CATLIN
ENGINEERS and SCIENTISTS

Post Office Box 10279
Wilmington, NC 28404-0279
Telephone: (910) 452-5861
Fax: (910) 452-7563

June 14, 2004

Commander
Naval Facilities Engineering Command
Atlantic Division
6506 Hampton Blvd., Bldg. A, Room 1306
Norfolk, VA 23508

Attention: EV32JC, Mr. John D. Conway, P. G.

Re: **FINAL** – Letter Report of Findings and Request for "No Further Action"
PP - 3363, Heating Oil UST
Marine Corps Base
Camp Lejeune, North Carolina

Navy Contract No. N62470-01-D-3009
Delivery Order No. 0102
CATLIN Project No. 203-117

Dear Mr. Conway:

The following letter report is submitted to document the recent sampling activities at the above referenced site. CATLIN Engineers and Scientists (CATLIN) was authorized to perform field activities and prepare the letter report by LANTDIV NAVFACENGCOM in accordance with Order for Supplies Contract Number N62470-01-D-3009 and Delivery Order Number 0102. Based on the recent investigation, this site appears to qualify for "Low Risk" classification and "No Further Action" status.

## Background and Purpose of Investigation

*(Refer to Figures 1 and 2)*

PP-3363 is a residence on Pender Street in the Paradise Point Housing Area, aboard Marine Corps Base (MCB) Camp Lejeune (Figure 1). The site contained one 550-gallon heating oil underground storage tank (UST), prior to tank removal. The area surrounding the former tank basin is the subject of this investigation. Previous investigations regarding PP-3363 include an *Underground Storage Tank Closure Report*, prepared by J.A. Jones Environmental Services, Inc., submitted January 10, 2002, and a report entitled *Leaking Underground Storage Tank (LUST) Phase 1 Limited Site Assessment Report*, prepared and submitted by Mid-Atlantic Associates, Inc. on October 15, 2002. Mid-Atlantic installed a temporary source area monitoring well for collection of a groundwater sample and advanced one hand-augered boring for collection of a soil sample along the former supply line. The soil sampling revealed the $C_9$-$C_{22}$ Aromatic hydrocarbon fraction concentration in excess of the lowest Maximum Soil Contaminant Concentration (MSCC). The groundwater sample collected from the temporary well revealed the $C_9$-$C_{22}$ Aromatic hydrocarbon fraction greater than the North Carolina Department of Environment and Natural Resources (NCDENR) Interim Groundwater Quality

Standard (IGWQS). Based on the soil and groundwater contamination levels identified, the site is eligible for "No Further Action" status with issuance of a Notice of Residual Petroleum or Land Use Restriction.

The purpose of this investigation was to complete fieldwork and reporting necessary for obtaining "No Further Action" status without Land Use Restriction. A soil sample was collected from the same area of contamination identified during the Limited Site Assessment (LSA) and analyzed for extractable and volatile petroleum hydrocarbons (EPH/VPH). One boring was advanced for installation of monitoring well USTPP3363-MW01. Groundwater was subsequently purged and sampled per Massachusetts Department of Environmental Protection (MADEP) VPH/EPH. The site plan and sample location are illustrated on Figure 2.

## Field Methods

CATLIN personnel installed one two-inch diameter, schedule 40 poly vinyl chloride (PVC) monitoring well (USTPP3363-MW01) within the boundaries of the former UST basin at site PP-3363 on March 2, 2004. A licensed driller installed the well utilizing standard hollow stem auger techniques to 12 feet below land surface (BLS) and screened between the depths of 2 and 12' BLS with 0.010-inch slotted PVC screen. Auger cuttings were collected during the boring phase of well installation for descriptive purposes only. A copy of the boring log and well construction record for USTPP3363-MW01 are attached. One soil sample, USTPP3363-SB02(1.5-2.5'), was collected by hand auger between 1.5' and 2.5' BLS for laboratory analysis.

CATLIN personnel returned on March 4, 2004 to gauge and sample monitoring well USTPP3363-MW01. Three well volumes were purged from the well and a groundwater sample was collected. New disposable latex gloves were worn and the groundwater sample was poured directly into the appropriately labeled glassware. The glassware was then placed on ice in an insulated cooler and transported following chain-of-custody protocol to Paradigm Analytical Laboratories, Inc. in Wilmington, North Carolina (NC Certification Number 481) for analysis per MADEP VPH and EPH. Chain-of-Custody documentation is included with the laboratory report.

