

N00204.AR.003901
NAS PENSACOLA
5090.3a

SITE CHARACTERIZATION REPORT ADDENDUM SITE 102 NAS PENSACOLA FL
3/5/2001
TETRA TECH

**TETRA TECH NUS, INC.**

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(850) 385-9899 • FAX (850) 385-9860 • www.tetrattech.com

TtNUS/TAL-01-012/0105-4.3

March 5, 2001

State of Florida
Department of Environmental Protection
Attn: Joe Fugitt
MS 4535
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Site Characterization Report Addendum
Site 102
U.S. Naval Air Station Pensacola
Pensacola, Florida

Mr. Fugitt:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit this Site Characterization Report (SCR) Addendum for Site 102 located at Naval Air Station (NAS) Pensacola, Pensacola, Florida. This SCR Addendum has been prepared for the U.S. Navy Southern Division Naval Facilities Engineering Command under Contract Tank Order 086, for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

The purpose of the investigation was to collect additional groundwater, surface soil, and subsurface soil samples. The collection of additional samples was recommended in the SCR (TtNUS, February 2000) and agreed upon, in comments, by Florida Department of Environmental Protection (FDEP) dated March 1, 2000.

PREVIOUS INVESTIGATIONS

Investigations conducted at Site 102 prior to the SCR associated fieldwork included a Preliminary Assessment (Law Engineering and Environmental Services, Inc., 1997) and a Phase I Environmental Assessment (Law Engineering and Environmental Services, Inc. 1997).

SCR field activities conducted during September and October 1999 included surface soil collection and analysis for metals, cyanide, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), and Pesticides / PCBs. Installation of two temporary monitoring wells (BRO-102-3S and BRO-102-4S) was accomplished using Direct-Push Technology. Groundwater samples from the two temporary monitoring wells were analyzed for metals, cyanide, VOCs, SVOCs, and Pesticides / PCBs. In February 2000 the NAS Pensacola Navy Public Works Center submitted the SCR based on the findings of all investigations.

Upon review of the SCR, FDEP issued a letter agreeing with the SCR recommendations. A copy of the Letter is provided in Attachment A. FDEP agreed that additional groundwater data needed to be collected for Site 102 and included in the final document. This letter report addresses the recommendation of the SCR and FDEP. In so doing, a summary of the work performed by TtNUS and the resulting data is also provided. Conclusions and recommendations for the site are provided in dedicated sections.

CONCLUSIONS

Soil Investigation Results

On October 21, 2000, TtNUS personnel advanced two soil borings, adjacent to temporary monitoring wells, BRO-102-4S and BRO-102-2S (Figure 1, Attachment B), to total depths of 10 feet below land surface (bls). Soil Samples for Flame Ionization Detector (FID) readings were collected from the 30 to 48 inch interval (Boring Log, Attachment D). Upon collection, the soil samples were placed in cleaned glass jars, capped with aluminum foil, and marked with the depth of collection. The samples were allowed to volatilize in the sealed jars for 3 to 5 minutes. The headspace vapor concentrations were measured after volatilization using a calibrated FID.

Two surface soil samples (BRO-102-5S-0-2 and BRO-102-6S-0-2) were collected from 0-2 feet bls. One subsurface soil sample (BRO-102-6S-2-4) was collected from 2-4 feet bls. The samples were analyzed at an off-site laboratory for the following parameters:

- Total aluminum and iron – SW-846 6010B
- Synthetic Precipitation Leaching Procedure (SPLP) – SW-846 1312

The soil sample analytical results are included in Table 1, Attachment D. Total aluminum was detected at 1400 mg/kg and total iron was detected at 650 mg/kg in sample BRO-102-5S-0-2. Total aluminum was detected at 1200 mg/kg and total iron was detected at 370 mg/kg in sample BRO-102-6S-0-2. Total aluminum was detected at 1200 mg/kg and total iron was detected at 290 mg/kg in sample BRO-102-6S-

2-4. The total analyses results were below the applicable FDEP Direct Exposure 1 (DE1) Soil Cleanup Target Level (SCTL) in Chapter 62-777 FAC.

SPLP analysis of sample BRO-102-6S-2-4 detected aluminum at 1.6 mg/L, an exceedence of the FDEP GCTL (0.20 mg/L).

Groundwater Investigation Results

On October 21, 2000, TiNUS personnel installed two monitoring wells (BRO-102-5S and BRO-102-6S) to replace the temporary wells (BRO-102-3S and BRO-102-4S, Figure 2, Attachment B). The total depths of the well screens are 7 feet bls for BRO-102-5S, and 10.28 feet bls for BRO-102-6S. The wells were constructed using 2-inch ID schedule 40 PVC with 0.01 slot by 5-foot screens (Monitoring Well Log, Attachment C). The wells were developed on 10/23/00 using a pump and surge method (Monitoring Well Development Record, Attachment C).

Two groundwater samples (BRO-102-5S and BRO-102-6S) were collected on 11/03/00 for submission to a fixed-based laboratory. The recorded turbidity for sample BRO-102-6S was 7 NTUs, and for sample BRO-102-5S, the turbidity was 0 NTUs (Groundwater Sampling Log Sheet, Attachment C). The samples were analyzed for the following parameters:

- Total aluminum and iron– SW-846 6010B

The groundwater sample analytical results are included in Attachment D. Aluminum was detected above the FDEP GCTL (0.20 mg/L) in both samples (910 ug/L – BRO-102-5S; 1700 ug/L – BRO-102-6S). However, aluminum is below the health-based GCTL of 7 mg/L (Attachment F). Iron was detected above the FDEP Groundwater Clean-up Target Level (GCTL) (300 ug/L) in both samples (460 ug/L – BRO-102-5S; 2100 ug/L – BRO-102-6S). But, iron is below the health-based GCTL of 2.1 mg/L.

CONCLUSIONS AND RECOMMENDATIONS

- Soil analytical results for aluminum and iron were below FDEP SCTLs;
- Groundwater analytical results for aluminum were greater than the FDEP GCTL, but below the health-based GCTL developed by the University of Florida, Center for Environmental & Human Toxicology (Attachment F);
- Soil SPLP analytical results for aluminum indicate that the soil may leach aluminum into the groundwater resulting in groundwater concentration of aluminum above the FDEP GCTLs;

- Groundwater analytical results for iron were greater than the FDEP GCTL and equal to the health-based GCTL;
- Soil SPLP analytical results for iron indicate that the soil does not leach additional iron into the groundwater;
- Groundwater analytical results from the initial site characterization (9/8/99 – 9/10/99) were below the health-based GCTLs for either of the two (2) temporary monitoring wells for aluminum and iron.

No further action is recommended for this site as there are no exceedences of FDEP SCTLs, and the groundwater analytical results are at or below health-based GCTLs.

Sincerely,



Terry Hansen, P.G.
Florida Professional Geologist No. 234
Tetra Tech NUS, Inc.

CC: R. Joyner (NAS Pensacola)
B. Hill (SOUTHNAVFACENGCOM)
G. Townsend (USEPA)
G. Wilfley (CH2M HILL)
B. Caldwell (EnSafe, Inc.)
A. Harris (EnSafe, Inc.)
M. Perry (TtNUS)
T. Hansen (2 copies)

PROFESSIONAL REVIEW CERTIFICATION

Site Characterization Report Addendum
Outlying Landing Field Bronson
Naval Air Station, Pensacola, Florida

This Site Characterization Report Addendum was prepared under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.

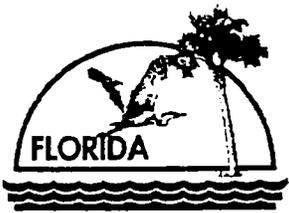


Terry Hansen, P.G.
Florida License No. 234

March 05, 2001

Date

ATTACHMENT A
FDEP Comment Letter



Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

March 1, 2000

Mr. Bill Hill
Code 1851
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 190010
North Charleston, South Carolina 29419-9010

RE: Draft Site Characterization Report, Sites 100 and 102,
Outlying Landing Field Bronson, Pensacola, Florida

Dear Mr. Hill:

I have completed the technical review of the above referenced document dated February 2000 (received February 11, 2000). I concur with the recommendation for no further action (NFA) at Site 100 and for additional groundwater assessment at Site 102. I recommend that the additional data be collected and included in the final document.

If I can be of any further assistance with this matter, please contact me at (850) 921-9989.

