CATLIN
Engineers and Scientists

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February 24, 2009

NAVFAC Mid-Atlantic
Marine Corps North Carolina IPT
Environmental Business Line
Code: OPCEV3MA
Attn: Mr. Melvin Acree
6506 Hampton Boulevard
Building C, Room 314
Norfolk, VA 23508-1278

Re: **CSFF 2005 Fuel Port Release – Additional Soil Sampling**
NCDENR Incident No. 87537
Marine Corps Base, Camp Lejeune, North Carolina
Navy Contract No. N62470-05-D-6200
Delivery Order Nos. Various
CATLIN Project No. 208-077

Dear Mr. Acree:

CATLIN Engineers and Scientists (CATLIN) has collected one soil sample along the perimeter of a soil excavation conducted by Sovereign Consulting Inc. (Sovereign) in June 2006 associated with the 2005 Fuel Port Release of JP-5 Jet Fuel (JP-5) at the Campbell Street Fuel Farm (CSFF) aboard Marine Corps Air Station (MCAS) New River. The sample was collected to determine if soil contamination above the North Carolina Department of Environment and Natural Resources (NCDENR) action levels was still present in this location (USTCSFF-SB12). Please find below a summary of the sampling activities, results and CATLIN's recommendations.

CSFF General Site Information and History

The CSFF project site is located along White Street aboard the MCAS, New River in Onslow County, North Carolina. The CSFF is an active fuel storage facility, which stores JP-5 fuel in four steel Aboveground Storage Tanks (ASTs) with capacities of 215,000 gallons each. These ASTs are connected by an aboveground fuel transfer line that enters a filter building before fuel is pumped to the flightline through an underground pipeline located along White Street. These ASTs replaced a system of eight USTs in 1985. The former USTs were reported to contain JP-5 fuel and aviation gasoline (AVGAS) and were of varying capacities ranging from unknown (two USTs) to120,000 gallons. Seven of the eight USTs were excavated and removed, and one AVGAS UST was reportedly filled with sand and abandoned in place. The AVGAS UST filled with sand and abandoned in-place is reportedly located behind the filter building,

the exact location is unknown. The CSFF UST site under NCDENR Incident Number 23297 is classified as Low Risk and Industrial/Commercial Land Use.

Various site assessments were completed at the CSFF project site in the early 1990s identifying soil and groundwater petroleum contamination, and the presence of free-phase product. The contamination was reportedly due to leaks from the former USTs and associated piping at the Fuel Farm/Building AS-143 area. The findings of the previous assessments have been summarized in reports submitted to NCDENR, Division of Waste Management (DWM), UST Section in the Wilmington Regional Office (WiRO).

2005 Fuel Port Release Information and History

According to the September 2005 Soil Contamination Report prepared by Engineering and Environment, Inc. (EEI), on August 15, 2005 a fuel port was discovered in an open position during a fueling operation. Upon discovery, the fuel port was immediately closed, however; an estimated 200 gallons of JP-5 was released. The spill was immediately reported to base personnel and first responders.

EEI conducted soil excavation activities on August 16 and 17, 2005. As stated in the Soil Contamination Report, the horizontal excavation limits corresponded to an area where the ground surface appeared visually stained and the vertical extent of the majority of the excavation extended to four feet below land surface (BLS). According to EEI, the north end of the excavation sloped up from four feet BLS to the land surface and the eastern portion of the excavation extended to only two feet BLS as site structures limited the access of the backhoe used during the excavation. In the southern portion of the excavation a concrete pad was present and surface material (approximately four inches of gravel) was removed with shovels, exposing hard-packed soil overlying the pad; the pad was not disturbed during the activities. EEI reported that approximately 30 cubic yards of petroleum-contaminated soil was removed from the release area. See Figure 1 for the location of the August 2005 EEI excavation area.

At the conclusion of the excavation, EEI collected four soil samples and then backfilled the excavation with clean fill material (See Figure 1). All four soil samples were analyzed for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO). Soil sample S0001 was collected from at the southern portion of the excavation at the base (approximately 0.5' BLS). Soil sample S0002 was collected from the eastern sidewall of the excavation at a depth of approximately 1 foot BLS. Soil sample S003 was collected from the central sidewall of the excavation at a depth of approximately 1.5 feet BLS. Soil sample S004 was collected from the western sidewall of the excavation at a depth of approximately 1.5 feet BLS. Analytical results revealed soil samples S0001, S0002 and S0004 each contained GRO and DRO at concentrations above the NCDENR action levels. Therefore, additional soil excavation was recommended.