## Results

MADEP VPH/EPH laboratory results for soil sample USTPP3363-SB02(1.5-2.5') reported no contaminant concentrations above the 10 mg/Kg laboratory quantitation limit.

VPH analysis of groundwater sample USTPP3363-MW01 revealed $C_5$-$C_8$, $C_9$-$C_{12}$ Aliphatic, and $C_9$-$C_{10}$ Aromatic concentrations at <100, 330, and 62 µg/L, respectively. EPH analysis revealed $C_9$-$C_{18}$, $C_{19}$-$C_{36}$ Aliphatics and $C_{11}$-$C_{22}$ Aromatics concentrations of 340, <100, and 140 µg/L, respectively. Petroleum aliphatic hydrocarbon fractions appear to conform to Interim Groundwater Quality Standards (IGWQS), as presented in the table below. A complete copy of laboratory analytical results for soil and water samples are attached.

**SUMMARY OF GROUNDWATER RESULTS**
**MADEP VPH/EPH**
**MARCH 4, 2004**

| Petroleum Carbon Fraction Class | IGWQS (µg/L) | USTPP3363-MW01 (µg/L) |
|---|---|---|
| $C_5$-$C_8$ Aliphatics | 420 | <100 |
| $C_9$-$C_{18}$ Aliphatics | 4,200 | 670 |
| $C_{19}$-$C_{36}$ Aliphatics | 42,000 | <100 |
| $C_9$-$C_{22}$ Aromatics | 210 | 202 |

## Summary and Conclusions

This investigation revealed no soil EPH/VPH fractions in excess of the lowest Maximum Soil Contaminant Concentrations (MSCC). Groundwater sampling revealed concentrations of the $C_9$-$C_{18}$ aliphatic fraction at 670 µg/L, which is below the IGWQS of 4,200 µg/L. $C_9$-$C_{22}$ aromatic hydrocarbons were reported at 202 µg/L, just below the 210 µg/L IGWQS. Previously detected groundwater contamination appears to have naturally attenuated to levels below IGWQS limits. The site should qualify for "Low Risk" classification and "No Further Action" status is recommended. Should you have any further questions, please feel free to contact us at your convenience.

