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MCAS CHERRY POINT  
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MANAGEMENT RECOMMENDATION REPORT UNDERGROUND STORAGE TANK  
PROGRAM SECOND SEMESTER 1999 JULY 1999 TO DECEMBER 1999 MCAS CHERRY  
POINT NC  
6/23/2000  
CATLIN ENGINEERS AND SCIENTISTS

**MANAGEMENT RECOMMENDATIONS REPORT  
UNDERGROUND STORAGE TANK PROGRAM  
MCAS CHERRY POINT**

**SECOND SEMESTER 1999  
(July - December 1999)**



**June 23, 2000**

**PREPARED FOR:**

**ENVIRONMENTAL AFFAIRS DEPARTMENT  
MARINE CORPS AIR STATION  
CHERRY POINT, NORTH CAROLINA**

**PREPARED BY:**



**MANAGEMENT RECOMMENDATIONS REPORT  
UNDERGROUND STORAGE TANK PROGRAM  
MCAS CHERRY POINT**

**SECOND SEMESTER 1999  
(JULY - DECEMBER 1999)**

**MARINE CORPS AIR STATION  
CHERRY POINT, NORTH CAROLINA**

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## EXECUTIVE SUMMARY

### **A. Introduction**

The purpose of this *Management Recommendations Report* is to provide recommendations to MCAS Cherry Point Environmental Affairs Department (EAD) managers responsible for making decisions regarding leaking underground storage tank (UST) incidents at MCAS Cherry Point and outlying/auxiliary landing fields. The recommendations are based on recent monitoring data collected in accordance with the *Monitoring Plan* and presented in the *Periodic Monitoring Report* and procedures outlined in the *Program Strategy* adopted for the *MCAS Cherry Point UST Long-Term Monitoring Program*.

This *Management Recommendations Report* is designed to contain recommendations only. Data, findings, and conclusions in support of the recommendations are contained in the corresponding *Periodic Monitoring Report* covering the same reporting period.

### **B. Major Recommendations in Brief**

The recommendations relevant to the First Semester 2000 Monitoring Event were presented and incorporated in the First Semester 1999 Management Recommendations Report, dated February 4, 2000. As such, this document, and its recommendations, are essentially unchanged from the previous version. The recommendations relevant to the Second Semester 2000 Monitoring Event will be presented in the forthcoming First Semester 2000 Management Recommendations Report.

## D. GLOSSARY OF ABBREVIATIONS

2L	North Carolina Administrative Code; Title 15A Department of Environment, Health, and Natural Resources; Division of Water Quality. Subchapter 2L, Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina; NCAC T15A: 2L.0202
AFVR	Aggressive Fluid Vapor Recovery
AS	Air Sparging
AST	Aboveground Storage Tank
BQL	Below Quantitation Limits
BS	Biosparging
BV	Bioventing
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CSA	Comprehensive Site Assessment
DPE	Dual-Phase Extraction
DWQ	Division of Water Quality
EAD	Environmental Affairs Department, Facilities Directorate, Marine Corps Air Station Cherry Point, North Carolina
EDB	Ethylene Dibromide
EDD	Electronic Data Deliverables
EPA	Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
GCL	Gross Contamination Level
GS	Gas Chromatograph
Guidelines Vol. I	Groundwater Section Guidelines for the Investigation and Remediation of Soil and Ground Water; VOLUME I, Sources Other Than Petroleum Underground Storage Tanks; State of North Carolina, Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section; May, 1998.

Guidelines Vol. II	Groundwater Section Guidelines for the Investigation and Remediation of Soil and Ground Water, VOLUME II, Petroleum Underground Storage Tanks; State of North Carolina, Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section; January 2, 1998.
IPE	Isopropyl Ether
L.G.	Licensed Geologist
LANTDIV	Atlantic Division, Naval Facilities Engineering Command
MADEP	Massachusetts Department of Environmental Protection
MCAS	Marine Corps Air Station
MCOLF	Marine Corps Outlying Landing Field
MDL	Method Detection Limit
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MSCC	Maximum Soil Contaminant Concentration
MTBE	Methyl Tertiary Butyl Ether
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NOV	Notice of Violation
P.E.	Professional Engineer
PAH	Polynuclear Aromatic Hydrocarbons
QA/QC	Quality Assurance/Quality Control
RAC	Remedial Action Contractor
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
SW	Surface Water
TPH	Total Petroleum Hydrocarbons

ug/kg	Micrograms per Kilogram
ug/L	Micrograms per Liter
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons

**VOLUME I**  
**SECTION 1.0**  
**Of The**  
**MANAGEMENT RECOMMENDATIONS REPORT**  
**MCAS CHERRY POINT UST LONG-TERM MONITORING PROGRAM**

**MCAS CHERRY POINT**

**Covering The Period:**

**SECOND SEMESTER 1999**  
**(JULY 1999 - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 130***

## 1.0 SITE 130

### 1.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 14774  
NCDENR Site Priority Ranking: A or B  
Estimated Risk Classification: High, Past Evidence of Vapors  
Source Type(s): JP-5  
Free Product: Yes

### 1.2 *Monitoring Schedule for this Event*

Sampling completed.

