

APRIL 1999

MONTHLY PROGRESS REPORTS
POL SITES
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Contract Nos.
N62470-93-D-3032
and
N62470-97-D-5000

Prepared for:

Environmental Management Division
MCB Camp Lejeune
Jacksonville, North Carolina

Prepared by:



**OHM Remediation
Services Corp.**

A member of THE IT GROUP

5445 Triangle Parkway, Suite 400
Norcross, GA 30092

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<SMITHRE@ohm.com>], GS-5 NICOLE L HALL@EMD
Bcc:
Subject: Weekly Progress Update - MCB Camp Lejeune
Attachment:
Date: 6/22/99 12:43 PM

The following is a summary of events for the past ten days and our plans for the next ten days. Our offices in Norcross are moving to Alpharetta, Georgia starting this Friday and hopefully completing next Monday, 6/28/99. The following is our listing of new addresses, phone numbers, FAX, etc. Due to the lengthy commute, I will be using a home office for a portion of my time.

NEW OFFICE ADDRESS:

HOME OFFICE ADDRESS:

IT Corporation	James A. Dunn, Jr.
11560 Great Oaks Way, Suite 500	1700 Presidents Drive
Alpharetta, GA 30022	Lawrenceville, GA 30043
MAIN PHONE: 770-475-8994	PHONE: 770-513-7181
DIRECT DIAL: 770-663-1433	
FAX: 770-777-8166	FAX: 770-513-4402

RAC I ACTIVITIES

D. O. 0175 - LOT 203 TREATMENT PLANT

Normal O & M.

NORTH & SOUTH PLANTS

Plants in normal O & M. South plant treating all Building 25

water.

LOT 203 BIOCELL

Cell is empty awaiting new candidate soil.

GEIGER BIOCELL

Cell contains 350 tons of material fully remediated and awaiting reuse as backfill at Site 3.

— TT 2477/78

System on normal O & M.

— BM 820

System on normal O & M.

D. O. 0151 - RANGES A-1 & D-29

Expect to commence O & M of Range D-29 this week.

D. O. 0083 - GEIGER AIR SPARGE TRENCH

System on normal O & M.

D. O. 0078 - SITE 88, BUILDING 25 SURFACTANT TEST

Disposal activities continue (10 loads last week). Highest reading of PCE less than 140 PPM thus far. Vac truck in for repairs; using Cherry Point unit as replacement.

RAC III ACTIVITIES

— D. O. 011 - BUILDING 1613

Normal operation and maintenance of system.

D. O. 0013 - SITE 85 BATTERY PILES

Continue awaiting comments on revised Work sequence and Plans from state, LANTDIV and Base. Received comments from EPA.

— D. O. 0014 - BUILDING 1115 & HADNOT POINT FUEL FARM

Normal O & M of systems. Final paving restoration activities complete. Two AFVR events were performed last week and three are scheduled for this week. No additional odor complaints have been received from Bldg. 1101.

D. O. 0017 - RANGES B-12, F-11 AND I-1

Construction activities at Range I-1 are complete and BOD scheduled today, 6/22/99. Touch-up painting and re-seeding due to weather remain to be completed. At Range F-11, the bullet trap on the pistol side is completely installed; on the hi-power side tin roofing incomplete due to material shortage; estimated completion next week after receipt of materials. Wall construction will complete this week. Baffle construction underway with post installation. All electrical service installation is complete and awaiting inspection.

D. O. 0022 - BURN PITS AT SITES 9 & 54

Continue working with Base and Baker on siting and administrative issues for Site 54. Working on integration of new site into Base GIS mapping. Submittal of Work Plans for approval has been postponed until siting issues are finalized.

D. O. 0033 - LONG TERM O & M OF SYSTEMS

Pursuing subs for utility connections for relocation of offices to the rear of Lot 203.

D. O. 0034 - WILSON BAY PILING REMOVAL

Continue waiting on analytical results to determine status of wood waste streams. T & D may not occur during June; job cost will not be affected since no A & S activities are ongoing.

D. O. 0036 - MONITORING WELL ABANDONMENT

No activities last week. Received an RFP for a modification to this D.O. to add two sites comprising 19 wells due 6/24/99.

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 1

Date : May 14, 1999

Contract Number : N62470-93-D-3032

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 83

OHM Project No. : 17536

(Air Sparging System - Camp Geiger Site 35)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

DISTRIBUTION :

Original to :

Environmental Engineer -
Karen Wilson, Code 18311

One copy each to :

One Copy to:
ROICC: Rowse, Brent

One Copy to:
RPM: Landman, K

One Copy to:
Contract Specialist: Collier,
Maribeth

One Copy to:
Activity Point of Contact:
Raines, Rick

One Copy to:
RAC CM Hedley, Greg

ADDRESS :

6500 Hampton Blvd., Code 1831
LRA, Bldg. A, Rm. 2115
Norfolk, VA 23508-1297

ROICC/NAVFACENGCOCOM Contracts
1005 Michael Road
Camp Lejeune, NC 28547-2521

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

Building 58: AC/S EMD/IR
Marine Corps Base, PSC Box 20004
Camp Lejeune, NC 28542-0004

6500 Hampton Blvd., Code 0531
LRA, Bldg. A, Rm. 2410
Norfolk, VA 23508-1297

OHM DISTRIBUTION :

Project Manager: Dunn, James A Norcross, GA
File (5)

MONTHLY PROGRESS REPORT - SHORT FORM

Contract No. N62470-93-D-3032 Delivery Order No. 0083 Report Dates: Apr. 1, 1999 To Apr. 30, 1999

Project Name: OU #10, Site 35 Project Location: MCB Camp Geiger

Project No.: 917536 Project Manager: James A. Dunn, Jr.

Project Description: Installation of a 100' air sparge test trench dug to a depth of 42' with a horizontal injection pipe and O&M of the system for 6 months.

SHORT FORM STATUS

Pre-Construction

Site Walk* (Date: 00/00/00)

Design Review*

Cost Proposal (Due Date: 00/00/00)

Post-Construction

Demobilization (Date: 00/00/00)

Post Con. Submittal (Due: 00/00/00)

O&M Completion Date: 12/31/99

*Notes Attached

Dormant

Awaiting T&D

Regulatory Issue(s)

Analytical

Technical Review

Submittal Review

Postponement

Modification Number Pending:

Date submitted: (00/00/00)

Amount: \$

Significant Activities Performed/Associated With Item(s) Above: O&M of Phase I air sparge test trench.

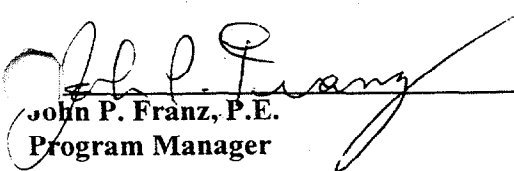
System remains in operation at request of Base. Second six month report will be prepared and submitted in May 1999.

Schedule Information (updates and variances): System will continue in operation indefinitely with sampling and analyses performed monthly.

Financial Information:	Current D.O. Ceiling (w/o fee):	\$	<u>672,078.00</u>
Elevated monthly costs reflect purchase of	Total \$ to Date (w/o fee)	\$	<u>509,247.00</u>
Air compressor and components.	Estimated Report Period \$:	\$	<u>28,844.00</u>
	Forecast @ Completion: Phase I	\$	<u>550,000.00</u>

Other Information: Under run will be utilized to perform Phase II activities augmented with additional funds.

Approved by:


John P. Franz, P.E.
Program Manager

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 1

Date : May 14, 1999

Contract Number : N62470-93-D-3032

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 94

OHM Project No. : 18040

(Biocell Operations - Lot 203)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

DISTRIBUTION :

ADDRESS :

Original to :

Environmental Engineer -
Karen Wilson, Code 18311

5500 Hampton Blvd., Code 1831
LRA, Bldg. A, Rm. 2115
Norfolk, VA 23508-1297

One copy each to :

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ROICC/NAVFACENGCOM Contracts
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Camp Lejeune, NC 28547-2521

One Copy to:
RPM: Landman, K

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

One Copy to:
Contract Specialist: Collier,
Maribeth

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

One Copy to:
Activity Point of Contact:
Raines, Rick

Building 58: AC/S EMD/IR
Marine Corps Base, PSC Box 20004
Camp Lejeune, NC 28542-0004

One Copy to:
RAC CM Hedley, Greg

6500 Hampton Blvd., Code 0531
LRA, Bldg. A, Rm. 2410
Norfolk, VA 23508-1297

OHM DISTRIBUTION :

Project Manager: Dunn, James A Norcross, GA
File (5)

MONTHLY PROGRESS REPORT - SHORT FORM

Contract No. N62470-93-D-3032 **Delivery Order No.** 0094 **Report Dates:** Apr. 1, 1999 to Apr. 30, 1999
Project Name: Lot 203 Biocell **Project Location:** MCB Camp Lejeune
Project No.: 918040 **Project Manager:** James A. Dunn, Jr.
Project Description: Construction, operation and maintenance of a biocell for treating petroleum contaminated soils

SHORT FORM STATUS

Pre-Construction

Post-Construction

Site Walk* (Date:00/00/00)

Demobilization (Date: 00/00/00)

Design Review*

Post Con. Submittal (Due: 00/00/00)

Cost Proposal (Due Date: 00/00/00)

X O&M (Completion Date: 3/31/99)

*Notes Attached

Dormant

Awaiting T&D

Technical Review

Modification Number Pending:

Regulatory Issue(s)

Submittal Review

Date submitted: (00/00/00)

Analytical

Postponement

Amount: \$

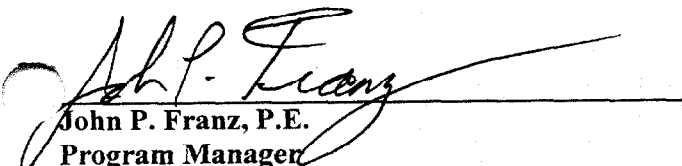
Significant Activities Performed/Associated With Item(s) Above: Cell empty – no field activities were performed in April.

Schedule Information (updates and variances): O & M of biocell will move to D.O. 0175.

Financial Information:	Current D.O. Ceiling (w/o fee):	\$	<u>142,902.00</u>
	Total \$ to Date (w/o fee)	\$	<u>139,372.00</u>
	Estimated Report Period \$:	\$	<u>200.00</u>
	Forecast @ Completion:	\$	<u>141,585.00</u>

Other Information: This is the last monthly report.

Approved by:


John P. Franz, P.E.
Program Manager

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 1

Date : May 14, 1999

Contract Number : N62470-93-D-3032

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 175

OHM Project No. : 20500

(Continue Operations at Treatment Systems)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

DISTRIBUTION :

ADDRESS :

Original to :

COTR -

Karen Wilson, Code 18311

6500 Hampton Blvd., Code 1831

LRA, Bldg. A, Rm. 2115

Norfolk, VA 23508-1297

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1005 Michael Road

Camp Lejeune, NC 28547-2521

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RPM: Landman, K

6500 Hampton Blvd.

LRA, Bldg. A, Rm. 3700

Norfolk, VA 23508-1297

One Copy to:

Contract Specialist: Collier,
Maribeth

6500 Hampton Blvd.

LRA, Bldg. A, Rm. 3700

Norfolk, VA 23508-1297

One Copy to:

RPM: Reuther, Lori

6500 Hampton Blvd.

LRA, Bldg. A, Rm. 3700

Norfolk, VA 23508-1297

One Copy to:

Activity Point of Contact: Hall,
Nikki

Building 58: AC/S EMD/IR

PSC Box 20004, MCB

Camp Lejeune, NC 28542-0004

One Copy to:

Activity Point of Contact:
Raines, Rick

Building 58: AC/S EMD/IR

Marine Corps Base, PSC Box 20004

Camp Lejeune, NC 28542-0004

One Copy to:

RAC CM Hedley, Greg

6500 Hampton Blvd., Code 0531

LRA, Bldg. A, Rm. 2410

Norfolk, VA 23508-1297

OHM DISTRIBUTION :

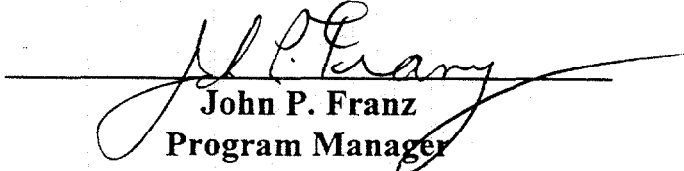
Project Manager: Dunn, James A Norcross, GA

File (5)

**MONTHLY PROGRESS REPORT
CONTRACT N62470-93-D-3032
DELIVERY ORDER 0175
April 30, 1999**

**OPERATION AND MAINTENANCE OF TREATMENT PLANTS
AND BIOCELLS, EXPANSION OF HADNOT POINT EXTRACTION
SYSTEM AND MAINTENANCE OF FIELD OFFICE 3/1/98 - 2/28/99
MCB CAMP LEJEUNE, NORTH CAROLINA
OHM Project 920500
Project Manager: Jim Dunn**

Approved by:


**John P. Franz
Program Manager**

1.0 INTRODUCTION

This Monthly Progress Report has been prepared to summarize the activities performed from April 1, 1999 to April 30, 1999, as well as a summary of the work planned for the month of May 1999 by OHM Remediation Services Corp., (OHM), on Delivery Order 0175 of the Navy-LANTDIV RAC Contract N62470-93-D-3032. This delivery order was signed on April 6, 1998.

The remediation effort consists of:

1. Expansion of the recovery well systems at the Hadnot Point North and South Plants.
2. Operation and maintenance of the Hadnot Point North and South Plants for a period of one year ending on March 31, 1999.
3. Operation and maintenance of the Lot 203 Groundwater Treatment Plant for a period of one year ending on March 31, 1999.
4. Operation and maintenance of the Air Sparging and SVE systems at AS-822, STT-69, TT-2477/78 and Berkley Manor for a period of eleven months ending March 31, 1999.
5. FY99 Site Management Plan and RAB Support.
6. Operation and maintenance of the Lot 203 Biocell for a period of one year through March 31, 1999.
7. Operation and maintenance of the Camp Geiger Biocell for a period of one year through March 31, 1999.
8. Transportation and disposal of approximately 650 tons of material from TP-457 to Carlyle Contractors for bio-treatment.

All work is to be performed in accordance with the Statement of Work and Specifications Section 01110, Rev. 1, both dated March 24, 1998.

2.0 WORK ACCOMPLISHED

During the month of April 1999, OHM has performed the following:

1. Operated and maintained the Groundwater Treatment Plant at Lot 203 for the month experiencing 30 hours of downtime due to changing the cartridge filters 8 times, repairing coupling on flow control valve, backwashing the carbon cells and performing monthly maintenance items. Treated 10,984,300 gallons of groundwater and 3,600 gallons of water from Building 25. (See detailed operating report attached.)
2. Operated and maintained the Hadnot Point North Plant for the month experiencing 34 hours of downtime due to changing the filters 13 times, cleaning solids from the system and performing normal monthly maintenance on the plant. Treated a total of 147,550 gallons of groundwater, 2,050 gallons of produced fluids from AFVR events and 4,780 gallons of produced fluids from Jones' AFVR events(See detailed operating report attached).
3. Operated and maintained the Hadnot Point South Plant for the month experiencing a total of 134 hours of downtime due to changing the filters 11 times, repairing an air leak between the plant and well 5, repairs to chemical pump and normal monthly maintenance of the plant. Treated a total of 308,438 gallons of groundwater, 52,800 gallons of Building 25 water and 9,000 gallons of produced water from the Hadnot Point Fuel Farm. (See detailed operating report attached).
4. Operation and maintenance of the air sparging/SVE units at BM 820 and TT 2477/78 was conducted under this D.O. (See detailed operating report attached.)
5. Placed the new South Plant extraction wells on-life.
6. Transported and disposed of the soils from TP-457.

