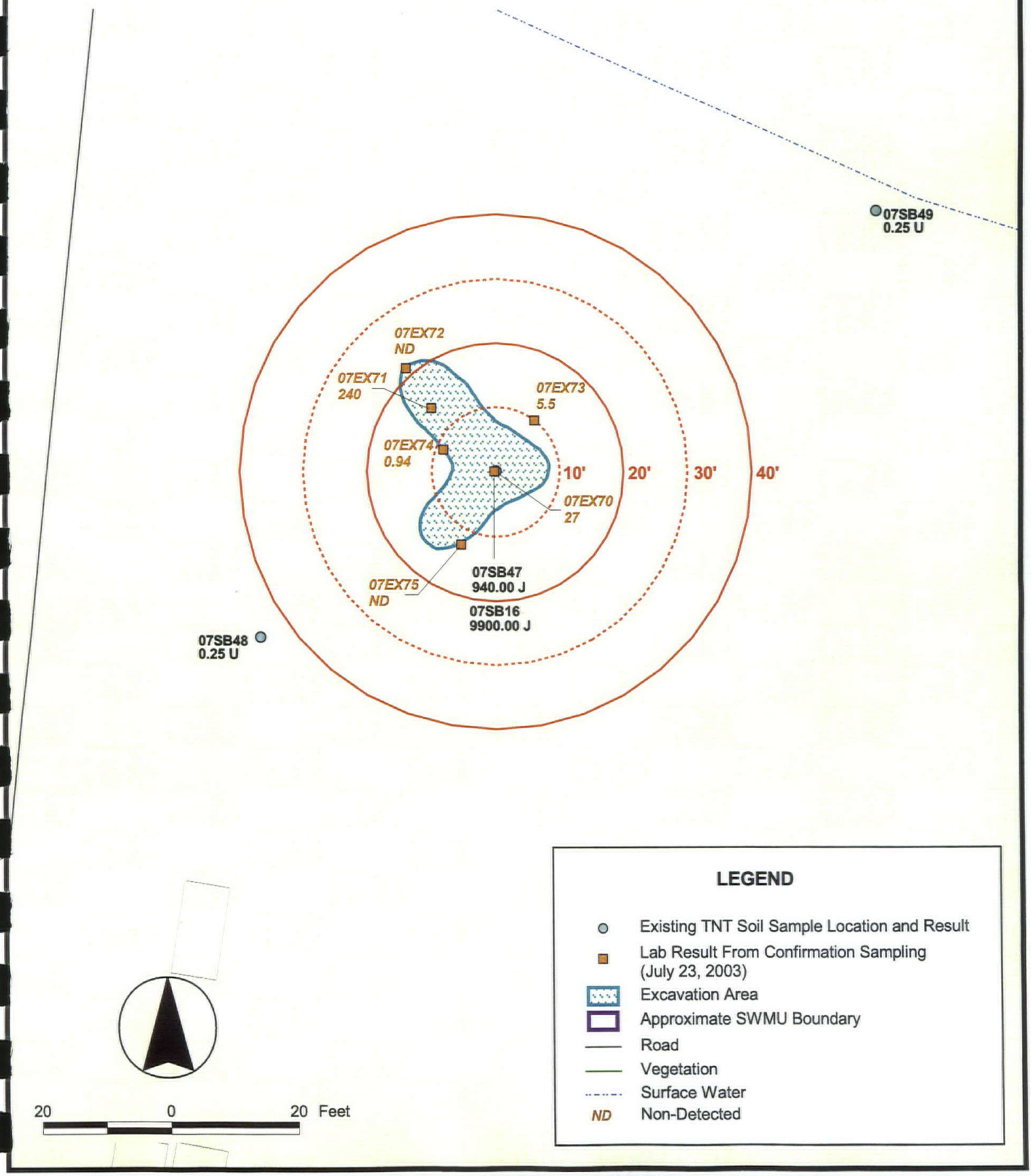


FIGURE 3

CONFIRMATION SAMPLE RESULTS AND EXCAVATED AREA

OLD RIFLE RANGE
NSWC CRANE, INDIANA



VOLUNTARY INTERIM MEASURE
EXCAVATION PHOTOGRAPHS
JULY 22 AND 23, 2003

PHOTOGRAPH 1
Site prior to excavation, showing "hot spot" 07SB16 AND 07SB47 in center and Phase 1 proposed sample locations.
View North, Monitoring Well 06-15 & 17 background center, 06C15 & 15P2 background right.

PHOTOGRAPH 2
Excavation in progress
View Northeast

VOLUNTARY INTERIM MEASURE
EXCAVATION PHOTOGRAPHS
JULY 22 AND 23, 2003

PHOTOGRAPH 3
Outline of the 2 areas requiring additional soil removal based on results of field test kits.
Larger of the 2 areas in foreground, smaller of 2 left center (close to rear wheel of truck). View Southeast

PHOTOGRAPH 4
Completed excavation showing plastic tarp covering excavated area pending filling.
Length (left to right) 34 feet. Width, at widest, 22 feet. View South

APPENDIX A

FIELD NOTES
SAMPLE LOG SHEETS
CHAIN-OF-CUSTODY SHEETS

FIELD NOTES FOR OLD RIFLE RANGE
MAY 2003

TNT VOLUNTARY INTERIUM MEASURE

TITLE NSWC

PROJECT NO. 3961

THURSDAY 5-29-03

BOOK 2500

Work continued from Page WEATHER: CRANE - CLOUDY 68°F

0730 KEITH SIMPSON AND TERRY RUJAHN @ PGH AIRPORT TO CRANE, IN.

1300 @ BLD 3245 LOAD SAMPLING EQ. INTO SUV. MET WITH TOM BRENT TO DISCUSS SAMPLING PLAN.

1430 KS, TR & TB TO SWMU 7 ORR & CONFIRMED LOCATION 07SB16/47. TOM ALSO CHECKED WITH DEMO RANGE FOR OUR ACCESS TO ORR OVER THE NEXT 3 DAYS. TOM RETURNED TO 3245. KS & TR LAY-OUT RADIUS/GRID FOR SAMPLING (SEE FIG. 1). TOOK PHOTOS OF LAY-OUT & SITE. SAMPLED THE 4 LOCATIONS ON 20' RADIUS. SAMPLES COLLECTED 0 to 1' BGS USING A SHOVEL THEN A PLASTIC TROWEL. SAMPLE WAS TRANSFERED INTO A LABELED ZIPLOC AND TEST KITS RUN @ BLD 3245

2010 COMPLETE & TESTS TO HOTEL

SEE PG 9

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE

DATE 5-29-03

WITNESS

DATE

TITLE NSWC CRANE
MAY 30, 2003

PROJECT NO. 3961
BOOK 2500

Work continued from Page

the **DTECHTOR** Table

Sample	the DTECHTOR Reading	TNT Equivalents
Soil (ppm)	LO	<0.5
	1-15	0.5-1.5
	15-45	1.5-3.0
	45-60	3.0-4.0
	60-75	4.0-5.0
	HI	>5.0
Water (ppb)	LO	<5
	1-30	5-15
	30-50	15-25
	50-75	25-45
	HI	>45

OVER

STRATEGIC DIAGNOSTICS INC.
NEWARK, DE 19702
D-TECH TNT EXPLOSIVES TEST
TK1004-1, LOT# 3E1231
D-TECH TNT/RDX SOIL EXTRACT PAC
TK1001S1, LOT # 2L1070
D-TECH DILUTION PAC
TK1001S1-1, LOT # 3E1186

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE
WITNESS

DATE 5.30.03
DATE

TITLE NSWC CRANE
MAY 30, 03

PROJECT NO. 3961
BOOK 2500

Work continued from Page

SAMPLE ID	DATE	TIME	LOCATION	RESULT %	RESULT PPM	COMMENTS
0755 54	5.29.03	1515	N 20	9% =	1.1	METEK
55		1535	W 20	56 =	3.5	
56		1530	S 20	LO =	<0.5	
57		1520	~~W~~ E 20	44 =	3.0	
58	5.30.03	1012	N 10	—	4.0	CARD
59		1015	W 10	—	<0.5	
60		1018	S 10	—	8.0	D
61		1022	E 10	—	14	D
62		1508	NE 10	TO	LAMCKS	LAB
63		1510	SW 10			
64		1514	NW 10			
65		1518	SE 10			
0755 16/47		1025	—		>50	KIT-D

METER BROKE DOWN AFTER 4 TEST
USED CARD ON PG 8 FOR RESULTS - OK

D = RAN 1:10 DILUTION

% ABOVE IS METER READING

DTECHTOR METER TK1001M-1
S/N D35625
% FROM METER

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE
WITNESS

DATE 5-30.03
DATE

TITLE NSWC CRANE PROJECT NO. 3961

FRIDAY 5-30-03 BOOK 2500

Work continued from Page WEATHER: SUNNY AM 65°F

PM CLOUDY 76°F

0630 TR & KS TO HARDWARE STORE PICK-UP SUPPLIES FOR JOB TO BASE / BLD 3245 LOAD SUV CALL IN HRS.

0910 TO ORR NO ACCESS TO ORR UNTIL 1030 - TO MGBG INSTALLED WELL TAG & ~~TO~~ KS REMOVED OLD IDW FENCE AREA.

0945 AT ORR SAMPLED 4 LOCATIONS @ 10' Ø

1040 @ 3245 TO RUN TNT TEST KITS - LUNCH @ 1200

COMPLETE TEST KITS - CALLED ROGER CLARK & MARK FRANCIS DISCUSSED RESULTS WILL COLLECT 4 LAB SAMPLES @ 45° OFF-SET

1440 TO ORR & COLLECT SAMPLES

1550 RETURN TO 3245 PACK SAMPLES START DEMOB

1650 TO SWMU 16 FOR ROUND OF WL

1730 @ 3245 CLEAN-UP TO

1745 FEDEX

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [illegible] DATE 5-30-03

WITNESS DATE

TITLE NSWC CRANE PROJECT NO. 3961

SAT 5-31-03 BOOK 2500

Work continued from Page RAIN OVERNITE 65-68°F

0700 KS & TR @ 3245 CLEAN-UP AND INVENTORY

0910 COMPLETE INVENTORY TO AIRPORT / PGH / HOME

ALL SOIL SAMPLES WERE COLLECTED BY DIGGING A HOLE APROX 6X6" X 10" DEEP - THEN "CLEAN" SIDES & BTM. USING PLASTIC TROWEL & MIXING IN-SITU THEN SAMPLE. SHOVEL WAS DECONED AFTER EACH USE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605

Work continued to Page

SIGNATURE [illegible] DATE 5-31-03

WITNESS DATE

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS 54 (KS)
Sample Location: 07 SB 54
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5-29-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: KS ~~1315~~ 1515	0 - 1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT, TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL
Method: PLASTIC TROWEL			
Monitor Reading (ppm): —			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	—

OBSERVATIONS / NOTES:

RESULTS: 1.1 PPM TNT

MAP:

Also see figure 1

NORTH 20' OF 07SB 16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

K. Simpson

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ KS 55
Sample Location: 07 SB 55
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.29.03 Time: 1535 Method: PLASTIC TRUWEL Monitor Reading (ppm): —	0 - 1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT, TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL TR ASH FRAGS 1/2" Ø