### 1.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 1.4 *Site Remediation Method*

Current site remediation strategy is to reduce soil and ground water contaminants with AS/SVE technology, and natural attenuation. Interim free product recovery is underway and a free product recovery system is also being installed.

### 1.5 *Recommended Remediation Modifications*

None.

## **1.6 Recommended Steps Toward Site Closure**

### **1.6.1 Reduce Risk Ranking from "High" to "Intermediate"**

Site 130 is temporarily ranked as a "High" risk site due to petroleum vapors that were reported in the sewer line extension to Building 130 and from a sink drain in a nearby building. This was identified in the Addendum Comprehensive Site Assessment Report, Building 130, Volume I, Section 3.2, Page 9. Recommend that the RAC contractor take a series of vapor samples from the sewer line. If none are present, then reduce the temporarily assigned risk to "Intermediate." Reduction of risk from "High" to "Intermediate" is very beneficial because it increases the target ground water contamination cleanup levels from 2L to the GCLs as detailed in the Guidelines, Vol. II. Recommend that steps be taken to reduce risk ranking sooner rather than later. If there is a serious threat of explosion due to accumulation of the vapors in a confined space, then that condition needs to be detected and eliminated.

### **1.6.2 Reduce Risk Ranking from "Intermediate" to "Low"**

A reduction in the temporarily assigned risk ranking from "Intermediate" to "Low" is dependent upon removal of the free product from this site. Recommend that emphasis be placed on free product removal during the remediation phase.

### **1.6.3 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 using industrial/commercial soil cleanup levels.

**VOLUME I**  
**SECTION 2.0**  
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**MCAS CHERRY POINT UST LONG-TERM MONITORING PROGRAM**

**MCAS CHERRY POINT**

**Covering The Period:**

**SECOND SEMESTER 1999**  
**(JULY - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 133***

## 2.0 SITE 133

### 2.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 6443, 9739, and 9741  
NCDENR Site Priority Ranking: D/E  
Estimated Risk Classification: Intermediate, Presence of Free Product  
Source Type(s): JP-5  
Free Product: Yes

### 2.2 *Monitoring Schedule for this Event*

Sampling completed.

### 2.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 2.4 *Site Remediation Method*

A site assessment is being performed prior to developing a secondary Source Abatement Plan for product removal and soil abatement.

### 2.5 *Recommended Remediation Modifications*

None.

## **2.6 Recommended Steps Toward Site Closure**

Complete secondary source abatement. Once all free product and contaminated soils are abated, prepare closure documentation.

### **2.6.1 Reduce Risk Ranking from "Intermediate" to "Low"**

A reduction in the temporarily assigned risk ranking from "Intermediate" to "Low" is dependent upon removal of the free product from this site. A reduction in risk ranking to "Low" eliminates the requirement to remediate soils to soil-to-groundwater MSCCs. Industrial/commercial MSCCs would be applicable to this site.

### **2.6.2 Site Closure Sampling and Analysis**

The free product and contaminated soils at this site are being managed by the UST Program. The dissolved-phase ground water plume at this site is being investigated and remediated under CERCLA Operable Unit 1. Recommend that once free product and soils are abated, site closure sampling be conducted in accordance with Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

**VOLUME I**  
**SECTION 3.0**  
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**MCAS CHERRY POINT**

**Covering The Period:**

**SECOND SEMESTER 1999**  
**(JULY 1999 - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 137***

### 3.0 SITE 137

#### 3.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 10686  
NCDENR Site Priority Ranking: E  
Estimated Risk Classification: Intermediate, Free Product  
Source Type(s): #2 Fuel Oil and JP-5  
Free Product: Yes

#### 3.2 *Monitoring Schedule for this Event*

Sampling completed.

#### 3.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

#### 3.4 *Site Remediation Method*

Free-phase product at the site is being recovered with a horizontal well pumping system. Site surficial ground water contamination is being assessed and remediated under CERCLA Operable Unit 1 (OU-1).

#### 3.5 *Recommended Remediation Modifications*

From January 1 to July 1, 1999, approximately 7,000 gallons of free-phase product (JP-5 and #2 Fuel Oil) were recovered at Site 137 by the existing product recovery system. No system modifications are recommended.

