

10/1/08-02152

Final

# Non-time-critical Removal Action Completion Report Site 18, Former Naval Magazine Waste Storage Area

Naval Station Norfolk  
Norfolk, Virginia



Prepared for

**Department of the Navy**  
**Naval Facilities Engineering Command**  
**Mid-Atlantic**

Contract No. N6247-03-D-0260  
Task Order-WE04

**October 2008**

Prepared by



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Under the

**AGVIQ-CH2M HILL JV II Program  
Contract N62467-03-D-0260**

Prepared by



**Virginia Beach, Virginia**

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# Acronyms and Abbreviations

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bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DPT	direct push technology
EOS®	Edible Oil Substrate®
ERD	enhanced reductive dechlorination
ft	foot, feet
ft <sup>2</sup>	square feet
gpm	gallons per minute
GPS	global positioning system
H&S	health and safety
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSO	Health and Safety Officer
IDW	investigation-derived waste
IRP	Installation Restoration Program
JV II	AGVIQ/CH2M HILL Joint Venture II
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NFA	No Further Action
NM	Naval Magazine
NSN	Naval Station Norfolk
NTCRA	Non-time-critical Removal Action
psi	pounds per square inch
PVC	polyvinyl chloride
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
TCA	trichloroethane
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound

# Introduction

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AGVIQ-CH2M HILL Joint Venture II (JV II) was contracted by the Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Division to implement a Non-time-critical Removal Action (NTCRA) for Installation Restoration Program (IRP) Site 18, Former Naval Magazine (NM) Waste Storage Area, at Naval Station Norfolk (NSN) in Norfolk, Virginia. This work has been performed under existing contract number N62467-03-D-0260, Task Order WE04.

This completion report describes the enhanced reductive dechlorination (ERD) remediation that was selected as a NTCRA to promote the biodegradation of contaminants in groundwater, specifically chlorinated volatile organic compounds (VOCs). This action was implemented to reduce contaminant concentrations at previously identified hot spot areas to below action levels. The NTCRA involved injecting 27 injection locations with a mix of Edible Oil Substrate® (EOS®) and potable water to address the estimated area of the plume (approximately 11,000 square feet [ft<sup>2</sup>]). Design parameters for the NTCRA were based on the Engineering Evaluation/Cost Analysis (CH2M HILL, 2008) as refined in the *Final Non-time-critical Removal Action Work Plan, Site 18, Former Naval Magazine Waste Storage Area* (JV II, 2008a). Following a performance evaluation of the NTCRA, a Record of Decision (ROD) will be developed to address residual concentrations of VOCs in groundwater and document land use control restrictions.

The work identified in the NTCRA Work Plan was implemented between July 7 and July 30, 2008. Work activities include the installation and abandonment of 27 temporary injection points, injection of 1,415 gallons of EOS® and 51,045 gallons of water into the subsurface, and mobilization and demobilization from the site. The following sections describe the implementation of the NTCRA.

This document is issued by the Navy, lead agency responsible for the NTCRA at Site 18, in partnership with the United States Environmental Protection Agency (USEPA) Region 3 and the Virginia Department of Environmental Quality (VDEQ), under Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

## 1.1 Site Location

NSN is located on 4,631 acres of land in the northwestern portion of Norfolk, Virginia. NSN is bounded by Willoughby Bay to the north, the confluence of the Elizabeth and James Rivers to the west, and the City of Norfolk to the south and east. Site 18 is located in the southeastern corner of NSN and consists of the Former NM Storage Area (Figure 1-1).

## 1.2 Site History

Site 18 was used from 1975 to 1979 to store drums containing waste oil, metal plating solutions and sludges, chlorinated organic solvents (trichloroethene [TCE], 1,1,1-trichloroethane [TCA]), acids, and paint stripping solutions) (CH2M HILL, 2007). The storage area was an open, unpaved yard east of the metal storage buildings in the NM Storage Area (Taussig Can Area). Accidental releases of drum contents occurred onsite, but an intentional spill occurred in July 1979 (ES&E, 1983). As a result of the July 1979 spill, a pit was excavated and an existing drainage ditch was widened and lengthened to channel the waste oil and contaminated runoff. The liquids were periodically pumped from the pit and transported to a wastewater treatment plant. Soil in the area of the spill was sampled and found to be contaminated primarily with chromium and cadmium. The soil was, however, determined to be non-hazardous. A one-time landfill permit was obtained in October 1980 from the Virginia Department of Solid Waste to allow the contaminated soil at Site 18 to remain in place. The area was re-graded and seeded to establish a vegetative cover.

The landfill permit required monthly monitoring of the surface water to determine if contaminant transport occurred (ES&E, 1983). The monitoring program was conducted for 55 months and in October 1985, the State Water Control Board agreed to discontinue the monitoring because no significant contamination was observed.

In 1995, a Resource Conservation and Recovery Act (RCRA) inspection was conducted and concluded that no signs of adverse impacts or threats to human health or the environment were observed; therefore, the site was no longer subject to RCRA inspections. In addition, two surface soil samples were collected during the 1995 Phase I RRR Study (Baker, 1996), which resulted in Site 18 being recommended for a No Further Action (NFA) site.

In fall 2000, the NSN Partnering Team decided to reevaluate Site 18 because the previous NFA recommendation was based upon a comparison of site soils to the Environmental USEPA risk-based concentrations (RBCs) for industrial use. The site was reassessed in comparison with the soil RBCs for residential use and the Team recommended an additional investigation. Subsequent investigations were completed to further characterize the site and it was determined the contaminants of potential concern were limited to TCE; cis-1,2-dichloroethene; 1,1-dichloroethene; and vinyl chloride in groundwater (CH2M HILL, 2008).