Sincerely,

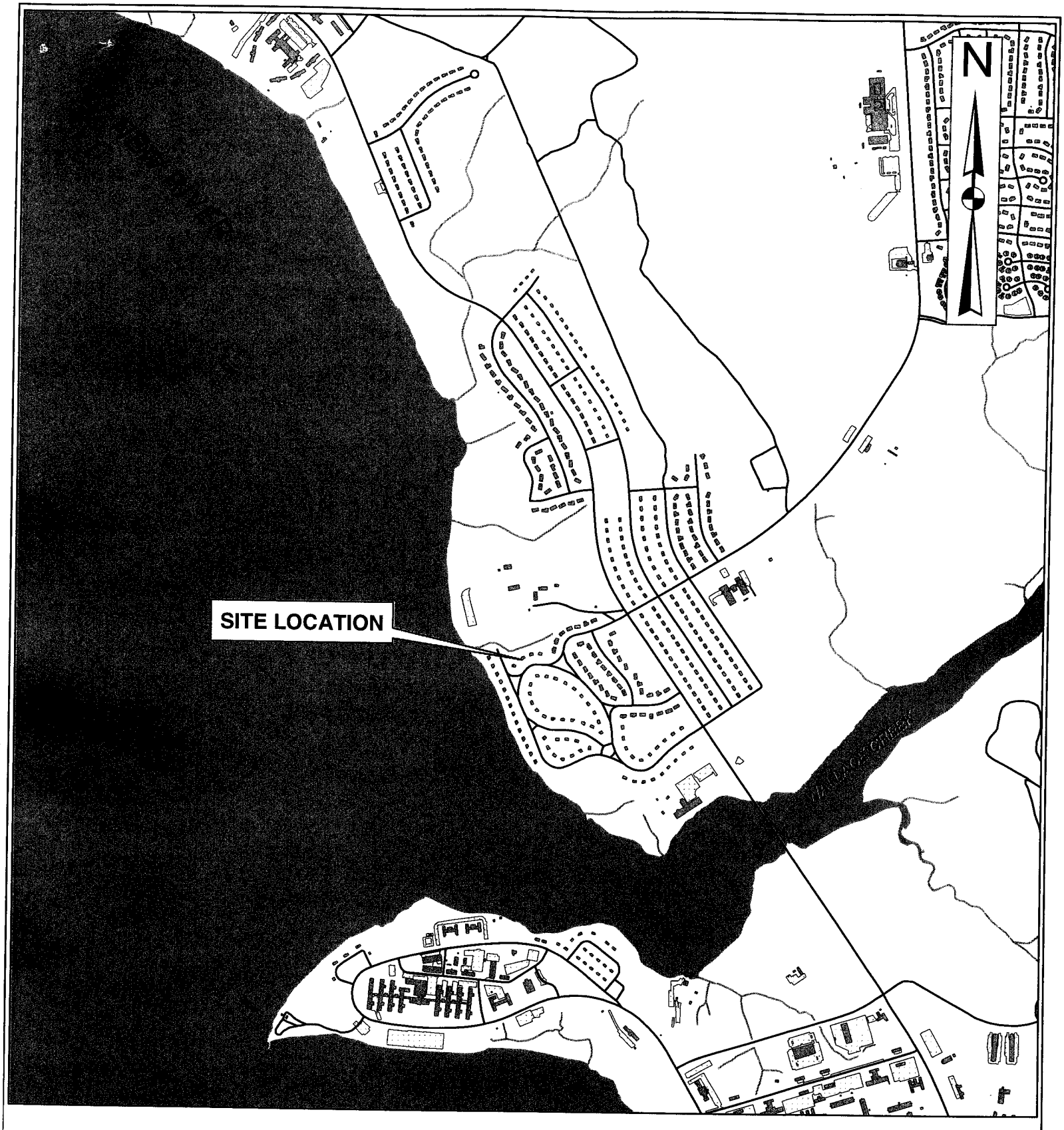
NORTH CAROLINA PROFESSIONAL SEAL 11299 ENGINEER MICHAEL E. MASON 6-14-04

Michael E. Mason, P.E.
CATLIN Program Manager

Attachments: Figures 1 and 2, Laboratory analytical report, Well construction record

cc: Ms. Pamela Argilan – Code AQ11B Contracts, correspondence only
Commanding General, Attn: Director I&E, EMD, EQB