Sincerely,

Joseph F. Fugitt

~~Joseph F. Fugitt, P.G.~~
Remedial Project Manager

cc: Ron Joyner, NAS Pensacola
Gena Townsend, USEPA Region IV
Terry Hansen, Tetra Tech NUS, Inc., Tallahassee
Charlie Goddard, FDEP Northwest District

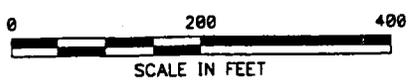
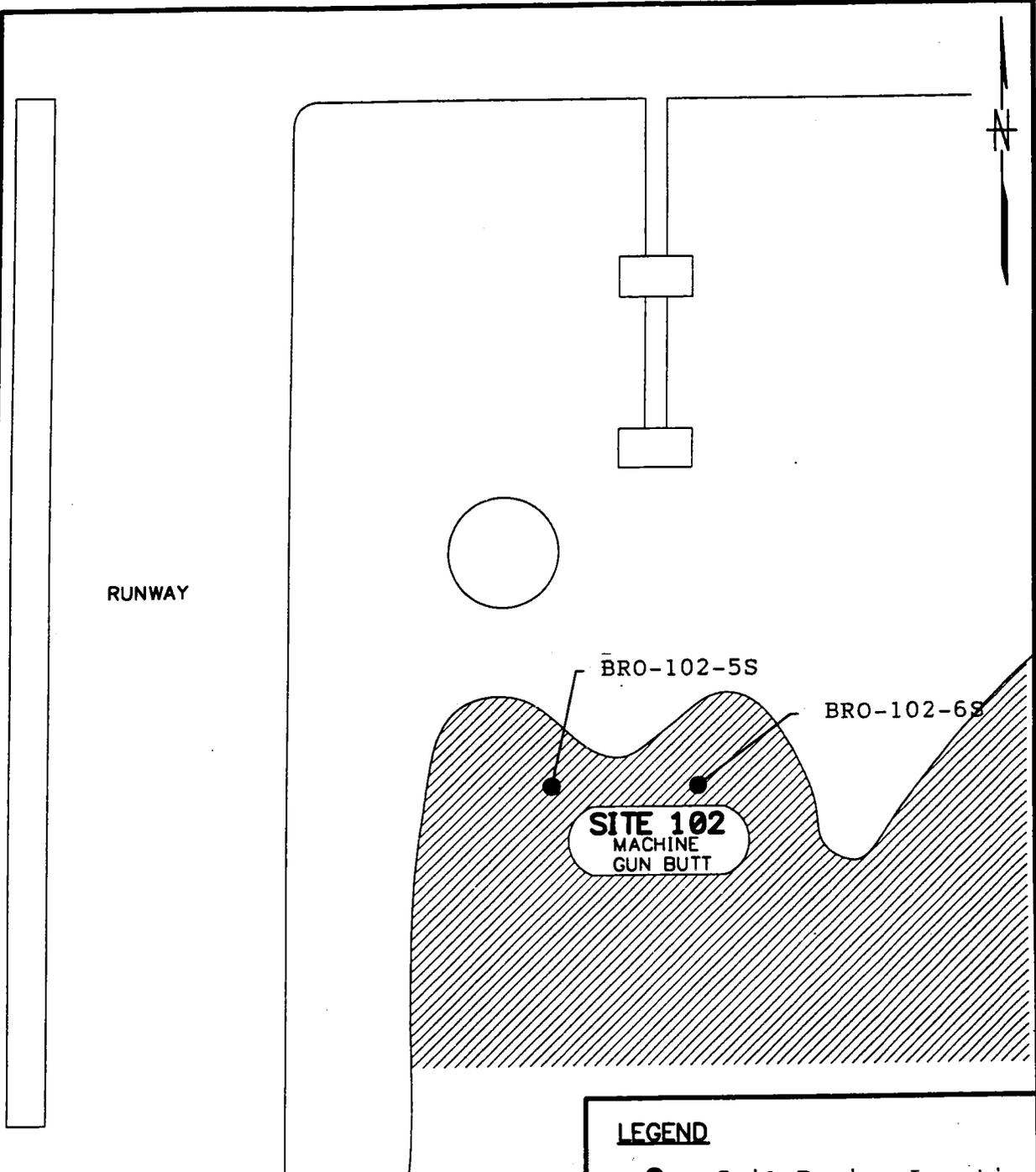
TJB

JJC

ESN

ATTACHMENT B
Figures

ACAD:0105cm09.DWG 01/25/00 MF



LEGEND

- Soil Boring Location
- ▨ POTENTIAL WETLANDS

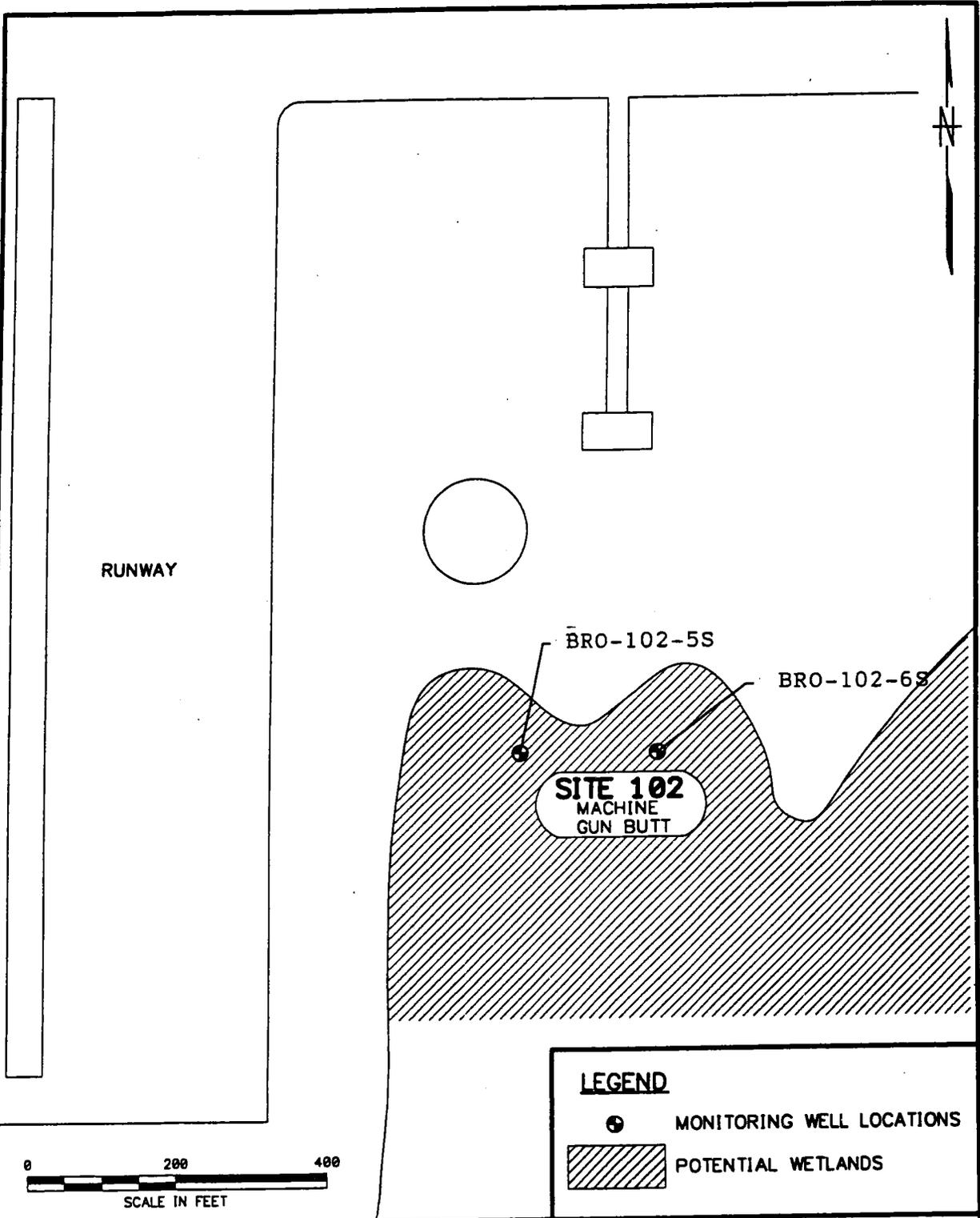
DRAWN BY	DATE
MF	1/24/00
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	



GROUNDWATER SAMPLE LOCATIONS
SITE 102
OLF BRONSON
NAVAL AIR STATION
PENSACOLA, FLORIDA

CONTRACT NO.	
0105	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV.
Figure 1	0

ACAD:01.05cm09.DWG 01/25/00 MF



LEGEND

-  MONITORING WELL LOCATIONS
-  POTENTIAL WETLANDS

DRAWN BY	DATE
MF	1/24/00
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	



GROUNDWATER SAMPLE LOCATIONS
 SITE 102
 OLF BRONSON
 NAVAL AIR STATION
 PENSACOLA, FLORIDA

CONTRACT NO. 0105	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. Figure 2	REV. 0

ATTACHMENT C
Tables

TABLE 1
SUMMARY OF INORGANIC ANALYTES DETECTED IN SOILS-SITE 102

OUTLYING LANDING FIELD BRONSON, PENSACOLA, FLORIDA

PAGE 1 OF 2

Sample No.	BRO-102-5S-0-2	BRO-102-6S-0-2	BRO-102-6S-2-4	
Sample Location	BRO-102-5S	BRO-102-6S	BRO-102-6S	
Collect Date	10/21/2000	10/21/2000	10/21/2000	
Sample Depth (bls)	0 to 2 ft.	0 to 2 ft.	2 to 4 ft.	
	DE1 ¹ /DE2 ² /LE ³ (mg/kg)			
Metals⁴ (mg/kg)				
Aluminum	72,000/ * / ***	1400	1200	1200
Iron	23,000/480,000/ ***	650	370	290

¹ DE1= Direct Exposure limit for residential area from Chapter 62-777, F.A.C.

² DE2= Direct Exposure limit for industrial area from Chapter 62-777, F.A.C.

³ LE= Leachability for groundwater limit from Chapter 62-777, F.A.C.

⁴ SW-846 6010B

* Contaminant is not a health concern for this default exposure scenario.

*** Leachability values may be derived using the SPLP Test to calculate site-specific SCTLs or may be determined using TCLP in the event oily wastes are present.