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	—

OBSERVATIONS / NOTES:

RESULTS = 3.5 PPM TNT

MAP:

Also see figure 1

20' W OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

KS/SL

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07-~~SB~~ KS SS 56
Sample Location: 07 SB 56
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5·29·03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: ~~1330~~ KS 1530	0 - 1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT, TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL
Method: PLASTIC TRAVEL			
Monitor Reading (ppm): ——			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	—

OBSERVATIONS / NOTES:

RESULTS = <0.5 PPM

MAP:

Also see figure 1

SOUTH 20' OF 07 SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

KS SL

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

Sample ID No.: 07 ~~SB~~ KS SS 57
Sample Location: 07 SB 57
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.29.03 Time: KS ~~1320~~ 1520 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0-1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT, TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	—

OBSERVATIONS / NOTES:

RESULTS = 3.0 PPM TNT

MAP:

Also see figure 1

EAST 20' OF 07 SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

KS

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

Sample ID No.: 07 ~~SB~~ SS 58
Sample Location: 07 SB 58
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.30.03 Time: 1012 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0 - 1'	BRN	ON GRASS AREA, TR ROOTS, SILT TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL, MOIST, TR ASH

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	

OBSERVATIONS / NOTES:

ASH - TR MAX ½" Ø

RESULTS = 4.0 PPM TNT

MAP:

Also see figure 1

10' N OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

Sample ID No.: 07 ~~SB~~ SS 59
Sample Location: 07 SB 59
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5-30-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1015	0 - 1	BRN	ON GRASS AREA, TR ROOTS, MOIST SILT, TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL
Method: PLASTIC TROWEL			
Monitor Reading (ppm): —			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	

OBSERVATIONS / NOTES:

RESULTS = <0.5 PPM TNT

MAP:

Also see figure 1

10' W OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS 60
Sample Location: 07 SB 60
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5-30-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1018	0-1'	BRN.	ON GRASS AREA, TR. ROOTS, MOIST, SILT TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL TR ASH, MAX ½" Ø
Method: PLASTIC TUBE			
Monitor Reading (ppm): —			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	

OBSERVATIONS / NOTES:

RESULTS = 8.0 PPM TNT

MAP:

Also see figure 1

10' S OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS61
Sample Location: 07 SB 61
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-30-03 Time: 1022 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0-1'	BRN.	ON GRASS AREA, TR ROOTS, MOIST, SILT TR CLAY, TR SANDSTONE & LIMESTONE GRAVEL

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	TEST KIT	✓	

OBSERVATIONS / NOTES:

RESULTS = 14 PPM TNT

MAP:

Also see figure 1

10' E OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS 62 0001
Sample Location: 07 SB 62
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.30.03 Time: ~~1508~~ 1508 Method PLASTIC TRAVEL Monitor Reading (ppm): —	0 - 1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT TR CLAY, TR LIMESTONE & SANDSTONE GRAVEL

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz	✓	

OBSERVATIONS / NOTES:

LAB SAMPLE - LAUCKS

MAP:

Also see figure 1

10' NE OF 07SB16/47

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS 63 0001
Sample Location: 07 SB ~~62~~ 63
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.30.03 Time: 1510 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0-1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT TR CLAY TR SANDSTONE & LIMESTONE GRAVEL

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz	✓	

OBSERVATIONS / NOTES:

SENT TO LAUCKS

MAP:

Also see figure 1

10' SW OF 07SB16/47

Circle If Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

Sample ID No.: 07 ~~SB~~ SS 64 0001
Sample Location: 07 SB 64
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5.30.03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1514	0-1'	BRN	ON GRASS AREA, TR ROOTS MOIST SILT TR CLAY TR LIMESTONE & SANDSTONE GRAVEL TR ASH - ½" Ø MAX
Method: PLASTIC TROWEL			
Monitor Reading (ppm): —			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz	✓	
		—	
		—	
		—	
		—	

OBSERVATIONS / NOTES:

SENT TO LAUCKS

MAP:

Also see figure 1

10' NW OF 07SB16/47

Circle If Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 job # 3961 SWMU 7

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 07 ~~SB~~ SS 65 0001
Sample Location: 07 SB 65
Sampled By: K. Simpson & T. Rojahn
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5.30.03 Time: 1518 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0-1'	BRN	ON GRASS AREA, TR ROOTS, MOIST, SILT TR CLAY TR SANDSTONE & LIMESTONE GRAVEL TR ASH - 1/2" Ø MAX

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4oz	✓	

OBSERVATIONS / NOTES:

SENT TO LAUCKS

MAP:

Also see figure 1

10' SE OF 07SB 16/47

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO: 3961	SITE NAME: NSWC CRANE	PROJECT MANAGER AND PHONE NUMBER: ROGER CLARK 412 921 8415	LABORATORY NAME AND CONTACT: CAMCS
SAMPLERS (SIGNATURE): [illegible]		FIELD OPERATIONS LEADER AND PHONE NUMBER: KEITH SIMPSON 412 921 8131	ADDRESS:
		CARRIER/WAYBILL NUMBER: FEDEX 8280 7402 8878	CITY, STATE: SEATTLE WA

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☒ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: TNT - 8330

DATE YEAR 2003	TIME	SAMPLE ID (ORR TNT VOLUNTARY INTERIM MEASURE)	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TNT - 8330								COMMENTS
5/30	1508	075562 0001	S	G	1	1								
	1510	075563 0001	S	G	1	1								
	1514	075564 0001	S	G	1	1								
↓	1518	075565 0001	S	G	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [illegible]	5.30.03	1830	1. RECEIVED BY FEDEX	5.30.03	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

[redacted]ISTR[redacted]ON: [redacted] WH[redacted]ACCO[redacted]NIES [redacted]LE) [redacted] YE[redacted](FIE[redacted]PY) [redacted] NK ([redacted]OPY [redacted] 3/9[redacted]
FORM NO. TNTUS-001

FIELD NOTES FOR OLD RIFLE RANGE
JULY 2003

NSWC CRANE, IN
CTO 160 N3961
SUMMARY OF FIELD ACTIVITIES
JULY 22 AND 23, 2003

The following is a summary of field activities for CTO 160 job N3961, Phase 2 – Confirmatory Sampling conducted July 22 and 23, 2003, at the NSWC Crane facility, Crane, Indiana. Keith Simpson (TtNUS, Pgh.) served as Field Operation Leader (FOL).

1.0 BACKGROUND

Soil sampling and soil removal at a localized area contaminated with trinitrotoluene (TNT) within SWMU 7 was conducted as part of a Voluntary Interim Measure (VIM). Phase 1 sampling was conducted during May 29 and 30, 2003, at which time samples were collected and analyzed for TNT using both field test kits and a fixed-base laboratory. The Phase 1 sample results were used to delineate the area of contamination and to calculate the volume of soil required to be excavated in order to achieve the voluntary cleanup.

2.0 PHASE 2 – SOIL EXCAVATION AND CONFIRMATORY SAMPLING

Toltest, Inc. (current RAC contractor) was contracted by the Navy to excavate and remove up to 18 cy (12 cy plus 6 additional if needed) of contaminated soil at SWMU 7. A backhoe and 2 dump trucks were used to perform the excavation and disposal. One truck was loaded on July 22, 2003; this load represented approximately 70% of the total soil removal needed to accomplish the VIM. After this first truck was loaded the FOL collected four confirmatory soil samples (1 composite from the bottom of the excavation & 3 side wall grabs). These samples were analyzed on site using a D TECH ™ TNT Explosives Test Kit (see the table below for test results). Tom Brent of Crane Environmental was at the site during the soil sampling and it was determined that the excavation was not down to the required one foot depth at the southeast side and more soil would need to be excavated from that area. The excavation completion along with any addition soil needed to be excavated, based on field test results, would be preformed the next morning.

Analysis of the four samples, using field test kits, was completed July 22. Two of the sample results were above the proposed excavation level of 16 ppm. These two samples were located on the NW and N side of the excavation (see attached figure). On the morning of July 23, discussions were held among Bill Gates (SDIV) Tom Brent (Crane Environmental) and Roger Clark, Mark Francis, Keith Simpson (TtNUS) and it was decided to remove an additional 3 to 4 cy of soil from the 2 areas (1.5 to 2cy each area) with the elevated test kits results bringing the total soil excavated to 16 ± cy.

At the completion of the VIM excavation, six soil samples were collected and sent to Laucks Testing Laboratory for TNT analysis (see soil sample log sheets and chain of custody forms).

A total of 10 samples were collected, 4 analyzed using field test kits & 6 sent to Laucks Testing Lab. All samples were collected using disposable plastic trowels and placed directly into 8oz., wide-mouth glass jars and held/shipped on ice. Excavation side-wall samples were collected at the midpoint in the excavation wall at a depth ½ foot bgs and bottom samples were collected at 1 foot bgs which was the bottom of the excavation.

The following table lists sample IDs, dates and time collected, depth collected and results of field test kit analysis.

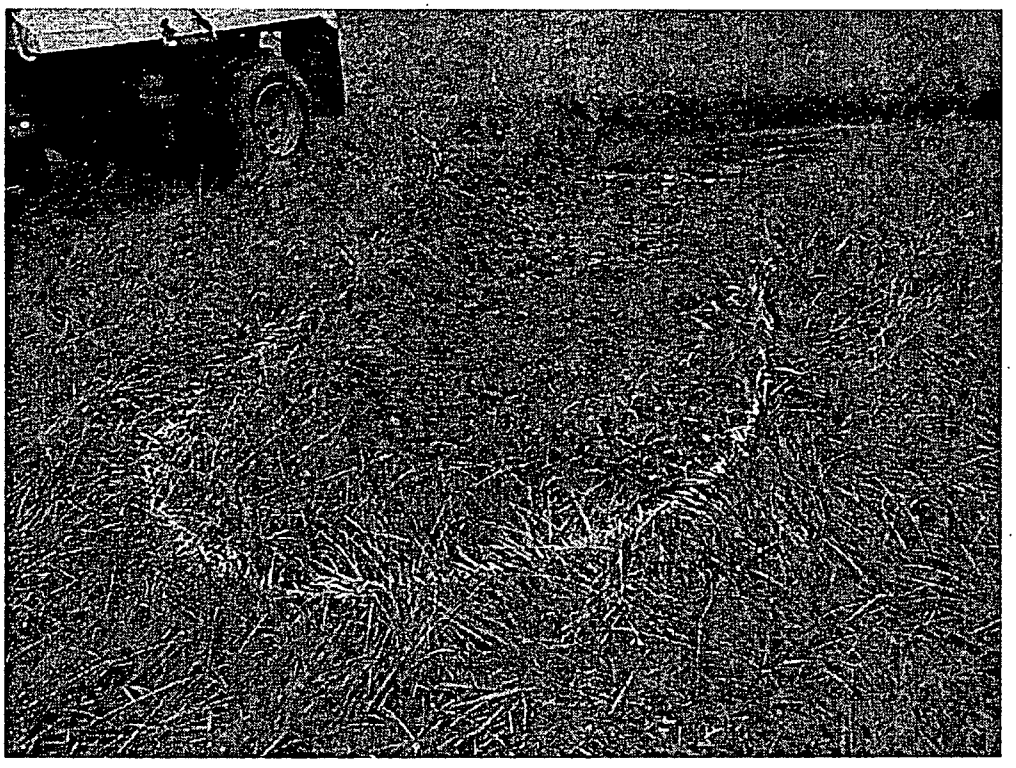
Sample ID	Date Collected	Time Collected	Sample Depth (Feet)	Test Kit Results	Comments
07EX66	7/22/03	1530	1	<10	Comp. sample
07EX67	7/22/03	1533	0.5	>50	Grab sample
07EX68	7/22/03	1540	0.5	20	Grab sample
07EX69	7/22/03	1545	0.5	<5	Grab sample
07EX70	7/23/03	1030	1	Sent to fixed -	Grab sample
07EX71	7/23/03	1033	1	base lab.	Grab sample
07EX72	7/23/03	1038	0.5	"	Grab sample
07EX73	7/23/03	1043	0.5	"	Grab sample
07EX74	7/23/03	1050	0.5	"	Grab sample
07EX75	7/23/03	1052	0.5	"	Grab sample

For more details on any of the above activities, see the following: log book #2500, sample log forms, COCs and site photographs (attached).