#### 3.6 *Recommended Steps Toward Site Closure*

The dissolved-phase ground water contamination at Site 137 is being investigated and remediated under CERCLA Operable Unit 1. Free product removal is being managed under the UST program. Recommend that free product removal continue until completed.

**VOLUME I**  
**SECTION 4.0**  
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**Covering The Period:**  
**SECOND SEMESTER 1999**  
**(JULY 1999 - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**  
***SITE 296***

#### 4.0 SITE 296

##### 4.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 9951  
NCDENR Site Priority Ranking: E  
Estimated Risk Classification: High, Proximity to Potable Well 9  
Source Type(s): Diesel Fuel  
Free Product: Yes

##### 4.2 *Monitoring Schedule for this Event*

Sampling completed.

##### 4.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

##### 4.4 *Site Remediation Method*

Currently, only passive site remediation such as natural attenuation and biodegradation are in effect.

##### 4.5 *Recommended Remediation Modifications*

Recommend that the free product and contaminated soils be removed by excavation.

## **4.6 Recommended Steps Toward Site Closure**

### **4.6.1 Recommendations Concerning "High" Risk Ranking**

Site 296 has a temporarily assigned risk ranking of "High" because the source area is located within 1,000 feet of drinking water supply well #9. This potable well is approximately 700 feet downgradient. Reducing the risk ranking from "High" to "Intermediate" at this site would not be possible without abandoning the drinking water supply well. Given the cost of abandoning the well, and installing another to replace it, the benefits would need to be weighty to justify such a large expense. The benefit of reducing the risk from "High" is that the target cleanup goals would be less stringent.

Since the most recent sampling event did not encounter ground water in excess of 2L, the benefits of going to the GCLs are small. We do not recommend abandoning the nearby drinking water supply well in order to reduce the risk ranking from "High" to "Intermediate."

Note that preliminary analytical results from the next periodic monitoring event, dated August 10, 1999, indicate the presence of Chrysene in 65GW15, 65GW17, and 65GW34 in excess of the 2L standard of 5 ug/L. These results are being checked and will be reported in the next Periodic Monitoring Report.

### **4.6.2 Recommendations Concerning Free Product Recovery**

Elimination of free product at this site is critical to remove it from long-term monitoring and move toward site closure. Furthermore, this appears to be an attainable goal. Recommend excavation of free product and contaminated soil. Backfill excavation with gravel to the annual high water table elevation.

Then final backfill with clean soil. Install a 4-inch diameter type II recovery well in the center of the excavated area for ground water confirmation sampling and to provide for an effective AFVR "mop up" event if necessary.

### **4.6.3 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below 2L, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

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**MCAS CHERRY POINT**

**Covering The Period:**

**SECOND SEMESTER 1999**  
**(JULY 1999 - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 486***

## 5.0 SITE 486

### 5.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 9264  
NCDENR Site Priority Ranking: E  
Estimated Risk Classification: Intermediate, Free Product  
Source Type(s): #2 Fuel Oil  
Free Product: Yes

### 5.2 *Monitoring Schedule for this Event*

Sampling completed.

### 5.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 5.4 *Site Remediation Method*

Current site remediation strategy is to periodically bail free product from monitoring well 57GW14 and passive ground water remediation through factors such as natural attenuation and biodegradation. However, no remediation contract for active remediation has been initiated.

### 5.5 *Recommended Remediation Modifications*

Recommend that the free product and contaminated soils be removed by excavation.

## **5.6 Recommended Steps Toward Site Closure**

### **5.6.1 Reduce Risk Ranking from "Intermediate" to "Low"**

Removal of free product from the site to below 1/8-inch thickness will reduce the risk ranking from "Intermediate" to "Low."

Note that preliminary analytical results from the next periodic monitoring event, dated August 10, 1999, indicate the presence of chrysene in 57GW05 and 57GW09 in excess of the 2L standard of 5 ug/L. The GCL for chrysene is also 5 ug/L. These results are being checked and will be reported in the next Periodic Monitoring Report.

### **5.6.2 Recommendations Concerning Free Product Recovery**

Elimination of free product at this site is critical to remove it from long-term monitoring and move toward site closure. Furthermore, this appears to be an attainable goal. Recommend excavation of free product and contaminated soil. Backfill excavation with gravel to the annual high water table elevation. Then final backfill with clean soil. Install a 4-inch diameter type II recovery well in the center of the excavated area for ground water confirmation sampling and to provide for an effective AFVR "mop up" event if necessary.