TABLE 2
SUMMARY OF INORGANIC ANALYTES DETECTED IN GROUNDWATER SAMPLES-SITE 100

OUTLYING LANDING FIELD BRONSON, PENSACOLA, FLORIDA

Sample No.	BRO-102-5S	BRO-102-6S
Sample Location	BRO-102-5S	BRO-102-6S
Collect Date	11/3/2000	11/3/2000

	Groundwater Criteria ² (ug/L)	
Metals¹ (ug/L)		
Aluminum	200	910 1,700
Iron	300	460 2,100

¹ SW-846 6010B

² As provided in Chapter 62-777, F.A.C.

Bold indicates an exceedance of limits.

TABLE 1
SUMMARY OF INORGANIC ANALYTES DETECTED IN SOIL LEACHATE SAMPLES-SITE 100

OUTLYING LANDING FIELD BRONSON, PENSACOLA, FLORIDA
 PAGE 2 OF 2

Sample No.	BRO-102-5S-0-2	BRO-102-6S-0-2	BRO-102-6S-2-4
Sample Location	BRO-102-5S	BRO-102-6S	BRO-102-6S
Collect Date	10/21/2000	10/21/2000	10/21/2000
Sample Depth (bls)	0 to 2 ft.	0 to 2 ft.	2 to 4 ft.
	Groundwater Criteria ² (ug/L)		
Metals¹ (ug/L)			
Aluminum	200	--	1600
Iron	300	--	--

¹ SW-846 1312 followed by 6010B

² As provided in Chapter 62-777, F.A.C.

Bold indicates an exceedance of limits.

-- Not Detected

ATTACHMENT D

Soil Boring Log

Monitoring Well Sheet

Monitoring Well Development Record

Groundwater Sample Log

Low Flow Purge Data Sheet



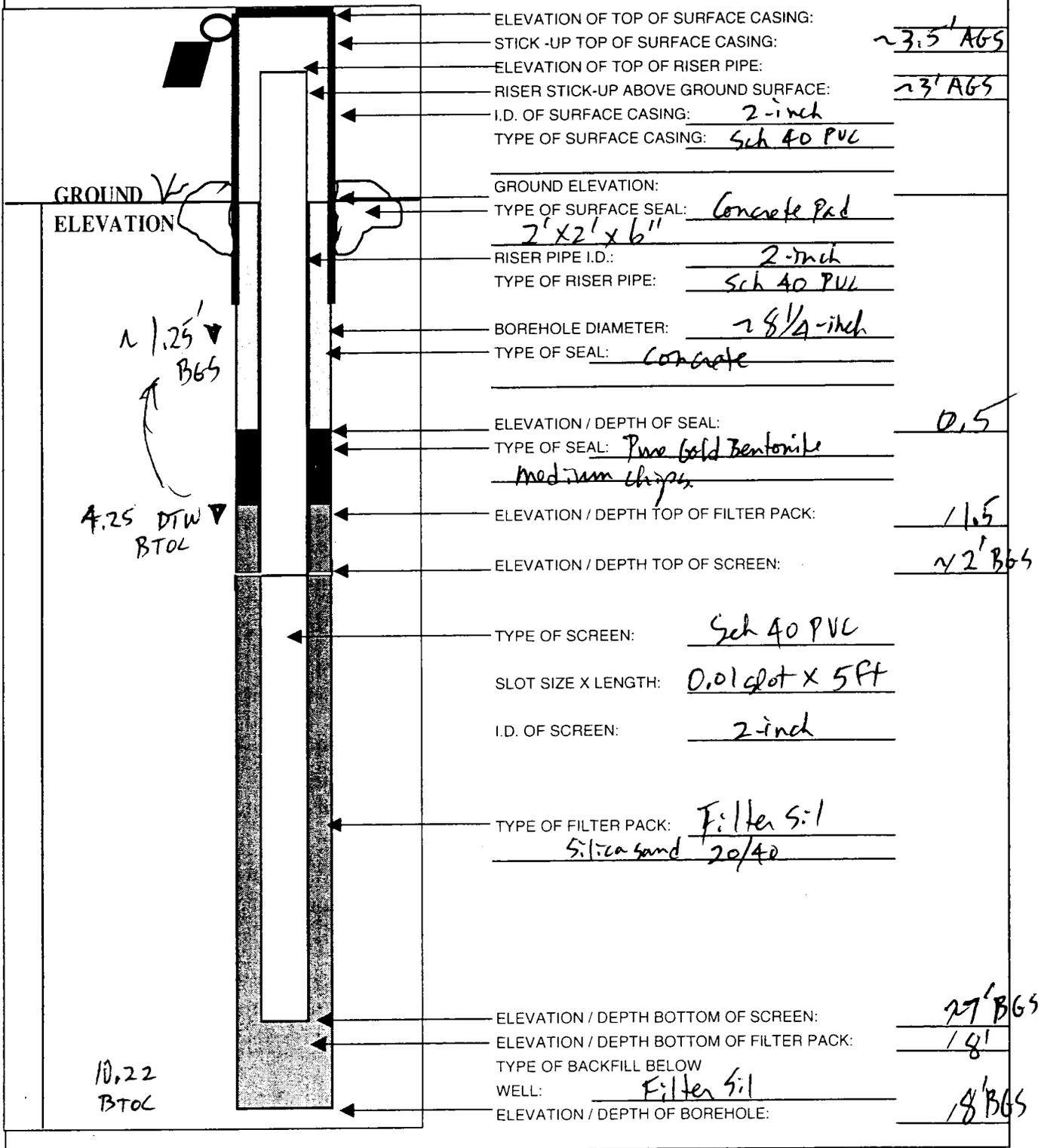
Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET

BORING NO. BR0-102-55

Site 102

PROJECT: Branson Fld. Machine Gun Butt DRILLING Co.: A E C S BORING No.: BR0-102-55
 PROJECT No.: N0401 CTO 112 DRILLER: David Cobb DATE COMPLETED: 10-21-00
 SITE: A E C S DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: Geoprobe w/ Angh DEV. METHOD: Pump & Suck EASTING: _____



ELEVATION OF TOP OF SURFACE CASING: _____

STICK -UP TOP OF SURFACE CASING: ~3.5' AGS

ELEVATION OF TOP OF RISER PIPE: _____

RISER STICK-UP ABOVE GROUND SURFACE: ~3' AGS

I.D. OF SURFACE CASING: 2-inch

TYPE OF SURFACE CASING: Sch 40 PVC

GROUND ELEVATION

GROUND ELEVATION: _____

TYPE OF SURFACE SEAL: Concrete Pad

2' x 2' x 6"

RISER PIPE I.D.: 2-inch

TYPE OF RISER PIPE: Sch 40 PVC

~1.25' BGS

BOREHOLE DIAMETER: ~ 8 1/4-inch

TYPE OF SEAL: Concrete

4.25' DTW BTOL

ELEVATION / DEPTH OF SEAL: 0.5

TYPE OF SEAL: Pure Gold Bentonite
medium chips

ELEVATION / DEPTH TOP OF FILTER PACK: 11.5

ELEVATION / DEPTH TOP OF SCREEN: ~2' BGS

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 0.01 slot x 5 ft

I.D. OF SCREEN: 2-inch

TYPE OF FILTER PACK: Filter 5:1
Silica sand 20/40

10.22 BTOL

ELEVATION / DEPTH BOTTOM OF SCREEN: 27' BGS

ELEVATION / DEPTH BOTTOM OF FILTER PACK: 18'

TYPE OF BACKFILL BELOW WELL: Filter Sil

ELEVATION / DEPTH OF BOREHOLE: 18' BGS



Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: BRO-102-5S Stick-up Depth to Bottom (ft.): 10.41 BTOC Responsible Personnel: Gary J. Davis
 Site: Machine Gun Butt Brook Static Water Level Before (ft.): 4.96 Drilling Co.: A ECS
 Date Installed: 10-21-00 Static Water Level After (ft.): _____ Project Name: Machine Gun Butt - Bronson Field
 Date Developed: 10-23-00 Screen Length (ft.): 5 ft Project Number: _____
 Dev. Method: Pump & Surge Specific Capacity: _____
 Pump Type: "Whale" - submersible Casing ID (in.): 2-inch

2 gal/40 sec.