3.0 WORK PLANNED

During the month of May 1999, OHM is scheduled to perform the following:

1. Continue normal operation and maintenance of all three plant systems and the operation and maintenance of the BM 820 and TT 2477/78 air sparge/SVE systems.

4.0 PROBLEMS AND SOLUTIONS

No new issues arose during the current month and all previous problems have been satisfactorily resolved.

5.0 COST/SCHEDULE SUMMARY

Cost Summary:

The following is a summary of the costs associated with this delivery order. A detailed performance report is attached.

D.O. ceiling amount (without fee)	\$ 1,271,076.00
Approximate cost through April 1999	\$ 1,007,370.00
Approximate cost for April 1999	\$ 123,827.00
Remaining funds	\$ 263,706.00
Estimated cost to complete	\$ 259,549.00
Current period estimate at complete	\$ 1,266,920.00
Prior period estimate at complete	\$ 991,668.00

Physical % complete
Financial % complete

86.22%
79.25%

Current cost at completion estimate is based upon using all funds remaining in the delivery order to continue operation and maintenance activities through June 30, 1999.

Schedule Summary:

Original contract completion date	03/31/99
Current contract completion date	03/31/99
Prior period schedule completion date	06/30/99
Current period schedule completion date	06/30/99
Current period schedule construction completion date	04/13/99

Current period schedule completion date is based on projected availability of funding to extend O&M beyond contract completion date.

6.0 NON-COMPLIANCE CHECKOFF LIST

No non-compliance issues have been associated with this delivery order.

7.0 WASTE MATERIALS TRACKING

The free product collected during AFVR events is being stored at the treatment plant until sufficient quantity is available for cost effective recycling. The soils from TP-457 (total 691 tons) were transported to the facilities of E. S. & J. (formerly Carlisle Contractors). See attached T & D log.

8.0 GOVERNMENT MATERIALS TRACKING

No government owned materials have been utilized on this delivery order.

9.0 MODIFICATION LOG

One modification has been issued under this delivery order for the transportation and disposal of soils located at TP-457.

10.0 WORK DIRECTIVE LOG

The current Work Directive Log is attached.

11.0 ATTACHMENTS

Performance Report (2 pages)
Current Schedule (2 pages)
Monthly Treatment Plant Report (2 pages)
Hydrocarbon Recovery (18 pages)
Work Directive Log (1 page)

JOB # 920500 D.O. # 175
PERFORMANCE REPORT
ACTUAL DOLLARS AS OF APRIL 1999

NOTE: ALL DOLLARS INCLUDE MARK-UPS; AWARD FEE IS NOT INCLUDED

BOLD OVERRIDE AUTOMATIC CALCULATION

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
WBS CODE	DESCRIPTION	CURRENT BUDGETED QUANTITY	QUANTITY REVISIONS/ADJUSTMENTS	PROJECTED QUANTITY AT COMPLETION (C + D)	TASK UNIT	INSTALLED QUANTITY	TASK PERCENT COMPLETE (G / E)	CURRENT BUDGETED DOLLARS Thru Mod 1	DOLLAR REVISIONS/ADJUSTMENTS (D x O)	PROJECTED BUDGETED DOLLARS (I + J)	EARNED DOLLARS (H x K)	ACTUAL DOLLARS TO DATE FROM PTS	CPI (M / L)	BUDGETED COST/UNIT (I / C)	ACTUAL COST/UNIT TO DATE (M / G)	ETC BASED ON ACTUAL COSTS TO DATE (see note Q)	FORECAST (BUDGET IF LESS THAN 15% COMPLETE) (M + Q)	VARIANCE FROM CURRENT BUDGET (R - I)	PERCENT OF TOTAL PROJECT (K/TOTAL K)	PHYSICAL PERCENT COMPLETE (H x T)
		2000000	N&S Plant Work Plans	100		100	%	100	100.0%	8,418	0	8,418	8,418	6,657	0.79	84.18	66.57	0	6,657	(1,761)
	North Plant																			
2011000	North Plant Site Set-up	100		100	%	100	100.0%	11,050	0	11,050	11,050	1,293	0.12	110.50	12.93	0	1,293	(9,757)	0.87%	0.87%
2012000	North Plant Well Installation	100		100	%	100	100.0%	12,134	0	12,134	12,134	20,053	1.65	121.34	200.53	0	20,053	7,918	0.95%	0.95%
2012100	North Plant Well Development	100		100	%	100	100.0%	1,878	0	1,878	1,878	0	0.00	18.78	0.00	0	0	(1,878)	0.15%	0.15%
2012200	North Plant Well Vaults & Pads	100		100	%	100	100.0%	5,003	0	5,003	5,003	631	0.13	50.03	6.31	0	631	(4,372)	0.39%	0.39%
2012300	North Plant Pumps & Instrumentation	100		100	%	100	100.0%	10,590	0	10,590	10,590	5,983	0.56	105.90	59.83	0	5,983	(4,607)	0.83%	0.83%
2012400	North Plant Well Electrical	100		100	%	100	100.0%	3,250	0	3,250	3,250	0	0.00	32.50	0.00	0	0	(3,250)	0.28%	0.28%
2012500	North Plant Well Start-up	100		100	%	100	100.0%	1,308	0	1,308	1,308	0	0.00	13.08	0.00	0	0	(1,308)	0.10%	0.10%
2013000	North Plant GW Collection Piping	100		100	%	100	100.0%	12,266	0	12,266	12,266	10,668	0.87	122.66	106.68	0	10,668	(1,597)	0.98%	0.98%
2014000	North Plant Disposal	100		100	%	16	16.0%	4,342	0	4,342	695	685	0.99	43.42	42.81	3,596	4,281	(61)	0.34%	0.05%
	South Plant																			
2021000	South Plant Site Set-up	100		100	%	100	100.0%	8,910	0	8,910	8,910	1,684	0.19	89.10	16.84	0	1,684	(7,226)	0.70%	0.70%
2022000	South Plant Well Installation	100		100	%	100	100.0%	16,007	0	16,007	16,007	42,971	2.68	160.07	429.71	0	42,971	26,964	1.26%	1.26%
2022100	South Plant Well Development	100		100	%	100	100.0%	2,781	0	2,781	2,781	0	0.00	27.81	0.00	0	0	(2,781)	0.22%	0.22%
2022200	South Plant Well Vaults & Pads	100		100	%	100	100.0%	7,504	0	7,504	7,504	7,665	1.02	75.04	76.65	0	7,665	161	0.59%	0.59%
2022300	South Plant Pumps & Instrumentation	100		100	%	100	100.0%	15,699	0	15,699	15,699	11,275	0.72	156.99	112.75	0	11,275	(4,424)	1.24%	1.24%
2022400	South Plant Well Electrical	100		100	%	100	100.0%	3,250	0	3,250	3,250	0	0.00	32.50	0.00	0	0	(3,250)	0.26%	0.26%
2022500	South Plant Well Start-up	100		100	%	100	100.0%	1,332	0	1,332	1,332	0	0.00	13.32	0.00	0	0	(1,332)	0.10%	0.10%
2023000	South Plant GW Piping	100		100	%	100	100.0%	59,250	0	59,250	59,250	0	0.00	592.50	0.00	5,000	5,000	(54,250)	4.88%	4.88%
2050000	N&S Plant Final Report	100		100	%	0	0.0%	1,619	0	1,619	0	0	N/A	16.19	N/A	1,619	1,619	0	0.13%	0.00%
	O&M N&S Plants																			
2030000	O&M of North & South Plants	100		100	%	85	85.0%	63,437	0	63,437	53,921	73,676	1.37	634.37	866.78	13,000	86,678	23,240	4.99%	4.24%
2040000	N & S Plant Sampling & Analysis	100		100	%	85	85.0%	29,882	0	29,882	25,399	65,603	2.58	298.82	771.80	13,000	78,603	48,722	2.35%	2.00%
	O&M Lot 203 GWTP																			
2120000	Lot 203 GWTP Sampling & Analysis	100		100	%	85	85.0%	25,493	0	25,493	21,669	2,670	0.12	254.93	31.41	10,000	12,870	(12,823)	2.01%	1.70%
2130000	Lot 203 O&M	100		100	%	85	85.0%	118,229	0	118,229	100,495	154,877	1.54	1,182.29	1,819.73	30,000	184,677	66,446	9.30%	7.91%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
WBS CODE	DESCRIPTION	CURRENT BUDGETED QUANTITY	QUANTITY REVISIONS/ ADJUSTMENTS	PROJECTED QUANTITY AT COMPLETION	TASK UNIT	INSTALLED QUANTITY	TASK PERCENT COMPLETE	CURRENT BUDGETED DOLLARS	DOLLAR REVISIONS/ ADJUSTMENTS	PROJECTED BUDGETED DOLLARS	EARNED DOLLARS	ACTUAL DOLLARS TO DATE	CFI	BUDGETED COST/UNIT	ACTUAL COST/UNIT TO DATE	ETC BASED ON ACTUAL COSTS TO DATE	FORECAST (BUDGET IF LESS THAN 15% COMPLETE)	VARIANCE FROM CURRENT BUDGET	PERCENT OF TOTAL PROJECT	PHYSICAL PERCENT COMPLETE
		Thru Mod 1		(C + D)			(G / E)	Thru Mod 1	(D x O)	(I + J)	(H x K)	FROM PTS	(M / L)	(I / C)	(M / G)	(see note Q)	(M + Q)	(R - I)	(K/TOTAL K)	(H x T)
	O&M Biocells																			
2230000	O&M Lot 203 Biocell	100		100	%	100	100.0%	60,645	0	60,645	60,645	1,029	0.02	606.45	10.29	0	1,029	(59,616)	4.77%	4.77%
2239000	Lot 203 Biocell Batch Load Out	100		100	%	100	100.0%	7,697	0	7,697	7,697	5,331	0.69	76.97	53.31	0	5,331	(2,365)	0.61%	0.61%
2240000	O&M Camp Geiger Biocell	100		100	%	100	100.0%	32,057	0	32,057	32,057	1,190	0.04	320.57	11.90	0	1,190	(30,867)	2.52%	2.52%
2249000	Camp Geiger Biocell Batch Load Out	100		100	%	0	0.0%	5,014	0	5,014	0	0	N/A	50.14	N/A	5,014	5,014	0	0.39%	0.00%
	Corrective Actions																			
2300000	Corrective Actions	100		100	%	66	66.0%	81,302	0	81,302	53,659	53,183	0.99	813.02	805.80	20,000	73,183	(6,119)	6.40%	4.22%
	O&M SVE/Air Sparge Systems																			
2400000	O&M Site 820	100		100	%	85	85.0%	152,162	0	152,162	129,338	66,793	0.52	1,521.62	785.81	25,500	92,293	(59,869)	11.97%	10.18%
2410000	Site 820 Carbon Demob	100		100	%	0	0.0%	3,557	0	3,557	0	0	N/A	35.57	N/A	3,557	3,557	0	0.28%	0.00%
2500000	O&M Site 822	100		100	%	85	85.0%	5,173	0	5,173	4,397	7,903	1.80	51.73	92.98	500	8,403	3,230	0.41%	0.35%
2600000	O&M Site 69	100		100	%	85	85.0%	4,324	0	4,324	3,876	4,339	1.18	43.24	51.05	500	4,839	515	0.34%	0.29%
2700000	O&M Site 2477/78	100	0	100	%	85	85.0%	91,473	0	91,473	77,752	47,988	0.62	914.73	564.58	18,500	64,488	(26,985)	7.20%	6.12%
2710000	Site 2477/78 Carbon Demob	100		100	%	0	0.0%	3,557	0	3,557	0	2,699	N/A	35.57	N/A	858	3,557	0	0.28%	0.00%
3000000	Load Soils @ TP457	100		100	%	100	100.0%	28,476	0	28,476	28,476	20,355	0.71	284.76	203.55	0	20,355	(8,122)	2.24%	2.24%
	Administration & Support																			
9900010	Administration & Support	100		100	%	85	85.0%	371,103	0	371,103	315,438	390,368	1.24	3,711.03	4,592.58	110,000	500,368	129,264	29.20%	24.82%
9900200	Site Management Plan	100		100	%	0	0.0%	905	0	905	0	0	N/A	9.05	N/A	905	905	0	0.07%	0.00%
TOTAL PROJECT COSTS								1,271,076	0	1,271,076	1,095,942	1,007,370	0.92			259,549	1,266,920	(4,156)	100.00%	86.22%
NOTES: Note Q: Calculation of ETC is "@IF(G25=0,K25-M25,@IF(H25>0.15,(E25-G25)*P25,@IF(M25<K25,K25-M25,(E25-G25)*P25))"																FINANCIAL PERCENT COMPLETE (M/I)				
1)																(of Current Budgeted Dollars)				
2)																79.25%				
3)																				
4)																				
5)																				
VARIANCE ANALYSIS:										5)										
1) Existing funding will allow O & M of all systems through June 30, 1999										6)										
2)										7)										
3)										8)										
4)																				

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	1999						
					JAN	FEB	MAR	APR	MAY	JUN	JUL
D.O. 175 (20500) - Treatment Systems											
Premobilization Activities											
A5STD0060	Award Date	1	06APR98A	06APR98A							
A5STD0070	Submit Preliminary Plans	20	13JUL98A	07AUG98A							
A520000000	N & S Work Plans	40*	13JUL98A	04SEP98A							
A5STD0080	Navy Approve Preliminary Plans	18*	10AUG98A	02SEP98A							
A5STD0090	OHM Submit Final Plans	2	03SEP98A	04SEP98A							
A5STD0135	Preconstruction Meeting-	1	09SEP98A	09SEP98A							
Mobilization / Site Setup											
A5STD0140	Mobilization for Construction	1	05JAN99A	05JAN99A							
North Plant											
A520120000	North Plant Well Drilling	2	09NOV98A	10NOV98A							
A520121000	North Plant Well Development	1	11NOV98A	11NOV98A							
A520110000	North Plant Site Setup	1	18JAN99A	19JAN99A							
A520122000	North Plant Well Vaults & Pad	2	20JAN99A	21JAN99A							
A520130000	North Plan GW Collection Piping	10	21JAN99A	03FEB99A	■						
A520123000	North Plant Pumps & Instrumentation	3	04FEB99A	08FEB99A	■						
A520124000	North Plant Well Electrical	1	09FEB99A	09FEB99A	■						
A520125000	North Plant Well Start Up	1	10FEB99A	10FEB99A	■						
A520140000	North Plant Disposal	1	11FEB99A	11FEB99A	■						
South Plant											
A520220000	South Plant Well Drilling	3	12NOV98A	16NOV98A							
A520221000	South Plant Well Development	2	17NOV98A	18NOV98A							
A520210000	South Plant Site set up	1	12FEB99A	12FEB99A							

Project Start 02FEB99
Project Finish 22OCT99
Data Date 30APR99
Run Date 07MAY99

175G

■ Early Bar
■ Progress Bar
■ Critical Activity

IT/OHM Remediation
MCB Camp Lejeune, NC Master Project
D.O. 175 Extraction Well OU1 Site 78

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	1999							
					FEB	MAR	APR	MAY	JUN	JUL		
A520222000	South Plant Well Vaults & Pads	3	15FEB99A	17FEB99A	■							
A520230000	South Plant GW Collection Piping	32*	18FEB99A	23MAR99A	■	■						
A520223000	South Plant Pumps & Instrumentation	5	24MAR99A	30MAR99A			■					
A520224000	South Plant Well Electrical	1	31MAR99A	31MAR99A			▼					
A520225000	South Plant Well Start Up	1	01APR99A	01APR99A			▼					
Demobilization / Clean-up												
A520500000	N & S Final Construction Report	33	04MAY99	18JUN99					■	■		
Operations & Maintenance												
A520300000	N & S Plants O & M	334*	01AUG98A	30JUN99	■	■	■	■	■	■	■	■
A520400000	N & S Sampling & Analysis	334*	01AUG98A	30JUN99	■	■	■	■	■	■	■	■