### **5.6.3 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

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**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 1083***

## 6.0 SITE 1083

### 6.1 *Site Information*

Location:	MCAS Cherry Point, North Carolina
Incident No.:	9839
NCDENR Site Priority Ranking:	A or B
Estimated Risk Classification:	Intermediate, Free Product and Proximity to Surface Water
Source Type(s):	JP-5
Free Product:	Yes

### 6.2 *Monitoring Schedule for this Event*

Sampling completed.

### 6.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 6.4 *Site Remediation Method*

Total Fluid Recovery, SVE and Natural Attenuation is ongoing.

### 6.5 *Recommended Remediation Modifications*

None.

### 6.6 *Recommended Steps Toward Site Closure*

#### 6.6.1 **Reduce Risk Ranking from "Intermediate" to "Low"**

A reduction in the temporarily assigned risk ranking from "Intermediate" to "Low" is dependent upon removal of the free product from this site.

#### 6.6.2 **Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for residential soil cleanup levels.

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**FOR**

***SITE 1640***

## 7.0 SITE 1640

### 7.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 14774

NCDENR Site Priority Ranking: A or B

Estimated Risk Classification: Intermediate, Free Product

Source Type(s): JP-5

Free Product: Yes

### 7.2 *Monitoring Schedule for this Event*

Sampling completed.

### 7.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 7.4 *Site Remediation Method*

The site remediation strategy is currently being re-evaluated while product skimming is ongoing.

### 7.5 *Recommended Remediation Modifications*

Consider installing a skid mounted total fluids recovery system already available aboard the Air Station as a pilot test.

## **7.6 Recommended Steps Toward Site Closure**

### **7.6.1 Reduce Risk Ranking from "Intermediate" to "Low"**

A reduction in the temporarily assigned risk ranking from "Intermediate" to "Low" is dependent upon removal of the free product from this site. Elimination of free product at this site is critical to remove it from long-term monitoring and move toward site closure. Furthermore, this appears to be an attainable goal. Recommend excavation of free product and contaminated soil. Backfill excavation with gravel to the annual high water table elevation. Then final backfill with clean segregated soil from the excavation. Install a 4-inch diameter type II recovery well in the center of the excavated area for ground water confirmation sampling and to provide for an effective AFVR "Mop up" event if necessary.

### **7.6.2 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

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**FOR**

***SITE 1672***

## 8.0 SITE 1672

### 8.1 *Site Information*

Location:	MCAS Cherry Point, North Carolina
Incident No.:	6905
NCDENR Site Priority Ranking:	B
Estimated Risk Classification:	High, Past Evidence of Vapors and Proximity to Potable Well 12
Source Type(s):	Gasoline
Free Product:	No

### 8.2 *Monitoring Schedule for this Event*

Sampling completed.

### 8.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 8.4 *Site Remediation Method*

AS/SVE is ongoing.

### 8.5 *Recommended Remediation Modifications*

None.

## **8.6 Recommended Steps Toward Site Closure**

### **8.6.1 Reduce Risk Ranking from "High" to "Low"**

Site 1672 was ranked "High" risk because of two reasons: past evidence of vapors in Building 79 and because of the contamination source's proximity to Potable Well 12. Past concerns about vapors in Building 79 are no longer relevant to the risk ranking because this building has been demolished.

Proximity to Potable Well 12 is the remaining reason for a "High" risk ranking. Recommend that Potable Well 12 be abandoned due to proximity of the benzene plume.

These actions would reduce the risk ranking to "Low." Ground Water is already compliant with GCLs. Therefore, the only remaining hurdle to site closure would be confirmatory samples of soils with analysis results compared to the residential MSCCs.

### **8.6.2 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for residential MSCCs. Residential MSCCs are applicable due to proximity to housing units across Roosevelt Boulevard.

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***SITE 1783***

## 9.0 SITE 1783

### 9.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 9275

NCDENR Site Priority Ranking: E

Estimated Risk Classification: High, Proximity to Potable Well 25

Source Type(s): Diesel Fuel and #2 Fuel Oil

Free Product: Yes

### 9.2 *Monitoring Schedule for this Event*

Sampling completed.

### 9.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 9.4 *Site Remediation Method*

The 2,500-gallon USTs and associated distribution lines and dispenser were removed on August 15, 1994. Approximately 30 tons of contaminated soil were also excavated during the UST removal activities. Soil and ground water were abated with AS/BS/SVE technology, and natural attenuation. The system has been shut down and quarterly closure sampling will commence in February 2000.

### 9.5 *Recommended Remediation Modifications*

Free product was not detected at the site during this monitoring period. However, monitoring wells 55GW15 and 55GW16 were not gauged. These wells have historically had small amounts of product. Recommend that any free product in these wells be removed.