NSWC CRANE, IN
CTO 160 N3961
VIM EXCAVATION PHOTOGRAPHS
JULY 22 AND 23, 2003

Site prior to excavation, showing "hot spot" 07SB16/46 in center and Phase 1 proposed sample locations.
View North, Monitoring well 06-15 & 17 background center, 06C15 & 15P2 background right.

Excavation in progress
View Northeast



Outline of the 2 areas requiring additional soil removal based on results of field test kits.
Larger of the 2 areas in foreground, smaller of 2 left center (close to rear wheel of truck).
View Southeast

Completed excavation showing plastic tarp covering excavated area pending filling.
Length (left to right) 34 feet. Width, at widest, 22 feet.
View South

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961
PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 66
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 7.22.03	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1525	1'	BRN.	MOIST SILT, TR CLAY
Method: PLASTIC TRUCK	1528	1'	↓	TR LIMESTONE GRAVEL
DIRECT FILL	1530	1'	↓	FRAGS.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	FIELD TEST	✓	

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL

SAMPLE TIME = 1530

RESULTS = <10 PPM OF TNT

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): KS/SL

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961

PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 67
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-22-03 Time: 1533 Method: PLASTIC TROWEL Monitor Reading (ppm): —	~~0~~ 15 0.5'	BRN	MOIST, SILT, TR CLAY.

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	FIELD TEST	✓	

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL
RESULT >50 PPM

MAP:

TR LIMESTONE GRAVEL FRAGS. & TR ASH & FILL (BRICK FRAGS). VERY LITTLE OF BOTH ASH/FILL NOTED

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

KS

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961
PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX68
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-22-03 Time: 1540 Method: PLASTIC TUBE Monitor Reading (ppm): —	~~0~~ KS 0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	FIELD TEST	✓	

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL
RESULT = 20 PPM

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): KJ Sl

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961

PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX69
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7.22.03 Time: 1545 Method: PLASTIC TRAVEL Monitor Reading (ppm): —	~~0~~ 1.5 0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	FIELD TEST	✓	

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL

RESULT = < 5 PPM

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961
PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 70
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7.23.03 Time: 1030 Method: PLASTIC TROWEL Monitor Reading (ppm): —	1'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz GLASS	✓	
	LAUCKS		

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL

SAMPLE COLLECTED FROM BTM. OF EXCAVATION

MAP:

SAMPLES 70 → 75 (6) (ALL SAMPLES SENT TO LAUCKS) NO FILL OR ASH NOTED IN ANY OF THE SAMPLES.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961

PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 71
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7·23·03 Time: 1033 Method: PLASTIC TROWEL Monitor Reading (ppm): —	1'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz GLASS LAUCKS	✓	

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL

SAMPLE COLLECT FROM BTM. OF EXCAVATION

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): KJS

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961
PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 72
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7.23.03 Time: 1038 Method: PLASTIC TROWEL Monitor Reading (ppm): —	~~0.~~ 0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 OZ GLASS	✓	
	LAUCKS		

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL

SIDEWALL SAMPLE

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961
PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 73
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-23-03 Time: 1043 Method: PLASTIC TROWEL Monitor Reading (ppm): —	~~0~~ PLS - 0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz GLASS	✓	
	CAUCIRS		

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL
SIDEWALL SAMPLE

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [illegible]

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961

PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 74
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7.23.03 Time: 1050 Method: PLASTIC TROWEL Monitor Reading (ppm): —	0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 OZ GLASS	✓	
	LAUCILI		

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL
SIDEWALL SAMPLE

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SOIL SAMPLE LOG SHEET

Project Site Name: NSWC Crane, IN - ORR
Project No.: CTO 160 #N3961

PHASE 2 SAMPLING

[] Surface Soil
[] Subsurface Soil
[] Sediment
[X] Other: Excavation
[] QA Sample Type:

Sample ID No.: 07 EX 75
Sample Location: ORR SWMU 7
Sampled By: Keith Simpson
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7.23.03 Time: 1052 Method: PLASTIC TRAVEL Monitor Reading (ppm): —	0.5'	BRN	MOIST, SILT, TR CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TNT	4 oz GLASS	✓	
	LAYERS		

OBSERVATIONS / NOTES:

TOLTEST INC. EXCAVATING SOIL
SIDEWALL SAMPLE

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 160 N 3961	NSWC CRANE	ROGER CLARK 412.921 8415	LAUCKS TESTING
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		KEITH SIMPSON 412 921 8131	
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FEDEX 8412 2491 4120	SEATTLE, WA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

ORR - SWMU 7
EXCAVATION SAMPLING

DATE YEAR 2003	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: TNT	4 oz glass							COMMENTS
7/23	1030	07 EX 70	S	G	1	1								
	1033	07 EX 71	S	G	1	1								
	1038	07 EX 72	S	G	1	1								
	1043	07 EX 73	S	G	1	1								
	1050	07 EX 74	S	G	1	1								
	1052	07 EX 75	S	G	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	7.23.03	1700	1. RECEIVED BY FEDEX	7.23.03	1700
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 3/99 NO. [redacted]6-00[redacted]

APPENDIX B

LABORATORY DATA
(DATA VALIDATION LETTERS)

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	R. CLARK	DATE:	JUNE 26, 2003
FROM:	BERNARD F. SPADA III	COPIES:	DV FILE M. FRANCIS
SUBJECT:	ORGANIC DATA VALIDATION – EXP CTO 160, NSWC CRANE SDG T1608		
SAMPLES:	4 / Soil / EXP		

07SS62-0001 07SS63-0001 07SS64-0001
07SS65-0001

OVERVIEW

The sample set for CTO 160; NSWC Crane, SDG T1608 consists of four (4) environmental soil samples. All samples were analyzed for 2,4,6-trinitrotoluene by Method SW-846 8330.

The samples were collected by TetraTech NUS on May 30th, 2003 and analyzed by Laucks Testing Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8330 analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

- * Data completeness
- * Holding times
- * Initial and continuing calibration
- * Blank results
- * Surrogate spike recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- * Compound Quantitation
- * Compound Identification
- * Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Explosives

The laboratory reported surrogate recoveries from one column only. All surrogate recoveries reported on the primary column were acceptable. No action was taken on this basis.

The result for 2,4,6-trinitrotoluene exceeded the linear calibration range of the instrument in sample 07SS64-0001. The sample was re-analyzed at a 5X dilution. The result from the diluted analysis was used for validation.

All sample IDs were incorrectly identified by the laboratory. The reviewer corrected the database and all sample Form Is.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation as modified by EPA Region V (8/93) and the NFESC guidelines "Navy IRCDQM" (Sept 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Bernard F Spada III

Tetra Tech NUS
Bernard F Spada III
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 3961

SDG: T1608 MEDIA: SOIL DATA FRACTION: EX

nsample	07SS62 0001
samp_date	5/30/2003
lab_id	0305449-01
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	11		

nsample	07SS63 0001
samp_date	5/30/2003
lab_id	0305449-02
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	32		

nsample	07SS64 0001
samp_date	5/30/2003
lab_id	0305449-03
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	79		

PROJ_NO: 3961

SDG: T1608 MEDIA: SOIL DATA FRACTION: EX

nsample	07SS65 0001
samp_date	5/30/2003
lab_id	0305449-04
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	1.5		

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

Explosives

TO:	**R. CLARK**	**DATE:**	**AUGUST 21, 2003**
FROM:	**BERNARD F. SPADA III**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – EXP CTO 160, NSWC CRANE SDG T1609**		
SAMPLES:	6 / Soil / EXP		

07EX70	07EX71	07EX72
07EX73	07EX74	07EX75

OVERVIEW

The sample set for CTO 160; NSWC Crane, SDG T1609 consists of six (6) environmental soil samples. All samples were analyzed for 2,4,6-trinitrotoluene by Method SW-846 8330.

The samples were collected by TetraTech NUS on July 23rd, 2003 and analyzed by Laucks Testing Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8330 analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

- * Data completeness
- * Holding times
- * Initial and continuing calibration
- * Blank results
- * Surrogate spike recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- * Compound Quantitation
- * Compound Identification
- * Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Explosives

The laboratory reported surrogate % recovery from one column only. No action was taken on this basis.

The result for 2,4,6-trinitrotoluene exceeded the linear calibration range of the instrument in sample 07EX71. The sample was re-analyzed at a dilution. The result from the diluted analysis was transposed to the un-diluted analysis and used for validation.

The result for 2,4,6-trinitrotoluene is taken from the dilution analysis of sample 07EX71 exceeded the 25%

difference between analytical columns quality control criteria. The result for 2,4,6-trinitrotoluene was qualified as estimated (J) in sample 07EX71.

Positive results for 2,4,6-trinitrotoluene were reported from the C18 column regardless of whether the concentration was higher on the CN column. This item is noted for completeness.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Qualification was made based on percent difference between analytical columns non-compliance.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation as modified by EPA Region V (8/93) and the NFESC guidelines "Navy IRCDQM" (Sept 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Bernard F Spada III

Tetra Tech NUS
Bernard F Spada III
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

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APPENDIX A

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D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 3961

SDG: T1609 MEDIA: SOIL DATA FRACTION: EXP

nsample	07EX70
samp_date	7/23/2003
lab_id	0307329-01
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	27		

nsample	07EX71
samp_date	7/23/2003
lab_id	0307329-02
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	250	J	U

nsample	07EX72
samp_date	7/23/2003
lab_id	0307329-03
qc_type	NM
units	MG/KG
Pct_Solids	100
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	0.5	U	

PROJ_NO: 3961

SDG: T1609 MEDIA: SOIL DATA FRACTION: EXP

nsample	07EX73	nsample	07EX74	nsample	07EX75
samp_date	7/23/2003	samp_date	7/23/2003	samp_date	7/23/2003
lab_id	0307329-04	lab_id	0307329-05	lab_id	0307329-06
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/KG	units	MG/KG	units	MG/KG
Pct_Solids	100	Pct_Solids	100	Pct_Solids	100
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	5.5		

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	0.94		

Parameter	Result	Val Qual	Qual Code
2,4,6-TRINITROTOLUENE	0.5	U	

APPENDIX C

STANDARD BOOTSTRAP PROCEDURE

Bootstrap Methodology Summary

The exposure point concentrations (EPCs) presented in Tables 4-9A through 4-15A were determined using the guidance presented in the U.S. EPA reference titled, ***Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*** (December 2002). The methodology is outlined in Exhibit 14 of the UCL guidance. Prior to the calculation of the EPC, the distribution of a data set (normal, lognormal, undefined) was determined using the Shapiro-Wilk W-test. Then, the 95 percent upper confidence limit (UCL) for the arithmetic mean was calculated per one of the three methodologies presented below. The UCLs for data sets determined to be normally distributed were calculated using the Student's *t* statistic. The UCLs for data sets determined to be lognormally distributed were calculated using the Land method. The UCLs for data sets not determined to be normally or lognormally distributed were calculated using the non-parametric Standard Bootstrap Procedure. The resulting 95% UCL for a parameter was compared to the maximum detected concentration in the data set and was selected as the EPC if the 95 % UCL was less than the maximum detected concentration. Otherwise, the maximum detected concentration was selected as the EPC.