Start

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units $\mu S/cm$)	Turbidity (NTU)	Remarks (odor, color, etc.)		
								mg/l DO	Sal	No Odor
1200	0.1	~1	5.34	23.2	5.06	0.068	999	3.47	0.00	lt. milky brown
1230	0.01	~30	5.38	23.2	4.98	0.061	768	5.18	0.00	Clearing after surge
1300	-0-	~60	5.40	23.1	4.86	0.059	421	5.18	0.00	clearing more
1330	-0-	~90	5.42	23.1	4.68	0.057	98	5.17	0.00	" "
1400	-0-	~120	5.42	23.3	4.55	0.057	40	4.20	0.00	clear
1430	-0-	~150	5.42	23.4	4.54	0.056	26	4.35	0.00	clear
1500	-0-	~180	5.42	23.3	4.55	0.056	21	4.26	0.00	clear



GROUNDWATER SAMPLE LOG SHEET

Project Site Name:

Bronson Machine Gun Butt
NASP Bldg 1032 Site 102

Sample ID No.:

BR0-102-55-6W3

Project No.:

CTO 140/0547
NO105 E5000260

Sample Location:

BR0-102-55

Sampled By:

Gary J. Davis

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

C.O.C. No.:

Type of Sample:

- Low Concentration
- High Concentration

SAMPLING DATA:

Date: <u>11-03-00</u>	Color	pH	S.C.	Temp.	Turbidity	DO	TBD	TBD
Time: <u>1030</u>	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method: <u>Peristaltic</u>	<u>Clear</u>	<u>4.44</u>	<u>0.065</u>	<u>23.7</u>	<u>-0-</u>	<u>3.08</u>		

PURGE DATA:

Date: <u>11-03-00</u>	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	TBD	TBD
Method: <u>Peristaltic</u>								
Monitor Reading (ppm): <u>-0-</u>	See Low Flow Purge Data Sheet							
Well Casing Diameter & Material								
Type: <u>2 inch ID Sch 40 pipe</u>								
Total Well Depth (TD): <u>10.41</u>								
Static Water Level (WL): <u>6.50</u>								
One Casing Volume (gal/L): <u>~0.7</u>								
Start Purge (hrs): <u>0650</u>								
End Purge (hrs): <u>1030</u>								
Total Purge Time (min): <u>100</u>								
Total Vol. Purged (gal/L): <u>~4 gal</u>								

BTOL

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>Total (Al & Fe)</u>	<u>Nitric</u>	<u>1 250 ml Poly</u> <u>500 ml</u>	<u>1 9/00</u>

OBSERVATIONS / NOTES:

5 ft screen, tubing intake set 2.5' above bottom. 3.91' of water col. X, 1.67
pumping ~100ml/min or less. 0.653 gal ± 1 vol

Circle if Applicable:

<input type="checkbox"/> MS/MSD	Duplicate ID No.:
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Signature(s):

Gary J. Davis

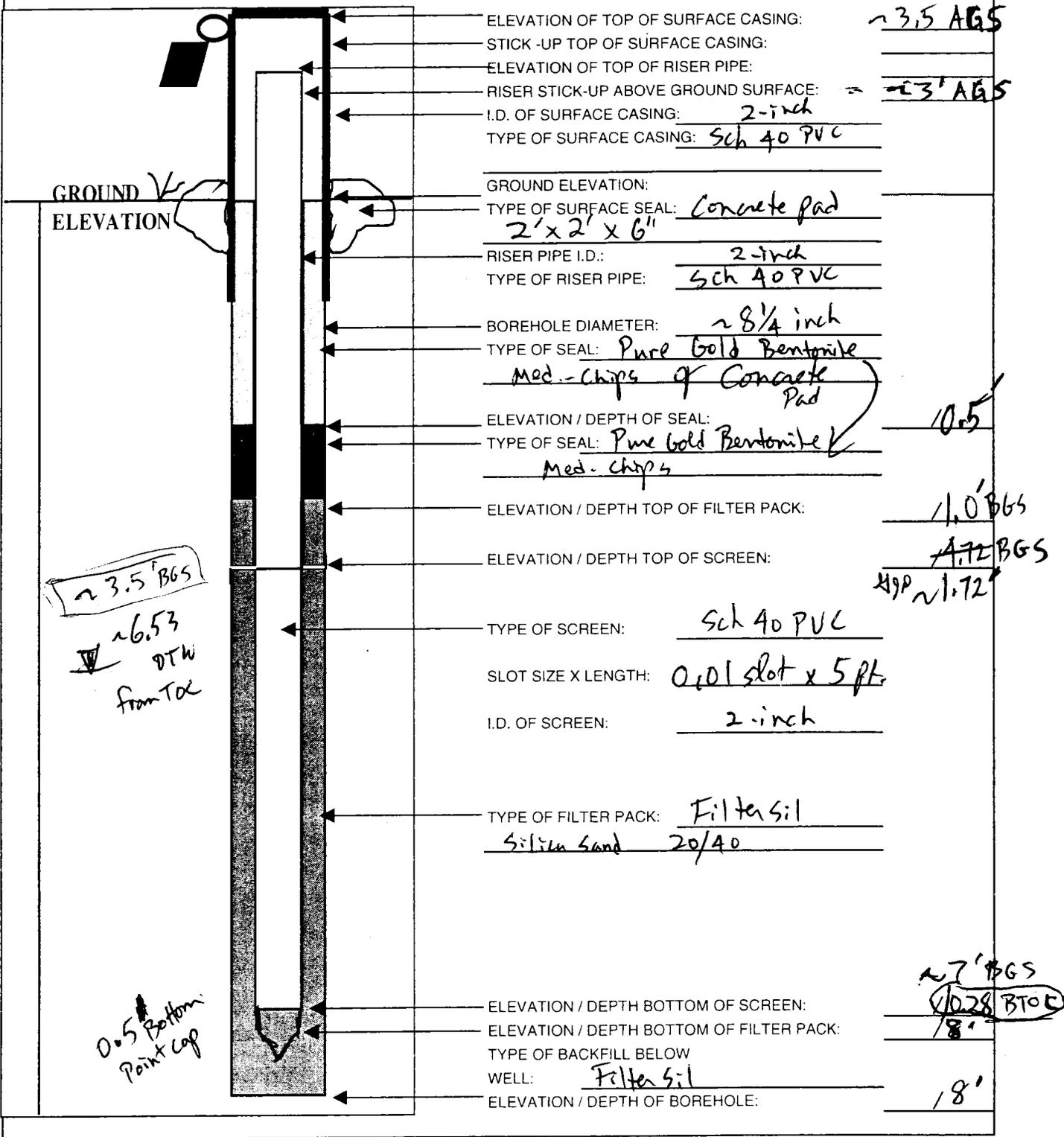


Tetra Tech NUS, Inc. **OVERBURDEN MONITORING WELL SHEET**

BORING NO.: BRD-102-65

Site 102

PROJECT: Bronson Fld Machine Gun Bldg DRILLING Co.: AECs BORING No.: BRD-102-65
 PROJECT No.: N0401 CTD 112 DRILLER: David Cobb DATE COMPLETED: 10-21-00
 SITE: AECs DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: Geoprobe w/ Auger DEV. METHOD: Pump & Surge EASTING: _____



GROUND ELEVATION

~ 3.5' BGS
~ 6.53 DTW from Tol

0.5' Bottom Point Cap

ELEVATION OF TOP OF SURFACE CASING: ~ 3.5 AGS
 STICK-UP TOP OF SURFACE CASING: _____
 ELEVATION OF TOP OF RISER PIPE: _____
 RISER STICK-UP ABOVE GROUND SURFACE: ~ 3' AGS
 I.D. OF SURFACE CASING: 2-inch
 TYPE OF SURFACE CASING: Sch 40 PVC
 GROUND ELEVATION: _____
 TYPE OF SURFACE SEAL: Concrete pad
2' x 2' x 6"
 RISER PIPE I.D.: 2-inch
 TYPE OF RISER PIPE: Sch 40 PVC
 BOREHOLE DIAMETER: ~ 8 1/4 inch
 TYPE OF SEAL: Pure Gold Bentonite
Med. chips of Concrete Pad
 ELEVATION / DEPTH OF SEAL: 10.5'
 TYPE OF SEAL: Pure Gold Bentonite
Med. chips
 ELEVATION / DEPTH TOP OF FILTER PACK: 11.0' BGS
 ELEVATION / DEPTH TOP OF SCREEN: 11.72' BGS
11.72'
 TYPE OF SCREEN: Sch 40 PVC
 SLOT SIZE X LENGTH: 0.01 slot x 5 ft
 I.D. OF SCREEN: 2-inch
 TYPE OF FILTER PACK: Filter sil
Silica Sand 20/40
 ELEVATION / DEPTH BOTTOM OF SCREEN: 10.28' BGS
 ELEVATION / DEPTH BOTTOM OF FILTER PACK: 10.28' BGS
 TYPE OF BACKFILL BELOW WELL: Filter sil
 ELEVATION / DEPTH OF BOREHOLE: 18'

10.28
- 1.50
= 9.72
- 5.12
= 4.60



DEP Form # 62-770.900(3)
 Form Title: Petroleum or Petroleum Products
Water Sampling Log
 Effective Date: September 23, 1997

Petroleum or Petroleum Products

Water Sampling Log

BRO-102-65 N0105 0000 EJ0050260

FDEP FACILITY NO.:	WELL NO.: - 65	SAMPLE ID: BRO102-65	DATE: 11/3/00
SITE NAME: OLF Bronson		SITE LOCATION: Machine 6m Butt	

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 10.29	DEPTH TO WATER (ft): 8.01	WELL CAPACITY (gal/ft): .4
------------------------	------------------------------	---------------------------	----------------------------

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH - DEPTH TO WATER) x WELL CAPACITY =
 = (10.29 - 8.01) x .4 = .91

PURGE METHOD: Peristaltic				PURGING INITIATED AT: 0855		PURGING ENDED AT: 0943		
				PURGE RATE (gpm): 100 ml/min		TOTAL VOLUME PURGED (gal): 1.5		
WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (umhos)	COLOR	ODOR	APPEARANCE	OTHER
1	.4	5.26	23.5	.059	No color	None	Clear	
2	~1.0	5.29	23.6	.052	"	"	"	
3	~1.5	5.32	24.0	.050	"	"	"	

SAMPLING DATA

SAMPLED BY/ AFFILIATION: Dan Hartnett	SAMPLER(S) SIGNATURE(S): <i>Dan Hartnett</i>	
SAMPLING METHOD(S): Peristaltic pump	SAMPLING INITIATED AT: 09:43	SAMPLING ENDED AT: 09:48

FIELD DECONTAMINATION: Y <input checked="" type="checkbox"/> N		FIELD-FILTERED: Y <input checked="" type="checkbox"/> N		DUPLICATE: Y <input checked="" type="checkbox"/> N		
SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
1	HDP	500ml	HNO3	None		Fe, Al

REMARKS:
 MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)
 WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

ATTACHMENT E
Laboratory Analytical Reports
Data Validation Report



Tetra Tech NUS, Inc.