## **9.6 Recommended Steps Toward Site Closure**

### **9.6.1 Recommendations Concerning "High" Risk Ranking**

Site 1783 is ranked "High" risk because of its proximity to Potable Well 25. Given that the remediation system is already constructed and operating, abandoning Potable Well 25 is not recommended.

Ground water contamination was detected above 2L during this monitoring event. EPA Method 601 detected chloroform (21 ug/L) and tetrachloroethene (4.8 ug/L) at levels above their 2L standard. These contaminants are not constituents of petroleum and likely result from past maintenance activities. Petroleum constituents benzene (10ug/L), ethylbenzene (79.2 ug/L), 1-methylnaphthalene (63.8 ug/L), 2-methylnaphthalene (91.6 ug/L) and naphthalene (100.0 mg/L) all exceeded their 2L standard. However, free product levels are historically decreasing and contamination levels are below published GCLs.

There is no evidence of downward vertical migration of contaminants. The source area is in excess of 500 feet downgradient of Potable Well 25. Once free product is below  $\pm 1/8$  inch, recommend requesting that the Washington Regional Office reduce the risk ranking from "High" to "Low."

### **9.6.2 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

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***SITE 1786***

## 10.0 SITE 1786

### 10.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 9273

NCDENR Site Priority Ranking: E

Estimated Risk Classification: Intermediate, Free Product

Source Type(s): Gasoline, Diesel Fuel, and # 2 Fuel Oil

Free Product: Yes

### 10.2 *Monitoring Schedule for this Event*

Sampling completed.

### 10.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 10.4 *Site Remediation Method*

In July 1994, both 2,500-gallon USTs and associated plumbing were removed. During the UST excavation, some contaminated soils were also removed and properly disposed of.

SVE and natural attenuation were used to address remnant soil and ground water contamination. The system has been shut down and quarterly closure sampling will commence in February 2000.

### 10.5 *Recommended Remediation Modifications*

Free product was not detected at the site during this monitoring period. However, monitoring well 54GW28 was not gauged. This well has historically had small amounts of product. Recommend that this well be added to the monitoring schedule and that any free product in these wells be removed.

## **10.6 Recommended Steps Toward Site Closure**

### **10.6.1 Reduce Risk Ranking from "Intermediate" to "Low"**

Given that the thickness of product in 54GW28 has nearly been historically decreasing to below 1/8 inch, aggressive excavation to remove product does not appear to be warranted. Recommend removal of product over the next six months and monitoring to determine whether the product level in this well will return to significantly higher levels. If product continues to flow into this well, aggressive excavation may be considered.

If free product thickness at the site can be reduced to below 1/8 inch, then the site can be reranked as "Low." Dissolved-phase ground water contamination levels are already within GCLs.

### **10.6.2 Site Closure Sampling and Analysis**

Law's Report of Limited Soil Assessment/Risk-Based Rules Evaluation found soils to be within industrial/commercial MSCCs. Recommend that every effort be made to "mop up" any remaining free product in well 54GW28 and proceed with site closure. Public notification would be required to close this site in accordance with 15A NCAC 2L.0115(K) because groundwater is not remediated below 2L, nor are soils remediated to below the lesser of residential or soil-to-groundwater MSCCs.

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***SITE 3904***

## 11.0 SITE 3904

### 11.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 15120

NCDENR Site Priority Ranking: C

Estimated Risk Classification: Intermediate, Free Product

Source Type(s): Diesel Fuel

Free Product: Yes

### 11.2 *Monitoring Schedule for this Event*

Sampling completed.

### 11.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 11.4 *Site Remediation Method*

The 1,000-gallon UST and associated plumbing was removed. In addition, contaminated soils and free product were excavated at this site.

### 11.5 *Recommended Remediation Modifications*

None. Remediation appears to be complete as a result of excavation and free product pumping.

### 11.6 *Recommended Steps Toward Site Closure*

11.6.1 Recommend confirmatory ground water sampling and preparation of site closure documentation.

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***SITE 3996***

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***SITE 4075***

## 13.0 SITE 4075

### 13.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 6360, 9950, 9140, and 9276

NCDENR Site Priority Ranking: E

Estimated Risk Classification: High, Past Evidence of Vapors and Proximity to Potable Well 3

Source Type(s): JP-5, Gasoline

Free Product: Yes

### 13.2 *Monitoring Schedule for this Event*

Sampling completed.

### 13.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 13.4 *Site Remediation Method*

Current site remediation strategy is to reduce soil and ground water contaminants with AS/SVE technology and natural attenuation. In addition, a free product recovery system is also being installed.