In June 2006 Sovereign began the additional soil excavation activities at the subject site. According to the September 21, 2006 Soil Cleanup Report prepared by Sovereign, approximately 1,100 tons of petroleum-impacted soil was excavated and removed from the subject site. The boundary of the excavation is illustrated on the attached Figure 1. Soils were excavated within the boundary to the water table (approximately seven feet BLS). Sovereign collected soil confirmation samples from the sidewalls of the excavation at a depth of approximately four to six feet BLS per GRO/DRO analysis. Analytical results revealed soil contamination above the NCDENR action levels in the samples collected from the northern, northeastern and eastern sidewalls. Therefore, Sovereign conducted additional excavation in these areas and again soil confirmation samples were collected from the sidewalls of the excavation per GRO/DRO analysis. Analytical results from this second round of confirmation sampling revealed no exceedances of the NCDENR action levels in all the samples except one. Soil sample USTCSFF-SB12 collected from the eastern sidewall of the excavation at a depth of approximately 2.75 feet BLS revealed DRO at a concentration of 386 mg/kg which was still above the 40 mg/kg NCDENR action level.

Also, please note that Sovereign collected two soil samples from within the pump station (USTCSFF-P01 and USTCSFF-P02) in June 2006. As stated in the Soil Cleanup Report, each of these samples contained GRO and DRO above the NCDENR action levels of 10 mg/kg and 40 mg/kg, respectively. However, further soil excavation in the vicinity of the pump station was not feasible at that time due to the potential for structural damage to the aboveground piping system. The soil contamination in this area is planned for remediation when the upgrade to the pumping station takes place in the near future.

Current Soil Sampling

On November 28, 2008 CATLIN personnel arrived on-site to conduct soil sampling activities. One soil boring was installed in the vicinity of previous soil sample USTCSFF-SB12 to approximately three feet BLS by hand auger technique. Soil samples were collected continuously during advancement and divided into one foot intervals for lithology description. Soil samples revealed a brown, silty sand from the ground surface to one foot BLS. The one to two foot depth interval revealed a brown, sandy clay with low plasticity. A brown to gray silty sand was encountered from two to three feet BLS. Hydrocarbon odor was noted in the soil from the two to three foot BLS interval. A soil sample, USTCSFF-SB12(2008), was collected for laboratory analysis from this boring at a depth of 2.5 to 3 feet BLS.

The soil sample collected for laboratory analysis was packed in the appropriate pre-labeled glassware and placed in a chilled cooler pending delivery to SGS Environmental Services, Inc. (SGS) in Wilmington, North Carolina. SGS subsequently shipped the sample to Friedman and Bruya, Inc. (FBI) – Environmental Chemists in Seattle, Washington under proper Chain of Custody (COC) procedures. FBI analyzed the

sample for Total Petroleum Hydrocarbons (TPH) as Diesel using EPA Method 8015M in addition to conducting a forensic evaluation by Capillary Gas Chromatography (GC) using a Flame Ionization Detector (FID). The complete laboratory report and documentation is attached and summarized as follows:

As illustrated on Figure 1, Diesel Range Organics (DRO) was detected in the USTCSFF-SB12(2008) at a concentration of 270 mg/kg, which is still above the NCDENR action level of 40 mg/kg for DRO. The concentration of DRO detected in this sample collected was not unexpected as the sample collected at this location in 2006 contained concentrations of DRO at 386 mg/kg.

CATLIN hypothesized that the source of the DRO contamination present in the USTCSFF-SB12(2008) was not the 2005 surface release of JP-5. Therefore, CATLIN asked FBI to conduct a forensic evaluation of the DRO contamination present in the USTCSFF-SB12(2008) sample. The evaluation by FBI can be found in the attached January 2, 2009 laboratory report. In the report FBI states, "The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation". To conduct a more thorough evaluation of the DRO contamination found in the USTCSFF-SB12(2008) sample, FBI requested the analytical results and the GC charts from the four samples collected during the initial excavation completed by EEI in 2005 and also the analytical results and GC charts from a portion of the samples collected during the 2006 excavation by Sovereign. Upon receipt of this data FBI conducted an additional evaluation. This subsequent evaluation by FBI can be found in the attached February 5, 2009 narrative. A portion of this narrative is stated below:

> "Review of the GC/FID traces generated shows that the sample CSFF-S0004 (the most contaminated sample from the initial excavation) contains a middle distillate such as JP-5 or similar material. The bell shaped or Gaussian pattern of peaks consistent with normal alkanes indicates that the middle distillate appears to have undergone little to no biological degradation. The undegraded nature of this material is consistent with impact from the documented release of JP-5 that occurred in August 2005. It was requested that the material present in the sample CSFF-S0004 be compared to that identified in the sample USTCSFF-SB12(2008). The GC/FID trace generated shows that the sample USTCSFF-SB12(2008) also contains a middle distillate such as JP-5 or similar material. However, the low level or absence of peaks characteristic of normal alkanes indicates that the middle distillate in the sample USTCSFF-SB12(2008) has undergone substantial biological degradation.... The degraded nature of this material is consistent with a historic release.".