Internal Correspondence

TO: Mr. Gerald Walker **DATE:** December 26, 2000

FROM: Suzanne I. Smith **CC:** File

SUBJECT: Inorganic Data Validation – Aluminum and Iron
CTO086 – NAS Pensacola, Bronson Field
SDG 26005

SAMPLES: 3/Soil

BRO-102-5S-0-2	BRO-102-6S-0-2	BRO-102-6S-2-4
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3/Leachate

BRO-102-5S-0-2	BRO-102-6S-0-2	BRO-102-6S-2-4
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2/Aqueous

BRO-102-5S	BRO-102-6S
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OVERVIEW

The sample set for CTO086, SDG 26005; Bronson Field, Pensacola, Florida consists of three (3) soil environmental samples, three (3) leachate environmental samples, and two (2) aqueous environmental samples. The environmental samples were analyzed for Aluminum and Iron.

The samples were collected by Tetra Tech NUS on October 21, 2000 and analyzed by Accura Analytical Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW-846 Method 6010B analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * • Data Completeness
- * • Holding Times
- * • Laboratory method/field quality control blank results
- * • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter.

•Page - 2
Memo: Mr. G. Walker
December 26, 2000

Aluminum and Iron Fraction

All other quality control criteria were met for this fraction.

Executive Summary

Laboratory performance: All other quality control criteria were met.

Other factors affecting data quality: No other factors affected data quality.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1996), and the NFESC guidelines "Navy Installation Restoration Chemical Data Quality Manual" (September, 1999). The text of the report has been formulated to address only those problems affecting data quality.

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



Suzanne J. Smith

Project Chemist
Tetra Tech NUS, Inc.

SOIL DATA
 AAL
 SDG: 26005

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

BRO-102-5S-0-2 ✓
 10/21/00
 AC02198
 NORMAL
 90.0 %
 MG/KG

BRO-102-6S-0-2 ✓
 10/21/00
 AC02195
 NORMAL
 85.0 %
 MG/KG

BRO-102-6S-2-4 ✓
 10/21/00
 AC02196
 NORMAL
 87.0 %
 MG/KG

//
 100.0 %

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	1400			1200			1200					
IRON	650			370			290					

STATION PENSACOLA

WATER DATA

AAL

SDG: 26005

SAMPLE NUMBER:	BRO-102-5S ✓	BRO-102-5S-0-2 ✓	BRO-102-6S ✓	BRO-102-6S-0-2 ✓
SAMPLE DATE:	10/21/00	10/21/00	10/21/00	10/21/00
LABORATORY ID:	AC02197	AC02198	AC02194	AC02195
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	MG/L	MG/L	MG/L	MG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	0.050	U		1.0	U		0.050	U		1.6		
IRON	0.10	U		1.0	U		0.10	U		1.0	U	

WATER DATA
 AAL
 SDG: 26005

SAMPLE NUMBER:	BRO-102-6S-2-4 ✓			
SAMPLE DATE:	10/21/00	//	//	//
LABORATORY ID:	AC02196			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	MGL			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	8 1.0	U										
IRON	8 1.0	U										

HOLDING TIME
12/11/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/L	BRO-102-5S	AC02197	NORMAL	26005	M	10/21/00	10/31/00	11/03/00	10	3	13
MG/L	BRO-102-5S-0-2	AC02198	NORMAL	26005	M	10/21/00	10/27/00	10/31/00	6	4	10
MG/L	BRO-102-6S	AC02194	NORMAL	26005	M	10/21/00	10/31/00	11/03/00	10	3	13
MG/L	BRO-102-6S-0-2	AC02195	NORMAL	26005	M	10/21/00	10/27/00	10/31/00	6	4	10
MG/L	BRO-102-6S-2-4	AC02196	NORMAL	26005	M	10/21/00	10/27/00	10/31/00	6	4	10

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CASE NARRATIVE for Project Number: 26005
Client Project: Bronson Fld-Machine Gun Butt
Project Manager: Gerry Walker
Sampler(s): Gary Davis

The following items were noted concerning this project:

1. All soil results have reported on a dry weight basis and the reporting limits have been adjusted accordingly.
2. The Matrix Spike and Matrix Spike Duplicate analyses associated with Total / SPLP Iron and Aluminum was performed on sample BRO-102-5S-0-2.
3. The Matrix Spike and Matrix Spike Duplicate recoveries for Total Aluminum was outside the method specified limits due to high analyte concentration.
4. The relative percent difference between the Matrix Spike and Matrix Spike Duplicate analyses was outside the method specified limits for Total Iron due to sample heterogeneity.
5. The EDD file matches the submitted data reports.


Quality Assurance Manager


Laboratory Manager

**PROJECT QUALITY CONTROL RESULTS
AAL PROJECT #26005**

Method No ¹	Analyte / Component	Project Control Rec		Accuracy Limits		Project Control		Precision Limits		Project Control Recoveries		Accuracy Limits		Project Control		Precision Limits			
		MS	MSD	MS	MS	MS/MSD Recoveries		MS/MSD % Deviation		MS/MSD Deviation		LCS	LCS	LCS Recoveries		Field Dup % Deviation		Field Dup Deviation	
		Water	Soil ²			Water	Soil ²	Water	Soil ²	Water	Soil ²	Water	Soil ²	Water	Soil ²	Water	Soil ²	Water	Soil ²
METALS BY ICP																			
6010B	Aluminum *		398	510	50-150	30-170	#DIV/0!	25%	<30	<50		99	79-115	79-115			<50	<75	
6010B	Iron *		84	130	50-150	30-170	#DIV/0!	43%	<30	<50		103	85-112	85-112			<50	<75	

* Expected value for MS/MSD/LCS = 100ppm

Notes:
1) SW-846 Methods unless otherwise noted
2) Includes sediments, waste, solids

MS - Not Specified
MSD - Not Applicable

**TABLE 2-3
PROJECT QUALITY CONTROL OBJECTIVES
AAL PROJECT #26005**

Method No	Analyte / Component	Project Control Rec.		Accuracy Limits	Precision Limits	Project Control	Project Control Rec	Accuracy Limits	Precision Limits
		MS	MSD	MS/MSD Recoveries	MS/MSD Deviation	MS/MSD % Deviation	LCS	LCS Recoveries	Field Dup Deviation
		SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP
SPLP Metals				(%)	(%)			(%)	(%)
6010B	Aluminum *	110	104	50-150	<50	6%	94	70-130	<50
6010B	Iron *	111	106	50-150	<50	5%	102	70-130	<50

* Expected value for MS/MSD/LCS = 4.0ppm

Notes:

- 1) SW-846 Methods unless otherwise noted
- 2) Includes sediments, waste, solids

NS = Not Specified
NA = Not Applicable

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LABORATORY REPORT

Accura Sample ID #: AC02194

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/21/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: WATER

Client Sample ID: BRO-102-6S

ANALYSIS: Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/03/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

<RDL

0.050

Iron

<RDL

0.10



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SC Certification # 98015

USACE-MRD Approved

LABORATORY REPORT

Accura Sample ID #: AC02195

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/21/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: SOIL

Client Sample ID: BRO-102-6S-0-2

ANALYSIS: % Solids

Method Ref: EPA 160.3

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/27/2000

Result Units: %

Analyte Name

Analytical Results

Reported Detection Limits

Solids

85

1.0

ANALYSIS: Metals

Method Ref: 3050B/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/02/2000

Result Units: mg/Kg

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

1200

5.9

Iron

370

12

ANALYSIS: SPLP Extraction Procedure

Method Ref: 1312

Date Ext/Dig/Prep: 10/26/2000

Date Analyzed: 10/27/2000

Result Units:

Analyte Name

Analytical Results

Reported Detection Limits

SPLP Extraction

COMPLETE

ANALYSIS: SPLP Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/31/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

1.6

1.0

Iron

<RDL

1.0



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LABORATORY REPORT

Accura Sample ID #: AC02196

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/21/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: SOIL

Client Sample ID: BRO-102-6S-2-4

ANALYSIS: % Solids

Method Ref: EPA 160.3

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/27/2000

Result Units: %

Analyte Name

Analytical Results

Reported Detection Limits

Solids

87

1.0

ANALYSIS: Metals

Method Ref: 3050B/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/02/2000

Result Units: mg/Kg

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

1200

5.7

Iron

290

11

ANALYSIS: SPLP Extraction Procedure

Method Ref: 1312

Date Ext/Dig/Prep: 10/26/2000

Date Analyzed: 10/27/2000

Result Units:

Analyte Name

Analytical Results

Reported Detection Limits

SPLP Extraction

COMPLETE

ANALYSIS: SPLP Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/31/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