Project Start 02FEB98
Project Finish 22OCT99
Data Date 30APR99
Run Date 07MAY99

■ Early Bar
■ Progress Bar
■ Critical Activity

175G

IT/OHM Remediation
MCB Camp Lejeune, NC Master Project
D.O. 175 Extraction Well OU1 Site 78

OUTPUT TABLE Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - TT 2477/78
AS/SVE Field 1

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
10/10/97	11:00	7	140	204	0.744	13.6		
10/14/97	14:22	14.9	145	427	0.771	29.4	7.1	
10/14/97	17:00	17.5	858	466	4.563	190.5	19.0	
10/15/97	8:30	33	145	541	0.771	37.4	92.6	
10/16/97	10:50	39	226	563	1.202	60.6	104.8	
10/18/97	13:30	57.7	123	607	0.654	35.5	142.2	
11/04/97	8:28	244	121	518	0.643	29.8	395.7	
11/10/97	9:00	285	98.9	522	0.526	24.6	442.2	
11/12/97	10:20	298	113.9	563	0.606	30.5	457.1	
12/09/97	10:41	319	52	574	0.277	14.2	476.7	
12/19/97	10:22	373	51	522	0.271	12.7	506.9	
01/07/98	8:30	434	62	403	0.330	11.9	538.1	
01/12/98	11:00	437	16	437	0.085	3.3	539.0	
01/21/98	12:25	510	106	165	0.564	8.3	556.8	
02/04/98	11:00	577	36	198	0.191	3.4	573.2	
02/13/98	9:00	649	38	223	0.202	4.0	584.3	
02/23/98	8:30	690	39	223	0.207	4.1	591.3	
03/17/98	1:30	825	27	264	0.144	3.4	612.5	
03/25/98	12:50	890	2713	497	14.427	641.5	1485.7	4 Additional SVE/AS wells brought on line
04/07/98	9:30	990	3762	306	20.006	547.2	3962.2	
04/14/98	12:00	1046	220	555	1.170	58.1	4668.4	
04/24/98	9:30	1121	244	583	1.298	67.7	4865.0	
05/07/98	11:30	1169	167	631	0.888	50.1	4982.8	
05/12/98	9:00	1200	646	649	3.435	199.7	5144.1	
05/28/98	12:00	1277	148	229	0.787	16.1	5490.2	
06/04/98	10:15	1301	350	251	1.861	41.9	5519.2	
06/10/98	8:30	1346	84	308	0.447	12.3	5570.0	
06/18/98	9:00	1400	350	327	1.755	51.4	5641.8	
06/24/98	9:00	1446	158	403	0.840	30.3	5720.0	
06/30/98	8:30	1488	142	626	0.755	42.3	5783.6	
07/10/98	12:00	1572	133	632	0.707	40.0	5927.5	
07/17/98	9:30	1630	126	625	0.670	37.5	6021.2	
07/21/98	13:00	1678	114	623	0.606	33.8	6092.5	
08/05/98	10:30	1749	30	605	0.160	8.6	6155.2	
08/12/98	10:00	1801	91	615	0.484	26.6	6193.5	
08/22/98	9:00	2006	15	1080	0.080	7.7	6340.1	
09/02/98	12:00	2029	11	602	0.058	3.2	6345.3	
09/13/98	8:45	2039	120	530	0.638	30.3	6352.3	Water in line
09/19/98	9:35	2085	78	145	0.415	5.4	6386.5	
09/25/98	11:45	2134	123	568	0.654	33.2	6425.9	
09/30/98	9:30	2171		654			6451.6	Zero ppm as methane data recorded

Date	Time	SVE Valve Hour Meter (Hrs)	Calculated Vapor			TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
			TH Conc (PPM _{measured}) (PPMV)	Flowrate (Q) tube) (SCFM)	TH Conc (C) (mg/l)			
10/09/98	9:25	2240		667			6451.6	Zero ppm as methane data recorded
10/15/98	10:15	2286		802			6451.6	Zero ppm as methane data recorded
10/20/98	11:45	2322		872			6451.6	Zero ppm as methane data recorded
10/28/98	9:10	2384	9.5	884	0.051	4.0	6456.7	
11/05/98	14:20	2474	12	655	0.064	3.7	6471.2	
11/13/98	12:00	2498	29	832	0.154	11.5	6478.8	
11/18/98	13:50	2541		831			6489.1	
12/03/98	8:50	2658	67.5	764	0.359	24.5	6548.9	
12/10/98	11:35	2716	6.5	770	0.035	2.4	6581.5	
12/14/98	9:25	2745	88.5	774	0.471	32.6	6602.6	
12/21/98	10:20	2800	6	765	0.032	2.2	6642.5	
01/06/99	8:50	2923	53.5	599	0.285	15.2	6687.1	
01/15/99	12:45	3059	15	536	0.080	3.8	6741.2	
01/20/99	9:00	3173	100	153	0.532	7.3	6767.5	
01/25/99	12:10	3296	8.5	302	0.045	1.2	6789.2	
02/25/99	10:00	3378	81	420	0.431	16.2	6819.0	Blower Repaired
03/03/99	12:30	3471	8	374	0.043	1.4	6853.1	
03/08/99	9:00	3588	8	346	0.043	1.3	6859.8	
03/12/99	7:30	3899	29	343	0.154	4.7	6899.1	
03/25/99	6:42	4217	29	343	0.154	4.7	6961.9	
03/31/99	8:35	4218	20	482	0.106	4.6	6962.1	
04/08/99	8:00	4408	22	373	0.117	3.9	6995.7	
04/13/99	10:00	4526	13	408	0.069	2.5	7011.5	
04/21/99	12:00	4719	9	417	0.048	1.8	7028.8	
05/01/99	8:00	4935	2	151	0.011	0.1	7037.5	

Notes:

percent water vapor by volume
SVE Field # 1 pipe diameter

0.003 at 68 degrees F (from Perry's handbook)
6

$$C = (\text{PPM}_{\text{measured}}) \times K \times (M_g/K_g) / 1000$$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$$Q = K \times \text{Sqrt}((P_{\text{std}} - P) \times dP \times (T_{\text{std}} / (T + 460)))$$

Q: vapor flowrate (SCFM)

K: pipe constant

dP: manometer differential pressure (in w.c.)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

Assumptions:

M_g = 128 mg/mg-mole

K_g = 24.07 dsm³/10⁶ gm -mole

K_{6-inch} = 93 (SVE Field #1)

M = Q x C x 0.0895

M: hydrocarbon recovery rate (lb/day)

OUTPUT TABLE Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / SVE system
MCB CAMP LEJEUNE - TT 2477/78
AS/SVE Field 2

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
10/20/97	9:45							
10/22/97	7:30	11	175	416	0.931	34.6	7.9	
11/10/97	15:30	242	99	429	0.526	20.2	271.8	
01/07/98	12:30	544	179	409	0.952	34.8	618.0	
01/12/98	10:20	662	45	403	0.239	8.6	724.8	
01/21/98	13:10	807	105	409	0.558	20.4	812.6	
01/31/98	10:30	913	11	409	0.058	2.1	862.4	
02/04/98	9:00	985	342	366	1.819	59.5	954.9	
02/13/98	14:30	1114	25	376	0.133	4.5	1126.8	
02/23/98	11:30	1207	152	358	0.808	25.9	1185.7	
04/07/98	14:30	1820		352			1516.3	
04/14/98	13:30	1950	42	370	0.223	7.4	1536.4	
04/24/98	13:00	2096	92	369	0.489	16.2	1608.0	
05/07/98	15:00	2289	102	401	0.542	19.5	1751.3	
05/12/98	12:30	2369	110	406	0.585	21.3	1819.2	
05/29/98	9:15	2524	56	360	0.298	9.6	1918.8	
06/04/98	13:30	2558	54	340	0.287	8.7	1931.8	
06/10/98	12:00	2675	52	340	0.277	8.4	1973.6	
06/18/98	12:30	2786	59	340	0.314	9.5	2015.1	
06/25/98	12:30	2884	114	306	0.606	16.6	2068.5	
06/30/98	12:30	2986	104	309	0.553	15.3	2136.2	
07/10/98	15:30	3146	39	307	0.207	5.7	2206.1	
07/17/98	13:00	3258	34	307	0.181	5.0	2231.0	
07/21/98	10:00	3303	32	309	0.170	4.7	2240.1	
08/05/98	13:30	3500	19	307	0.101	2.8	2270.8	
08/12/98	13:30	3614	36	303	0.191	5.2	2289.8	
08/22/98	12:30	3648	51	352	0.271	8.5	2299.5	
09/02/98	9:00	3668	59	306	0.314	8.6	2306.6	
09/13/98	12:10	3689	42	308	0.223	6.2	2313.1	
09/19/98	13:30	3782	19	318	0.101	2.9	2330.6	
09/25/98	15:05	3880	17		0.090		2336.4	
09/30/98	13:00	3960		254			2336.4	Flow data not given
10/10/98	8:53	4123		257			2336.4	zero ppm as methane data recorded
10/15/98	14:12	4206		721			2336.4	zero ppm as methane data recorded
10/20/98	14:35	4290		685			2336.4	zero ppm as methane data recorded
10/28/98	13:30	4421	16	836	0.085	6.4	2353.8	zero ppm as methane data recorded

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
11/04/98	12:06	4507	6	1187	0.032	3.4	2371.3	
11/13/98	15:10	4570		720			2375.7	
11/18/98	15:30	4649		611			2375.7	
12/03/98	11:00	4888	22	544	0.114	5.6	2403.4	
12/10/98	14:00	5002	21	822	0.109	8.0	2435.7	
12/14/98	11:55	5066	21	774	0.112	7.7	2456.7	
12/22/98	9:50	5197	43	606	0.226	12.3	2511.3	
01/06/99	12:05	5433	17	679	0.090	5.5	2598.6	
01/19/99	15:45	5522	31	466	0.165	6.9	2621.5	
01/20/99	10:55	5541	25	271	0.133	3.2	2625.5	
01/25/99	14:25	5665	23	382	0.122	4.2	2644.6	
02/25/99	10:00	5868	30		0.160		2662.3	
03/03/99	12:30	5961	16	273	0.085	2.1	2666.3	
03/08/99	9:00	6099	12	278	0.064	1.6	2676.9	
03/12/99	7:30	6313	13	276	0.069	1.7	2691.6	
03/25/99	6:42	6625	13	276	0.069	1.7	2713.8	
03/31/99	8:35	6633	14	274	0.074	1.8	2714.4	
04/08/99	8:00	6823	20	273	0.106	2.6	2731.9	
04/13/99	10:00	6941	10	391	0.053	1.9	2742.9	
04/21/99	12:00	7134	13		0.069		2750.4	
05/01/99	8:00	7349	9		0.048		2750.4	

Notes:

percent water vapor by volume
SVE Field # 2 pipe diameter

0.003 at 68 degrees F (from Perry's handbook)
8

$$C = (\text{PPM}_{\text{measured}}) \times K \times (\text{M}_g/\text{K}_g) / 1000$$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$$Q = (1-B) \times V \times A \times (P/P_{\text{std}}) \times (T_{\text{std}}/T)$$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

$$M = Q \times C \times 0.0895$$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

B = 0.003 from Perry's Chemical Handbook

A = 0.196 sq. ft

OUTPUT TABLE Cumulative Mass of Volatile Hydrocarbons Discharged
 Air Sparging (AS) / Soil Vapor Extraction (SVE) System
 MCB CAMP LEJEUNE - TT-2477/78
 SVE Stack

Date	Time	SVE Valve Hour Meter (Hrs)	Vapor Velocity		Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
			TH Conc (PPMv)	(f/min)						
10/10/97	11:00	7								SVE Field 1
10/10/97	11:32	8	10	4500	552	843	0.053	4.0	0.0	SVE Field 1
10/10/97	14:22	10	58	4500	560	831	0.308	22.9	1.6	SVE Field 1
10/10/97	17:00	13	30	4500	560	831	0.160	11.9	3.5	SVE Field 1
10/14/97	14:22	15	58	4500	560	831	0.308	22.9	4.9	SVE Field 1
10/14/97	17:00	18	30	4500	560	831	0.160	11.9	6.8	SVE Field 1
10/15/97	8:30	33	65	4500	547	850	0.346	26.3	19.1	SVE Field 1
10/15/97	12:10	34	40	4000	546	757	0.213	14.4	20.0	SVE Field 1
10/15/97	13:00	35	40	4000	546	757	0.213	14.4	20.5	SVE Field 1
10/15/97	14:30	36	135	4000	542	763	0.718	49.0	22.5	SVE Field 1
10/16/97	11:15	39	44	5000	535	966	0.236	20.4	26.3	SVE Field 1
10/18/97	8:49	53	30	4000	540	766	0.158	10.8	35.4	SVE Field 1
10/18/97	13:30	58	37	3900	546	738	0.197	13.0	37.7	SVE Field 1
10/18/97	15:20	60	46	4000	548	754	0.244	16.5	38.9	SVE Field 1
10/20/97	9:45	91	40	5000	542	954	0.213	18.2	61.6	SVE/AS Fields 1&2
10/21/97	14:20	102	40	5000	553	934	0.213	17.8	69.7	SVE/AS Field 2
10/22/97	7:30	119	60	4500	527	883	0.319	25.2	85.1	SVE/AS Field 2
10/23/97	11:20	143		4900	527	962			97.7	SVE/AS Field 1
10/27/97	8:43	236	962	4800	527	942	5.114	431.2	936.5	SVE/AS Field 2
11/04/97	8:28	401	121	4500	527	883	0.642	50.8	2589.2	SVE Field 1
11/05/97	12:00	429	581	4800	545	910	3.090	251.7	2762.8	SVE Field 1
11/07/97	13:45	453	151	5000	545	948	0.802	68.1	2925.8	not recorded
11/10/97	9:00	525	368	5000	531	974	1.956	170.5	3283.7	SVE/AS Field 1
11/10/97	15:30	526	232	4700	532	914	1.231	100.7	3289.4	SVE/AS Field 2
11/12/97	10:20	568	408	4200	530	818	2.170	158.9	3516.6	SVE/AS Field 1
11/19/97	9:00	166			519				2185.5	SVE/AS Field 1
11/19/97	9:00	166			519				2185.5	SVE/AS Field 2
12/09/97	10:41	577	188	3600	513	726	0.999	64.9	2741.1	4 additional SVE/AS wells on, SVE/AS Field 1
12/19/97	10:22	739	131	6500	526	1277	0.696	79.5	3228.4	SVE/AS Field 1
01/07/98	8:30	929	55	4600	540	880	0.295	23.2	3634.9	SVE/AS Field 1
01/07/98	12:30	933	123	5000	547	945	0.655	55.4	3641.5	SVE/AS Field 2
01/12/98	10:20	1051	15	4300	523	850	0.078	5.9	3792.1	
01/12/98	11:00	1052	3	4600	531	895	0.017	1.4	3792.2	
01/21/98	12:25	1268	16	6400	521	1270	0.085	9.6	3841.6	
02/04/98	12:40	1521	17	7000	517	1399	0.093	11.6	3953.3	
02/13/98	14:30	1715	12	7100	528	1390	0.062	7.7	4031.2	
02/23/98	11:30	1849	78	7000	539	1342	0.414	49.7	4191.4	
03/13/98	11:30	2165	18	7100	525	1398	0.094	11.7	4595.7	
03/17/98	1:30	2262	26	6900	520	1372	0.139	17.0	4653.8	
03/25/98	12:50	2333	1271	7800	538	1499	6.759	906.5	6019.8	
04/07/98	14:30	2764	571	7100	553	1327	3.036	360.6	17397.9	
04/15/98	13:30	2959	70	7100	552	1329	0.372	44.3	19043.0	
04/24/98	13:00	3170	120	7000	542	1335	0.638	76.2	19572.8	
06/30/98	8:30	4424	54	7900	544	1501	0.287	38.6	22572.5	
06/30/98	12:30	4428	38	7700	556	1431	0.202	25.9	22577.9	
07/10/98	12:00	4689	52	7900	565	1445	0.277	35.8	22887.4	
07/10/98	15:30	4671	57	7600	566	1388	0.303	37.7	22890.5	