Recommendations

It is CATLIN's opinion that the DRO contamination found in the USTCSFF-SB12(2008) soil sample is not related to the 2005 surface release. CATLIN feels that the DRO contamination in this area is from historic releases associated with the former UST system(s). CATLIN recommends that no further assessment at the 2005 Fuel Port Release until the upgrades to the pumping station are conducted.

The levels of DRO in sample USTCSFF-SB12(2008) are fairly low (270 mg/kg) and at this concentration of DRO it is unlikely that any of the Industrial/Commercial MSCCs would be exceeded. However, per the UST Section *Guidelines for Assessment and Corrective Action for UST Releases* dated July 15, 2008; a soil sample should be collected in the vicinity of USTCSFF-SB12(2008) per EPA Method 8260B, 8270C and MADEP VPH/EPH analysis to confirm soil contamination does not exceed the Industrial/Commercial MSCCs. If contaminants are below the Industrial/Commercial MSCCs, No Further Action pending a Land Use Restriction should be applicable to the soil in the area of USTCSFF-SB12(2008).

CATLIN Engineers and Scientists appreciate the opportunity to continue to provide services to NAVFAC Mid-Atlantic and the MCB on your environmental projects.

Sincerely,

Shane A. Chasteen
Project Manager

Michael E. Mason, P.E.
Program Manager

cc: Ms. Susan Tsimpinos - NAVFAC Mid-Atlantic Contracts
Commanding Officer - Attn: Director I&E/EMD/EQB (with two copies)