<RDL

1.0

Iron

<RDL

1.0



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LABORATORY REPORT

Accura Sample ID #: AC02197

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/21/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: WATER

Client Sample ID: BRO-102-5S

ANALYSIS: Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/03/2000

Result Units: mg/L

<u>Analyte Name</u>	<u>Analytical Results</u>	<u>Reported Detection Limits</u>
Aluminum	<RDL	0.050
Iron	<RDL	0.10


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LABORATORY REPORT

Accura Sample ID #: AC02198

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/21/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: SOIL

Client Sample ID: BRO-102-5S-0-2

ANALYSIS: % Solids

Method Ref: EPA 160.3

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/27/2000

Result Units: %

Analyte Name

Analytical Results

Reported Detection Limits

Solids

90

1.0

ANALYSIS: Metals

Method Ref: 3050B/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/02/2000

Result Units: mg/Kg

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

1400

5.6

Iron

650

11

ANALYSIS: SPLP Extraction Procedure

Method Ref: 1312

Date Ext/Dig/Prep: 10/26/2000

Date Analyzed: 10/27/2000

Result Units:

Analyte Name

Analytical Results

Reported Detection Limits

SPLP Extraction

COMPLETE

ANALYSIS: SPLP Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/31/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

<RDL

1.0

Iron

<RDL

1.0



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FL Certification # E87429

NC Certification # 483

SC Certification # 98015

USACE-MRD Approved

LABORATORY REPORT

Accura Sample ID #: AC02199

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/25/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: WATER

Client Sample ID: METHOD BLANK-1

ANALYSIS: Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/03/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

<RDL

0.050

Iron

<RDL

0.10



Accura Analytical Laboratory, Inc.

ACCURA ANALYTICAL LABORATORY, INC.

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LABORATORY REPORT

Accura Sample ID #: AC02200

Accura Project #: 26005

Client: Tetra Tech Nus -Tallahassee

Date Sampled: 10/25/2000

Client Contact: GERRY WALKER

Date Received: 10/25/2000

Client Project Number:

Date Reported: 11/07/2000

Client Project Name: BRONSON FLD-MACHINE GUN BUTT

Sample Matrix: SOIL

Client Sample ID: METHOD BLANK-2

ANALYSIS: Metals

Method Ref: 3050B/6010B

Date Ext/Dig/Prep: 10/31/2000

Date Analyzed: 11/02/2000

Result Units: mg/Kg

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

<RDL

5.0

Iron

<RDL

10

ANALYSIS: SPLP Extraction Procedure

Method Ref: 1312

Date Ext/Dig/Prep: 10/26/2000

Date Analyzed: 10/27/2000

Result Units:

Analyte Name

Analytical Results

Reported Detection Limits

SPLP Extraction

COMPLETE

ANALYSIS: SPLP Metals

Method Ref: 3010A/6010B

Date Ext/Dig/Prep: 10/27/2000

Date Analyzed: 10/31/2000

Result Units: mg/L

Analyte Name

Analytical Results

Reported Detection Limits

Aluminum

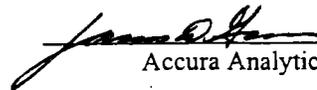
<RDL

1.0

Iron

<RDL

1.0



Accura Analytical Laboratory, Inc.



Tetra Tech NUS, Inc.

Internal Correspondence

TO: Mr. Terry Hansen **DATE:** February 6, 2001
FROM: Suzanne I. Smith **CC:** File
SUBJECT: Inorganic Data Validation – Aluminum and Iron
CTO086 – NAS Pensacola, Bronson Field
SDG ORL13288
SAMPLES: 3/Aqueous
BRO-102-5S BRO-102-6S BRO-102-EQB

OVERVIEW

The sample set for CTO086, SDG ORL13288; Bronson Field, Pensacola, Florida consists of two (2) aqueous environmental samples and one (1) equipment blank. The samples were analyzed for Aluminum and Iron.

The samples were collected by Tetra Tech NUS on November 3, 2000 and analyzed by Environmental Conservation Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to EPA Method 202.1 (Aluminum) and EPA Method 236.1 (Iron) analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * • Data Completeness
- * • Holding Times
- Laboratory method/field quality control blank results
- * • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter.

Aluminum and Iron Fraction

Blank analysis

Affected samples : None

<u>Analyte</u>	<u>Maximum Concentration(mg/L)</u>	<u>Action Level(mg/L)</u>
Aluminum	0.11	0.55

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in the blanks. Dilution factors and sample aliquots were taken into consideration.

All other quality control criteria were met for this fraction.

Executive Summary

Laboratory performance: All quality control criteria were met.

Other factors affecting data quality: No other factors affected data quality.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1996), and the NFESC guidelines "Navy Installation Restoration Chemical Data Quality Manual" (September, 1999). The text of the report has been formulated to address only those problems affecting data quality.

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


Suzanne J. Smith

Project Chemist
Tetra Tech NUS, Inc.

DATA VALIDATION TRACKING FORM

Site Name: NAS Pensacola

Region: 4

Proj Manager: T. Hansen

CTO: 086

Charge No.: 0105

Validation:

Validator: _____

Full

QA: _____

Limited

Cursory

Sample Delivery Group: 13288

Fraction:

AQUEOUS

SOLID

METALS

3

MISC

OTHER

Date Assigned: _____

LOE Allotted: _____ hrs

Due Date: _____

LOE Expended:

Date Valid Complete: 2/6/01

Validation _____ hrs

Date QA Complete: _____

Corrections _____ hrs

QA _____ hrs

Total LOE Expended _____ hrs

PACKAGE TRACKING

CTO: 086 JOB NO: 0105
SDG: 13288 VALIDATION REQUIRED: C
DATE DISK RECEIVED: 2/1/01 PROJECT MANAGER: T. Hansen
DATE DATA RECEIVED: _____ REGION: 4

PROJECT NAME: NAS Pensacola
NETWORK PATH: P:\Valid\SD\U\CTO086\

FRACTIONS RECEIVED:

- OV _____
- OVG _____
- OS _____
- PAH _____
- PEST/PCB _____
- HERB _____
- PET _____
- EXP _____
- DIOX _____
- M _____
- MF _____
- MISC _____
- OTHER _____

NOTES:

Sent to S. Smith 2/5/01 - faxed.
Hard copy sent directly to her - no raw
data in Pgh.

CTO086-NAS PENSACOLA
 WATER DATA
 ENCO LABORATORIES
 SDG: 13288

SAMPLE NUMBER:	BRO-102-5S	BRO-102-6S	BRO-102-EQB	
SAMPLE DATE:	11/03/00	11/03/00	11/03/00	//
LABORATORY ID:	ORL13288-2	ORL13288-1	ORL13288-3	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	MG/L	MG/L	MG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	0.91			1.7			0.11					
IRON	0.46			2.1			0.10	U				

13288

HOLDING TIME

02/05/01

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/L	BRO-102-5S	ORL13288-2	NORMAL	13288	M	11/03/00	//	11/13/00	0	0	10
MG/L	BRO-102-6S	ORL13288-1	NORMAL	13288	M	11/03/00	//	11/13/00	0	0	10
MG/L	BRO-102-EQB	ORL13288-3	NORMAL	13288	M	11/03/00	//	11/13/00	0	0	10

Environmental Conservation Laboratories, Inc.
10207 General Drive
Orlando, Florida 32824-8529
407 / 826-5314
Fax 407 / 850-6945
www.encolabs.com



DHRS Certification No. E83182

CLIENT : Tetra Tech NUS
ADDRESS: 1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32312

REPORT # : ORL13288
DATE SUBMITTED: November 4, 2000
DATE REPORTED : November 20, 2000

PAGE 1 OF 4

ATTENTION: Gerry Walker

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

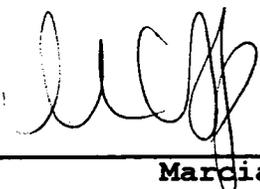
PROJECT #: N3876

CTO #0146/086 BRONSON SITE 102

11/03/00

#1 - BRO-102-6S @ 09:43
#2 - BRO-102-5S @ 10:30
#3 - BRO-102-EQB @ 08:45

PROJECT MANAGER



Marcia C. Terlep

ENCO LABORATORIES

REPORT # : ORL13288
DATE REPORTED: November 20, 2000
REFERENCE : N3876
PROJECT NAME : CTO #0146/086
BRONSON SITE 102

PAGE 2 OF 4

RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>BRO-102-6S</u>	<u>BRO-102-5S</u>	<u>Units</u>
Aluminum	202.1	1.7	0.91	mg/L
Date Analyzed		11/13/00	11/13/00	
Iron	236.1	2.1	0.46	mg/L
Date Analyzed		11/06/00	11/06/00	

ENCO LABORATORIES

REPORT # : ORL13288
DATE REPORTED: November 20, 2000
REFERENCE : N3876
PROJECT NAME : CTO #0146/086
BRONSON SITE 102

PAGE 3 OF 4

RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>BRO-102-EQB</u>	<u>LAB BLANK</u>	<u>Units</u>
Aluminum	202.1	0.11	0.10 U	mg/L
Date Analyzed		11/13/00	11/13/00	
Iron	236.1	0.10 U	0.10 U	mg/L
Date Analyzed		11/06/00	11/06/00	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : ORL13288
DATE REPORTED: November 20, 2000
REFERENCE : N3876
PROJECT NAME : CTO #0146/086
BRONSON SITE 102