<u>Method 1 - 95 % UCL Calculation for Normally Distributed Data – The Student's *t* Statistic</u>

The 95 percent upper confidence limit (one-tailed test) is calculated as follows:

$$UCL_{0.95} = \bar{x} + t_{0.95,n-1} \frac{S_x}{\sqrt{n}}$$

where: $\bar{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$ = arithmetic mean

$$S_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$ = the sample standard deviation

$t_{0.95,\,n-1}$ = Value found in t-distribution table

<u>Method 2 – 95 % UCL Calculation for Log-normally Distributed Data – The Land Method</u>

The following formula is used to calculate the upper 95% confidence interval (UCL95%) for the geometric mean (x_g):

$$UCL_{0.95} = \exp\left[\bar{y} \pm 0.5(S_y)^2 + \frac{S_y(H_{0.95,n})}{\sqrt{n-1}}\right]$$

where: $\bar{y}_1$ = arithmetic mean of the log-transformed data, y = ln(x)

Sy = standard deviation of y

$H_{0.95,n}$ = factor for sample size n

Method 3 - 95 % UCL Calculation when the Distribution of the Data is Undefined – The Standard Bootstrap Procedure

In the bootstrap procedure, repeated samples of size n are drawn with replacement from the given set of observations. The process is repeated a large number of times and each time an estimate of θ is computed.

Step 1: Let (x_{i1}, x_{i2}, … , x_{in}) represent the ith sample of size n with replacement from the original data set (x_1, x_2, …, x_n). Then compute the sample mean and denote it $\bar{x}_i$.

Step 2: Perform Step 1 independently N times (e.g., 1000-2000) each time calculating a new estimate. Denote those estimates by $\bar{x}_1$, $\bar{x}_2$, $\bar{x}_3$,…, $\bar{x}_n$. The bootstrap estimate of the population mean is the arithmetic mean $\bar{x}_B$, of the N estimates $\bar{x}_i$: i = 1,2, …,N. The bootstrap estimate of the standard error is given by:

$$\hat{\sigma}_B = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(\bar{x}_i - \bar{x}_B)^2}$$

The (1-α) 100% standard bootstrap UCL for θ is given by:

$$UCL = \hat{\theta} + z_\alpha \hat{\sigma}_\beta$$

It should be noted for all the above procedures, the 95 percent confidence interval for a second sample of size n drawn from the same population will most likely not be the same as that for the first sample. In theory, if an interval estimate is calculated for the means of a very large set of samples of size n, the true population mean will be within 95 percent of this limit.

APPENDIX D

VOLUNTARY INTERIM MEASURES WORK PLAN AND AFTER ACTION REPORT

VOLUNTARY INTERIM MEASURES
WORK PLAN
and
AFTER ACTION REPORT

SWMU 7
OLD RIFLE RANGE

NAVAL SURFACE WARFARE CENTER CRANE, INDIANA

October 2003

CONTRACT NO. N68950-00-D-0200
DELIVERY ORDER # FC78
TOLTEST PROJECT NO. 75210.01

Submitted to:

OFFICER IN CHARGE OF NAVFAC CONTRACTS
NAVAL SURFACE WARFARE CENTER
BUILDING 2516
300 HIGHWAY 361
CRANE, INDIANA 47522-5082

TOLTEST, INC.

VOLUNTARY INTERIM MEASURES WORK PLAN

SWMU 7
OLD RIFLE RANGE

NAVAL SURFACE WARFARE CENTER CRANE, INDIANA

July 2 2003

CONTRACT N68950-00-D-0200
DELIVERY ORDER #FC78
TOLTEST PROJECT NO. 75210.01

Prepared by:

TOLTEST, INC.
508 West Elnora
ODON, INDIANA 47562
(812) 636-8501

PREPARED BY:

TolTest Project Manager — Peter J. Chevalier — 9/17/03 (Date)

APPROVALS:

TolTest Regional Manager — Lance Parsons — 9/17/03 (Date)

TolTest QA/QC Manager — Shayne Newsome — 9/17/03 (Date)

CLIENT ACCEPTANCE:

U. S. Navy Responsible Authority — Terry Mahoney (COTR) — 9/17/03 (Date)

Thomas Brent (ECOTR) — (Date)

Bill Gates (SOUTHDIV) — (Date)

1.0 INTRODUCTION

TOLTEST has been retained by the Naval Facilities Engineering Command, Officer in Charge of Construction (OICC) under contract N68950-00-D-0200, Delivery Order (DO) #FC78 to provide a Voluntary Interim Measures Work Plan (WP) for completing remediation activities at the Old Rifle Range (ORR), Naval Surface Warfare Center (NSWC) Crane, Indiana.

The objective of this work is to remove and properly dispose of soil contaminated with TNT. After post-excavation sample results (samples to be obtained and submitted for analysis by TetraTech NUS) indicates that cleanup objectives have been met, the excavation will be backfilled with stone.

TolTest's Corporate Health and Safety Plan (HASP), available upon request) will supplement this WP and will govern the safe work practices of TolTest personnel. The WP and HASP conform to Occupational Safety and Health Administration (OSHA) regulations identified in 29 Code of Federal Regulations (CFR) 1910.120 "Hazardous Waste Operations and Emergency Response" and applicable parts of 29 CFR 1920 and 1926. A copy of this WP will be on site during remedial activities.

Transportation of waste materials will comply with United States Department of Transportation (USDOT 49CFR) regulations.

1.1 Site Description

SWMU 7 resides on the east side of the demolition range and is currently accessible by a gravel road through the demolition range. The area to be excavated is generally flat with a slight slope to the east. There is a drop in elevation of approximately four feet from the west and south sides of the site. The site is covered entirely in grass.

2.0 CONSTRUCTION EQUIPMENT AND PERSONNEL

Table 2-1 lists the equipment expected to be used and TOLTEST personnel positions assigned to this cleanup activity.

TABLE 2-1

Equipment	Key TolTest Personnel
Backhoe/Excavator	Regional Manager
Dump Truck	Project Manager
Assorted hand tools	Site Supervisor
	Operators/Drivers
	Laborers

The Navy personnel involved and TOLTEST'S personnel positions are described below.

NAVFACENGCOM Southern Division
Overview of project execution.

NSWC Crane Officer In Charge of Construction (OICC)
Southern Division's on-site representative and liaison between NSWC Crane and TOLTEST. This individual's title is Contracting Officer's Technical Representative.

NSWC Crane Environmental Protection Department (EPD)
The EPD is responsible for monitoring TOLTEST'S performance for compliance with RCRA and other pertinent environmental regulations. A representative from EPD, referred to as the Environmental Contracting Officer Technical Representative, will sign, as the generator, any manifests for waste materials requiring disposal.

TOLTEST Regional Manager
TOLTEST'S Regional Manager (RM) is responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements. The RM will report directly to the OICC and will provide the major point of contact and control for matters concerning contractual issues on the project. The RM will approve all deliverables before their submission to the U.S. Navy and ultimately will be responsible for the quality of the After Action Report.

TOLTEST Project Manager
TOLTEST'S Project Manager's (PM) primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The PM has responsibility for ensuring that the project meets objectives and TOLTEST'S quality standards. The PM is the primary point of contact with the ECOTR concerning environmental issues. The PM will:

- Develop a work schedule and arrange off-site disposal
- Obtain representative sample for waste characterization
- Direct the Site Supervisor and monitor the progress of the work
- Write the After Action Report
- Provides site-specific training as required by the HASP
- Stops work when necessary to ensure the safety of personnel and to prevent damage to the environment.

Site Supervisor
The TOLTEST Site Supervisor will be responsible for the on-site work and will report directly to the PM.

Operators/Drivers
Equipment operators will be responsible for proper operation and maintenance of heavy equipment utilized on the site. They will be familiar with the scope of work and will be under the direct supervision of the Site Supervisor.

Laborer

Laborers will report to the Site Supervisor and will be responsible for general site cleanup and maintenance.

3.0 EXCAVATION SEQUENCE AND OPERATIONAL APPROACH

The excavation sequence and operational approach to complete the project objectives are defined in the following sections.

3.1 Permitting and Notification

NSWC Crane facility requires issuance of permits before initiation of excavation activities. TolTest's PM will be responsible for obtaining an Excavation and Trenching Permit through the Public Works Department, Building 56. No unexploded ordnance clearance is required for this job. However, should a suspicious item be unearthed, TolTest will stop work and notify the NSWC Crane Explosive Ordnance Division and the ECOTR. TolTest will notify the ECOTR a minimum of 10 days in advance of commencement of field activities.

3.2 Pre-Removal Activities

The PM will obtain a representative sample of the soil to be excavated for waste characterization purposes. The sample will be obtained with a clean stainless steel spoon and mixing bowl. Aliquots of the soil from within the area to be excavated will be combined in the bowl to form one composite sample. Characterization, as required by the disposal facility, will include analysis for reactive cyanide and sulfide, flash point, pH, total TNT, and TCLP metals (performed on a leached extract). Analytical results will be submitted to the disposal facility for approval.

Once the WP has been approved, representatives of TOLTEST and NSWC Crane will conduct a site walk to delineate the boundaries of the area of excavation.

3.3 Soil Removal

The size of the area of contamination is small enough that the bucket of the excavator will be able to reach into the zone of contamination without the need for the excavator to enter the zone. In this manner, only the bucket of the excavator will come into contact with contaminated soil and thus only the bucket will require decontamination. If it is necessary for the excavator to enter the zone of contamination, then thick felt will be placed under the tracks of the excavator to prevent them from contacting contaminated soil.

Excavation of the contaminated soil will be accomplished with the excavator and hand tools. Hand digging will be necessary to ensure that: 1) excavation does not occur outside the boundaries of contamination; and 2) contaminated soil is not spread outside the zone of contamination. Contaminated soil will be loaded directly into a dump truck, which will be situated within the swing radius of the excavator and as close to the excavation as possible.

3.4 Field Screening

The zone of contamination will be excavated to a depth of approximately one-foot. TetraTech NUS will then obtain samples from within the excavation for the purpose of field screening to determine the presence of TNT. Based on the field screening results, the ECOTR may direct TolTest to excavate additional soil in six-inch depth increments.