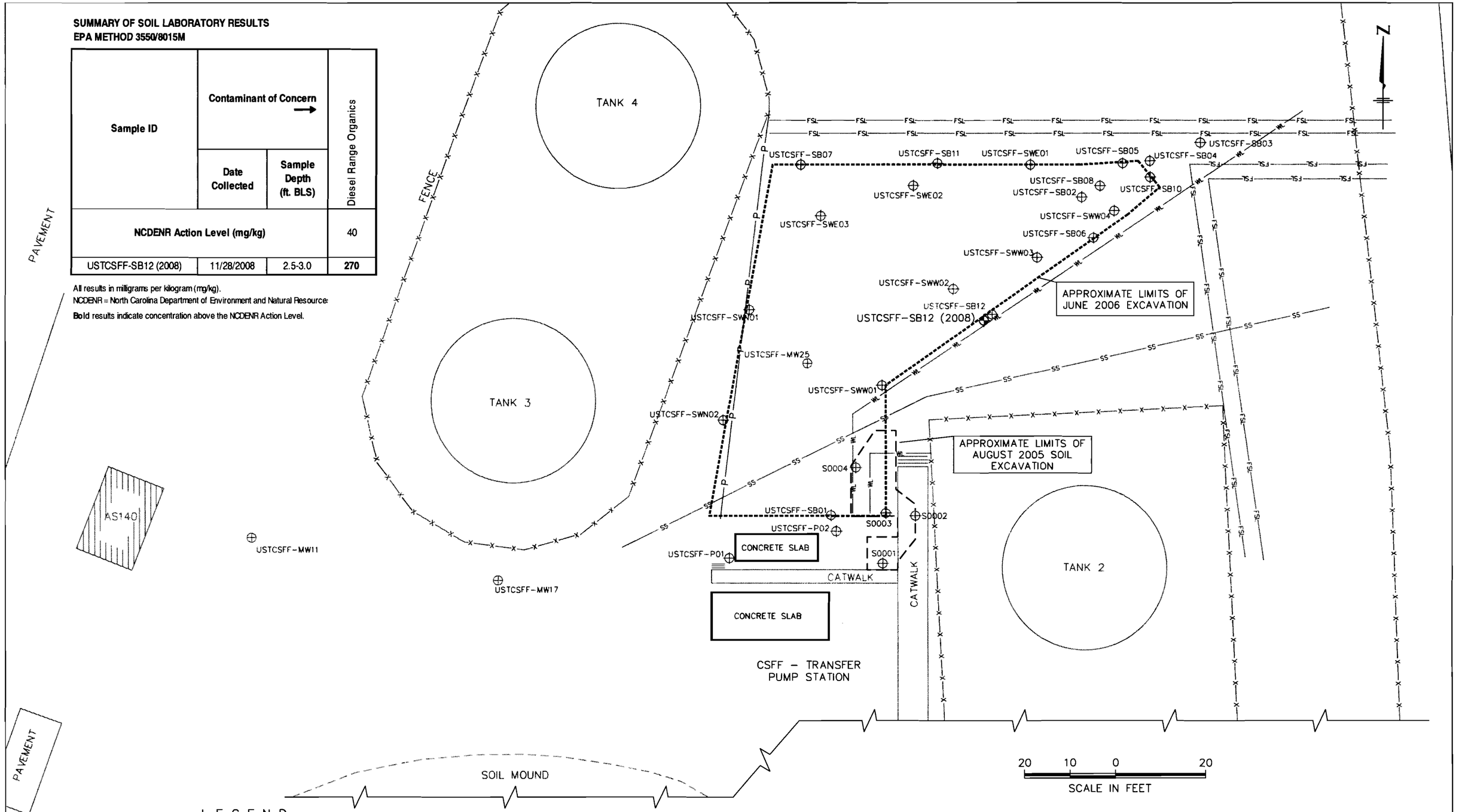
208077_CSFF_FuelPort_LtrRpt.doc

FIGURES

SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 3550/8015M

Sample ID	Contaminant of Concern → Date Collected	Sample Depth (ft. BLS)	Diesel Range Organics
NCDENR Action Level (mg/kg)			40
USTCSFF-SB12 (2008)	11/28/2008	2.5-3.0	**270**

All results in milligrams per kilogram (mg/kg).
NCDENR = North Carolina Department of Environment and Natural Resources
Bold results indicate concentration above the NCDENR Action Level.



LEGEND

EXISTING	NEW	DESCRIPTION
		BUILDING
		RECOVERY WELL
		TYPE II MONITORING WELL
		TYPE III MONITORING WELL
		SOIL BORING
		FENCE

EXISTING	DESCRIPTION
SS	SEWER LINE
P	POWER LINE
WL	WATER LINE
	JUNE 2006 EXCAVATION LINE
	AUGUST 2005 EXCAVATION LINE
FSL	FIRE SUPRESSION LINE

NOTE: SAMPLE LOCATIONS AND EXCAVATION BOUNDARIES ARE APPROXIMATE.

CATLIN Engineers and Scientists

PROJECT	TITLE	FIGURE
SOIL SAMPLING 2005 FUEL PORT RELEASE CAMPBELL STREET FUEL FARM CAMP LEJEUNE, N.C.	SITE PLAN WITH SUMMARY OF LABROATORY RESULTS – DIESEL RANGE ORGANICS	1

JOB NO. 208-077 | DATE: FEB 2009 | SCALE: 1"=20' | DRAWN BY: LCJ | CHECKED BY: SAC

208077-CSFF-SURFACE RELEASE

ATTACHMENT 1

JANUARY 2, 2009 LABORATORY REPORT FROM FBI

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 2, 2009

Shane Chasteen, Project Manager
Richard Catlin & Associates
P.O.Box 10279
Wilmington, NC 28405

Dear Mr. Chasteen:

Included are the results from the testing of material submitted on December 2, 2008 from the CSFF Soil Sampling 208-077 G128-2284, F&BI 812017 project. The soil samples submitted for forensic evaluation arrived in good condition. Upon arrival, the samples USTCSFF-SB12 (2008), CSFFSB05B and CSFFSB09B were placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample USTCSFF-SB12 (2008) was extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes. In addition, the level of material present in the sample USTCSFF-SB12 (2008), CSFFSB05B and CSFFSB09B was quantified by GC/FID Method 8015M. The results of this testing, including the associated quality assurance, are also enclosed.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson, Chemist

Enclosures
es/KJ
NAA0102R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/09
Date Received: 12/02/08
Project: CSFF Soil Sampling 208-077 G128-2284, F&BI 812017
Date Extracted: 12/08/08
Date Analyzed: 12/08/08

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)

Sample ID	GC Characterization
USTCSFF-SB12 (2008)	The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a middle distillate such as kerosene. The medium boiling compounds appear as a regular pattern of peaks on top of a hump or unresolved complex mixture (UCM). This material elutes from *n*-C_9 to *n*-C_{18} showing a maximum near *n*-C_{14}. This correlates with a temperature range of approximately 150°C to 320°C with a maximum near 250°C. Within this range, the dominant peaks present are indicative of isoprenoids. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