Date	Time	SVE Valve Hour Meter	Vapor Velocity		Absolute Temperature	Calculated Vapor Flowrate (Q)	TH Conc (C)	TH Discharge Rate (M)	Cumulative Mass of Hydrocarbons Discharged	Comments
			TH Conc	(V)						
			(Hrs)	(PPMv)	(ft/min)	(degrees Rankine)	(SCFM)	(mg/l)	(lb/day)	
07/17/98	9:30	4840	52	7900	545	1498	0.277	37.1	23153.6	
07/17/98	13:00	4843	55	7800	558	1445	0.292	37.8	23158.3	
07/21/98	10:00	4933	51	7900	551	1482	0.271	36.0	23296.7	Field #2
07/21/98	13:00	4936	50	8000	557	1485	0.266	35.3	23301.1	Field #1
08/05/98	10:30	5200	15	7500	551	1407	0.080	10.0	23550.7	Field #1
08/05/98	13:30	5203	12	7100	554	1325	0.064	7.6	23551.8	Field #2
08/12/98	10:00	5365	41	7500	558	1389	0.218	27.1	23668.8	Field #1
08/12/98	13:30	5368	37	7100	567	1294	0.197	22.8	23671.9	Field #2
08/22/98	9:00	5604	14	7400	551	1388	0.074	9.2	23829.5	Field #1
08/22/98	12:30	5607	37	6300	565	1153	0.197	20.3	23831.3	Field #2
09/02/98	9:00	5644	37	7100	553	1327	0.197	23.4	23865.0	Field #2
09/02/98	12:00	5647	33	7500	556	1394	0.175	21.9	23867.8	Field #1
09/13/98	8:45	5672	32	7300	548	1377	0.170	21.0	23890.1	Field #1
09/13/98	12:10	5676	33	6800	561	1293	0.175	19.7	23893.5	Field #2
09/19/98	9:35	5817	25	2100	550	395	0.133	4.7	23965.1	Field #1
09/19/98	13:30	5821	6	7000	555	1304	0.032	3.7	23965.8	Field #2
09/25/98	11:45	5963	23	6300	556	1171	0.122	12.8	24014.7	Field #1
09/25/98	15:05	5966	3	6000	561	1105	0.016	1.6	24015.6	Field #2
09/30/98	9:30	6081		6500	553	1215			24019.4	Field #1, zero ppm as methane data recorded
09/30/98	13:00	6084		2900	556	539			24019.4	Field #2, zero ppm as methane data recorded
10/09/98	9:25	6297	33	6100	540	1168	0.175	18.3	24100.8	Field #1
10/10/98	8:53	6320		6000	537	1155			24109.6	Field #2, no ppm as methane data given
10/15/98	10:15	6441		4900	540	938			24109.6	Field #1, zero ppm as methane data recorded
10/15/98	14:12	6445		6000	555	1117			24109.6	Field #2, zero ppm as methane data recorded
10/20/98	11:45	6582		6100	544	1159			24109.6	Field #1, zero ppm as methane data recorded
10/20/98	14:35	6565		6100	544	1159			24109.6	Field #2, zero ppm as methane data recorded
10/28/98	9:10	6753	9	6000	536	1157	0.048	5.0	24129.0	Field #1
10/28/98	13:30	6757	19	6500	552	1217	0.101	11.0	24130.3	Field #2
11/04/98	12:06	6881	29	5100	533	989	0.152	13.4	24193.4	Field #2
11/05/98	14:20	6907	26	5600	528	1096	0.138	13.6	24208.0	Field #1
11/13/98	12:00	6973	29	5600	526	1100	0.154	15.2	24247.6	Field #1
11/13/98	15:10	6975		5900	528	1155			24248.2	Field #2
11/18/98	13:50	7094		6700	543	1275			24248.2	Field #1
11/18/98	15:30	7096		6700	541	1280			24248.2	Field #2
12/03/98	8:50	7449	27	6400	533	1241	0.141	15.7	24363.3	Field #1
12/03/98	11:00	7451	28	6700	541	1280	0.138	15.8	24364.6	Field #2
12/10/98	11:35	7620	12	6400	531	1246	0.061	6.8	24444.4	Field #1
12/10/98	14:00	7622	12	6500	535	1256	0.064	7.2	24445.0	Field #2
12/14/98	9:25	7713	24	6000	521	1190	0.128	13.6	24484.4	Field #1
12/14/98	11:55	7716	24	6800	529	1329	0.128	15.2	24486.2	Field #2
12/21/98	10:20	7882	23	6100	533	1183	0.122	12.9	24583.4	Field #1
12/22/98	9:50	7905	38	6900	542	1316	0.202	23.8	24601.0	Field #2
01/06/99	8:50	8255	20	5700	514	1146	0.106	10.9	24854.1	Field #1
01/06/99	12:05	8267	15	5400	513	1088	0.080	7.8	24858.8	Field #2
01/15/99	12:45	8477	9	5400	534	1045	0.048	4.5	24912.4	Field #1
01/19/99	15:45	8576	38	5900	540	1129	0.202	20.4	24963.7	Field #2
01/20/99	9:00	8593	26	5700	525	1122	0.136	13.6	24975.8	Field #1
01/20/99	10:55	8595	43	6100	538	1172	0.226	23.7	24977.4	Field #2
01/25/99	12:10	8717	125	5800	536	1118	0.665	66.5	25206.7	
01/25/99	14:25	8719	16	5700	539	1093	0.082	8.1	25209.8	
02/25/99	10:00	8943	26	5900	530	1151	0.138	14.2	25313.9	Blower out for repair Blower Repaired, Fields operating together

Date	Time	SVE Valve Hour Meter (Hrs)	Vapor Velocity		Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
			TH Conc (PPMv)	(ft/min)						
03/03/99	12:30	9036	21	4000	556	744	0.112	7.4	25355.9	
03/08/99	9:00	9153	3	5700	523	1127	0.016	1.6	25377.9	
03/12/99	7:30	9367	12	5880	531	1145	0.064	6.5	25414.3	
03/25/99	6:42	9541	12	5800	531	1129	0.064	6.4	25461.3	
03/31/99	8:35	9684	10	5700	542	1087	0.053	5.2	25495.9	
04/08/99	8:00	9876	6	6400	549	1205	0.032	3.4	25530.4	
04/13/99	10:00	9993	3	5700	535	1101	0.016	1.6	25542.6	
04/21/99	12:00	10188	5	6000	546	1136	0.027	2.7	25560.0	
05/01/99	8:00	10403	2	5600	531	1090	0.011	1.0	25576.7	
Average			73	5701	541	1088	0.366	38.7	25355.9	

Notes:

percent water vapor by volume
SVE Field # 1 pipe diameter

0.003
6 at 68 degrees F (from Perry's handbook)

$C = (PPM_{measured}) \times K \times (M_p/K_g) / 1000$
C: vapor concentration (mg/l)
PPM_{measured}: FID reading (PPM)
K: number of carbon atoms in calibration gas
(1 in methane)
TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$
Q: vapor flowrate (SCFM)
B: percent water vapor in flowstream
V: vapor velocity (ft/min)
A: cross-sectional area (sq. ft)
P: absolute pressure of flowstream (" Hg)
P_{std}: standard pressure (29.92" Hg)
T: absolute temperature of flowstream (degrees Rankine)
T_{std}: standard temperature (528 degrees Rankine)

$M = Q \times C \times 0.0895$
M: hydrocarbon recovery rate (lb/day)

Assumptions:
Mg = 128 mg/mg-mole
Kg = 24.07 dsm³/10⁶ gm -mole
B = 0.003 from Perry's Chemical Handbook
A = 0.196 sq. ft

OUTPUT TABLE Cumulative Mass of Volatile Hydrocarbons Discharged
 Air Sparging (AS) / Soil Vapor Extraction (SVE) System
 MCB CAMP LEJEUNE - TT-247778
 SVE Stack

Date	Time	SVE Valve Hour Meter	Vapor Velocity		Absolute Temperature	Calculated Vapor Flowrate (Q)	TH Conc (C)	TH Discharge Rate (M)	Cumulative Mass of Hydrocarbons Discharged	Comments
			TH Conc	(V)						
		(Hrs)	(PPMv)	(ft/min)	(degrees Rankine)	(SCFM)	(mg/l)	(lb/day)	(lbs)	
10/10/97	11:00	7								
10/10/97	11:32	8	10	4500	552	843	0.053	4.0	0.0	SVE Field 1
10/10/97	14:22	10	58	4500	560	831	0.308	22.9	1.6	SVE Field 1
10/10/97	17:00	13	30	4500	560	831	0.160	11.9	3.5	SVE Field 1
10/14/97	14:22	15	58	4500	560	831	0.308	22.9	4.9	SVE Field 1
10/14/97	17:00	18	30	4500	560	831	0.160	11.9	6.8	SVE Field 1
10/15/97	8:30	33	65	4500	547	850	0.346	26.3	19.1	SVE Field 1
10/15/97	12:10	34	40	4000	546	757	0.213	14.4	20.0	SVE Field 1
10/15/97	13:00	35	40	4000	546	757	0.213	14.4	20.5	SVE Field 1
10/15/97	14:30	36	135	4000	542	763	0.718	49.0	22.5	SVE Field 1
10/16/97	11:15	39	44	5000	535	966	0.236	20.4	26.3	SVE Field 1
10/18/97	8:49	53	30	4000	540	766	0.158	10.8	35.4	SVE Field 1
10/18/97	13:30	58	37	3900	546	738	0.197	13.0	37.7	SVE Field 1
10/18/97	15:20	60	46	4000	548	754	0.244	16.5	38.9	SVE Field 1
10/20/97	9:45	91	40	5000	542	954	0.213	18.2	61.6	SVE/AS Fields 1&2
10/21/97	14:20	102	40	5000	553	934	0.213	17.8	69.7	SVE/AS Field 2
10/22/97	7:30	119	60	4500	527	883	0.319	25.2	85.1	SVE/AS Field 2
10/23/97	11:20	143		4900	527	962			97.7	SVE/AS Field 1
10/27/97	8:43	236	962	4800	527	942	5.114	431.2	936.5	SVE/AS Field 2
11/04/97	8:28	401	121	4500	527	883	0.642	50.8	2589.2	SVE Field 1
11/05/97	12:00	429	581	4800	545	910	3.090	251.7	2762.8	SVE Field 1
11/07/97	13:45	453	151	5000	545	948	0.802	68.1	2925.8	not recorded
11/10/97	9:00	525	368	5000	531	974	1.956	170.5	3283.7	SVE/AS Field 1
11/10/97	15:30	526	232	4700	532	914	1.231	100.7	3289.4	SVE/AS Field 2
11/12/97	10:20	568	408	4200	530	818	2.170	158.9	3516.6	SVE/AS Field 1
11/19/97	9:00	166			519				2185.5	SVE/AS Field 1
11/19/97	9:00	166			519				2185.5	SVE/AS Field 2
12/09/97	10:41	577	188	3600	513	726	0.999	64.9	2741.1	4 additional SVE/AS wells on, SVE/AS Field 1
12/19/97	10:22	739	131	6500	526	1277	0.696	79.5	3228.4	SVE/AS Field 1
01/07/98	8:30	929	55	4600	540	880	0.295	23.2	3634.9	SVE/AS Field 1
01/07/98	12:30	933	123	5000	547	945	0.655	55.4	3641.5	SVE/AS Field 2
01/12/98	10:20	1051	15	4300	523	850	0.078	5.9	3792.1	
01/12/98	11:00	1052	3	4600	531	895	0.017	1.4	3792.2	
01/21/98	12:25	1268	16	6400	521	1270	0.085	9.6	3841.6	
02/04/98	12:40	1521	17	7000	517	1399	0.093	11.6	3953.3	
02/13/98	14:30	1715	12	7100	528	1390	0.062	7.7	4031.2	
02/23/98	11:30	1849	78	7000	539	1342	0.414	49.7	4191.4	
03/13/98	11:30	2165	18	7100	525	1398	0.094	11.7	4595.7	
03/17/98	1:30	2262	26	6900	520	1372	0.139	17.0	4653.8	
03/25/98	12:50	2333	1271	7800	538	1499	6.759	906.5	6019.8	
04/07/98	14:30	2764	571	7100	553	1327	3.036	360.6	17397.9	
04/15/98	13:30	2959	70	7100	552	1329	0.372	44.3	19043.0	
04/24/98	13:00	3170	120	7000	542	1335	0.838	76.2	19572.8	
06/30/98	8:30	4424	54	7900	544	1501	0.287	38.6	22572.5	
06/30/98	12:30	4428	38	7700	556	1431	0.202	25.9	22577.9	
07/10/98	12:00	4669	52	7900	565	1445	0.277	35.8	22887.4	
07/10/98	15:30	4671	57	7600	566	1388	0.303	37.7	22890.5	

Date	Time	SVE Valve Hour Meter (Hrs)	Vapor Velocity		Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
			TH Conc (PPMv)	(ft/min)						
07/17/98	9:30	4840	52	7900	545	1498	0.277	37.1	23153.6	
07/17/98	13:00	4843	55	7800	558	1445	0.292	37.8	23158.3	
07/21/98	10:00	4933	51	7900	551	1482	0.271	36.0	23296.7	Field #2
07/21/98	13:00	4936	50	8000	557	1485	0.266	35.3	23301.1	Field #1
08/05/98	10:30	5200	15	7500	551	1407	0.080	10.0	23550.7	Field #1
08/05/98	13:30	5203	12	7100	554	1325	0.064	7.6	23551.8	Field #2
08/12/98	10:00	5365	41	7500	558	1389	0.218	27.1	23668.8	Field #1
08/12/98	13:30	5368	37	7100	567	1294	0.197	22.8	23671.9	Field #2
08/22/98	9:00	5604	14	7400	551	1388	0.074	9.2	23829.5	Field #1
08/22/98	12:30	5607	37	6300	565	1153	0.197	20.3	23831.3	Field #2
09/02/98	9:00	5644	37	7100	553	1327	0.197	23.4	23865.0	Field #2
09/02/98	12:00	5647	33	7500	556	1394	0.175	21.9	23867.8	Field #1
09/13/98	8:45	5672	32	7300	548	1377	0.170	21.0	23890.1	Field #1
09/13/98	12:10	5676	33	6800	561	1253	0.175	19.7	23893.5	Field #2
09/19/98	9:35	5817	25	2100	550	395	0.133	4.7	23965.1	Field #1
09/19/98	13:30	5821	6	7000	555	1304	0.032	3.7	23965.8	Field #2
09/25/98	11:45	5963	23	6300	556	1171	0.122	12.8	24014.7	Field #1
09/25/98	15:05	5966	3	6000	561	1105	0.016	1.6	24015.6	Field #2
09/30/98	9:30	6081		6500	553	1215			24019.4	Field #1, zero ppm as methane data recorded
09/30/98	13:00	6084		2900	556	539			24019.4	Field #2, zero ppm as methane data recorded
10/09/98	9:25	6297	33	6100	540	1168	0.175	18.3	24100.8	Field #1
10/10/98	8:53	6320		6000	537	1155			24109.6	Field #2, no ppm as methane data given
10/15/98	10:15	6441		4900	540	938			24109.6	Field #1, zero ppm as methane data recorded
10/15/98	14:12	6445		6000	555	1117			24109.6	Field #2, zero ppm as methane data recorded
10/20/98	11:45	6562		6100	544	1159			24109.6	Field #1, zero ppm as methane data recorded
10/20/98	14:35	6565		6100	544	1159			24109.6	Field #2, zero ppm as methane data recorded
10/28/98	9:10	6753	9	6000	536	1157	0.048	5.0	24129.0	Field #1
10/28/98	13:30	6757	19	6500	552	1217	0.101	11.0	24130.3	Field #2
11/04/98	12:06	6881	29	5100	533	989	0.152	13.4	24193.4	Field #2
11/05/98	14:20	6907	26	5600	528	1096	0.138	13.6	24208.0	Field #1
11/13/98	12:00	6973	29	5600	526	1100	0.154	15.2	24247.6	Field #1
11/13/98	15:10	6975		5900	528	1155			24248.2	Field #2
11/18/98	13:50	7094		6700	543	1275			24248.2	Field #1
11/18/98	15:30	7096		6700	541	1280			24248.2	Field #2
12/03/98	8:50	7449	27	6400	533	1241	0.141	15.7	24363.3	Field #1
12/03/98	11:00	7451	26	6700	541	1280	0.138	15.8	24364.6	Field #2
12/10/98	11:35	7620	12	6400	531	1246	0.061	6.8	24444.4	Field #1
12/10/98	14:00	7622	12	6500	535	1256	0.064	7.2	24445.0	Field #2
12/14/98	9:25	7713	24	6000	521	1190	0.128	13.6	24484.4	Field #1
12/14/98	11:55	7716	24	6800	529	1329	0.128	15.2	24486.2	Field #2
12/21/98	10:20	7882	23	6100	533	1183	0.122	12.9	24583.4	Field #1
12/22/98	9:50	7905	38	6900	542	1316	0.202	23.8	24601.0	Field #2
01/06/99	8:50	8255	20	5700	514	1146	0.106	10.9	24854.1	Field #1
01/06/99	12:05	8267	15	5400	513	1088	0.080	7.8	24858.8	Field #2
01/15/99	12:45	8477	9	5400	534	1045	0.048	4.5	24912.4	Field #1
01/19/99	15:45	8576	38	5900	540	1129	0.202	20.4	24963.7	Field #2
01/20/99	9:00	8593	26	5700	525	1122	0.136	13.6	24975.8	Field #1
01/20/99	10:55	8595	43	6100	538	1172	0.226	23.7	24977.4	Field #2
01/25/99	12:10	8717	125	5800	536	1118	0.665	66.5	25206.7	
01/25/99	14:25	8719	16	5700	539	1093	0.082	8.1	25209.8	
02/25/99	10:00	8943	26	5900	530	1151	0.138	14.2	25313.9	Blower out for repair Blower Repaired, Fields operating together