3.5 Decontamination

The bucket will be the only part of the excavator that will require decontamination since it will be the only piece of equipment (aside from shovels) that will come into contact with the contaminated soil. The bucket will undergo a dry decontamination process whereby the contaminated soil is scraped off with shovels and scrapers. No water spray will be used for decontamination. The contaminated soil that is scraped off will be placed into the bed of the dump truck before it leaves the site. The ECOTR will approve the effectiveness of the decontamination procedure. Personal protective equipment and all consumables will be disposed of in an NSWC Crane dumpster for ultimate disposition at the NSWC Crane sanitary landfill.

3.6 Waste Management

Contaminated soil that is removed from the site will be loaded onto a dump truck and transported to the Republic Services landfill in Worthington, Indiana, for disposal. Shipping manifests will be completed by TOLTEST and signed by the ECOTR as the generator. Shipping manifests will accompany all loads to the disposal facility. The ECOTR and TolTest will retain a copy of the manifests.

3.7 Site Restoration

Site restoration will not commence until the ECOTR informs TolTest that post-excavation results have met the desired cleanup goals. Until that time, the excavation will be covered with 6 mil plastic sheeting and secured with sandbags and pins. The cover will be inspected once a week and repaired and maintained as necessary.

At the direction of the ECOTR, TolTest will commence with site restoration activities. This will include grading the work site around the area of excavation to repair ruts caused by heavy equipment, and filling the excavation with number 53 stone. Grass seed will be spread and covered with straw in the graded area. The stone will be compacted with the bucket of the excavator or similar equipment. If necessary, erosion control measures (i.e. installing silt fence) will be implemented to minimize erosion and runoff from the site.

3.8 Cleanup and Emergency Response

Each day upon completion of work, TOLTEST will remove all excess materials and debris from the NSWC Crane property. The work areas will be left in a neat and clean condition and all materials and/or debris will be disposed of properly. Spill cleanup or other repair of damage to the environment resulting from TOLTEST'S actions will be the responsibility of TOLTEST.

4.0 SITE SAFETY AND HEALTH

The TolTest corporate HASP will govern the safe work practices of TolTest. All TolTest personnel have been trained in TolTest safe work practices and all TolTest personnel on site will have a current 8-hour HAZWOPER certification. Prior to the start of work, the PM will conduct a tailgate safety briefing to discuss the job-specific safety requirements.

5.0 REPORTING REQUIREMENTS

TolTest will develop a detailed After Action Report containing all closure documentation including; tabulated analytical results of post-excavation samples (supplied by TetraTech); debris removal activities; waste disposal documentation; photographic documentation; copies of waste manifests; chain-of-custody documentation; and a discussion of all work performed. This report will be completed within five days from receipt of the completed waste manifest, or from receipt of laboratory data (whichever is later).

6.0 SCHEDULE

The work schedule will be eight to ten-hour days, or as allowed by the NSWC Crane Army Ammunition Activity. Excavation will commence once approvals, permits, and notifications have been given or received and a date with TetraTech has been arranged. It is anticipated that excavation of the contaminated soil and restoration of the site will each be completed in one day.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Site Description 1

2.0 EXCAVATION SEQUENCE 1

2.1 Permitting and Notification 1
2.2 Pre-Removal Activities 1
2.3 Soil Removal and Disposal 2
2.4 Field Screening 2
2.5 Decontamination 2

3.0 SITE RESTORATION 2

Appendix A Tetra Tech NUS drawing
Appendix B Waste Characterization Analytical Results
Appendix C Special Waste Acceptance Application
Appendix D Special Waste Approval
Appendix E Photographs
Appendix F Special Waste Disposal Notification/Manifests

1.0 INTRODUCTION

TOLTEST was retained by the Naval Facilities Engineering Command, Officer in Charge of Construction (OICC) under contract N68950-00-D-0200, Delivery Order (DO) #FC78 to perform a Voluntary Interim Measures cleanup at the Old Rifle Range (ORR), Solid Waste Management Unit (SWMU) 7, Naval Surface Warfare Center (NSWC) Crane, Indiana.

The objective of this work was to remove and properly dispose of soil contaminated with trinitrotoluene (TNT). Post-excavation samples were obtained and submitted for analysis by Tetra Tech NUS (Tetra Tech). TolTest completed backfill of the excavation.

TolTest's Corporate Health and Safety Plan (HASP) supplemented the Work Plan while performing this scope of work.

1.1 Site Description

SWMU 7 resides on the east side of the demolition range and is accessible by a gravel road through the demolition range or from Highway 8. The area that was excavated was generally flat with a slight slope to the east. The site was initially covered entirely in grass.

2.0 EXCAVATION SEQUENCE

The Statement of Work received from NSWC Crane included a hand drawing of the area of contamination (drawn by Tetra Tech). This drawing identified the locations of samples previously obtained by Tetra Tech and an outline of the area to be excavated. A copy of this drawing is included in **Appendix A**.

2.1 Permitting and Notification

NSWC Crane facility requires issuance of permits before initiation of excavation activities. TolTest's Project Manager (PM) obtained an Excavation and Trenching Permit through the Public Works Department, Building 56. No unexploded ordnance clearance was required for this job, per Mr. Tom Brent of the NSWC Crane Environmental Protection Department (EPD).

2.2 Pre-Removal Activities

Prior to excavation activities, the PM obtained a representative sample of the soil to be excavated for waste characterization purposes. The sample was obtained by mixing aliquots of the soil from within the area to be excavated into one composite sample. Analytical parameters for waste characterization required by the disposal facility included reactive cyanide and sulfide, flash point, pH, total TNT, and TCLP metals (performed on a leached extract). Analytical results of the waste characterization sample are provided in **Appendix B**.

The analytical results were submitted along with the Special Waste Acceptance Application (provided in **Appendix C**) to Republic Services, Inc. Approval for disposal of the soil at the Sycamore Ridge Landfill (also referred to as the Worthington Landfill) was granted on July 21, 2003. A copy of the approval is provided in **Appendix D**.

2.3 Soil Removal and Disposal

Excavation of the contaminated soil commenced on July 22, 2003, initially only to eight inches deep. Using the diagram drawn by Tetra Tech as a guide, the area to be excavated was marked out on the grass with white paint. Excavation of the soil within this boundary then commenced. Several of the sample location stakes placed by Tetra Tech are visible in Photo 1 (**Appendix E**). Stake SB16/47 is in the center of the excavation (the photo looks West). All sample location stakes within the boundary of excavation were removed along with the contaminated soil.

The soil was loaded into a dump truck, which was parked adjacent to the excavation. The bed of the truck had been lined with plastic sheeting to aid in ease of unloading and to prevent contaminated soil from contacting the truck. The truck shown in Photo 1 was loaded with soil and parked for the night in the gravel lot just to the north of Building 600. The next morning, a smaller single-axle dump truck was loaded with soil dug from eight inches to 12 inches deep. Both trucks were transported to the Sycamore Ridge Landfill on July 23, 2003. A Special Waste Disposal Notification/Manifest, signed by Mr. Jerry McCracken of EPD as generator, accompanied each truck. Copies of the completed Notifications are provided in **Appendix F**. A total of 24.84 tons of soil were disposed of at the landfill.

2.4 Field Screening

The Work Plan stated that Tetra Tech NUS was to obtain samples from within the excavation for the purpose of field screening for the presence of TNT. These samples were obtained and screened by Tetra Tech on July 22, 2003 after the initial eight inches of soil were removed. Additional soil was excavated on July 23, 2003 to one-foot deep (as described above) paying particular attention to ensuring that the side walls of the excavation were squared up and did not slope into the excavation. The contractual amount for tonnage (including a 50% contingency) was met by excavating the soil to one-foot deep (i.e., no additional excavation could be conducted under this contract).

2.5 Decontamination

The bucket of the backhoe was the only piece of equipment that required decontamination since it alone came into contact with the contaminated soil. The bucket was decontaminated by scraping off the contaminated soil with shovels. No water spray was used for decontamination. Personal protective equipment and all consumables were disposed of in an NSWC Crane dumpster for ultimate disposition at the NSWC Crane landfill.

3.0 SITE RESTORATION

Following excavation activities, the excavation was covered with 6 mil plastic sheeting and secured with sandbags (Photo 2). The cover was inspected once a week and repaired and maintained as necessary. Approximately 350 gallons of rainwater were pumped off the plastic sheeting onto the surrounding grass on August 26, 2003.

At the direction of Mr. Tom Brent of EPD, TolTest filled the excavation with number 53 stone on September 12, 2003 (Photo 3). The stone was compacted with the bucket of the backhoe.

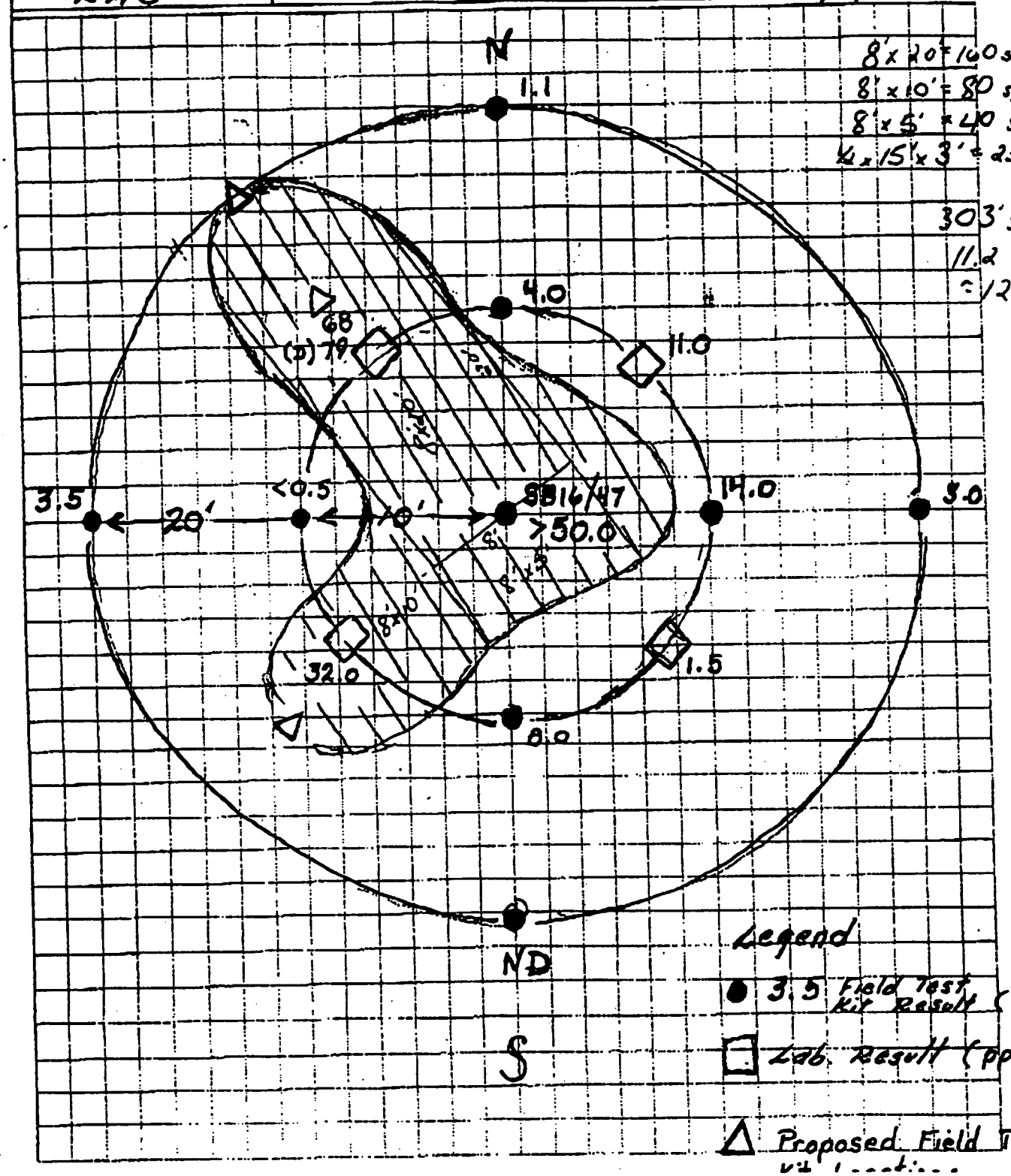
APPENDIX A

Tetra Tech NUS Site Drawing

1 INCH = 6.67 FEET
1 SI = 44.49 SF

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT: Southdiv - Bill Gates	JOB NUMBER:
SUBJECT: Crane SWMU 7 Old Rifle Range	
BASED ON: TNT Results (Soil)	DRAWING NUMBER:
BY: RAC	CHECKED BY: / APPROVED BY: / DATE: 6/5/03