Date of Report: 01/02/09
Date Received: 12/02/08
Project: CSFF Soil Sampling 208-077 G128-2284, F&BI 812017
Date Extracted: 12/05/08
Date Analyzed: 12/05/08

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING EPA METHOD 8015M
Extended to Include Motor Oil Range Compounds
Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Extended (C_{10}-C_{36})	Surrogate (% Recovery) (Limit 67-127)
USTCSFF-SB12 (2008) 812017-01	270	89
CSFFSB05B 812017-02	80	90
CSFFSB09B 812017-03	35 x	88
Method Blank	<10	91

Date of Report: 01/02/09
Date Received: 12/02/08
Project: CSFF Soil Sampling 208-077 G128-2284, F&BI 812017
Date Extracted: 12/05/08
Date Analyzed: 12/16/08

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING EPA METHOD 8015M
Extended to Include Motor Oil Range Compounds
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Extended (C_{10}-C_{36})	Surrogate (% Recovery) (Limit 67-127)
CSFFSB05B 812017-02	86	99
CSFFSB09B 812017-03	<10	96
Method Blank	<10	96

Date of Report: 01/02/09
Date Received: 12/02/08
Project: CSFF Soil Sampling 208-077 G128-2284, F&BI 812017

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING EPA METHOD 8015M

Laboratory Code: 812017-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	500	21	91	78-126

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	500	85	87	70-127	2

Date of Report: 01/02/09
Date Received: 12/02/08
Project: CSFF Soil Sampling 208-077 G128-2284, F&BI 812017

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING EPA METHOD 8015M

Laboratory Code: 812017-03 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	<10	110	69-125

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	104	105	70-127	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

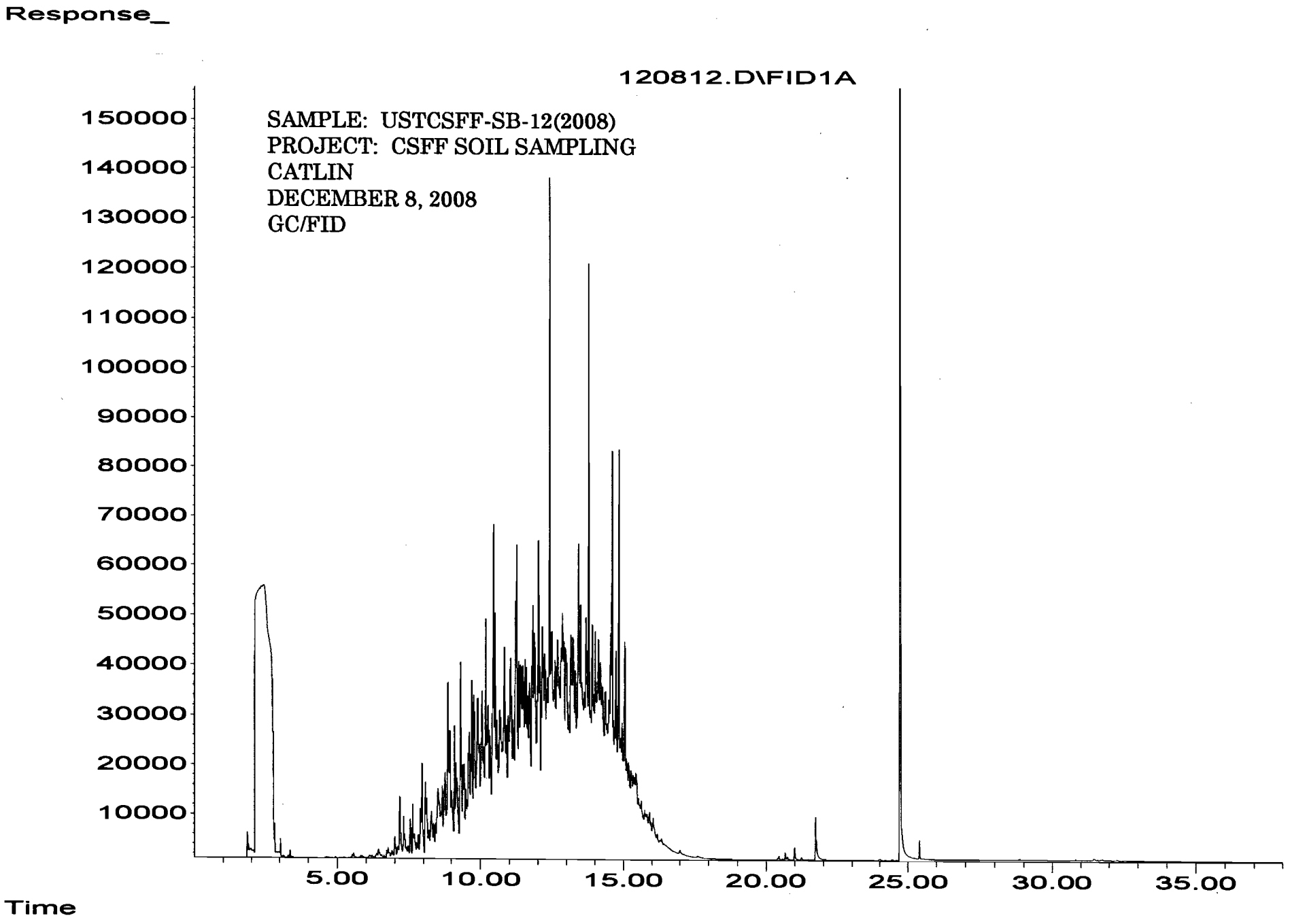
pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.