### 13.5 *Recommended Remediation Modifications*

None.

## ***13.6 Recommended Steps Toward Site Closure***

### **13.6.1 Discussion Concerning "High" Risk Ranking**

Site 4075 is temporarily ranked as a "High" risk site due to its proximity to Potable Well 3 and past evidence of vapors in sanitary sewers and storm drains in the vicinity of the site. Since dissolved phase groundwater exceeds GCLs, a reduction of risk ranking from "High" to "Intermediate" would not expedite moving the site toward closure at this time. Recommend that a check for vapors be performed immediately. If vapors from this site pose a serious threat of explosion due to their accumulation in a confined space, they need to be identified and eliminated.

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**FOR**

***SITE MTFP***

## 14.0 SITE MTFP

### 14.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 9839

NCDENR Site Priority Ranking: E

Estimated Risk Classification: Intermediate, Proximity to Surface Water

Source Type(s): JP-5

Free Product: No

### 14.2 *Monitoring Schedule for this Event*

Sampling completed.

### 14.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 14.4 *Site Remediation Method*

Following May 5, 1986 and January 1993 release incidents, the pipeline was temporarily shut down and repaired. For both incidents, free floating fuel on the surface water was contained and recovered. Approximately 350 gallons were recovered from the first incident and 300 gallons from the second incident. Petroleum-laden soil was excavated following both incidents. The volume of soil removed from the first incident was not reported. Approximately 55 cubic yards were excavated following the second incident. Current site remediation strategy is long-term monitoring to evaluate effectiveness of natural abatement factors such as attenuation and biodegradation.

### 14.5 *Recommended Remediation Modifications*

None.

#### **14.6 Recommended Steps Toward Site Closure**

According to the Guidelines Vol. II, this site is ranked "Intermediate" risk because total polynuclear aromatic hydrocarbon (PAH) values exceed ten times the surface water standards shown in 15A NCAC 2B.0208. The surface water standard for PAH is 31.1 nanograms per liter (ng/L). Multiplying this standard by ten and converting the units to micrograms per liter (ug/L) determines the level of PAHs in ground water that elevates a site from "Low" risk to "Intermediate" risk if the source area is within 500 feet of surface waters.

$$31.1 \text{ ng/L} \times 10 \times \frac{1 \text{ ug/L}}{1000 \text{ ng/L}} = 0.311 \text{ ug/L}$$

Total PAH contaminant levels in well 41GW11 are 90.26 ug/L. This value is high enough for MTFP to be an "intermediate" risk site in accordance with the Guidelines Vol. II. However, given the low levels of contamination at the site when compared to GCLs; the distance from the site to the surface water; and the dilution effects that occur when the ground water mixes with the surface water, a strong case could be made to close this site. Recommend that confirmatory surface water and soil sampling be conducted and that a closure document be prepared for this Site MTFP.

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***SITE P15***

## 15.0 SITE P15

### 15.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: I8715  
NCDENR Site Priority Ranking: None  
Estimated Risk Classification: High, Proximity to Potable Well 3  
Source Type(s): JP-5  
Free Product: Yes

### 15.2 *Monitoring Schedule for this Event*

Sampling completed.

### 15.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 15.4 *Site Remediation Method*

Current site remediation strategy is to reduce ground water contaminants with AS and natural attenuation. In addition, a free product recovery system is also in operation.

### 15.5 *Recommended Remediation Modifications*

None.

### 15.6 *Recommended Steps Toward Site Closure*

Continued operation of remedial system. Recommend that Potable Well 3 be sampled because it is within 1000 feet of this "high" risk site.

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***SITE TFB***

## 16.0 SITE TFB

### 16.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 6359  
NCDENR Site Priority Ranking: D  
Estimated Risk Classification: High, Proximity to Potable Well 7  
Source Type(s): JP-5  
Free Product: Yes

### 16.2 *Monitoring Schedule for this Event*

Sampling completed.

### 16.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 16.4 *Site Remediation Method*

AS/SVE and natural attenuation is underway. A free product recovery system is also operational.

### 16.5 *Recommended Remediation Modifications*

None.

### 16.6 *Recommended Steps Toward Site Closure*

Site TFB has a "High" risk ranking due to the proximity of Potable Well 7. Therefore, 2L is the target ground water contamination cleanup goal. Recommend continued remediation of this site until free product is removed and the dissolved phase ground water plume contaminant concentrations are below 2L.