8'x20'=160 sq ft
8'x10'=80 sq ft
8'x5'=40 sq ft
4x15'x3'=23 sq ft
303 sq ft
11.2
≈12 cy

APPENDIX B

Waste Characterization Analytical Results

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

SWMU7-WC

Lab Name: SOUTHWEST_LABORATORY_____ Contract: TOLTEST___

Lab Code: SWOK__ Case No.: 52783 SAS No.: _____ SDG No.: 52783_

Matrix: (soil/water): WATER Lab Sample ID: 52783.01__

Level (low/med): LOW__ Date Received: 07/08/03

% Solids: _91.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	1.8	U		P_
7440-39-3	Barium___	1120	_		P_
7440-43-9	Cadmium__	1.1	U		P_
7440-47-3	Chromium_	6.0	_		P_
7439-92-1	Lead_____	38.7	_		P_
7439-97-6	Mercury__	1.0	U		AV
7782-49-2	Selenium_	5.7	B		P_
7440-22-4	Silver___	0.60	U		P_

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

CLIENT_ID:_SWMU7-WC

FORM I - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

LABORATORY RESULTS

LAB ID : 52783.01
SAMPLE : SWMU7-WC
SDG : 52783
MATRIX : S
SITE : SWMU 7

REPORTED : 07/11/03
SAMPLED : 07/07/03
SUBMITTED: 07/08/03

HAZARDOUS WASTE CHARACTERIZATION

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
CORROSIVITY PH	0.10	su	7.8	07-09-03 13:10	KAL	SW9045
IGNITABILITY	200	deg F	>200	07-10-03 09:05	SB	SW 1010
React. Sulfide	20.0	mg/Kg	ND	07-10-03 14:00	MS	SW7.3.4.2
REACTIVE CYANIDE	0.13	mg/kg	ND	07-11-03 15:21	DT	SW 7.3.3.2

COMPOUND* = RESULTS REPORTED AS RECEIVED
ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE
METHODOLOGY: SM = STANDARD METHODS, 18TH EDITION,1992/19TH EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1985
SW = SW 846 Rev. 4 1996

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SWMU7-WC

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

Matrix: (soil/water) SOIL Lab Sample ID: 52783.01

Sample Amt: 2.0 G % Moisture: 9 Date Received: 07/08/03

Extraction Volume: 20 ML Date Extracted: 07/09/03

Extraction Method: SONC Date Analyzed: 07/11/03

GPC Cleanup: (Y/N) N Dilution Factor: 50.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	25000	U
121-82-4	RDX	25000	U
99-35-4	TNB	14000	PJ
99-65-0	DNB	25000	U
479-45-8	TETRYL	25000	U
98-95-3	NB	25000	U
118-96-7	TNT	1050000	
1946-51-0	4ADNT	25000	U
35572-78-2	2ADNT	25000	U
606-20-2	26DNT	25000	U
121-14-2	24DNT	25000	U
88-72-2	2NT	25000	U
99-99-0	4NT	25000	U
99-08-1	3NT	25000	U
3,4-DNT surrogate spiked		11500.00	

FORM I

TOLEDO ST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Pittsburgh ☐ Other _____

Chain of Custody Record

40074

Project No.: 75210.01
Client:
P.O. No.: F-1660
Project/Location: NSWC Crane Swmu 7
Project Mgr.: P. Chevalier
Sampler's Name: Peter J. Chevalier
Phone No. 812/636-8501
Sampler's Signature: [signature]

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	TCLP metals	TNT 8330	Reac. Cy	Reac. Sulf.	pH	Flash Point			Preserved Yes/No	LAB USE ONLY Lab #
1	SWMU7-WC	7/7/03	1453	C	Soil	composite for waste characterization	2	✓	✓	✓	✓	✓	✓				
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
	[signature]	7/7/03 1800	[signature]	7-8-03 10:00
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 0.9 °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled properly for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 4/99

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

July 16, 2003

CLIENT:	TOLTEST
PROJECT:	NSWC CRANE
SDG NO:	52783
FRACTION:	8330 EXPLOSIVES

One soil sample was extracted and analyzed for explosives by SW-846, method. It should be noted that the Carbosorb reverse phase column is necessary as the quantitation column for this method since all compounds can be separated to a reasonable degree of resolution. The Zorbax SB-CN column is used as the confirmation column as it has two peaks with co-elution, including five compounds. The compounds that co-elute on this column are:(DNB&TNB) and (4NT, 2NT&HMX). Therefore if any or all of these individual compounds in each peak are present on the quantitation column and the peak is also present in the confirmation column the compound is considered present and reported as a positive result. Any target hit detected above the MDL is analyzed for confirmation.

Note: (1) A P-flag qualifier on the FORM 1 report indicates that the relative percent difference between the concentration detected on quantitation column and confirmation column was greater than 25% difference. (2) All target analytes detected between the reporting limit and the MDL are reported with a J-flag indicating an estimated value and any target analytes detected below the MDL are reported at the reporting limit with a "U" flag indicating undetected. A manual integration report is included for each manual integration performed on this data including a before and after picture of the peak, as well as the reason for the integration.

The following problems occurred during the analysis of this sample: The sample extract was discolored. Historically this indicates potentially high concentrations of organic extractables. The sample was analyzed at a 50-fold dilution as a screening measure and to guard against system performance degradation. The sample contained 1050000ug/kg of TNT at this dilution and therefore no lesser dilution was analyzed. The sample was reanalyzed for confirmation and TNT was confirmed. The surrogate was diluted out at this dilution, therefore 0% recovery.

Initial Calibration: Within method requirements.

Continuing calibration verifications: Within method requirements.

Blanks: No target analytes were detected in the extraction blank.

Surrogates: All surrogates were within QC limits with the following exceptions: The sample had 0% recovery due to the 50-fold dilution (see comment above).

Laboratory Control Spikes: The laboratory control spikes had all recoveries within QC control limits.

Matrix Spikes: No matrix spikes were requested on this sample.

Diana L. Hoke
Organic Program Manager

July 16, 2003

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

Matrix: (soil/water) SOIL Lab Sample ID: BL0709SB

Sample Amt: 2.0 G % Moisture: _____ Date Received: _____

Extraction Volume: 20 ML Date Extracted: 07/09/03

Extraction Method: SONC Date Analyzed: 07/11/03

GPC Cleanup: (Y/N) N Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	500	U
121-82-4	RDX	500	U
99-35-4	TNB	500	U
99-65-0	DNB	500	U
479-45-8	TETRYL	500	U
98-95-3	NB	500	U
118-96-7	TNT	500	U
1946-51-0	4ADNT	500	U
35572-78-2	2ADNT	500	U
606-20-2	26DNT	500	U
121-14-2	24DNT	500	U
88-72-2	2NT	500	U
99-99-0	4NT	500	U
99-08-1	3NT	500	U
3,4-DNT surrogate spiked		11500.00	

FORM I

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LCS1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

Matrix: (soil/water) SOIL Lab Sample ID: LC0709SB

Sample Amt: 2.0 G % Moisture: _____ Date Received: _____

Extraction Volume: 20 ML Date Extracted: 07/09/03

Extraction Method: SONC Date Analyzed: 07/11/03

GPC Cleanup: (Y/N) N Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	9030	
121-82-4	RDX	9600	
99-35-4	TNB	7870	
99-65-0	DNB	9030	
479-45-8	TETRYL	10400	
98-95-3	NB	8910	
118-96-7	TNT	9140	
1946-51-0	4ADNT	9190	
35572-78-2	2ADNT	9170	
606-20-2	26DNT	9210	
121-14-2	24DNT	9070	
88-72-2	2NT	8980	
99-99-0	4NT	8950	
99-08-1	3NT	9130	
3,4-DNT surrogate spiked		11500.00	

FORM I

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LCSD1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

Matrix: (soil/water) SOIL Lab Sample ID: LD0709SB

Sample Amt: 2.0 G % Moisture: _____ Date Received: _____

Extraction Volume: 20 ML Date Extracted: 07/09/03

Extraction Method: SONC Date Analyzed: 07/11/03

GPC Cleanup: (Y/N) N Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	8890	
121-82-4	RDX	9420	
99-35-4	TNB	7700	
99-65-0	DNB	8870	
479-45-8	TETRYL	10200	
98-95-3	NB	8720	
118-96-7	TNT	9000	
1946-51-0	4ADNT	9010	
35572-78-2	2ADNT	9020	
606-20-2	26DNT	9030	
121-14-2	24DNT	8920	
88-72-2	2NT	8800	
99-99-0	4NT	8830	
99-08-1	3NT	8950	
3,4-DNT surrogate spiked		11500.00	

FORM I

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	MBLK1	109	0
02	LCS1	108	0
03	LCSD1	107	0
04	SWMU7-WC	0D	0
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(83-130)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE/DUPLICATE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 52783

LCS Sample NO.: LCS1

COMPOUND	SPIKE ADDED (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
HMX	4000	4520	113	76-119
RDX	4000	4800	120	80-120
TNB	4000	3940	98	73-121
DNB	4000	4520	113	79-120
TETRYL	4000	5210	130	24-139
NB	4000	4450	111	79-121
TNT	4000	4570	114	74-128
4ADNT	4000	4590	115	64-142
2ADNT	4000	4590	115	80-122
26DNT	4000	4600	115	77-119
24DNT	4000	4530	113	79-122
2NT	4000	4490	112	79-121
4NT	4000	4480	112	80-120
3NT	4000	4570	114	79-122

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	4000	4450	111	2	30	76-119
RDX	4000	4710	118	2	30	80-120
TNB	4000	3850	96	2	30	73-121
DNB	4000	4440	111	2	30	79-120
TETRYL	4000	5110	128	2	45	24-139
NB	4000	4360	109	2	30	79-121
TNT	4000	4500	113	2	35	74-128
4ADNT	4000	4510	113	2	40	64-142
2ADNT	4000	4510	113	2	40	80-122
26DNT	4000	4510	113	2	35	77-119
24DNT	4000	4460	112	2	35	79-122
2NT	4000	4400	110	2	35	79-121
4NT	4000	4420	110	1	35	80-120
3NT	4000	4470	112	2	35	79-122