203-117PP-3363LtrRprt.doc



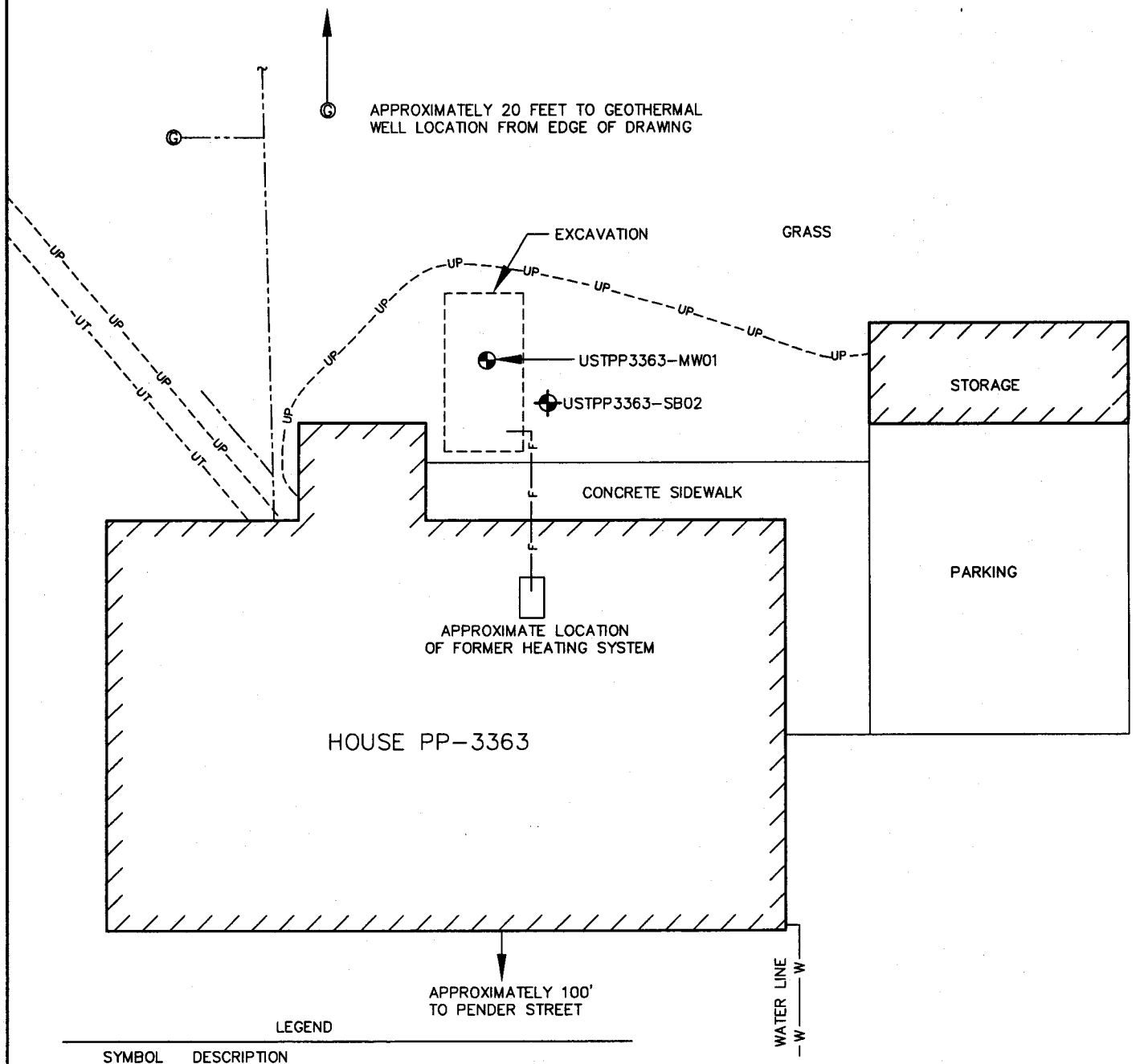

1,500 750 0 1,500 Feet

SCALE

CATLIN
ENGINEERS and SCIENTISTS

| PROJECT | TITLE | FIGURE |
|---|---|---|
| BUILDING PP-3363<br>MARINE CORPS BASE<br>CAMP LEJEUNE, NC | SITE VICINITY MAP | 1 |

| JOB NO. | DATE | SCALE | DRAWN BY | CHECKED BY |
|---|---|---|---|---|
| 203-117 | MAY 2004 | AS SHOWN | SAC | BA |




LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| ◓ | TYPE II WELL |
| ⊕ | SOIL BORING |
| Ⓖ | GEOTHERMAL WELL (EXISTING) |
| ——— | WATER LINES FOR GEOTHERMAL WELLS |
| ——F——— | FORMER FUEL LINES (APPROXIMATE LOCATION) |
| ----UP--- | UNDERGROUND POWER LINES (APPROXIMATE LOCATION) |
| ---UT--- | UNDERGROUND TELEPHONE LINE (APPROXIMATE LOCATION) |

10 5 0 10

SCALE IN FEET

REFERENCE: MID-ATLANTIC ASSOCIATES, P.A. AND J.A. JONES ENVIRONMENTAL SERVICES SITE MAP DATED 9/18/01

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

| PROJECT | TITLE | FIGURE |
|---|---|---|
| PARADISE POINT HOUSING AREA MARINE CORPS BASE CAMP LEJEUNE, N.C. | PP-3363 SITE PLAN | 2 |

| JOB NO: | DATE: | SCALE: | DRAWN BY: | CHECKED BY: |
|---|---|---|---|---|
| 203117 | MAY 2004 | 1"=10' | WHW | BA |

203117-PP-3363-SITE 2

# WELL LOG

CATLIN ENGINEERS and SCIENTISTS
Wilmington, North Carolina

SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT NO.: 203-117 | STATE: NC | COUNTY: Onslow | LOCATION: Jacksonville |
| PROJECT NAME: 7 Funded Site Closures | | LOGGED BY: Tom Stetler | WELL ID: USTPP3363 -MW01 |
| | | DRILLER: Bobbie Fowler | |
| NORTHING: 3,840,890.3 | EASTING: 283,019.6 | CREW: Bill Miller | |
| SYSTEM: UTM-WGS 84 (m) | BORING LOCATION: Behind residence | | T.O.C. ELEV.: |
| DRILL MACHINE: Diedrich D-25 | METHOD: HSA | 0 HOUR DTW: 1.82 | BORING DEPTH: 12.0 |
| START DATE: 3/3/04 | FINISH DATE: 3/3/04 | 24 HOUR DTW: 2.76 | WELL DEPTH: 12.0 |