Response_
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SAMPLE: USTCSFF-SB-12(2008)
PROJECT: CSFF SOIL SAMPLING
CATLIN
DECEMBER 8, 2008
GC/FID
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140000
130000
120000
110000
100000
90000
80000
70000
60000
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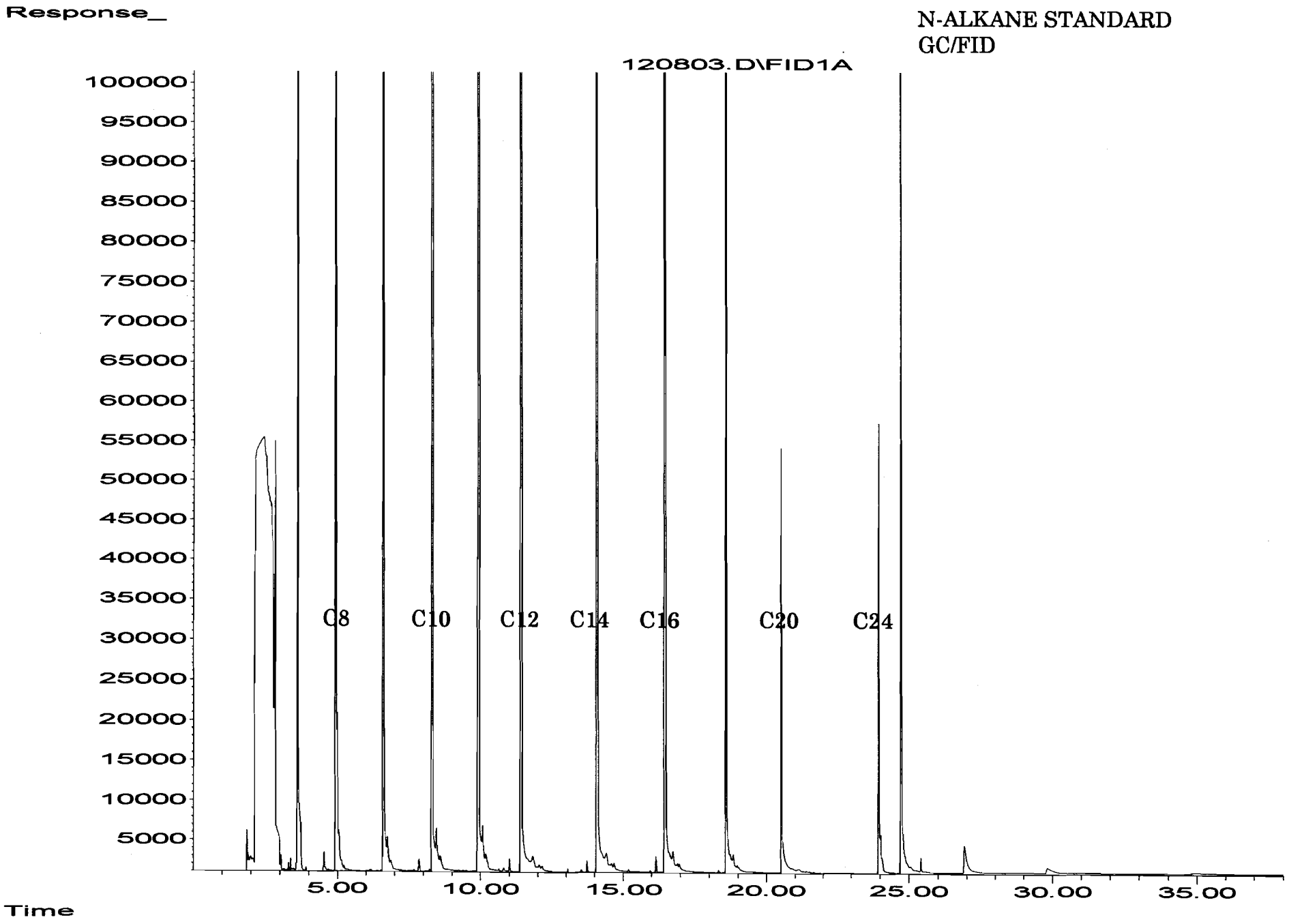
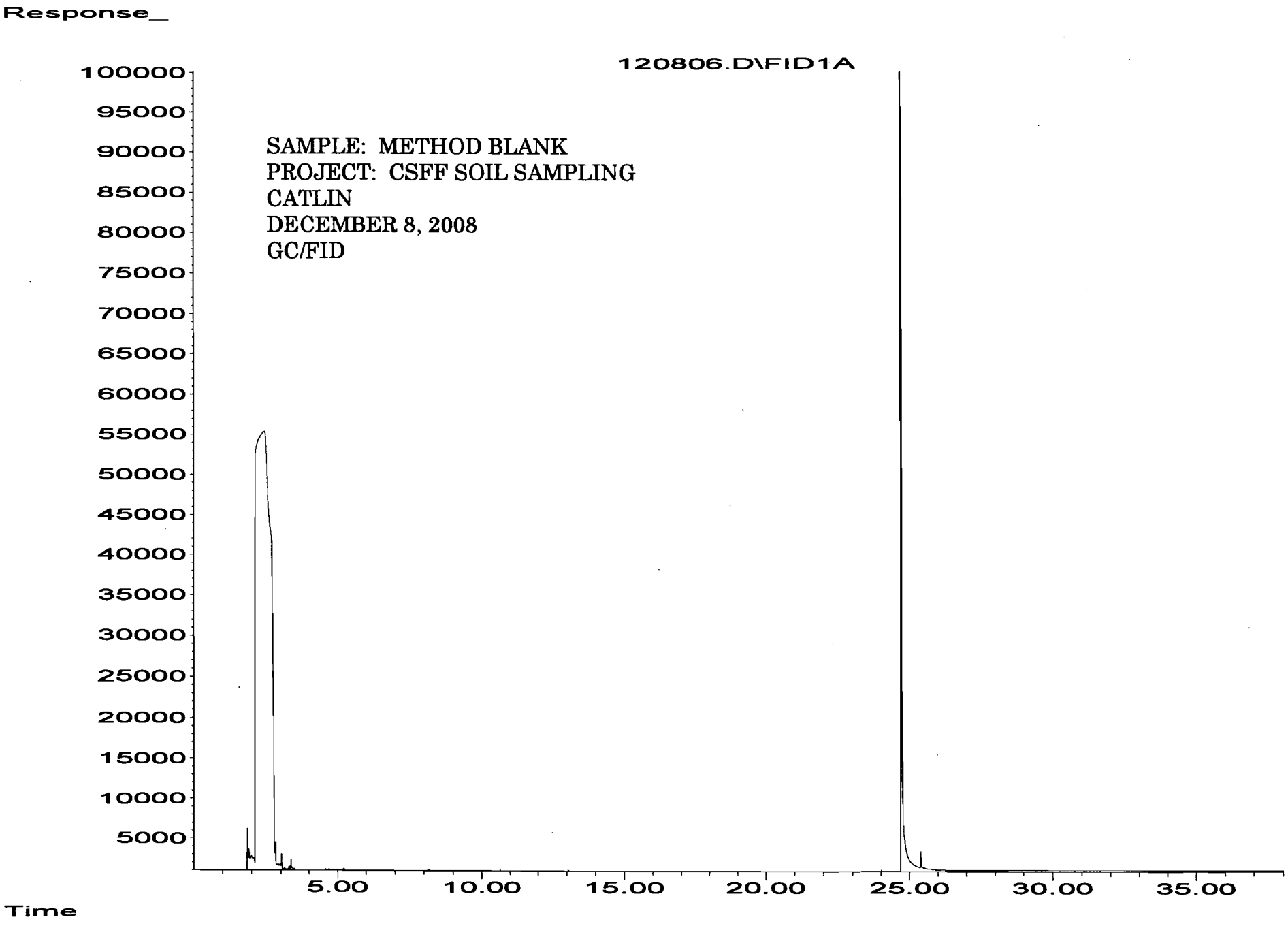
Time