PAGE 4 OF 4

QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
------------------	----------------------------------	--------------------------	-------------------------	--------------------------

Aluminum

MS Reported value; 9.8 mg/L - MSD Reported value; 10.2 mg/L
MS Expected value; 10 mg/L - MSD Expected value; 10 mg/L
MS % Recovery 98% - MSD % Recovery 102%
MS Control Limits 65-125% - MSD Control Limits 65-125%
Date Analyzed 11/13/00 - Date Analyzed 11/13/00

LCS Reported value; 9.99 mg/L
LCS Expected value; 10 mg/L
LCS % Recovery 99.9%
LCS Control Limit 65-125%
Date Analyzed 11/13/00

Iron

MS Reported value; 0.93 mg/L - MSD Reported value; 0.9 mg/L
MS Expected value; 1.0 mg/L - MSD Expected value; 1.0 mg/L
MS % Recovery 93% - MSD % Recovery 91%
MS Control Limits 63-129% - MSD Control Limits 63-129%
Date Analyzed 11/06/00 - Date Analyzed 11/06/00

LCS Reported value; 0.98 mg/L
LCS Expected value; 1.0 mg/L
LCS % Recovery 98%
LCS Control Limit 63-129%
Date Analyzed 11/06/00

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

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ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE <i>Bronson Site 102</i>				PROJECT NO. <i>N3876</i>				P.O. NUMBER				MATRIX TYPE				REQUIRED ANALYSIS				PAGE <i>1</i> OF <i>1</i>									
PROJECT LOC. (State) <i>FL</i>		SAMPLER(S) NAME <i>D. Hartnett/G. Davis</i>						PHONE <i>850/85-9899</i>		FAX		<i>Fe, Al</i> SURFACE WATER GROUND WATER WASTEWATER DRINKING WATER SOIL/SOLID/SEDIMENT NONAQUEOUS LIQUID (oil, solvent, etc.) AIR SLUDGE OTHER				<input checked="" type="checkbox"/> STANDARD REPORT DELIVERY <input type="checkbox"/> EXPEDITED REPORT DELIVERY (surcharge) Date Due: _____													
CLIENT NAME <i>Tetra Tech NUS</i>						CLIENT PROJECT MANAGER <i>Gerry Walker</i>																							
CLIENT ADDRESS (CITY, STATE, ZIP) <i>1401 Oven Park Dr, Tallahassee, FL 32311</i>																													
SAMPLE																													
STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION						PRESERVATIVE				NUMBER OF CONTAINERS SUBMITTED				REMARKS										
1	<i>11/3/00</i>	<i>0943</i>	<input checked="" type="checkbox"/>		<i>BR0-102-6s</i>																								
2	<i>"</i>	<i>1030</i>	<input checked="" type="checkbox"/>		<i>BR0-102-5s</i>																								
3	<i>"</i>	<i>0845</i>	<input checked="" type="checkbox"/>		<i>BR0-102-EQB</i>																								
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SAMPLE KIT PREPARED BY: <i>UB</i>				DATE							TIME		RELINQUISHED BY: (SIGNATURE)				DATE		TIME		RECEIVED BY: (SIGNATURE)				DATE		TIME		
<input type="checkbox"/> JACKSONVILLE <input checked="" type="checkbox"/> ORLANDO				<i>11/1/00</i>							<i>11:45</i>		<i>Lea Burch</i>				<i>11/1/00</i>		<i>11:45</i>		<i>Dan Hartnett</i>				<i>11/3/00</i>		<i>12:00</i>		
RELINQUISHED BY: (SIGNATURE)				DATE							TIME		RECEIVED BY: (SIGNATURE)				DATE		TIME		RELINQUISHED BY: (SIGNATURE)				DATE		TIME		
<i>Dan Hartnett</i>				<i>11/3/00</i>		<i>1730</i>																							
RECEIVED BY: (SIGNATURE)				DATE		TIME		RELINQUISHED BY: (SIGNATURE)				DATE		TIME		RECEIVED BY: (SIGNATURE)				DATE		TIME							
RECEIVED FOR LABORATORY BY: (SIGNATURE)				DATE		TIME		CUSTODY INTACT		ENCO LOG NO.		REMARKS																	
<i>Dana Esmer</i>				<i>11/4/00</i>		<i>9:00</i>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<i>ORL-13288</i>																			
<input type="checkbox"/> Jacksonville <input checked="" type="checkbox"/> Orlando																													

ATTACHMENT F

**University of Florida, Center for Environmental & Human Toxicology
Health-Based GCTLs**



UNIVERSITY OF
FLORIDA

Center for Environmental & Human Toxicology

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Gainesville, Florida 32611-0885
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November 30, 1999

Ms. Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
Room 471 A, Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Ms. Mora-Applegate:

At your request, we have developed health-based groundwater cleanup target levels (GCTLs) for those contaminants which currently have GCTLs that are set by secondary standards or are based on organoleptic criteria. Attachment 1 shows the equation used by FDEP to calculate health-based GCTLs for non-carcinogens. Attachment 2 provides the list of contaminants, their current GCTL and basis, and the health-based GCTL. Attachment 3 provides the reference doses (RfDs) and their sources, used in the calculation of the health-based GCTLs.

We hope that this information is helpful. If you have any questions regarding the derivation of these values, please do not hesitate to contact us.

Sincerely,

Christopher J. Saranko, Ph.D.

Stephen M. Roberts, Ph. D.

cc: Tim Bahr
attachments

Attachment 1

Equation for Deriving Site-Specific Cleanup Target Levels For Non-Carcinogens in Groundwater

$$\text{GCTL } (\mu\text{g/L}) = \frac{\text{RfD}_{\text{oral}} \times \text{BW} \times \text{RSC} \times \text{CF}}{\text{Wconsp.}}$$

Parameter	Definition (units)	Default Value
GCTL	groundwater cleanup target level ($\mu\text{g/L}$)	n/a
RfD_{oral}	chronic oral reference dose (mg/kg/day)	Chemical-specific ^b
BW	average body weight (kg)	70 ^a
RSC	relative source contribution (%)	20%
CF	conversion factor ($\mu\text{g/mg}$)	1000
Wconsp.	average water consumption (L/day)	2

Equations and default parameters from FDEP 'Ground Water Guidance Concentration Manual', Bureau of Drinking Water and Ground Water Resources, June 1994.

^bToxicity values from IRIS, HEAST, or other sources as provided in Tables 5b of the Technical Report for Chapter 62-777, F.A.C.

Note: For those parameters where the derived GCTL is lower than what can reasonably be measured in a laboratory, the PQL will be designated as the groundwater cleanup target level.

Attachment 2

Comparison of Organoleptic and Secondary Standard GCTLs with Health-Based Values

Contaminant	CAS #	Current GCTL	Health-Based GCTL
		(µg/L)	(µg/L)
Acenaphthene	83-32-9	20 <i>Organoleptic</i>	420 <i>Systemic Toxicant</i>
Aluminum	7249-90-5	200 <i>Secondary Standard</i>	7000 <i>Systemic Toxicant</i>
Biphenyl, 1,1- [or Diphenyl]	92-52-4	0.5 <i>Organoleptic</i>	350 <i>Systemic Toxicant</i>
Butyl acetate, n-	123-86-4	43 <i>Organoleptic</i>	N/A
Chlorophenol, 3-	108-43-0	10 <i>Organoleptic / PQL</i>	35 <i>Systemic Toxicant</i>
Chlorophenol, 4-	106-48-9	5.5 <i>Organoleptic / PQL</i>	35 <i>Systemic Toxicant</i>
Chloropicrin	76-06-2	7.3 <i>Organoleptic</i>	N/A
Copper	7440-50-8	1000 <i>Secondary Standard</i>	280 ^a <i>Systemic Toxicant</i>
Cumene [or Isopropyl benzene]	98-82-8	0.8 <i>Organoleptic</i>	700 <i>Systemic Toxicant</i>
Dichlorobenzene, 1,3-	541-73-1	10 <i>Organoleptic / PQL</i>	210 <i>Systemic Toxicant</i>
Dichlorophenol, 2,3-	576-24-9	10 <i>Organoleptic / PQL</i>	21 <i>Systemic Toxicant</i>
Dichlorophenol, 2,4-	120-83-2	0.5 <i>Organoleptic / PQL</i>	21 <i>Systemic Toxicant</i>
Dichlorophenol, 2,5-	583-78-8	10 <i>Organoleptic / PQL</i>	21 <i>Systemic Toxicant</i>
Dichlorophenol, 2,6-	87-65-0	4 <i>Organoleptic / PQL</i>	21 <i>Systemic Toxicant</i>
Dichlorophenol, 3,4-	95-77-2	0.5 <i>Organoleptic / PQL</i>	21 <i>Systemic Toxicant</i>
Ethyl ether	60-29-7	750 <i>Organoleptic</i>	1400 <i>Systemic Toxicant</i>
Ethylbenzene	100-41-4	30 <i>Secondary Standard</i>	700 ^b <i>Primary Standard</i>
Fluoride	7782-41-4	2000 <i>Secondary Standard</i>	4000 ^c <i>Primary Standard</i>
Formaldehyde	50-00-0	600 <i>Organoleptic</i>	1400 <i>Systemic Toxicant</i>
Hexane, n-	110-54-3	10 <i>Organoleptic / PQL</i>	420 <i>Systemic Toxicant</i>
Iron	7439-89-6	300 <i>Secondary Standard</i>	2100 <i>Systemic Toxicant</i>
Manganese	7439-96-5	50 <i>Secondary Standard</i>	980 ^d <i>Systemic Toxicant</i>
Methyl acetate	79-20-9	5000 <i>Organoleptic / PQL</i>	7000 <i>Systemic Toxicant</i>