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

Comments: _____

FORM III

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

Lab Sample ID : BL0709SB Lab File ID : 4_071110

Matrix: (soil/water) SOIL

Date Extracted : 07/09/03 Extraction Method : SONC

Date Analyzed : 07/11/03 Time Analyzed : 1406

Instrument ID : LC4 LC Column ID : CARBOSORB

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	LCS1	LC0709SB	07/11/03
02	LCSD1	LD0709SB	07/11/03
03	SWMU7-WC	52783.01	07/11/03
04			
05			
06			
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Comments: _____

FORM IV

6D

EXPLOSIVES INITIAL CALIBRATION RT SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 52783

Lab Code: SWOK Instrument ID: LC4

GC Column: CARBOSORB Date(s) Analyzed: 07/11/03 07/11/03

COMPOUND	RT OF STANDARDS L1	L2	L3	L4	L5	RT WINDOW FROM	TO
HMX	4.99	4.99	4.99	4.99	4.98	4.91	5.07
RDX	7.53	7.50	7.49	7.48	7.47	7.37	7.61
TNB	10.18	10.17	10.17	10.15	10.15	10.01	10.33
DNB	12.42	12.41	12.41	12.39	12.39	12.21	12.61
TETRYL	13.25	13.22	13.22	13.18	13.19	13.00	13.44
NB	14.08	14.08	14.09	14.07	14.08	13.86	14.32
TNT	15.98	15.97	15.98	15.95	15.97	15.72	16.24
4ADNT	16.63	16.60	16.60	16.55	16.57	16.33	16.87
2ADNT	17.56	17.52	17.51	17.45	17.46	17.22	17.80
26DNT	18.68	18.67	18.68	18.65	18.67	18.38	18.98
24DNT	19.35	19.33	19.33	19.29	19.31	19.02	19.64
2NT	22.70	22.72	22.74	22.71	22.74	22.37	23.11
4NT	24.27	24.27	24.29	24.26	24.28	23.89	24.69
3NT	26.16	26.18	26.20	26.16	26.20	25.77	26.63
3,4-DNT	15.19	15.18	15.19	15.15	15.16	14.94	15.44

RT Window based on level L3

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783 Inst. ID: LC4

LC Column: CARBOSORB Date(s) Analyzed: 07/11/03 07/11/03

Method: EXPG11

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	238016	308941	242563
RDX	255108	284284	268763
TNB	701960	700299	673971
DNB	952019	935635	901621
TETRYL	460783	460489	444476
NB	647020	654394	630788
TNT	649647	651009	625603
4ADNT	442302	438322	417625
2ADNT	652157	653644	624982
26DNT	450011	454032	436430
24DNT	866851	846429	819497
2NT	439175	399720	382771
4NT	369211	344737	337042
3NT	457386	435686	419080
3,4-DNT	285380	283438	274087

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	266113	258476	262822	10.73
RDX	324750	330602	292701	11.49
TNB	795329	779461	730204	7.35
DNB	1058089	1053703	980213	7.29
TETRYL	530192	523964	483981	8.25
NB	743609	741976	683558	8.01
TNT	735016	734417	679138	7.62
4ADNT	489760	486823	454966	7.00
2ADNT	735202	732886	679774	7.48
26DNT	513152	508839	472493	7.57
24DNT	963934	964998	892342	7.61
2NT	451184	452161	425002	7.48
4NT	394441	394550	367996	7.32
3NT	493202	492732	459617	7.25
3,4-DNT	319722	327164	297958	7.99
MEAN RSD				8.03

6D

EXPLOSIVES INITIAL CALIBRATION RT SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 52783

Lab Code: SWOK Instrument ID: LC5

GC Column: ZORBAX SB-CN Date(s) Analyzed: 05/29/03 05/29/03

COMPOUND	RT OF STANDARDS L1	L2	L3	L4	L5	RT WINDOW FROM	TO
HMX	16.99	16.96	16.85	16.84	16.92	16.77	16.93
RDX	11.70	11.66	11.60	11.40	11.47	11.48	11.72
TNB	11.00	10.98	10.95	10.93	10.95	10.79	11.11
DNB	11.00	10.98	10.95	10.93	10.95	10.75	11.15
TETRYL	34.13	33.93	33.77	33.80	33.88	33.55	33.99
NB	10.24	10.23	10.20	10.15	10.19	9.97	10.43
TNT	21.30	21.23	21.14	21.16	21.23	20.88	21.40
4ADNT	22.85	22.69	22.37	22.30	22.41	22.10	22.64
2ADNT	22.07	21.92	21.52	21.55	21.86	21.23	21.81
26DNT	20.21	20.13	19.96	19.98	20.06	19.66	20.26
24DNT	18.74	18.65	18.53	18.53	18.60	18.22	18.84
2NT	16.99	16.96	16.85	16.84	16.92	16.48	17.22
4NT	16.99	16.96	16.85	16.84	16.92	16.45	17.25
3NT	18.07	18.00	17.88	18.08	18.07	17.45	18.31
3,4-DNT	25.19	25.07	24.83	24.91	25.00	24.58	25.08

RT Window based on level L3

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783 Inst. ID: LC5

LC Column: ZORBAX SB-CN Date(s) Analyzed: 05/29/03 05/29/03

Method: CEXPE30

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	717413	828458	825321
RDX	366391	310676	288769
TNB	2240897	2231375	2168907
DNB	2255100	2231375	2168907
TETRYL	621003	671114	582585
NB	771016	711526	692133
TNT	885393	998031	1061698
4ADNT	556023	447561	421536
2ADNT	871335	739106	640853
26DNT	622130	581053	593660
24DNT	1207624	1127009	1129727
2NT	727305	828458	825321
4NT	720338	828458	825321
3NT	421331	394200	423341
3,4-DNT	597964	403809	342130

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	955373	966654	858644	12.07
RDX	361672	350051	335512	10.16
TNB	2539493	2557167	2347568	7.90
DNB	2528585	2527046	2342203	7.36
TETRYL	670373	674413	643898	6.34
NB	814069	811224	759994	7.39
TNT	1171330	1212549	1065800	12.40
4ADNT	481973	465004	474419	10.71
2ADNT	806966	771714	765995	11.15
26DNT	682315	667745	629381	7.08
24DNT	1297934	1354214	1223302	8.27
2NT	955373	958258	858943	11.43
4NT	955373	958258	857550	11.72
3NT	497814	428439	433025	8.91
3,4-DNT	409316	427084	436060	22.02
MEAN RSD				10.33

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 52783 Inst. ID: LC4 Method: EXPG11

LC Column: CARBOSORB Init. Calib Date(s): 07/11/03 07/11/03

Client Sample No.: EXPL3 Date Analyzed : 07/11/03

Lab Sample ID : 6-82-10 Time Analyzed : 1645

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.98	4.91	5.07	239787	262822	8.8
RDX	7.46	7.37	7.61	272065	292701	7.1
TNB	10.14	10.01	10.33	666163	730204	8.8
DNB	12.37	12.21	12.61	896319	980213	8.6
TETRYL	13.13	13.00	13.44	441733	483981	8.7
NB	14.07	13.86	14.32	625800	683558	8.4
TNT	15.93	15.72	16.24	630342	679138	7.2
4ADNT	16.50	16.33	16.87	407979	454966	10.3
2ADNT	17.38	17.22	17.80	622049	679774	8.5
26DNT	18.62	18.38	18.98	432193	472493	8.5
24DNT	19.26	19.02	19.64	815421	892342	8.6
2NT	22.70	22.37	23.11	381500	425002	10.2
4NT	24.24	23.89	24.69	332833	367996	9.6
3NT	26.15	25.77	26.63	416236	459617	9.4
3,4-DNT	15.13	14.94	15.44	274884	297958	7.7
Average % D						8.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 52783 Inst. ID: LC5 Method: CEXPE30

LC Column: ZORBAX SB-CN Init. Calib Date(s): 05/29/03 05/29/03

Client Sample No.: EXPL3 Date Analyzed : 07/15/03

Lab Sample ID : 6-82-10 Time Analyzed : 1306

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	19.44	19.28	19.60	917633	858644	-6.9
RDX	13.13	12.95	13.31	355768	335512	-6.0
TNB	12.54	12.46	12.62	2566444	2347568	-9.3
DNB	12.54	12.38	12.70	2554758	2342203	-9.1
TETRYL	38.97	38.76	39.18	625118	643898	2.9
NB	11.70	11.54	11.86	805776	759994	-6.0
TNT	24.51	24.37	24.65	1155527	1065800	-8.4
4ADNT	26.27	25.90	26.64	529533	474419	-11.6
2ADNT	25.28	24.91	25.65	782106	765995	-2.1
26DNT	23.23	23.05	23.41	676765	629381	-7.5
24DNT	21.43	21.00	21.86	1304332	1223302	-6.6
2NT	19.44	19.01	19.87	912531	858943	-6.2
4NT	19.44	19.01	19.87	924104	857550	-7.8
3NT	20.66	20.48	20.84	466995	433025	-7.8
3,4-DNT	29.00	28.80	29.20	396580	436060	9.1
Average % D						7.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 52783 Inst. ID: LC5 Method: CEXPE30

LC Column: ZORBAX SB-CN Init. Calib Date(s): 05/29/03 05/29/03

Client Sample No.: EXPL3 Date Analyzed : 07/15/03

Lab Sample ID : 6-82-10 Time Analyzed : 1431

COMPOUND	RT	RT WINDOW FROM	TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	19.52	19.28	19.60	919706	858644	-7.1
RDX	13.26	12.95	13.31	365536	335512	-8.9
TNB	12.64	12.46	12.62	2526190	2347568	-7.6
DNB	12.64	12.38	12.70	2558122	2342203	-9.2
TETRYL	39.03	38.76	39.18	653172	643898	-1.4
NB	11.84	11.54	11.86	786609	759994	-3.5
TNT	24.46	24.37	24.65	1060990	1065800	0.5
4ADNT	26.29	25.90	26.64	549423	474419	-15.8*
2ADNT	25.34	24.91	25.65	835929	765995	-9.1
26DNT	23.24	23.05	23.41	626471	629381	0.5
24DNT	21.44	21.00	21.86	1287004	1223302	-5.2
2NT	19.52	19.01	19.87	919706	858943	-7.1
4NT	19.52	19.01	19.87	919706	857550	-7.2
3NT	20.69	20.48	20.84	428949	433025	0.9
3,4-DNT	29.02	28.80	29.20	387167	436060	11.2
Average % D						6.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

LC Column: CARBOSORB Init. Calib. Date(s): 07/11/03 07/11/03

Instrument ID: LC4

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT
01	EXPL1	6-84-10	07/11/03	1055	15.19
02	EXPL2	6-83-10	07/11/03	1127	15.18
03	EXPL3	6-82-10	07/11/03	1159	15.19
04	EXPL4	6-86-10	07/11/03	1231	15.15
05	EXPL5	6-80-10	07/11/03	1302	15.16
06	MBLK1	BL0709SB	07/11/03	1406	15.14
07	LCS1	LC0709SB	07/11/03	1438	15.16
08	LCSD1	LD0709SB	07/11/03	1510	15.15
09	SWMU7-WC	52783.01	07/11/03	1542	0.00
10	EXPL3	6-82-10	07/11/03	1645	15.13
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14					
15					
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36					