| DEPTH | BLOW COUNT 6in / 6in / 6in / 6in | OVA (ppm) | LAB. | USCS | LOG | SOIL AND ROCK DESCRIPTION | WELL DETAIL |
|---|---|---|---|---|---|---|---|
| | | | | | | 0.0 LAND SURFACE | 0.0 |
| 0.0 | | 2.7 | | SM | | 0.2 TOPSOIL<br>Brown, silty, f. to vf. SAND. Minor fines. Moist. No HCO (slight?). Moderately well sorted. 2.0 | 0.0 2" Sch. 40 PVC 2.0 |
| 3.0 | | 1.8 | | SM | | 3.0<br>S. A. A. Light brown, silty, f. to vf. SAND. Minor fines. Wet. No HCO. Well sorted. 5.0 | |
| 8.0 | | .9 | | SM | | 8.0<br>S. A. A. Brown, silty, f. to vf. SAND. Well sorted. Saturated. Slight HCO. 10.0 | 0.5 1.0 2" Slot .010 Sch. 40 PVC |
| | | | | CH | | Dark gray, fat CLAY. Minor silt. Very soft, plastic. Strong HCO. 12.0 | 12.0 12.0 |
| | | | | | | Boring Terminated at Depth 12.0 ft<br>Soil descriptions from auger cuttings | |

Concrete | Bentonite Pellets | #2 Medium Sand

CATLIN BORING LOG 203-117 7 FUNDED SITE CLOSURES.GPJ CATLIN.GDT 5/21/04

FILE COPY

**PARADIGM ANALYTICAL LABORATORIES, INC.**
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Ben Ashba
Richard Catlin & Associates
P.O. Box 10279
Wilmington NC 28404-0279

Report Number: G128-1268

Client Project: 7 funded site closures, Camp Lejeune

Dear Mr. Ashba:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

3/15/04

Laboratory Directory Date
J. Patrick Weaver

## EPH (Aliphatics/Aromatics) Results

*by MDEP-EPH*

Client Name: Richard Catlin & Associates

Project Name: 7 funded site closures, Camp Lejeune

| Sample Information and Analytical Results | |
|---|---|
| Sample Identification | USTPP3363-SB02(1.5-2.5') |
| Sample Matrix | Soil |
| Date Collected | 03/02/04 |
| Date Received | 03/03/04 |
| Date Extracted | 03/04/04 |
| Date Analyzed | 03/10/04 |
| Dry Weight | 82.8 |
| Dilution Factor | 1 |
| $C_9$-$C_{18}$ Aliphatics* | < 10 (mg/Kg) |
| $C_{19}$-$C_{36}$ Aliphatics* | < 10 (mg/Kg) |
| $C_{11}$-$C_{22}$ Aromatics* | < 10 (mg/Kg) |
| Aliphatic Surrogate % Recovery | 87 |
| Aromatic Surrogate % Recovery | 83 |

**Comments:**

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-1268-8C

Reviewed By:

Attachment 3

# EPH Laboratory Reporting Form

## Calibration and QA/QC Information

Initial Calibration Date: 02/17/04

### Calibration Ranges and Limits

| Range | MDL (µg/L) | MDL (mg/Kg) | ML (µg/L) | ML (mg/Kg) | RL (µg/L) | RL (mg/Kg) |
|---|---|---|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.1 | 0.8 | 0.3 | 2.6 | 100 | 10 |
| $C_{19}$-$C_{36}$ Aliphatics | 0.1 | 1.6 | 0.3 | 5 | 100 | 10 |
| $C_{11}$-$C_{22}$ Aromatics | 0.2 | 2.1 | 0.6 | 6.7 | 100 | 10 |

### Calibration Concentration Levels

| Range | Levels (µg/L) | Levels (mg/Kg) | %RSD or CCC | Method of Quantitation |
|---|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.06 | 1 | 0.87 | Linear Regression |
| | 0.15 | 2.5 | | |
| | 0.3 | 5 | | |
| | 0.6 | 10 | | |
| | 1.2 | 20 | | |
| $C_{19}$-$C_{36}$ Aliphatics | 0.08 | 1.33 | 24.6 | Calibration Factor |
| | 0.2 | 3.33 | | |
| | 0.4 | 6.67 | | |
| | 0.8 | 13.3 | | |
| | 1.6 | 26.7 | | |
| $C_{11}$-$C_{22}$ Aromatics | 0.17 | 2.83 | 3.7 | Calibration Factor |
| | 0.425 | 7.08 | | |
| | 0.85 | 14.2 | | |
| | 1.7 | 28.3 | | |
| | 3.4 | 56.7 | | |

Calibration Check Date: 03/10/04

### Calibration Check

| Range | Levels (µg/mL) | Levels (mg/Kg) | RPD |
|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.6 | 10 | 18.8 |
| $C_{19}$-$C_{36}$ Aliphatics | 0.8 | 13.3 | -7.5 |
| $C_{11}$-$C_{22}$ Aromatics | 1.7 | 28.3 | -10.5 |