Contaminant	CAS #	Current GCTL	Health-Based GCTL
		(µg/L)	(µg/L)
Methyl methacrylate	80-62-6	25 <i>Organoleptic</i>	9800 <i>Systemic Toxicant</i>
Methyl tert-butyl ether [or MTBE]	1634-04-4	50 <i>Organoleptic</i>	210 <i>Systemic Toxicant</i>
Methylnaphthalene, 1-	90-12-0	20 <i>Organoleptic</i>	140 <i>Systemic Toxicant</i>
Methylnaphthalene, 2-	91-57-6	20 <i>Organoleptic</i>	140 <i>Systemic Toxicant</i>
Naphthalene	91-20-3	20 <i>Organoleptic</i>	140 <i>Systemic Toxicant</i>
Phenol	108-95-2	10 <i>Organoleptic</i>	4200 <i>Systemic Toxicant</i>
Silver	7440-22-4	100 <i>Secondary Standard</i>	35 <i>Systemic Toxicant</i>
Sulfate	14808-79-8	250000 <i>Secondary Standard</i>	N/A
Toluene	108-88-3	40 <i>Secondary Standard</i>	1000 ^a <i>Primary Standard</i>
Total dissolved solids [or TDS]	C-010	500000 <i>Secondary Standard</i>	N/A
Trichlorophenol, 2,4,5-	95-95-4	4 <i>Organoleptic</i>	700 <i>Systemic Toxicant</i>
Trimethylbenzene, 1,2,3-	526-73-8	10 <i>Organoleptic</i>	350 <i>Systemic Toxicant</i>
Trimethylbenzene, 1,2,4-	95-63-6	10 <i>Organoleptic</i>	350 <i>Systemic Toxicant</i>
Trimethylbenzene, 1,3,5-	108-67-8	10 <i>Organoleptic</i>	350 <i>Systemic Toxicant</i>
TRPH	No CAS#	5000 ##	280 ^f <i>Systemic Toxicant</i>
Vinyl acetate	108-05-4	88 <i>Organoleptic</i>	7000 <i>Systemic Toxicant</i>
Xylenes, total	1330-20-7	20 <i>Secondary Standard</i>	10000 ^a <i>Primary Standard</i>
Zinc	7440-66-6	5000 <i>Secondary Standard</i>	2100 <i>Systemic Toxicant</i>

^aThe National Center for Environmental Assessment (NCEA) recommends a reference dose range of 0.04-0.07 mg/kg-day. The health-based GCTL is based on a RfD of 0.04 mg/kg-day.

^bThe health-based GCTL for ethylbenzene is the basis for the Primary Standard.

^cThe value for fluoride is the Primary Standard. A value based on systemic toxicity would be lower.

^dWhen considering risk from non-dietary exposure to manganese, the USEPA recommends modifying the reference dose to account for background exposure. In this case, the unmodified RfD was used because the formula used to calculate the GCTL uses a relative source contribution term to account for background exposure.

^eThe values for Toluene and Xylenes, total are the Primary Standards. Values based on systemic toxicity would be higher.

^fThe health-based GCTL for TRPH is based on the fraction-specific RfD (0.04 mg/kg-day) for the C₆-C₁₅ hydrocarbon fraction recommended by the Total Petroleum Hydrocarbon Working Group (TPHCWG). If site-specific data on the composition of the TRPH is available, it could be used to derive a site-specific GCTL.

N/A = Not available

= Based on similarity to oil and grease standard as provided in Chapter 62-302, F.A.C.

Attachment 3

Sources of Toxicity Information Used to Calculate Health-Based GCTLs

Contaminant	CAS #	Oral RfD	Oral RfD Source	Health-Based GWCTL
		(mg/kg-day)		(µg/L)
Acenaphthene	83-32-9	0.06	IRIS	420
Aluminum	7249-90-5	1	NCEA	7000
Butyl acetate, n-	123-86-4	N/A	N/A	N/A
Biphenyl, 1,1- [or Diphenyl]	92-52-4	0.05	IRIS	350
Chlorophenol, 3-	108-43-0	0.005	Surrogate (a)	35
Chlorophenol, 4-	106-48-9	0.005	Surrogate (a)	35
Chloropicrin	76-06-2	N/A	N/A	N/A
Copper	7440-50-8	0.037	HEAST	259 ^a
Cumene [or Isopropyl benzene]	98-82-8	0.1	IRIS	700
Dichlorobenzene, 1,3-	541-73-1	0.03	IRIS	210
Dichlorophenol, 2,3-	576-24-9	0.003	Surrogate (b)	21
Dichlorophenol, 2,4-	120-83-2	0.003	IRIS	21
Dichlorophenol, 2,5-	583-78-8	0.003	Surrogate (b)	21
Dichlorophenol, 2,6-	87-65-0	0.003	Surrogate (b)	21
Dichlorophenol, 3,4-	95-77-2	0.003	Surrogate (b)	21
Ethyl ether	60-29-7	0.2	IRIS	1400
Ethylbenzene	100-41-4	0.1	IRIS	700 ^b
Fluoride	7782-41-4	0.06	IRIS	4000 ^c
Formaldehyde	50-00-0	0.2	IRIS	1400
Hexane, n-	110-54-3	0.06	HEAST	420
Iron	7439-89-6	0.3	NCEA	2100
Manganese	7439-96-5	0.14	IRIS	980 ^d
Methyl acetate	79-20-9	1	HEAST	7000
Methyl methacrylate	80-62-6	1.4	IRIS	9800
Methyl tert-butyl ether [or MTBE]	1634-04-4	0.03	HAL	210
Methylnaphthalene, 1-	90-12-0	0.02	Surrogate (c)	140
Methylnaphthalene, 2-	91-57-6	0.02	Surrogate (c)	140
Naphthalene	91-20-3	0.02	IRIS	140

Contaminant	CAS #	Oral RfD	Oral RfD Source	Health-Based GWCTL
		(mg/kg-day)		(µg/L)
Phenol	108-95-2	0.6	IRIS	4200
Silver	7440-22-4	0.005	IRIS	35
Sulfate	14808-79-8	N/A	N/A	N/A
Toluene	108-88-3	0.2	IRIS	1400 ^e
Total Dissolved Solids (TDS)	C-010	N/A	N/A	N/A
Trichlorophenol, 2,4,5-	95-95-4	0.1	IRIS	700
Trimethylbenzene, 1,2,3-	526-73-8	0.05	Surrogate (d)	350
Trimethylbenzene, 1,2,4-	95-63-6	0.05	NCEA	350
Trimethylbenzene, 1,3,5-	108-67-8	0.05	NCEA	350
TRPH	No CAS#	0.04	TPHWG	280 ^f
Vinyl acetate	108-05-4	1	HEAST	7000
Xylenes, total	1330-20-7	2	IRIS	14000 ^g
Zinc	7440-66-6	0.3	IRIS	2100

^aThe National Center for Environmental Assessment (NCEA) recommends a reference dose range of 0.04 -0.07 mg/kg-day. The health-based GCTL is based on a RfD of 0.04 mg/kg-day.

^bThe health-based GCTL for ethylbenzene is the basis for the Primary Standard.

^cFluoride has a Primary Standard of 4,000 µg/L.

^dWhen considering risk from non-dietary exposure to manganese, the USEPA recommends modifying the reference dose to account for background exposure. In this case, the unmodified RfD was used because the formula used to calculate the GCTL uses a relative source contribution term to account for background exposure.

^eToluene and Total Xylenes have Primary Standards of 1,000 µg/L and 10,000 µg/L respectively.

^fThe health-based GCTL for TRPH is based on the fraction-specific RfD (0.04 mg/kg-day) for the C₈-C₁₆ hydrocarbon fraction recommended by the Total Petroleum Hydrocarbon Working Group (TPHCWG). If site-specific data on the composition of the TRPH is available, it could be used to derive a site-specific GCTL.

N/A = Not available

= Based on similarity to oil and grease standard as provided in Chapter 62-302, F.A.C.

Reference sources for toxicity data:

IRIS: U.S. EPA's Integrated Risk Information System

HEAST: U.S. EPA's Health Effects Assessment Summary Tables

NCEA: National Center for Environmental Assessment

OPP: U.S. EPA's Office of Pesticide Programs Reference Dose Tracking Report

HAL: Drinking Regulations and Health Advisories (U.S. EPA Office of Water)

TPHCWG: TPH Criteria Working Group Series. *Volume 4: Development of Fraction Specific Reference Doses and Reference Concentrations for Total Petroleum Hydrocarbons*, Amherst, MA: Amherst Scientific Publishers, 1997.

Surrogate (a): Surrogate RfD based oral RfD for 2-chlorophenol

Surrogate (b): Surrogate RfD based oral RfD for 2,4-dichlorophenol

Surrogate (c): Surrogate RfD based oral RfD for naphthalene

Surrogate (d): Surrogate RfD based oral RfD for 1,2,4-Trimethylbenzene