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***SITE TFC***

## 17.0 SITE TFC

### 17.1 *Site Information*

Location: MCAS Cherry Point, North Carolina  
Incident No.: 6906  
NCDENR Site Priority Ranking: E  
Estimated Risk Classification: High, Proximity to Industrial Supply Well N-1  
Source Type(s): Gasoline and Diesel  
Free Product: Yes

### 17.2 *Monitoring Schedule for this Event*

Sampling completed.

### 17.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 17.4 *Site Remediation Method*

Eleven of the 14 USTs have been removed from the site. During the excavation and removal of the USTs, contaminated soil was removed from the tank pits and disposed off-site. A free product recovery well was in operation at this facility for several years.

Current site remediation strategy is to continue free-phase product recovery with a horizontal free product vapor extraction system and AS/BS/SVE to address the soil and surficial ground water contamination.

### 17.5 *Recommended Remediation Modifications*

None.

## ***17.6 Recommended Steps Toward Site Closure***

The risk classification may be reduced in the future to "Intermediate" contingent on the abandonment of the Industrial Supply Well N-1 located approximately 200 feet southeast of the edge of the free product plume. A reduction in risk-classification will allow for cleanup of ground water to the less stringent GCLs in lieu of 2L. However, ground water contamination currently exceeds GCLs at this site.

EPA Method 601 detected a low level (1.0 ug/L) of trichloethene in well 14GW40. All of the other wells analyzed for EPA Method 601 were 2L compliant. Do not recommend continuous monitoring of EPA Method 601 compounds at this site during the remediation phase.

The proximity of this site to Industrial Supply Well N-1 is of significant concern. The dissolved phase plume in the surficial aquifer is moving in the direction of N-1 and there are no type II or type III sentinel wells between the known extent of the plume and the supply well. Recommend abandoning Industrial Supply Well N-1 to be protective of the Castle Hayne Aquifer.

Recommend installing a type II and a type III sentinel well upgradient of N-1.

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**FOR**

***SITE TFD***

## 18.0 SITE TFD

### 18.1 *Site Information*

Location: MCAS Cherry Point, North Carolina

Incident No.: 9265

NCDENR Site Priority Ranking: B

Estimated Risk Classification: High, Proximity to Potable Well 8

Source Type(s): Kerosene and #2 Fuel Oil

Free Product: Yes

### 18.2 *Monitoring Schedule for this Event*

Sampling completed.

### 18.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 18.4 *Site Remediation Method*

All of the USTs and associated plumbing were removed in 1997 when the tank farm was demolished. BS/BV technology is being used to remediate site soil and ground water contamination.

### 18.5 *Recommended Remediation Modifications*

Recommend that the free product and contaminated soils be removed by excavation.

Recommend that system operation continue until the site risk is reduced from "high" to "intermediate."

## **18.6 Recommended Steps Toward Site Closure**

### **18.6.1 Reduce Risk Ranking from "High" to "Intermediate"**

There is no evidence of downward vertical migration of contaminants. Recommend that the NCDENR Washington Regional Office be approached about reducing the risk of the site to "intermediate" because the contamination at this site is downgradient of Potable Well 8.

### **18.6.2 Recommendations Concerning Free Product Recovery**

Elimination of free product at this site is critical to remove it from long-term monitoring and move toward site closure. Furthermore, this appears to be an attainable goal. Recommend excavation of free product and contaminated soil. Backfill excavation with gravel to the annual high water table elevation. Then final backfill with clean soil. Install a 4-inch diameter type II recovery well in the center of the excavated area for ground water confirmation sampling and to provide for an effective AFVR "mop up" event if necessary.

### **18.6.3 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the "Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

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**MCLOF ATLANTIC AND MCALF BOGUE**

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**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 7012***

## 1.0 SITE 7012

### 1.1 *Site Information*

Location: MCOLF Atlantic, North Carolina

Incident No.: 15275

NCDENR Site Priority Ranking: B

Estimated Risk Classification: Intermediate, although within 1,000 feet of potable wells at Building 7019. Contamination is downgradient of receptor. NCDENR Patricia Coughlin decision on May 6, 1999.

Source Type(s): #2 Fuel Oil

Free Product: Yes

### 1.2 *Monitoring Schedule for this Event*

Sampling completed.

### 1.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 1.4 *Site Remediation Method*

The 7012 UST associated plumbing, and approximately 20 cubic yards of contaminated soil were removed on December 21, 1993.

### 1.5 *Recommended Remediation Modifications*

Recommend that the free product and contaminated soils be removed by excavation.