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

## VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: 7 funded site closures, Camp Lejeune

| Sample Information and Analytical Results | |
|---|---|
| Sample Identification | USTPP3363-SB02(1.5-2.5') |
| Sample Matrix | Soil |
| Collection Option (for Soil)* | 0 |
| Date Collected | 03/02/04 |
| Date Received | 03/03/04 |
| Date Extracted | 03/03/04 |
| Date Analyzed | 03/05/04 |
| Dry Weight | 83 |
| Dilution Factor | 1 |
| $C_5$-$C_8$ Aliphatics** | < 10 (mg/Kg) |
| $C_9$-$C_{12}$ Aliphatics** | < 10 (mg/Kg) |
| $C_9$-$C_{10}$ Aromatics** | < 10 (mg/Kg) |
| Surrogate % Recovery - PID | 100 |
| Surrogate % Recovery - FID | 100 |

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-1268-8B

Reviewed By:

Attachment 2

# VPH Laboratory Reporting Form

## Calibration and QA/QC Information

FID Initial Calibration Date: 03/02/04 PID Initial Calibration Date: 03/02/04

### Calibration Ranges and Limits

| Range | MDL | | ML | | RL | |
|---|---|---|---|---|---|---|
| | (µg/L) | (mg/Kg) | (µg/L) | (mg/Kg) | (µg/L) | (mg/Kg) |
| $C_5$-$C_8$ Aliphatics | 9.3 | 0.41 | 29.4 | 1.3 | 100 | 10 |
| $C_9$-$C_{12}$ Aliphatics | 7.9 | 0.3 | 25.2 | 0.97 | 100 | 10 |
| $C_9$-$C_{10}$ Aromatics | 0.5 | 0.04 | 1.5 | 0.14 | 100 | 10 |

### Calibration Concentration Levels

| Range | Levels (µg/L) | Levels (mg/Kg) | %RSD or CCC | Method of Quantitation |
|---|---|---|---|---|
| $C_5$-$C_8$ Aliphatics | 20 | 2 | 4.7 | Calibration Factor |
| | 80 | 8 | | |
| | 200 | 20 | | |
| | 800 | 80 | | |
| | 2000 | 200 | | |
| $C_9$-$C_{12}$ Aliphatics | 15 | 1.5 | 14.3 | Calibration Factor |
| | 60 | 6 | | |
| | 150 | 15 | | |
| | 600 | 60 | | |
| | 1500 | 150 | | |
| $C_9$-$C_{10}$ Aromatics | 32.5 | 3.25 | 0.998 | Linear Regression |
| | 130 | 13 | | |
| | 325 | 32.5 | | |
| | 1300 | 130 | | |
| | 3250 | 325 | | |

Calibration Check Date: 03/04/04

### Calibration Check

| Range | Levels (µg/L) | Levels (mg/Kg) | RPD |
|---|---|---|---|
| $C_5$-$C_8$ Aliphatics | 200 | 20 | -4.8 |
| $C_9$-$C_{12}$ Aliphatics | 150 | 15 | -4.0 |
| $C_9$-$C_{10}$ Aromatics | 325 | 32.5 | -1.6 |

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

## List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.011404.1

**PARADIGM ANALYTICAL LABORATORIES, INC.**
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 41594

18 of 18

Page 1 of 1

Client: Catlin
Address: 220 Old Dairy Rd.
Address: Wilmington NC 28405
Quote #: DOD 101

Project ID: 7 funded site closures, Camp Lejeune
Contact: Ben Ashba
Phone: 910-452-5861
Fax: 910-452-7563