Date	Time	SVE Valve Hour Meter (Hrs)	Vapor Velocity (V)		Absolute Temperature	Calculated Vapor Flowrate (Q)	TH Conc (C)	TH Discharge Rate (M)	Cumulative Mass of Hydrocarbons Discharged	Comments
			TH Conc (PPMv)	(ft/min)	(degrees Rankine)	(SCFM)	(mg/l)	(lb/day)	(lbs)	
03/03/99	12:30	9036	21	4000	556	744	0.112	7.4	25355.9	
03/08/99	9:00	9153	3	5700	523	1127	0.016	1.6	25377.9	
03/12/99	7:30	9367	12	5880	531	1145	0.064	6.5	25414.3	
03/25/99	6:42	9541	12	5800	531	1129	0.064	6.4	25461.3	
03/31/99	8:35	9684	10	5700	542	1087	0.053	5.2	25495.9	
04/08/99	8:00	9876	6	6400	549	1205	0.032	3.4	25530.4	
04/13/99	10:00	9993	3	5700	535	1101	0.016	1.6	25542.6	
04/21/99	12:00	10188	5	6000	546	1136	0.027	2.7	25560.0	
05/01/99	8:00	10403	2	5600	531	1090	0.011	1.0	25576.7	
Average:			73	5701	541	1088	0.388	38.7	25355.9	

Notes:

percent water vapor by volume
SVE Field # 1 pipe diameter

0.003 at 68 degrees F (from Perry's handbook)
6

$$C = (\text{PPM}_{\text{measured}}) \times K \times (M_p/K_p) / 1000$$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$$Q = (1-B) \times V \times A \times (P/P_{\text{std}}) \times (T_{\text{std}}/T)$$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

$$M = Q \times C \times 0.0895$$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm⁻³

B = 0.003 from Perry's Chemical Handbook

A = 0.196 sq. ft

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 3**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
11/05/97	17:00		207	351	1.101	34.6		
11/06/97	14:25	14	186	365	0.989	32.3	19.5	
11/09/97	8:30	45	176	339	0.936	28.4	58.7	
11/11/97	9:00	94	571	342	3.036	92.8	182.5	
11/16/97	14:00	120	1120	373	5.956	198.7	340.4	
11/19/97	9:00	164	328	217	1.746	34.0	553.7	
12/01/97	9:30	225	396	323	2.106	60.9	674.3	
12/17/97	9:00	357	32	324	0.170	4.9	855.4	
01/06/98	15:10	591	37	250	0.195	4.4	900.8	
01/12/98	14:00	672		272			908.2	
01/21/98	15:30	780		295			908.2	
01/26/98	13:00	812	26	253	0.138	3.1	910.2	
02/02/98	17:00	838		262			911.9	
02/11/98	15:00	927		568			911.9	
02/20/98	8:30	972	17	635	0.090	5.1	916.8	
02/24/98	9:00	1030	22	638	0.117	6.7	931.0	
03/05/98	8:00	1121		142			943.7	
03/15/98	7:30	1250	25	137	0.132	1.6	948.1	
03/26/98	2:00	1268	140	141	0.743	9.4	952.2	dp estimated due to water in line
04/08/98	11:30	1297	23	136	0.121	1.5	958.7	taken, estimated
04/13/98	11:15	1318		141			959.4	taken, estimated
04/23/98	13:00	1552	35	138	0.186	2.3	970.6	taken, estimated
04/29/98	8:45	1631	7	138	0.037	0.5	975.1	taken, estimated
05/06/98	9:30	1700	7	140	0.037	0.5	976.4	
05/19/98	12:00	1705	24	138	0.128	1.6	976.6	
06/05/98	11:45	1795	4	137	0.021	0.3	980.1	Field 4: water in line
06/12/98	11:30	1837	5	135	0.027	0.3	980.6	Field 4: water in line

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 3**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
06/18/98	15:45	1871	25	97	0.133	1.2	981.6	Field 4: water in line
06/26/98	10:00	1943	10	141	0.053	0.7	984.4	
06/29/98	10:00	1962	700	101	0.053	0.5	984.8	
07/09/98	15:45	2075	1500	141	0.043	0.5	987.2	
07/13/98	9:45	2128	900		0.043		987.8	
07/22/98	9:30	2160	1000	287	0.037	1.0	988.5	
08/03/98	11:15	2303	1500	143	0.048	0.6	993.1	
08/21/98	12:30	2393	300	315	0.096	2.7	999.3	Field 4: water in line
09/03/98	9:00	2431	300	375	0.117	3.9	1004.6	Field 4: water in line
09/12/98	10:45	2477			0.003		1008.3	Field 3: water in line
09/16/98	15:10	2517	1000		0.011		1008.3	
09/24/98	11:00	2671		636	0.558	31.8	1110.4	Field #3 & 4, Water in line
10/07/98	10:44	2719					1142.2	Field #3 & 4, Water in line
10/14/98	8:50	2794	1300	326			1142.2	water in lines
10/21/98	8:45	2798	2000	296			1142.2	Field #4: water in line
10/27/98	13:00	2863	2500	328	0.101	3.0	1146.2	Field #4: water in line
11/14/98	9:21	2958	2100	380	0.394	13.4	1178.5	Field #4, water in line
11/19/98	14:00	3027	2800	207			1197.8	Field #4, water in line
12/05/98	14:00	3411	2800	207			1197.8	
01/07/99	13:05	3301	2500	330	0.370	10.9	1172.8	
01/12/99	13:15	3358	2600	330	0.308	9.1	1196.6	
01/21/99	13:00	3572	2500	209	0.747	14.0	1299.6	
01/26/99	12:05	3692	2300	212	0.242	4.6	1346.1	
02/05/99	9:30	3933	1700	352	0.069	2.2	1380.1	Field #4, water in line
02/13/99	13:30	4097		374			1387.5	Field #4, water in line
02/17/99	13:00	4206	4000	347	0.002	0.1	1387.7	Field #4, water in line
02/22/99	9:45	4322	1900	324	0.049	1.4	1391.3	Field #4, water in line

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 3**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
03/03/99	10:00	4426	4000	284	0.074	1.9	1398.5	Field #4, water in line
03/12/99	8:30	4638	1700	203	0.043	0.8	1410.3	
03/17/99	13:00	4763	6000	510	0.043	1.9	1417.3	
03/29/99	11:00	4946		462	0.117	4.8	1443.2	Water in Line
04/08/99	12:00	5163	1700	445	0.112	4.4	1485.2	
04/15/99	9:00	5330	2200	446	0.069	2.8	1510.3	
04/21/99	8:00	5472	2400	448	0.032	1.3	1522.2	
04/30/99	8:00	5688	2400	448	0.032	1.3	1533.7	Extapolated Data

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = K \times \text{Sqrt}((P_{std} - P) \times dP \times (T_{std}/(T+460)))$

Q: vapor flowrate (SCFM)

K: pipe constant

dP: manometer differential pressure (in w.c.)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

K_{6-inch} = 93 (SVE Field #1)

K_{4-inch} = 42 (SVE Field #2)

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 4**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
11/05/97	17:00		350	315	1.861	52.5		
11/06/97	14:25	14		327			15.3	
11/09/97	8:30	45	536	305	2.850	77.7	65.5	
11/11/97	9:00	94	854	305	4.541	123.8	271.2	
11/16/97	14:00	120	431	333	2.290	68.3	375.2	
11/19/97	9:00	164	160	228	1.994	40.7	475.1	
12/01/97	9:30	225	183	202	1.329	24.0	557.3	
12/17/97	9:00	357	59	202	0.313	5.7	638.9	
01/06/98	15:10	591	80	249	0.423	9.4	712.4	
01/12/98	14:00	672	42	142	0.221	2.8	733.0	
01/21/98	15:30	780	59	317	0.314	8.9	759.4	
01/26/98	13:00	812	174	180	0.925	14.9	775.3	
02/02/98	17:00	838	231	114	1.228	12.5	790.1	
02/11/98	15:00	927	535	255	2.845	65.0	933.8	
02/20/98	8:30	972	152	360	0.808	26.1	1019.1	
02/24/98	9:00	1030	397	362	2.111	68.5	1133.4	
03/05/98	8:00	1121	44	255	0.234	5.3	1273.3	
03/15/98	7:30	1250	881	247	4.683	103.7	1566.5	
03/26/98	2:00	1268	229	251	1.219	27.4	1615.7	
04/08/98	11:30	1297		244			1632.2	dp estimated due to water in line
04/13/98	11:15	1318		253			1632.2	dp estimated, no field 4 FID taken, estimated
04/23/98	13:00	1552		247			1632.2	dp estimated, no field 4 FID taken, estimated
04/29/98	8:45	1631		248			1632.2	dp estimated, no field 4 FID taken, estimated
05/06/98	9:30	1700	180	251	0.957	21.5	1663.1	
05/19/98	12:00	1705	180	247	0.957	21.2	1667.6	
06/05/98	11:45	1795		246			1707.2	
06/12/98	11:30	1837		242			1707.2	Field 4: water in line
06/18/98	15:45	1871		245			1707.2	Field 4: water in line
06/26/98	10:00	1943	7	253	0.037	0.8	1708.5	Field 4: water in line
06/29/98	10:00	1962	8		0.043		1708.8	
07/09/98	15:45	2075	6		0.032		1708.8	
07/13/98	9:45	2128	7		0.037		1708.8	
07/22/98	9:30	2160	7		0.037		1708.8	
08/03/98	11:15	2303	7		0.037		1708.8	

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 4**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
08/21/98	12:30	2393					1708.8	Field 4: water in line
09/03/98	9:00	2431					1708.8	Field 4: water in line
09/12/98	10:45	2477		256			1708.8	Field 3: water in line
09/16/98	15:10	2517	1	248	0.005	0.1	1708.9	
09/24/98	11:00	2671	63	355	0.335	10.7	1743.5	Field #3 & 4, Water in line
10/07/98	10:44	2719					1754.1	Field #3 & 4, Water in line
10/14/98	8:50	2794		262			1754.1	water in lines
10/21/98	8:45	2798		283			1754.1	Field #4: water in line
10/27/98	13:00	2863		837			1754.1	Field #4: water in line
11/14/98	9:21	2958	21	256	0.112	2.6	1759.2	Field #4, water in line
11/19/98	14:00	3027		254			1762.9	Field #4, water in line
12/05/98	14:00	3411		254			1762.9	
01/07/99	13:05	3301	18	374	0.096	3.2	1755.5	
01/12/99	13:15	3358	19		0.101		1759.3	
01/21/99	13:00	3572	61	264	0.324	7.7	1793.6	
01/26/99	12:05	3692	50	269	0.266	6.4	1828.8	
02/05/99	9:30	3933					1860.9	Field #4, water in line
02/13/99	13:30	4097		350			1860.9	Field #4, water in line
02/17/99	13:00	4206	2	252	0.011	0.2	1861.5	Field #4, water in line
02/22/99	9:45	4322	9	362	0.045	1.5	1865.6	Field #4, water in line

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
AS/SVE Field 4**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
03/03/99	10:00	4426	12		0.064		1868.8	Field #4, water in line
03/12/99	8:30	4638	7	564	0.037	1.9	1877.1	
03/17/99	13:00	4763	6		0.032		1882.0	
03/29/99	11:00	4946	36	252	0.191	4.3	1898.4	Water in Line
04/08/99	12:00	5163	16		0.085		1918.0	
04/15/99	9:00	5330	9	356	0.048	1.5	1923.3	Water in Line
04/21/99	8:00	5472	5		0.027		1927.8	Water in Line
04/30/99	8:00	5688	5		0.027		1927.8	Extrapolated Data

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = K \times \text{Sqrt}((P_{std} - P) \times dP \times (T_{std}/(T+460)))$

Q: vapor flowrate (SCFM)

K: pipe constant

dP: manometer differential pressure (in w.c.)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

M_g = 128 mg/mg-mole

K_g = 24.07 dsm³/10⁶ gm -mole

K_{6-inch} = 93 (SVE Field #1)

K_{4-inch} = 42 (SVE Field #2)

**Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
SVE Stack**

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Vapor Velocity (V) (ft/min)	Absolute Pressure (" Hg)	Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
10/28/97	14:15				29.92	520					
10/29/97	8:20	2	38	4776	29.92	588	2330	0.202	42.1	1.9	AS/SVE Fields 1&2
10/30/97	10:10	9	148	4026	29.92	606	1906	0.787	134.3	26.9	AS/SVE Fields 1&2
10/30/97	13:49	10	139	3730	29.92	520	2058	0.739	136.1	31.5	AS/SVE Fields 1&2
11/04/97	11:10	15	76.2	4093	29.92	522	2250	0.405	81.6	55.0	AS/SVE Fields 1&2
11/05/97	17:30	31	123	4659	29.92	541	2471	0.654	144.6	130.4	AS/SVE Fields 1&2
11/06/97	14:25	49	73	4218	29.92	532	2274	0.388	79.0	214.7	AS/SVE Fields 3&4
11/09/97	8:30	115	77	4802	29.92	522	2637	0.409	96.6	456.6	AS/SVE Fields 3&4
11/11/97	9:00	164	59.9	4837	29.92	530	2618	0.319	74.6	629.6	AS/SVE Fields 3&4
11/11/97	10:20	165	84.3	4697	29.92	532	2533	0.448	101.6	634.5	AS/SVE Fields 1&2
11/14/97	14:30	232	103.4	5286	29.92	536	2831	0.550	139.3	970.8	AS/SVE Fields 1&2
11/15/97	8:30	249	63.7	4882	29.92	524	2672	0.339	81.0	1048.9	AS/SVE Fields 1&2
11/16/97	14:00	278	59.9	4597	29.92	527	2504	0.319	71.4	1140.9	AS/SVE Fields 3&4
11/28/97	14:30	400	90.8	5900	29.92	546	3104	0.483	134.2	1663.3	AS/SVE Fields 1&2
12/01/97	9:30	467	46.7	4700	29.92	534	2526	0.248	56.1	1929.0	AS/SVE Fields 3&4
12/17/97	9:00	736		4100	29.92	534	2206			2243.6	AS/SVE Fields 3&4
12/18/97	9:15	760	13.2	1700	29.92	526	928	0.070	5.8	2246.5	AS/SVE Fields 1&2
01/05/98	15:00	1192		3700	29.92	544	1953			2299.0	AS/SVE Fields 1&2
01/06/98	15:10	1215	5.3	3300	29.92	549	1726	0.028	4.4	2301.1	AS/SVE Fields 3&4
01/12/98	13:00	1357		5800	29.92	538	3095			2314.0	AS/SVE Fields 1&2
01/12/98	14:00	1358		5500	29.92	537	2941			2314.0	AS/SVE Fields 3&4
01/21/98	14:00	1572		5100	29.92	529	2768			2314.0	AS/SVE Fields 3&4
01/26/98	13:00	1612		5400	29.92	536	2893			2314.0	AS/SVE Fields 3&4
02/02/98	17:00	1679		4500	29.92	539	2397			2314.0	AS/SVE Fields 3&4
02/11/98	14:00	1845		4500	29.92	543	2379			2314.0	AS/SVE Fields 3&4
02/20/98	8:30	1911	0.1	2200	29.92	542	1165	0.001	0.1	2314.1	AS/SVE Fields 3&4
02/24/98	11:00	1987	1	6000	29.92	539	3196	0.005	1.5	2316.6	AS/SVE Fields 3&4
03/03/98	9:00	2144		4500	29.92	528	2447			2321.5	AS/SVE Fields 3&4
03/15/98	7:30	2407	20.4	2600	29.92	544	1372	0.108	13.3	2394.5	AS/SVE Fields 3&4
03/26/98	9:45	2488		1700	29.92	549	889			2417.0	AS/SVE Fields 3&4
04/10/98	15:30	2689	2.1	2100	29.92	541	1114	0.011	1.1	2421.7	AS/SVE Fields 1&2
04/13/98	13:45	2760	6.6	1400	29.92	548	734	0.035	2.3	2430.1	AS/SVE Fields 1&2
04/23/98	10:15	2996	2.5	2100	29.92	522	1155	0.013	1.4	2448.2	Stack vel est., AS/SVE Fields 1&2
04/29/98	12:20	3142	11	2100	29.92	544	1108	0.058	5.8	2470.0	AS/SVE Fields 1&2
06/29/98	10:00	3885	11	700	29.92	563	357	0.058	1.9	2588.7	
06/29/98	12:30	3888	13	400	29.92	557	206	0.069	1.3	2588.9	
07/09/98	11:15	4127	30	700	29.92	556	361	0.160	5.2	2621.0	
07/09/98	15:45	4132	21	600	29.92	568	303	0.112	3.0	2621.8	
07/13/98	9:45	4221	16	1300	29.92	556	671	0.085	5.1	2636.9	
07/13/98	12:30	4223	14	1000	29.92	557	515	0.074	3.4	2637.3	
07/22/98	9:30	4217	14	1400	29.92	556	723	0.074	4.8	2636.3	
07/22/98	12:00	4220	10	1200	29.92	558	617	0.053	2.9	2636.7	#3&4, Meter data given not cumulative
08/03/98	11:15	4505	10	1600	29.92	550	835	0.053	4.0	2677.8	#1&2, Meter data given not cumulative
08/03/98	13:45	4508	7	1500	29.92	549	784	0.037	2.6	2678.2	#3&4
08/21/98	12:30	4745	5	1000	29.92	560	513	0.027	1.2	2697.1	#1&2
08/21/98	16:45	4749	7	1100	29.92	555	569	0.037	1.9	2697.4	#3&4

Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
SVE Stack

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Vapor Velocity (V) (ft/min)	Absolute Pressure (^o Hg)	Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
09/03/98	9:00	4839	8	1000	29.92	554	518	0.043	2.0	2704.7	#3&4
09/03/98	13:30	4842	10	1100	29.92	556	568	0.053	2.7	2704.9	#1&2
09/12/98	7:30	4909	17	2400	29.92	541	1274	0.090	10.3	2723.1	#1&2
09/12/98	10:45	4912	19	1400	29.92	549	732	0.101	6.6	2724.2	#3&4
09/16/98	12:40	4935	11	900	29.92	560	461	0.058	2.4	2728.5	#1&2
09/16/98	15:10	4937	8	1200	29.92	556	620	0.043	2.4	2728.7	#3&4
09/24/98	11:00	5155		6000	29.92	548	3144			2739.4	#3&4
09/24/98					29.92	460				2739.4	Field # 1&2 in repair for water in line
10/07/98	10:44	5279		5600	29.92	550	2923			2739.4	#3&4
10/07/98					29.92	460				2739.4	Field # 1&2 in repair for water in line
10/14/98	8:50	5351		5500	29.92	542	2914			2739.4	#3&4, water in lines
10/14/98					29.92	460				2739.4	Field # 1&2 in repair for water in line
10/21/98	8:45	5472		5800	29.92	531	3136			2739.4	#3&4
10/21/98	14:05	5477		5400	29.92	541	2866			2739.4	#1&2
10/22/98	9:05	5496		5600	29.92	530	3034			2739.4	#1 Offline
10/27/98	8:21	5617	38	5800	29.92	537	3101	0.202	56.1	2880.8	#1&2
10/27/98	13:00	5621	18.5	5800	29.92	540	3084	0.098	27.2	2887.7	#3&4
11/14/98	7:42	5814	78	5200	29.92	530	2817	0.415	104.6	3417.4	#1&2
11/14/98	9:21	5815	57	4900	29.92	531	2649	0.303	71.9	3421.1	#3&4
11/19/98	10:15	5931		6100	29.92	536	3268			3594.8	Field # 1&2
11/19/98	14:00	5935		6100	29.92	538	3255			3594.8	Field # 3&4
12/05/98	14:00	6319		6100	29.92	538	3255			3594.8	Data Interpolation
12/31/98	14:00	6391		6100	29.92	538	3255			3594.8	Data Interpolation
01/07/99	9:40	6478	14	5400	29.92	522	2970	0.074	19.8	3630.6	Field # 1&2
01/07/99	13:05	6481	17	5400	29.92	529	2931	0.090	23.7	3633.4	Field # 3&4
01/12/99	9:10	6593	15	5000	29.92	528	2719	0.080	19.4	3734.0	Field # 1&2
01/12/99	13:15	6597	10	5000	29.92	530	2709	0.053	12.9	3736.7	Field # 3&4
01/21/99	10:05	6810	21	6100	29.92	531	3298	0.112	33.0	3940.2	Field # 1&2
01/21/99	13:00	6816	23	6000	29.92	537	3208	0.122	35.1	3948.7	Field # 3&4
01/26/99	8:35	6929	27	6000	29.92	520	3313	0.144	42.6	4131.6	Field #1&2
01/26/99	12:05	6932	9.5	6000	29.92	524	3288	0.051	14.9	4135.2	Field # 3&4
02/05/99	9:30	7172		600	29.92	542	318			4209.5	No FID data for this event
02/12/99	15:00	7337		1200	29.92	545	632			4209.5	
02/17/99	13:00	7446		2200	29.92	554	1140			4209.5	
02/22/99	9:45	7561	7.3	1900	29.92	520	1049	0.039	3.6	4218.2	

Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - BM-820
SVE Stack

Date	Time	SVE Valve Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Vapor Velocity (V) (ft/min)	Absolute Pressure (" Hg)	Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
03/03/99	10:00	7666	22	2000	29.92	545	1054	0.117	11.0	4250.3	
03/12/99	8:30	7878	9	4300	30.92	522	2365	0.048	10.1	4343.8	
03/17/99	13:00	8002	23	4700	31.92	562	2401	0.122	26.3	4437.9	
03/29/99	11:00	8186	36	5900	32.92	553	3063	0.191	52.5	4739.8	
04/08/99	12:00	8403	22	5700	33.92	556	2943	0.117	30.8	5116.4	
04/15/99	9:00	8569	6	5700	34.92	550	2976	0.032	8.5	5252.4	
04/21/99	8:00	8712	5	5200	35.92	527	2833	0.027	6.7	5297.8	
Average			22.2	3658.8	30.2	538	1951	0.118	23.9		

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas (1 in methane)

TH: total hydrocarbons calculated as gasoline (GRO)

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

at 68 degrees F (from Perry's handbook)

* Estimated value due to malfunctioning instrument

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

B = 0.003 from Perry's Chemical Handbook

A = 0.545 sq. ft

percent water vapor by volume 0.003

SVE Stack pipe diameter 10

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 3

Date : May 14, 1999

Contract Number : N62470-97-D-5000

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 11

OHM Project No. : 20704

(Building 1613, MCB Camp LeJuene, NC)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

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Project Manager: Dunn, James A Norcross, GA
Contract Admin.: Hussey, Julia Virginia Beach, V
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MONTHLY PROGRESS REPORT - SHORT FORM

Contract No. N62470-97-D-5000 Delivery Order No. 0011 Report Dates: Apr. 1, 1999 To Apr. 30, 1999

Project Name: Building 1613 SVE/Air Sparge Project Location: MCB Camp Lejeune, N.C.

Project No.: 20704 Project Manager: James A. Dunn, Jr., P.E.

Project Description: Installation of Air Sparge/SVE systems at Building 1613 to remediate petroleum contaminated soils and groundwater and operation and maintenance of the system for six months.

SHORT FORM STATUS

<input checked="" type="checkbox"/> Pre-Construction	<input type="checkbox"/> Post-Construction
<input checked="" type="checkbox"/> Site Walk (Date: 00/00/00)	<input type="checkbox"/> Demobilization (Date: 00/00/00)
<input checked="" type="checkbox"/> Design Review	<input type="checkbox"/> Post Con. Submittal (Due: 00/00/00)
<input checked="" type="checkbox"/> Cost Proposal (Submittal Date: 06/03/98)	<input checked="" type="checkbox"/> O&M (Completion Date: 05/26/99)

*Notes Attached

<input type="checkbox"/> Dormant		
_____ Awaiting T&D	_____ Technical Review	<u>Modification Number Pending:</u>
_____ Regulatory Issue(s)	_____ Submittal Review	Date submitted: (00/00/00)
_____ Analytical	_____ Postponement	Amount: \$

Significant Activities Performed/Associated With Item(s) Above: Normal operation and maintenance of the system. During April 1999, removed an estimated total of 482lbs of hydrocarbons from the site bringing the total to date to 24,590lbs.

Schedule Information (updates and variances): Sufficient funds exist within the delivery order to extend the O & M of the system for an additional six months.

Financial Information:	Current D.O. Ceiling (w/o fee):	\$	\$ 307,128.00
	Total \$ to Date (w/o fee)	\$	228,834.00
	Estimated Report Period \$:	\$	8,430.00
	Forecast @ Completion:	\$	\$ 240,336.00

Other Information: The current Hydrocarbon Recovery and Discharge reports are attached.

Approved by:


John P. Franz, P.E.
Program Manager

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Building 1613
AS/SVE Field 1**

Date	Time	SVE Blower Hour Meter (Hrs)	Flow Velocity (ft/min)	Temperature (Rankine)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
11/16/98	11:30	3087	2900	530	230	3.32	68.55		
11/17/98	9:45	3093	2900	530	230	12.12	250.07	39.83	
11/20/98	10:30	3166	2900	530	230	12.12	250.07	800.46	
12/01/98	11:30	3427	2900	532	225	2.90	58.57	2478.71	
12/11/98	11:00	3662	2900	520	231	7.81	161.22	3554.79	
12/15/98	10:35	3757	2900	519	231	5.17	106.88	4085.42	
12/22/98	12:20	3927	2900	537	223	9.87	197.25	5162.56	
01/08/99	15:50	3982	2100	527	165	13.32	196.44	5613.66	
01/11/99	13:50	4052	2100	522	163	4.76	69.62	6001.67	
01/20/99	14:35	4227	2500	522	194	4.67	81.31	6551.92	
01/29/99	14:45	4444	3000	526	227	2.28	46.25	7128.60	
02/05/99	17:06	4498	3300	525	255	130.21	2972.65	10524.87	
02/11/99	15:30	4640	3700	531	285	1.34	34.16	19420.02	
02/18/99	14:10	4807	3300	531	247	2.89	63.94	19761.33	
02/26/99	10:00	4995	5400	519	414	3.77	139.78	20559.24	
03/05/99	11:00	5162	4000	522	305	6.04	164.80	21618.93	
03/08/99	14:00	5239	3900	522	309	2.99	82.63	22015.85	
03/18/99	8:30	5473	3300	527	249	3.06	68.23	22751.28	
03/25/99	16:04	5640	2700	532	205	8.52	156.53	23533.25	
03/31/99	12:00	5784	3500	534	264	1.49	35.33	24108.85	
04/06/99	11:30	5930	2400	533	184	0.99	16.25	24265.73	
04/13/99	13:00	6020	2900	538	223	1.32	26.47	24345.83	
04/20/99	11:00	6192	3300	532	256	0.48	11.10	24480.47	
04/30/99	11:30	6433	3100	528	243	0.49	10.77	24590.28	

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

V: vapor velocity (ft/min)

B: percent water vapor in flowstream, calculation assumes saturated water stream or B = 0.

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

K_{4,inch} = 42 (SVE Field 1)

**Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Building 1613
SVE Stack**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc	Vapor Velocity	Absolute	Calculated Vapor	TH Conc (C)	TH Discharge	Cumulative Mass	Comments
			(PPM _{measured}) (PPMv)	(V) (ft/min)	Temperature (degrees Rankine)	Flowrate (Q) (SCFM)	(C) (mg/l)	Rate (M) (lb/day)	of Hydrocarbons Discharged (lbs)	
11/16/98	11:30	3087	1130	5000	550	418	6.01	224.61		
11/17/98	9:45	3093	1130	5000	550	418	6.01	224.69	56.16	
11/20/98	10:30	3166	2350	5000	550	418	12.50	467.28	1108.53	
12/01/98	11:30	3427	2672	3300	551	275	14.21	350.02	5552.62	
12/11/98	11:00	3662	1700	3100	543	262	9.04	212.28	8305.57	
12/15/98	10:35	3757	1833	3100	541	263	9.75	229.73	9180.40	BOD - Received on 12/15/98
12/22/98	12:20	3927	2193	3500	551	292	11.66	304.69	11073.15	
01/08/99	15:05	3982	2635	3400	540	289	14.01	362.88	11838.07	
01/11/99	13:50	4052	1032	3100	540	264	5.49	129.58	12556.25	
01/20/99	14:35	4227	594.5	4000	542	339	3.16	95.96	13378.56	
01/29/99	14:45	4444	402	3300	556	273	2.14	52.19	14048.33	
02/05/99	17:06	4498	20716	2400	542	203	110.16	2006.40	16364.24	
02/11/99	15:30	4640	232	2700	559	222	1.23	24.53	22372.43	
02/18/99	14:10	4807	682	2200	556	182	3.63	59.02	22663.13	
02/26/99	10:00	4995	840	1600	539	136	4.47	54.54	23107.92	
03/05/99	11:00	5162	1008	2500	547	210	5.36	100.77	23648.26	
03/08/99	14:00	5239	778	2500	548	210	4.14	77.63	23934.44	
03/18/99	8:30	5473	704	2700	555	224	3.74	74.91	24678.08	
03/25/99	16:04	5640	1592	2500	552	208	8.47	157.70	25487.39	
03/31/99	12:00	5784	367	2600	560	213	1.95	37.27	26072.31	
04/06/99	11:30	5930	188	3000	558	247	1.00	22.11	26252.92	
04/13/99	13:00	6020	303	3000	561	246	1.61	35.44	26360.82	
04/20/99	11:00	6192	119	2400	553	199	0.63	11.30	26528.29	
04/30/99	11:30	6433	108	2600	535	223	0.57	11.48	26642.65	

Notes:

$C = (PPM_{measured}) \times K \times (M_p/K_p) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream, calculation assumes saturated water stream or B = 0.