## **1.6 Recommended Steps Toward Site Closure**

### **1.6.1 Reduction of Risk ranking from "High" to "Intermediate"**

On May 6, 1999, Patricia Coughlin of NCDENR stated in a meeting with John Myers (EAD) and Gary McSmith (CATLIN) that she intended to reduce the risk ranking at Site 7012 from "High" to "Intermediate". This change was predicated upon the ground water flow direction being to the southeast, which is historically the ground water flow direction at this site. Flow to the southeast is away from the potable wells at Building 7019. However, ground water level measurements from this monitoring event indicated a component of flow to the north, toward the potable wells at Building 7019. Recommend that a series of monthly ground water level measurements be made at this site to determine if the ground water flow direction has shifted toward the potable wells to the north.

### **1.6.2 Reduce Risk Ranking from "Intermediate" to "Low"**

A reduction in the temporarily assigned risk ranking from "Intermediate" to "Low" is dependent upon removal of the free product from this site. Recommend that emphasis be placed on free product removal during the remediation phase. Recommend that no ground water remediation other than free product removal occur at this site.

### **1.6.3 Recommendations Concerning Free Product Recovery**

Elimination of free product at this site is critical to remove it from long-term monitoring and move toward site closure. Furthermore, this appears to be an attainable goal. Recommend excavation of free product and contaminated soil. Backfill excavation with gravel to the annual high water table elevation. Then final backfill with clean soil. Install a 4-inch diameter type II recovery well in the center of the excavated area for ground water confirmation sampling and to provide for an effective AFVR "mop up" event if necessary.

### **1.6.4 Site Closure Sampling and Analysis**

Recommend that once the risk is "Low" and ground water contamination levels are below GCLs, assess the site soil contamination hot spots per the Guidelines Vol. II, Section 7.3 for industrial/commercial soil cleanup levels.

**VOLUME II**  
**SECTION 2.0**  
**Of The**  
**MANAGEMENT RECOMMENDATIONS REPORT**  
**MCAS CHERRY POINT UST LONG-TERM MONITORING PROGRAM**

**MCOLF ATLANTIC AND MCALF BOGUE**

**Covering The Period:**

**SECOND SEMESTER 1999**  
**(JULY 1999 - DECEMBER 1999)**

**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE 8049***

## 2.0 SITE 8049

### 2.1 *Site Information*

Location:	MCALF Bogue, North Carolina
Incident No.:	8959
NCDENR Site Priority Ranking:	E
Estimated Risk Classification:	Intermediate, Free Product and Proximity to Surface Water
Source Type(s):	Diesel Fuel, #2 Fuel Oil, and Gasoline
Free Product:	Yes

### 2.2 *Monitoring Schedule for this Event*

Sampling completed.

### 2.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

### 2.4 *Site Remediation Method*

USTs 8049-1, 8049-2, 8049-3 and 8049-4 were all closed and removed between 1992 and 1995. A free product recovery system was installed at the site and began operation in May, 1995. Site 8049 was the location of an unexpected chemical reaction during a pilot test of hydrogen peroxide injection technology. Due to this incident, the site was reassessed and implementation of a new remedial system is dependent on funding and the results of that reassessment.

### 2.5 *Recommended Remediation Modifications*

None.

### 2.6 *Recommended Steps Toward Site Closure*

Recommend that removal of free product be the focus of any remedial activity at this site.

**VOLUME II**  
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**Covering The Period:**

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**SITE-SPECIFIC MANAGEMENT RECOMMENDATIONS REPORT**  
**FOR**

***SITE TAFDS***

### 3.0 SITE TAFDS

#### 3.1 *Site Information*

Location:	MCALF Bogue, North Carolina
Incident No.:	14989
NCDENR Site Priority Ranking:	E
Estimated Risk Classification:	Not an UST site
Source Type(s):	JP-5
Free Product:	Yes

#### 3.2 *Monitoring Schedule for this Event*

Sampling completed..

#### 3.3 *Recommended Monitoring Schedule Modifications*

Sampling completed.

#### 3.4 *Site Remediation Method*

An active site remediation plan which includes natural attenuation of ground water, a product recovery trench and BS/BV of impacted soils has been proposed. Installation of the active remediation system has not been initiated.

#### 3.5 *Recommended Remediation Modifications*

Consider excavation of contaminated soils and free product.

#### 3.6 *Recommended Steps Toward Site Closure*

TAFDS is not regulated as an UST site because the release came from aboveground bladder bags. Therefore, 2L applies to this site. Dissolved phase ground water contamination exceeds 2L in well 70GW05 for benzene, ethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene and naphthalene. Free product appears to be localized around well 70GW01. The advisability of excavating free product and contaminated soils with natural attenuation of the dissolved phase plume is currently being evaluated. Recommend that a decision about corrective action wait until the evaluation of excavation and natural attenuation is completed.