S1 = 3,4-DNT

QC LIMITS
(+/- 0.25 MINUTES)

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 52783

LC Column: ZORBAX SB-CN Init. Calib. Date(s): 05/29/03 05/29/03

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT
01	EXPL1	6-84-10	05/29/03	1624	25.19
02	EXPL2	6-83-10	05/29/03	1705	25.07
03	EXPL3	6-82-10	05/29/03	1747	24.83
04	EXPL4	6-81-10	05/29/03	1828	24.91
05	EXPL5	6-80-10	05/29/03	1910	25.00
06	EXPL3	6-82-10	07/15/03	1306	29.00
07	SWMU7-WC	52783.01	07/15/03	1348	0.00
08	EXPL3	6-82-10	07/15/03	1431	29.02
09					
10					
11					
12					
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14					
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18					
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S1 = 3,4-DNT

QC LIMITS
(+/- 0.20 MINUTES)

FORM VIII

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 52783

Lab Code: SWOK Injection volume = 100uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.00	20.0	80.0	320	1280
RDX	5.00	20.0	80.0	320	1280
TNB	5.00	20.0	80.0	320	1280
DNB	5.00	20.0	80.0	320	1280
TETRYL	5.00	20.0	80.0	320	1280
NB	5.00	20.0	80.0	320	1280
TNT	5.00	20.0	80.0	320	1280
4ADNT	5.00	20.0	80.0	320	1280
2ADNT	5.00	20.0	80.0	320	1280
26DNT	5.00	20.0	80.0	320	1280
24DNT	5.00	20.0	80.0	320	1280
2NT	5.00	20.0	80.0	320	1280
4NT	5.00	20.0	80.0	320	1280
3NT	5.00	20.0	80.0	320	1280
3,4-DNT	5.00	20.0	80.0	320	1280

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	5.00	20.0	80.0	320	1280
RDX#2	5.00	20.0	80.0	320	1280
TNB#2	5.00	20.0	80.0	320	1280
DNB#2	5.00	20.0	80.0	320	1280
TETRYL#2	5.00	20.0	80.0	320	1280
NB#2	5.00	20.0	80.0	320	1280
TNT#2	5.00	20.0	80.0	320	1280
4ADNT#2	5.00	20.0	80.0	320	1280
2ADNT#2	5.00	20.0	80.0	320	1280
26DNT#2	5.00	20.0	80.0	320	1280
24DNT#2	5.00	20.0	80.0	320	1280
2NT#2	5.00	20.0	80.0	320	1280
4NT#2	5.00	20.0	80.0	320	1280
3NT#2	5.00	20.0	80.0	320	1280
3,4-DNT#2	5.00	20.0	80.0	320	1280

10A
EXPLOSIVES IDENTIFICATION SUMMARY

EPA SAMPLE NO.

SWMU7-WC

Lab Name: SWL-TULSA Contract: NSWCCRANE

Lab Code: SWOK Case No.: TOLTEST SAS No.: SDG No.: 52783

Lab Sample ID: 52783.01 Date(s) Analyzed: 07/11/03 07/15/03

Instrument ID (1): LC4 Instrument ID (2): LC5

GC Column (1): CARBOSORB GC Column (2): ZORBAX SB-CN

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	%D
TNB	1	10.15	10.01	10.33	7020	
	2	12.58	10.87	11.03	5310	27.7
TNT	1	15.94	15.72	16.24	527000	
	2	24.72	21.00	21.28	520000	1.3
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					
	1					
	2					

page 1 of 1

FORM X

APPENDIX C

Special Waste Acceptance Application

Code #:
Expiration Date:

SPECIAL WASTE ACCEPTANCE APPLICATION

Republic Services

- ☐ Brent Run
- ☐ Carleton Farms
- ☐ Forest Lawn
- ☐ National Serv-All
- ☐ Elk Run
- ☐ Victory
- ☐ Wabash
- ☐ Whiteleather
- ☒ Other: Sycamore Ridge
- ☐ New Application
- ☐ Change in Waste Stream Process or Characteristic

GENERATOR INFORMATION

Generator Name: NSWC Crane
Address: B3260 Code 0951 300 HWY 361 County: Martin
City: Crane State: IN Zip: 47522

Billing Name: TolTest, Inc.
Address: 508 W. Elnora St.
City: Odon State: IN Zip: 47562

Generation Location: (if different than above) Street City County State Zip

Generator Contact: Jerry McCracken
Phone Number: 812/854-6153
Fax Number: -4177

Consultant: TolTest, Inc
Phone Number: 812 636-8501
Fax Number: 812 636-7572

WASTE PROFILE

Waste Name: (Please list all similar waste streams for this certification - separate applications are required for other waste streams)
TNT-contaminated soil

Quantity: 12 Cubic Yards _____ Tons per Year ☐ Month ☐ Day ☐ One Time ☒

Delivery Method: ☒ Bulk ☐ Drums ☐ Other

Transporter: TolTest, Inc. Phone:

Is the waste a listed hazardous waste? ☐ Yes ☒ No Delisted hazardous waste? ☐ Yes ☒ No

Does the waste contain any of the following: Asbestos? ☐ Yes ☒ No PCB's? ☐ Yes ☒ No

Pesticides/Herbicides? ☐ Yes ☒ No Free liquids? ☐ Yes ☒ No

Is the waste an infectious waste? ☐ Yes ☒ No Heat generating waste? ☐ Yes ☒ No

Physical state at 70 °F ☒ Solid ☐ Semi-solid ☐ Liquid Color: brown

Flash Point? 2000°F Fugitive dust? ☐ Yes ☒ No Water reactive? ☐ Yes ☒ No

Odor? ☐ Yes ☒ No If yes describe:

Process Generating Waste: Open Burning of Explosives

Supporting documentation attached: ☒ Analytical Data w/ Chain of Custody ☐ MSDS ☒ Generator Knowledge

If analytical data is attached, is the data derived from testing a representative sample in accordance with 40 CFR 261.20(c) and/or other applicable laws? ☒ Yes ☐ No

Generator's Certification Statement:

I hereby certify that the above and attached information is complete and accurate to the best of my ability, that no deliberate information was omitted, that all known and suspected hazards have been disclosed, and that the waste is not a regulated hazardous waste by government or local authority, and does not contain PCBs regulated by TSCA or any other regulatory authority. If any of the above changes, I agree to notify Republic Services.

Signature: Jerry L McCracken Date: 7/17/03

Name: Jerry L McCracken

White: Special Waste Coordinator Yellow: Landfill Pink: Generator

Form NSWAP Revised 2/01

APPENDIX D

Special Waste Approval

REPUBLIC SERVICES, INC.

Special Waste Management Decision

I. Decision Request: ☒ Initial ☐ Renewal ☐ Amendment ____

Management Facility: Sycamore Ridge
Intermediate Transfer Facility: N/A

Generator Name: NSWC Crane
Address: B3260 Code 0951 300 Hwy 361
Crane, IN 47522
Contact: Jerry McCracken
Phone: 812-854-6153
Site Location: Same as generator

Billing Name: TolTest Inc.
Address: 508 W. Elnora St - Odon, IN 47562
Consultant Name: TolTest Inc.
Consultant Phone: 812-636-8501
Transporter Name: TolTest Inc.
Transporter Phone: 812-636-8501

Waste Name: TNT-Contaminated Soil
Estimated Quantity: 12 cy/1X

II. Special Waste Manager Decision: ☒ Approved ☐ Disapproved
If disapproved, Explain: ____

Management Method(s): ☒ Landfill ☐ Solidification ☐ Bioremediation ☐ Other:
*Manifest all loads
*No Free Liquids

Precautions, Conditions or Limitations on approval: ____

Approval Number: 307130 **Decision Expiration Date:** 7/21/2004

Attached Document(s): ☐ None ☐ MSDS ☒ Certified Analytical Report ☐ Memo/Letter ☐ Process Knowledge

Special Waste Mgr. Signature: Stephanie Goodman Name(print): Stephanie Goodman
Date: 7/21/2003

III. Facility Operations Acknowledge: ____ Approved ____ Disapproved
State any additional Precautions, conditions, or limitations ____

Facility Mgr. Signature ____ Name(print): ____
Date: ____ Melissa L. Minick Melissa L. Minick 7/22/03

APPENDIX E

Photographs

Photo 1

Photo 2

Photo 3

APPENDIX F

Special Waste Disposal Notification Manifests

REPUBLIC SERVICES, INC.

SPECIAL WASTE DISPOSAL NOTIFICATION/MANIFEST
GENERATOR INFORMATION

Generator Name:NSWC Crane
Mailing Address:B3260 Code 0951 300
Hwy 361, Crane IN 47522

Generation Location: Hwy 361, Crane, IN
County: Martin
Date of Spill/ Clean-out: July 2003

Generator Contact: Jerry McCracken
Consultant/Contractor:Toltest

Generator Phone: 812-854-4177
Consultant/Contractor Phone: 812-636-7572

Consultant/Contractor Address: 508 W. Elnor St, Oden <IN 47562

Waste Name/ Material Spilled	Republic Services Approval #	Expiration Date	Volume/ Weight
TNT contaminated soil	307130	7/21/2004	12 cy 1/X

Attach additional sheet if necessary

I hereby certify that the above information is true and accurate to the best of my knowledge. I also certify that no changes have been made to any relevant raw material or to the waste generating process, since the last shipment of the waste.

Jerry L McCracken — Jerry L McCracken — 7/23/03
Name (print or type) — Signature — Date (MM/DD/YY)

TRANSPORTER INFORMATION

Company Name: customer will provide
Address: ToLTest Inc.
508 west Elnora st Oden In.

Contact: Peater Chevalier
Phone: 812 636 8501

I certify no hazardous waste or other regulated substance was knowingly introduced to the waste while in my custody. The waste transported in this vehicle is the waste identified above, to the best of my knowledge.

Bill Webster — Bill Webster — 07/23/03
Driver's Name (print or type) — Signature — Date (MM/DD/YY)

DISPOSAL SITE INFORMATION

Site Name: Worthington Landfill
Operating Number: 28-02
Qty Received:

[illegible] — [illegible] — 7/23/03
Name (print or type) — Signature — Date (MM/DD/YY

1636 TW.

TOC 76

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Jerry L. McCracken — Jerry L. McCracken — 7/23/03
Name (print or type) — Signature — Date (MM/DD/YY)

TRANSPORTER INFORMATION

Company Name: customer will provide
Address: ToLTest Inc. 508 west Elnor St. Oden In.
Contact: Peter Chevalier
Phone: 812 636 8501

I certify no hazardous waste or other regulated substance was knowingly introduced to the waste while in my custody. The waste transported in this vehicle is the waste identified above, to the best of my knowledge.

James Houser Jr — James Houser Jr — 07/23/03
Driver's Name (print or type) — Signature — Date (MM/DD/YY)

DISPOSAL SITE INFORMATION

Site Name: Worthington Landfill
Operating Number: 28-02
Qty Received:

Name (print or type) — Signature — Date (MM/DD/YY 7/23/03

6.48 TN.