N-ALKANE STANDARD
GC/FID

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PROJECT: CSFF SOIL SAMPLING
CATLIN
DECEMBER 8, 2008
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5.00
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Time

SGS 812017 MP 12/2/08 C02

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090838

(1)
CLIENT: CATLIN
CONTACT: Shane Chasteen PHONE NO: (910) 452-5861
PROJECT: CSFF Soil Sampling SITE/PWSID#: 208-077
REPORTS TO: Shane Chasteen E-MAIL:
FAX NO.: ( )
INVOICE TO: SGS Wilmington ~~Sheila @ CATLIN~~ QUOTE # 000101
P.O. NUMBER 281126-4

SGS Reference: G128-2284

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	(3) Analysis Required: 3550 Hydrocarbon Fingerprint / Forensic testing	TPH-DRO	Lab ID	REMARKS
G128-2284-1	UST CSFF-SB12 (2008)	11/28/08	0925	Soil	2	G	Y (X)	✓	01 A-B	(X) - Hold analysis pending DRO results. Caitlin to make decision to run forensic test. 12/1/08
-2	[redacted] CSFESB05B	11/28/08	1040	Soil	2	G	Y (X)	✓	02 A-B	
-3	CSFESB09B	11/28/08	10/5	Soil	2	G	Y (X)	✓	03 A-B	

Samples received at 1 °C

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:	Date	Time
[signature]	11/28/08	1410	[signature]	11/28/08	14:10
Relinquished By: (2) [signature]	12/1/08	1620	Received By: [signature]	12/02/08	10:00 Am
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

(4)
Shipping Carrier:
Shipping Ticket No:
Special Deliverable Requirements:
Special Instructions:
Requested Turnaround Time:
☐ RUSH ______ Date Needed
☐ STD

Samples Received Cold? (Circle) (YES) NO
Temperature °C: 5°C
Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

ATTACHMENT 2

FEBRUARY 5, 2009 LABORATORY NARRATIVE FROM FBI

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
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FAX: (206) 283-5044
e-mail: fbi@isomedia.com

February 5, 2009

Shane Chasteen, Project Manager
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28405

Dear Mr. Chasteen:

As requested, we have reviewed the report issued by Friedman and Bruya, Inc. (F&BI) on January 2, 2009 from the CSFF Soil Sampling 208-077 G128-2284, F&BI 812017 project. This report included analytical data generated from the testing of the soil samples USTCSFF-SB12 (2008), CSFFSB05B, and CSFFSB09B. In addition, we have reviewed the documents provided by Richard Catlin & Associates. These documents included site maps as well as analytical reports generated by SGS from the testing of soil samples collected at various locations at the site including the samples CSFF-S0004, USTCSFF-SB01, USTCSFF-SWW02, USTCSFF-SWW03, USTCSFF-SWE02, and, USTCSFF-SWE03. The purpose of this review was to provide further information regarding the nature of the contamination found at this site. Our findings are provided below.

The analytical work completed by F&BI and SGS included testing of soil samples using a gas chromatograph fitted with a flame ionization detector (GC/FID). Review of the GC/FID traces generated shows that the sample CSFF-S0004 contains a middle distillate such as JP-5 or similar material. The bell shaped or gaussian pattern of peaks consistent with normal alkanes indicates that the middle distillate appears to have undergone little to no biological degradation. The undegraded nature of this material is consistent with impact from the documented release of JP-5 that occurred in August 2005.

It was requested that the material present in the sample CSFF-S0004 be compared to that identified in the sample USTCSFF-SB12 (2008). The GC/FID trace generated shows that the sample USTCSFF-SB12 (2008) also contains a middle distillate such as JP-5 or similar material. However, the low level or absence of peaks characteristic of normal alkanes indicates that the middle distillate in the sample USTCSFF-SB12 (2008) has undergone substantial biological degradation. It should also be noted that a degraded middle distillate such as Jet A is likely present in the samples USTCSFF-SB01, USTCSFF-SWW02, USTCSFF-SWW03, USTCSFF-SWE02, CSFFSB05B, and USTCSFF-SWE03. The degraded nature of this material is consistent with a historic release.

If warranted, to confirm that the degraded fuel present at this site is historic in origin, additional information regarding the site history, additional DRO data generated from the site to date, and/or further testing of soil samples collected from the areas of interest would be needed.

Furthermore, during review of the data generated material other than Jet A was identified at the site. Specifically, the GC/FID traces associated with some of the soil samples show high boiling material eluting above *n*-C_{24}. This includes the GC/FID traces generated for the samples CSFFSB05B, USTCSFF-SWE01, and CSFFSB09B. This material boils above the temperature range expected for JP-5 and appears polar in origin. The boiling range and general composition of this material is not indicative of a middle distillate such as JP-5.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson
Chemist

Enclosures
mcp/KJ
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