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

at 68 degrees F (from Perry's handbook)

* Estimated value due to malfunctioning instrument

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

B = 0.003 from Perry's Chemical Handbook

A = 0.0873 sq. ft

percent water vapor by volume 0.003
SVE Stack pipe diameter 4

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 3

Date : May 14, 1999

Contract Number : N62470-97-D-5000

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 14

OHM Project No. : 20764

(Hadnot Point Fuel Farm, Bldg. 1115, MCB, Camp Lejeune)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

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Maribeth

One Copy to:
Activity Point of Contact Hall,
Nikki

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Norfolk, VA 23508-1297

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1005 Michael Road
Camp Lejeune, NC 28547-2521

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

Building 58: AC/S EMD/IR
PSC Box 20004, MCB
Camp Lejeune, NC 28542-0004

6500 Hampton Blvd., Code 0531
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Norfolk, VA 23508-1297

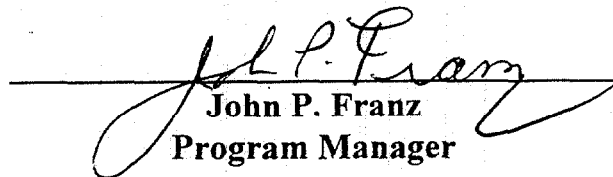
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Contract Admin.: Hussey, Julia Virginia Beach, V
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**MONTHLY PROGRESS REPORT
CONTRACT N62470-97-D-5000
DELIVERY ORDER 0014
OHM Project 920764
April 30, 1999**

**CONSTRUCTION AND OPERATION OF BIOSPARGING, AIR SPARGING,
AND SOIL VAPOR EXTRACTION SYSTEMS
WITH AGGRESSIVE FLUID VAPOR RECOVERY
AT HADNOT POINT FUEL FARM/BUILDING 1115
MCB CAMP LEJEUNE, NORTH CAROLINA
Project Manager: Jim Dunn**

Approved by:


John P. Franz
Program Manager

1.0 INTRODUCTION

This Monthly Progress Report has been prepared to summarize the activities performed from March 1, 1999 to March 31, 1999, as well as a summary of the work planned for the month of April 1999 by OHM Remediation Services Corp., (OHM), on Delivery Order 0014 of the Navy-LANTDIV RAC Contract N62470-97-D-5000. This delivery order was signed on June 30, 1998.

The remediation effort consists of:

1. Preparation of Work Plans including detailed drawings, HASP, FSP, T & D, and EPP plans.
2. Installation of a biosparging, air sparging and soil vapor extraction (SVE) systems at the Hadnot Point Fuel Farm/Building 1115 to remediate TPH contaminated soils.
3. Provision of aggressive fluid vapor recovery (AFVR) services to remove free product, if encountered.
4. Installation and hook-up of recovery wells and re-commissioning of the water treatment system at Hadnot Point Fuel Farm.
5. Operation and maintenance of the systems for a period of six months.

All work is to be performed in accordance with the Statement of Work Design dated May 14, 1998 and the proposed Corrective Action Plan prepared by Catlin & Assoc. forwarded with the Request for Proposals dated May 18, 1998, OHM's proposal dated June 17, 1998 and revisions dated June 22, 1998. The total current value of this delivery order including modifications is \$1,483,522.00 exclusive of fee.

2.0 WORK ACCOMPLISHED

During the month of April 1999, OHM has performed the following:

1. Continued site restoration activities at both sites. At month end, paving restoration was underway.
2. Received BOD for both sites.
3. Continued AFVR events in wells where warranted.
4. Continued to fine tune all systems.
5. Operated and maintained the northwest system removing a total of 292 lbs. of hydrocarbons for the month. The southeast system removed a total of 2,398 lbs. of hydrocarbons for the month.

3.0 WORK PLANNED

During the month of May 1999, OHM is scheduled to perform the following:

1. Complete site restoration activities.
2. Continue to operate and maintain both systems.

4.0 PROBLEMS AND SOLUTIONS

During the month no new problems arose; all previous issues have been resolved.

5.0 COST/SCHEDULE SUMMARY

Cost Summary:

The following is a summary of the costs associated with this delivery order. A detailed performance report is attached.

D.O. ceiling amount (without fee)	\$1,483,522.00
Approximate cost through April 1999	\$1,317,854.00
Approximate cost for April 1999	\$ 54,939.00
Remaining funds	\$ 165,668.00
Estimated cost to complete	\$ 100,386.00
Current period estimate at complete	\$1,418,239.00
Prior period estimate at complete	\$1,404,968.00
Physical % complete	88.82%
Financial % complete	88.63%

Apparent cost savings are due to lower costs of plans preparation than estimated and re-use of equipment from STT-69. Application of cost savings to fund additional months of O & M will occur after the August 1999 six-month contractual period.

Schedule Summary:

Original contract completion date	07/22/99
Current contract completion date	07/22/99
Prior period schedule construction completion date	02/26/99
Current period schedule construction completion date	02/26/99
Prior period O & M completion date	12/31/99
Current period O & M completion date	12/31/99

A current schedule is attached to this report.

6.0 NON-COMPLIANCE CHECKOFF LIST

No non-compliance issues have been associated with this delivery order.

7.0 WASTE MATERIALS TRACKING

No waste materials were generated during the month.

8.0 GOVERNMENT MATERIALS TRACKING

No government owned materials have been utilized on this delivery order.

9.0 MODIFICATION LOG

No modifications have been issued under this delivery order at this time.

10.0 WORK DIRECTIVE LOG

The current work directive log is attached.

11.0 ATTACHMENTS

Performance Report (1 page)

Current Schedule (2 pages)

Work Directive Log (1 page)

Hydrocarbon Summary Report (5 page)

Remedial Action E 115, Camp Lejeune

PERFORM REPORT
ACTUAL DOLLARS AS OF 04/30/99

NOTE: ALL DOLLARS INCLUDE MARK-UPS; AWARD FEE IS NOT INCLUDED

BOLD OVERRIDE AUTOMATIC CALCULATION

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
WBS CODE	DESCRIPTION	CURRENT BUDGETED QUANTITY	QUANTITY REVISIONS/ADJUSTMENTS	PROJECTED QUANTITY AT COMPLETION (C+D)	TASK UNIT	INSTALLED QUANTITY	TASK PERCENT COMPLETE (G/E)	CURRENT BUDGETED DOLLARS	DOLLAR REVISIONS/ADJUSTMENTS (DxO)	PROJECTED BUDGETED DOLLARS (I+J)	EARNED DOLLARS (HxK)	ACTUAL DOLLARS TO DATE	CPI (M/L)	BUDGETED COST/UNIT (O/C)	ACTUAL COST/UNIT TO DATE (M/G)	ETC BASED ON ACTUAL COSTS TO DATE (See note Q)	FORECAST (BUDGET IF LESS THAN 15% COMPLETE) (M+O)	VARIANCE FROM CURRENT BUDGET (R-I)	PERCENT OF TOTAL PROJECT (K/TOTAL K)	PHYSICAL PERCENT COMPLETE (HxT)
10000000	O & M Manual / As-Built	100	0	100	%	60	60.0%	11,138	0	11,138	6,683	15,840	2.37	111.38	264.00	5,000	20,840	9,702	0.75%	0.45%
20000000	Work Plans	100	0	100	%	100	100.0%	15,109	0	15,109	15,109	21,055	1.39	151.09	210.55	0	21,055	5,946	1.02%	1.02%
21000000	Drawings & Specs	100	0	100	%	100	100.0%	16,682	0	16,682	16,682	3,810	0.23	166.82	38.10	0	3,810	(12,872)	1.12%	1.12%
22000000	Const Sched	100	0	100	%	90	90.0%	3,219	0	3,219	2,897	0	0.00	32.19	0.00	300	300	(2,919)	0.22%	0.20%
23000000	Initial Procurement	100	0	100	%	90	90.0%	9,853	0	9,853	9,867	12,181	1.37	98.53	135.39	300	12,481	2,629	0.66%	0.60%
24000000	Mob / Demob	100	0	100	%	90	90.0%	37,826	0	37,826	34,044	46,051	1.35	378.26	511.68	2,000	46,051	10,225	2.55%	2.29%
25000000	NW Site Prep	100	0	100	%	100	100.0%	7,075	0	7,075	4,983	4,983	0.70	70.75	49.83	0	4,983	(2,092)	0.48%	0.48%
26000000	Rehab Hydrol WWTP	100	0	100	%	90	90.0%	12,879	0	12,879	11,591	7,279	0.63	128.79	80.87	3,000	10,279	(2,601)	0.87%	0.78%
30000000	NW Install Air Sparge Wells	100	0	100	%	100	100.0%	8,244	0	8,244	8,244	12,890	1.56	82.44	128.90	0	12,890	4,646	0.56%	0.56%
30100000	NW Install Bio Sparge Wells	100	0	100	%	100	100.0%	36,364	0	36,364	36,364	29,712	0.81	363.64	297.12	0	29,712	(6,652)	2.46%	2.46%
30200000	NW Bio Sparge Pilot Test	100	0	100	%	100	100.0%	4,785	0	4,785	19,904	4,785	4.15	47.85	199.04	0	19,904	15,118	0.32%	0.32%
31000000	NW SVE Horiz Well / Trench	100	0	100	%	100	100.0%	96,389	0	96,389	96,389	43,252	0.45	963.89	432.52	0	43,252	(53,138)	6.50%	6.80%
33000000	NW Bio/SVE/Air Sparge WH	100	0	100	%	100	100.0%	27,714	0	27,714	27,714	15,986	0.58	277.14	159.86	0	15,986	(11,728)	1.87%	1.87%
34000000	NW Remed Sys Install	100	0	100	%	100	100.0%	137,684	0	137,684	137,684	97,684	0.71	1,376.84	976.84	0	97,684	(40,000)	9.28%	9.28%
36000000	NW Site Restoration	100	0	100	%	95	95.0%	6,271	0	6,271	5,957	22,566	3.79	62.71	237.53	1,500	24,066	17,795	0.42%	0.40%
37000000	NW Sys Startup / Opt	100	0	100	%	100	100.0%	7,890	0	7,890	7,890	11,210	1.42	78.90	112.10	0	11,210	3,338	0.53%	0.53%
40000000	System O & M	100	0	100	%	33	33.0%	10,162	0	10,162	3,354	13,300	3.97	101.62	403.02	30,000	43,300	33,137	0.69%	0.23%
55000000	SE Site Prep	100	0	100	%	100	100.0%	7,453	0	7,453	7,453	6,290	0.84	74.53	62.90	0	6,290	(1,163)	0.60%	0.60%
60000000	SE Install Air Sparge Wells	100	0	100	%	100	100.0%	48,961	0	48,961	48,961	39,913	0.82	489.61	399.13	0	39,913	(9,047)	3.30%	3.30%
60100000	SE Install Bio Sparge Wells	100	0	100	%	100	100.0%	29,729	0	29,729	29,729	30,838	1.04	297.29	308.38	0	30,838	1,109	2.00%	2.00%
61000000	SE SVE Horiz Well / Trench	100	0	100	%	100	100.0%	220,958	0	220,958	220,958	313,466	1.42	2,209.58	3,134.66	0	313,466	92,508	14.89%	14.89%
63000000	SE Bio/SVE/Air Sparge WH	100	0	100	%	100	100.0%	74,296	0	74,296	74,296	67,968	0.91	742.96	679.68	0	67,968	(6,328)	6.01%	6.01%
64000000	SE Remed Sys Install	100	0	100	%	90	90.0%	206,879	0	206,879	186,191	190,443	1.02	2,068.79	2,116.03	0	190,443	(16,436)	13.95%	12.85%
66000000	SE Site Restoration	100	0	100	%	50	50.0%	5,969	0	5,969	2,984	28,828	9.66	59.69	576.55	5,000	33,828	27,852	0.40%	0.20%
67000000	SE System Startup / Opt	100	0	100	%	100	100.0%	11,656	0	11,656	11,656	17,905	1.54	116.56	179.05	0	17,905	6,249	0.79%	0.79%
70000000	AFVR	100	0	100	%	90	90.0%	42,035	0	42,035	37,832	52,779	1.40	420.35	586.43	14,000	66,779	24,744	2.83%	2.55%
80000000	Sampling & Analysis	100	0	100	%	33	33.0%	62,632	0	62,632	20,668	21,814	0.00	626.32	651.93	30,000	91,814	(11,118)	4.22%	1.38%
90000000	Fuel	100	0	100	%	75	75.0%	0	0	0	0	6,364	N/A	0.00	64.85	1,500	7,864	7,864	0.00%	0.00%
93000100	Admin & Support	100	0	100	%	75	75.0%	185,430	0	185,430	139,073	93,922	0.66	1,854.30	1,252.29	10,000	103,922	(81,509)	12.50%	9.37%
93400100	Per Diem	100	0	100	%	75	75.0%	127,073	0	127,073	95,305	63,682	0.67	1,270.73	847.76	2,000	65,682	(61,492)	6.57%	6.42%
35000000	Transport & Disposal	100	0	100	%	100	100.0%	10,977	0	10,977	10,977	2,119	0.19	109.77	21.19	0	2,119	(8,859)	0.74%	0.74%
TOTAL PROJECT COSTS								1,483,522	0	1,483,522	1,317,501	1,317,854	1.00			100,386	1,418,239	(65,283)	100.00%	88.82%

NOTES: Note Q: Calculation of ETC is " $Q=IF(G25=0,K25-M25,IF(H25>0.15,(E25-G25)*P25,IF(M25<K25,K25-M25,(E25-G25)*P25))$ "

1) FINANCIAL PERCENT COMPLETE (M/I) 88.83%

2) (of Current Budgeted Dollars)

3)

4)

5)

VARIANCE ANALYSIS:

1)

2)

3)

4)

5)

6)

7)

8)

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	1998			1999								
						OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Pre-Award Activities																	
10	Proposal Preparation	0	0		17JUN98A												
20	Negotiation & Award	9	0	18JUN98A	30JUN98A												
Premobilization Activities																	
30	Plans Preparation	30	0	01JUL98A	07AUG98A												
35	Plans Review	15	0	10AUG98A	02SEP98A												
40	Initial Procurement	45	0	10AUG98A	15JAN99A	[Solid black bar from 10AUG98A to 15JAN99A]											
25	Plans Revision	10	0	02SEP98A	03SEP98A												
45	Precontract Conference	1	0	09SEP98A	09SEP98A												
Mobilization / Site Set-up																	
50	Mobilization	1	0	10SEP98A	10SEP98A												
55	Site Set-up	1	0	11SEP98A	11SEP98A												
Northwest Site																	
130	Bio Test Well Installation	2	0	14SEP98A	15SEP98A												
132	Bio Test	5	0	21SEP98A	25SEP98A												
134	Air Sparge Well Installation NW	3	0	22SEP98A	24SEP98A												
100	Site Preparation NW	5	0	24SEP98A	25SEP98A												
160	Piping NW	18	0	26SEP98A	06NOV98A	[Solid black bar from 26SEP98A to 06NOV98A]											
135	SVE Horizontal Well NW	14	0	28SEP98A	10OCT98A												
164	SVE / AS Wellheads NW	5	0	28SEP98A	10OCT98A												
138	Jack & Bore Crossings NW & SE	8	0	19OCT98A	26OCT98A												
131	Bio Sparge Well Installation NW	8	0	26OCT98A	06NOV98A												
162	Bio Wellheads NW	6	0	09NOV98A	04DEC98A												
170	Remediation System Installation NW	5	0	07DEC98A	11DEC98A												
180	Site Restoration NW	2	0	14DEC98A	15DEC98A												