Date: 3-3-04
Turnaround: Standard
Job Number: 203-117
P.O. Number: 240115-1

Report To: Ben Ashba @ Catlin

Invoice To: Sheila @ Catlin

| | | | | Preservative | | | | Analysis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ice | HCl | methanol | | EPA 601 | MADEP EPH | MADEP VPH | | | | | | | |
| UST24-MW01 | 3-1 | 1:15p | GW | ✓ | ✓ | | | ✓ | | | | | | | | | -Summary and Volume EDD format<br>← report only bromochloromethane, chloroform, dibromochloromethane |
| UST1323-MW01 | 3-1 | 11:56a | GW | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | |
| UST1323-MW02 | 3-1 | 12:05 | GW | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | |
| USTA5-605-MW01 | 3-2 | 10:45a | GW | ✓ | ✓ | | | ✓ | | | | | | | | | ← report only bromodichloromethane, chloroform, dibromochloromethane |
| UST31-SB05 (7-8') | 3-2 | 2:45p | soil | ✓ | | ✓ | | | ✓ | ✓ | | | | | | | |
| UST31-MW01 | 3-2 | 2:30p | GW | ✓ | ✓ | | | ✓ | | | | | | | | | ← report only chloroform |
| USTM167-MW01 | 3-2 | 12:55 | GW | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | |
| USTPP3363-SB02 (4.5-5.5') | 3-2 | 1:50p | soil | ✓ | | ✓ | | | ✓ | ✓ | | | | | | | G128-1268 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tom Stetson | 3-3 | 9:50 | Jackie Johnson | 3/3/04 | 0950 | air bill 482 | NC ✓ SC ____ Other ____ |
| | | | | | | | SEE REVERSE FOR TERMS AND CONDITIONS |

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

FILE COPY

**PARADIGM ANALYTICAL LABORATORIES, INC.**
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Ben Ashba
Richard Catlin & Associates
P.O. Box 10279
Wilmington NC 28404-0279

Report Number: G128-1272

Client Project: 7 funded site closures, Camp Lejeune

Dear Mr. Ashba:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

3/23/04

Laboratory Directory Date
J. Patrick Weaver

## EPH (Aliphatics/Aromatics) Results

*by MDEP-EPH*

Client Name: Richard Catlin & Associates

Project Name: 7 funded site closures, Camp Lejeune

| Sample Information and Analytical Results | |
|---|---|
| Sample Identification | USTPP3363-MW01 |
| Sample Matrix | Water |
| Date Collected | 03/04/04 |
| Date Received | 03/09/04 |
| Date Extracted | 03/11/04 |
| Date Analyzed | 03/22/04 |
| Dry Weight | |
| Dilution Factor | 1 |
| $C_9$-$C_{18}$ Aliphatics* | 340 (µg/L) |
| $C_{19}$-$C_{36}$ Aliphatics* | < 100 (µg/L) |
| $C_{11}$-$C_{22}$ Aromatics* | 140 (µg/L) |
| Aliphatic Surrogate % Recovery | 42 |
| Aromatic Surrogate % Recovery | 64 |
| Fractionation Surrogate 1 % Recovery | 68 |

**Comments:**

* = Excludes any surrogates or internal standards.

Lab info: G128-1272-1D

Reviewed By:

Attachment 3

# EPH Laboratory Reporting Form

## Calibration and QA/QC Information

Initial Calibration Date: 03/10/04

### Calibration Ranges and Limits

| Range | MDL (µg/L) | MDL (mg/Kg) | ML (µg/L) | ML (mg/Kg) | RL (µg/L) | RL (mg/Kg) |
|---|---|---|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.1 | 0.8 | 0.3 | 2.6 | 100 | 10 |
| $C_{19}$-$C_{36}$ Aliphatics | 0.1 | 1.6 | 0.3 | 5 | 100 | 10 |
| $C_{11}$-$C_{22}$ Aromatics | 0.2 | 2.1 | 0.6 | 6.7 | 100 | 10 |

### Calibration Concentration Levels

| Range | Levels (µg/L) | Levels (mg/Kg) | %RSD or CCC | Method of Quantitation |
|---|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.06 | 1 | 2.20 | Calibration Factor |
| | 0.15 | 2.5 | | |
| | 0.3 | 5 | | |
| | 0.6 | 10 | | |
| | 1.2 | 20 | | |
| $C_{19}$-$C_{36}$ Aliphatics | 0.08 | 1.33 | 11.7 | Calibration Factor |
| | 0.2 | 3.33 | | |
| | 0.4 | 6.67 | | |
| | 0.8 | 13.3 | | |
| | 1.6 | 26.7 | | |
| $C_{11}$-$C_{22}$ Aromatics | 0.17 | 2.83 | 7.4 | Calibration Factor |
| | 0.425 | 7.08 | | |
| | 0.85 | 14.2 | | |
| | 1.7 | 28.3 | | |
| | 3.4 | 56.7 | | |

Calibration Check Date: 03/22/04

### Calibration Check

| Range | Levels (µg/mL) | Levels (mg/Kg) | RPD |
|---|---|---|---|
| $C_9$-$C_{18}$ Aliphatics | 0.6 | 10 | -7.6 |
| $C_{19}$-$C_{36}$ Aliphatics | 0.8 | 13.3 | -24.5 |
| $C_{11}$-$C_{22}$ Aromatics | 1.7 | 28.3 | -20.4 |

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

# VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: 7 funded site closures, Camp Lejeune

| Sample Information and Analytical Results | |
|---|---|
| Sample Identification | USTPP3363-MW01 |
| Sample Matrix | Water |
| Collection Option (for Soil)* | |
| Date Collected | 03/04/04 |
| Date Received | 03/09/04 |
| Date Extracted | 03/16/04 |
| Date Analyzed | 03/16/04 |
| Dry Weight | |
| Dilution Factor | 1 |
| $C_5$-$C_8$ Aliphatics** | < 100 (µg/L) |
| $C_9$-$C_{12}$ Aliphatics** | 330 (µg/L) |
| $C_9$-$C_{10}$ Aromatics** | 62 (µg/L) |
| Surrogate % Recovery - PID | 100 |
| Surrogate % Recovery - FID | 98 |

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-1272-1B

Reviewed By:

N.C. Certification #481 S.C. Certification #99029

Attachment 2

# VPH Laboratory Reporting Form

## Calibration and QA/QC Information

FID Initial Calibration Date: 03/15/04 PID Initial Calibration Date: 03/15/04

### Calibration Ranges and Limits

| Range | MDL (µg/L) | MDL (mg/Kg) | ML (µg/L) | ML (mg/Kg) | RL (µg/L) | RL (mg/Kg) |
|---|---|---|---|---|---|---|
| $C_5$-$C_8$ Aliphatics | 9.3 | 0.41 | 29.4 | 1.3 | 100 | 10 |
| $C_9$-$C_{12}$ Aliphatics | 7.9 | 0.3 | 25.2 | 0.97 | 100 | 10 |
| $C_9$-$C_{10}$ Aromatics | 0.5 | 0.04 | 1.5 | 0.14 | 100 | 10 |

### Calibration Concentration Levels

| Range | Levels (µg/L) | Levels (mg/Kg) | %RSD or CCC | Method of Quantitation |
|---|---|---|---|---|
| $C_5$-$C_8$ Aliphatics | 20 | 2 | 8.5 | Calibration Factor |
| | 80 | 8 | | |
| | 200 | 20 | | |
| | 800 | 80 | | |
| | 2000 | 200 | | |
| $C_9$-$C_{12}$ Aliphatics | 15 | 1.5 | 13.5 | Calibration Factor |
| | 60 | 6 | | |
| | 150 | 15 | | |
| | 600 | 60 | | |
| | 1500 | 150 | | |
| $C_9$-$C_{10}$ Aromatics | 32.5 | 3.25 | 1 | Linear Regression |
| | 130 | 13 | | |
| | 325 | 32.5 | | |
| | 1300 | 130 | | |
| | 3250 | 325 | | |

Calibration Check Date: 03/15/04

### Calibration Check

| Range | Levels (µg/L) | Levels (mg/Kg) | RPD |
|---|---|---|---|
| $C_5$-$C_8$ Aliphatics | 200 | 20 | -8.8 |
| $C_9$-$C_{12}$ Aliphatics | 150 | 15 | 8.6 |
| $C_9$-$C_{10}$ Aromatics | 325 | 32.5 | -2.8 |

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

## List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.011404.1

**PARADIGM ANALYTICAL LABORATORIES, INC.**
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 41366

Page 1 of 1

7 of 7

Client: Catlin | Project ID: 7 funded site closures, Compleiene | Date: 3-9-04 | Report To: Ben Ashba@Catlin

Address: 220 Old Dairy Rd. | Contact: Ben Ashba | Turnaround: Standard

Address: Wilmington NC 28405 | Phone: 910-452-5861 | Job Number: 203-117

Quote #: DOD 101 | Fax: 910-452-7563 | P.O. Number: 240115-1 | Invoice To: Sheila@CatLin

PARADIGM ANALYTICAL LABORATORIES

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | EPH | VPH | | | | | | | | - summary and Lejeune EDD format |
| STPP4363-MW01 | 3-4 | 4:03p | GW | ✓ | ✓ | | | ✓ | ✓ | | | | | | | | |
| | | | | | | | | | | | | | | | | | G128-1272 |

| Relinquished By: | Date: | Time: | Received By: | Date: | Time: | Temperature: | Chain Custody Seals: |
|---|---|---|---|---|---|---|---|
| Tim Stitt | 3-8 | 4:10 | Jordan S Johnson | 3/8/04 | 1610 | ambient 5.8c | NC ✓ SC ____ Other ____ |

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

N.C. Certification #481 S.C. Certification #99029