Project Start 01JUN98
 Project Finish 31AUG99
 Data Date 30APR99
 Run Date 07MAY99

[White bar] Early Bar
 [Black bar] Target Bar
 [Grey bar] Progress Bar
 [Thick black bar] Critical Activity

0499

Sheet 1 of 2

OHM Remediation Services Corp
Hannot Point Fuel Farm (20764)
Project 20764 (DO 014)

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Hadnot Point Fuel Farm, North West
AS/SVE Field 1**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
02/11/99								System Start-Up
02/15/99	14:00							System down with full tank
02/16/99	10:00							System down with full tank
02/17/99	13:30	94						System down for compressor
02/18/99	10:30	115						System daily ops. Check
02/19/99	13:00	141	1038		5.52		2.99	
02/22/99	15:15	215	2420	123	12.87	141.99	31.34	Water in Header Line
03/05/99	8:00	411	1675	556	8.91	443.44	120.26	
03/11/99	9:30	558	960	290	5.11	132.70	163.17	
03/18/99	11:00	725	653		3.47		193.02	Water in Header Line
03/25/99	14:45	886	1448	91	7.70	62.68	230.49	
04/01/99	10:00	929	1416	55	7.53	37.02	244.14	
04/06/99	13:00	1027	548	130	2.91	33.89	265.46	
04/13/99	15:00	1190	201	49	1.07	4.69	278.98	
04/20/99	14:00	1364	121		0.64		285.19	Water in Header Line
04/30/99	14:30	1603	132		0.70		291.89	Water in Header Line

Notes:

$$C = (\text{PPM}_{\text{measured}}) \times K \times (M_g/K_g) / 1000$$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$$Q = (1-B) \times V \times A \times (P/P_{\text{std}}) \times (T_{\text{std}}/T)$$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$$M = Q \times C \times 0.0895$$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

K_{4-inch} = 42 (SVE Field 1)

**Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Hadnot Point Fuel Farm, North West
SVE Stack**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Vapor Velocity (V) (ft/min)	Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
02/11/99										
02/15/99	14:00									
02/16/99	10:00									
02/17/99	13:30	94								
02/18/99	10:30	115								
02/19/99	13:00	141	269	300	531	26	1.43	3.30	1.79	
02/22/99	15:15	215	327	1300	528	112	1.74	17.44	33.75	
03/05/99	8:00	411	371	3000	536	255	1.97	44.97	288.58	
03/11/99	9:30	558	233	5500	549	456	1.24	50.60	581.28	
03/18/99	11:00	725	140	5300	571	381	0.74	25.42	845.78	
03/25/99	14:45	886	427	6500	566	523	2.27	106.20	1287.26	
04/01/99	10:00	929	168	4700	570	375	0.89	30.00	1409.27	
04/06/99	13:00	1027	88	5600	570	447	0.47	18.72	1508.75	
04/13/99	15:00	1190	51	6600	569	528	0.27	12.81	1615.84	
04/20/99	14:00	1364	35	2800	555	230	0.19	3.82	1676.15	
04/30/99	14:30	1603	38	2900	542	243	0.20	4.40	1717.12	

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

percent water vapor by volume 0.003

SVE Stack pipe diameter 4

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

at 68 degrees F (from Perry's handbook)

* Estimated value due to malfunctioning instrument

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

B = 0.003 from Perry's Chemical Handbook

A = 0.0873 sq. ft

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Hadnot Point Fuel Farm, South East
AS/SVE Field #1 (Motor Pool)**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
03/29/99								System Start-Up
03/30/99	7:30							Start-Up, Troubleshoot electrical problems
04/01/99	10:30	213	16138	39	85.82	298.49	380.82	
04/02/99	10:00	236	7242	683	38.51	2352.95	440.40	
04/09/99	8:00	304	26110	185	138.85	2298.73	691.66	
04/16/99	9:30	402	24803	201	131.90	2369.64	1244.43	
04/23/99	8:30	485	4644	465	24.70	1028.81	1515.21	
05/01/99	8:30	586	4532	520	24.10	1121.39	1617.88	

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

A = 0.196 sq.ft

**Cumulative Mass of Recovered Volatile Hydrocarbons
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Hadnot Point Fuel Farm, South East
AS/SVE Field #2 (Fuel Farm)**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Calculated Vapor Flowrate (Q) (pitot tube) (SCFM)	TH Conc (C) (mg/l)	TH Recovery Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Recovered (lbs)	Comments
03/29/99								System Start-Up
03/30/99	7:30							Start-Up, Troubleshoot electrical problems
04/01/99	10:30	213	21030	629	111.83	6292.71	496.26	
04/02/99	10:00	236	6088	183	32.37	530.22	565.36	
04/09/99	8:00	304	2887	111	15.35	152.07	632.98	
04/16/99	9:30	402	2539	107	13.50	129.58	691.89	
04/23/99	8:30	485	2043	1044	10.86	1015.00	734.02	
05/01/99	8:30	586	2168	995	11.53	1026.69	731.14	

Notes:

$$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$$

C: vapor concentration (mg/l)

PPM_{measured}: FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

$$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: gauge pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

* = Estimated value

$$M = Q \times C \times 0.0895$$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

A = 0.349 sq.ft

**Cumulative Mass of Volatile Hydrocarbons Discharged
Air Sparging (AS) / Soil Vapor Extraction (SVE) System
MCB CAMP LEJEUNE - Hadnot Point Fuel Farm, South East
SVE Stack**

Date	Time	SVE Blower Hour Meter (Hrs)	TH Conc (PPM _{measured}) (PPMv)	Vapor Velocity (V) (ft/min)	Absolute Temperature (degrees Rankine)	Calculated Vapor Flowrate (Q) (SCFM)	TH Conc (C) (mg/l)	TH Discharge Rate (M) (lb/day)	Cumulative Mass of Hydrocarbons Discharged (lbs)	Comments
03/29/99										
03/30/99	7:30									
04/01/99	10:30	213	6776	1300	544	439	36.03	1414.52	6276.93	
04/02/99	10:00	236	5654	6600	567	2136	30.07	5749.20	9709.55	
04/09/99	8:00	304	17907	6300	567	2039	95.23	17380.86	42477.14	
04/16/99	9:30	402	13147	6200	569	2000	69.91	12514.03	103512.55	
04/23/99	8:30	485	4555	600	544	203	24.22	439.42	125911.21	
05/01/99	8:30	586	4816	700	522	246	25.61	564.87	128024.40	

Notes:

$C = (PPM_{measured}) \times K \times (M_g/K_g) / 1000$

C: vapor concentration (mg/l)

PPM_{measured} FID reading (PPM)

K: number of carbon atoms in calibration gas
(1 in methane)

TH: total hydrocarbons calculated as gasoline
(GRO)

percent water vapor by volume
SVE Stack pipe diameter

0.003
8

$Q = (1-B) \times V \times A \times (P/P_{std}) \times (T_{std}/T)$

Q: vapor flowrate (SCFM)

B: percent water vapor in flowstream

V: vapor velocity (ft/min)

A: cross-sectional area (sq. ft)

P: absolute pressure of flowstream (" Hg)

P_{std}: standard pressure (29.92" Hg)

T: absolute temperature of flowstream (degrees Rankine)

T_{std}: standard temperature (528 degrees Rankine)

at 68 degrees F (from Perry's handbook)

* Estimated value due to malfunctioning instrument

$M = Q \times C \times 0.0895$

M: hydrocarbon recovery rate (lb/day)

Assumptions:

Mg = 128 mg/mg-mole

Kg = 24.07 dsm³/10⁶ gm -mole

B = 0.003 from Perry's Chemical Handbook

A = 0.3491 sq. ft

MONTHLY PROGRESS REPORT DISTRIBUTION COVER SHEET

Contract Name : RAC 3

Date : May 14, 1999

Contract Number : N62470-97-D-5000

Reporting Period : From: April 01, 1999 To: April 30, 1999

Delivery Order No : 34

OHM Project No. : 780151

(Prepare fee proposal for Work Plan Wilson Bay removal action)

Attached is the above-referenced OHM Monthly Progress Report. Distribution is being made as indicated below. If there should be any questions, please contact the Project manager or Dean Napoli at (609) 588-6493.

DISTRIBUTION :

Original to :

Environmental Engineer -
Karen Wilson, Code 18311

One copy each to :

One Copy to:
ROICC: Rowse, Brent

One Copy to:
RPM: Landman, K

One Copy to:
Contract Specialist: Collier,
Maribeth

One Copy to:
Activity Point of Contact
Senus, Mick

One Copy to:
RAC CM Hedley, Greg

ADDRESS :

6500 Hampton Blvd., Code 1831
LRA, Bldg. A, Rm. 2115
Norfolk, VA 23508-1297

ROICC/NAVFACEENGCOM Contracts
1005 Michael Road
Camp Lejeune, NC 28547-2521

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

6500 Hampton Blvd.
LRA, Bldg. A, Rm. 3700
Norfolk, VA 23508-1297

Building 58: AC/S EMD IRD
PSC Box 20004, MCB
Camp Lejeune, NC 28542-0004

6500 Hampton Blvd., Code 0531
LRA, Bldg. A, Rm. 2410
Norfolk, VA 23508-1297

OHM DISTRIBUTION :

Project Manager: ~~Dunn, James A~~ Norcross, GA
File (5)

MONTHLY PROGRESS REPORT - SHORT FORM

Contract No. N62470-97-D-5000 Delivery Order No. 0034 Report Dates: Apr 1, 1999 To Apr. 30, 1999

Project Name: Piling Removal – Wilson Bay Project Location: MCB Camp Lejeune, N.C.

Project No.: 780151 Project Manager: James A. Dunn, Jr., P.E.

Project Description: Remediate Wilson Bay through the removal of approximately 140 piling, wood debris and tires.

SHORT FORM STATUS

Pre-Construction

Post-Construction

Site Walk* (Date: 00/00/00)

Demobilization (Date: 00/00/00)

Design Review

Post Con. Submittal (Due: 00/00/00)

Cost Proposal (Submittal Date: 03/16/99)

O&M (Completion Date: 00/00/00)

*Notes Attached

Dormant

Awaiting T&D

Technical Review

Modification Number

Regulatory Issue(s)

Submittal Review

Date submitted:

Analytical

Postponement

Amount:

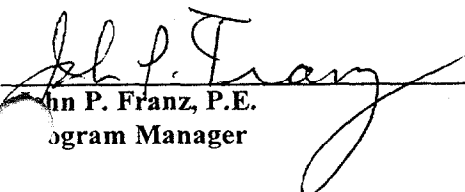
Significant Activities Performed/Associated With Item(s) Above: Submitted Work Plans for field activities and scheduled Pre-Con meeting for May 11, 1999. Anticipate commencement of field activities May 17, 1999.

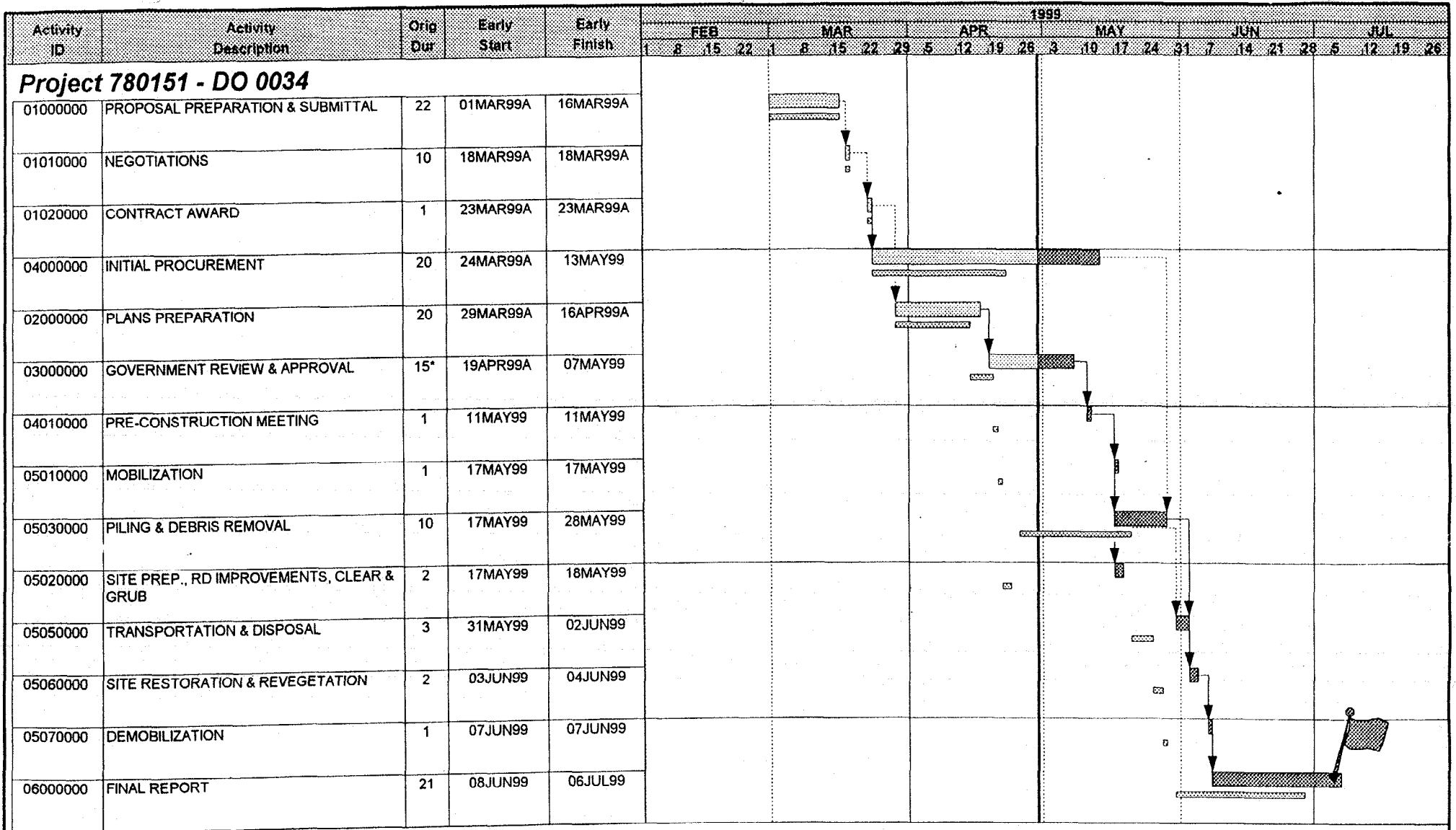
Schedule Information (updates and variances): Current schedule attached.

Financial Information:	Current D.O. Ceiling (w/o fee):	\$	<u>63,501.00</u>
	Total \$ to Date (w/o fee)	\$	<u>5,265.00</u>
	Estimated Report Period \$:	\$	<u>3,696.00</u>
	Forecast @ Completion:	\$	<u>63,501.00</u>

Other Information: None.

Approved by:


John P. Franz, P.E.
Program Manager



Project Start 01MAY98
 Project Finish 06JUL99
 Data Date 30APR99
 Run Date 07MAY99

Early Bar
 Target Bar
 Progress Bar
 Critical Activity

0299

OHM Remediation Services Corporation
 Piling Removal - Wilson Bay
 MCB, Camp Lejeune, North Carolina

Sheet 1 of 1

Project 780151 - DO 0034			
Date	Revision	Checked	Approved