# Activities Completed

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## 2.1 Objectives

The objective of this NTCRA was to implement the ERD to reduce the concentrations of chlorinated VOCs in groundwater at the site. To achieve this objective, an electron donor substrate was injected into the aquifer via temporary injection points to stimulate indigenous dehalogenating microbes, thereby enhancing the natural biodegradation of chlorinated VOCs in groundwater. The rationale for selecting ERD injection is presented in the *Final Engineering Evaluation/Cost Analysis, Site 18, Former Naval Magazine Waste Storage Area* (CH2M HILL, 2008).

## 2.2 Specific Activities Completed

The sections below describe the implementation of the NTCRA Work Plan (JV II, 2008a). Daily summaries of field activities can be found in the Contractor Production Reports (Appendix A) and the Contractor Quality Control Reports (Appendix B).

### 2.2.1 Safety Training

All field personnel were hazardous waste operations and emergency response (HAZWOPER) trained prior to mobilization. Site specific training was provided by the site Health and Safety (H&S) Officer (HSO) prior to onsite work activities. A 1-hour safety training session on the awareness and notification process related to the proximity of the site to the naval magazine area was also completed by site personnel prior to mobilization. Safety meetings and daily safety summaries were completed by field personnel (Appendix A and B).

### 2.2.2 Field Team Kick-off Meeting

A “kick-off” meeting was conducted prior to mobilization to discuss and finalize project logistics, H&S procedures, and other project requirements. This meeting was held on July 7, 2008.

### 2.2.3 Site Clearing

The initial site activities consisted of clearing dense brush vegetation at the site to provide a working area for the completion of the injections as well as staging areas for equipment, materials, and any investigation-derived waste (IDW). The asphalt parking area located at IRP Site 2 and the existing access path located between Site 2 and Site 18 (along the eastern border of Site 18) was used to access the site. Appendix C provides photographs of the site following the completion of site clearing activities.

## 2.2.4 Utility Location

Site 18 is an open field and there were no known utilities to be present within or in the vicinity of the site boundary. Nonetheless, before initiating injection activities, arrangements were made with Miss Utility (including NSN utilities), and a licensed, professional, third-party utility locator to confirm that no subsurface structures would be impacted by injection activities. Proposed injection locations were staked out using a global positioning system (GPS) in accordance with the work plan prior to the utility clearance.

## 2.2.5 Mobilization Meeting

A mobilization meeting was conducted to confirm the necessary equipment and materials that needed to be onsite to prepare for work and to determine staging and decontamination areas prior to mobilization. Attendees were present from the Navy, JV II, and JV II's subcontractors. The meeting was held on July 14, 2008.

## 2.2.6 Injection Point Installation and Testing

Temporary injection points were staked out in the field prior to mobilization to the site. Field adjustments of injection point locations were made by JV II as necessary. A total of 27 temporary injection points were placed. Of the 27 temporary injection points, 15 were shallow with a screened interval of 6–16 feet (ft) below ground surface (bgs), and 12 were deep with a screened interval of 12–22 ft bgs. The final locations of the temporary injection points, as surveyed with a GPS, are documented in Table 2-1 and shown on Figure 2-1. The locations of two monitoring wells (MW09S and MW10S) were also surveyed with the GPS to serve as quality control points (Table 2-1, Figure 2-1). Installation details of the temporary injection points are provided in Appendix D. Drilling was performed by A-Zone Environmental, and completed over a period of 4 days.

All drilling equipment was decontaminated via steam cleaning before starting work, in between boring locations, and after the job was completed before leaving the site. Water generated during decontamination was pumped into 55-gallon drums and labeled as IDW for disposal by JV II.

Each of the 27 injection points was advanced using a Geoprobe 6600 drill rig with direct push technology (DPT) methods. Each temporary injection point was constructed of flush jointed, threaded 1-inch diameter Schedule 40 polyvinyl chloride (PVC), with 10 ft of 0.02-inch slot screen.

The DPT methodology used for each temporary injection point installation was:

- Place 3.6-inch expendable point into 3.25-inch expendable point holder
- Drive 3.25-inch casing to desired depth
- Lower 1-inch diameter PVC screen and riser down the casing
- Retract the outer 3.25-inch casing using the 3.25-inch rod grip puller, while holding the well down, and install silica sand pack around the screen
- Install the sand pack to a depth of 1 ft above the screen

- Install a bentonite seal 2 ft above the sand pack
- Grout in a Portland cement seal to the surface

During drilling of injection point 11S and 14S, the drill rig hit an obstruction at approximately 8 ft bgs. Boring 11S was moved approximately 2 ft south and 14S was moved approximately 3 ft south to advance the drilling rods. The attempted boreholes were abandoned by filling with grout.

After installation and grouting, the temporary injection points were allowed to set overnight and were developed using a peristaltic pump by purging a minimum of 1 gallon of water from each well, or until the pumped water was clear of sediment and turbidity. Details on the volume purged from each temporary injection point during development are provided in Appendix D. Development water was pumped into 55-gallon drums and labeled as IDW for disposal by JV II.

On the second day of drilling, an injection test was performed on two temporary injection points to ensure that the installation method being used provided injection points with a suitable injection capacity. A holding tank was filled with potable water from the metered hydrant for use during the test. Temporary injection points 18D and 14S were used for the test. The test showed that the injection points were able to receive water at an average rate of 9–11 gallons per minute (gpm) each for a period of 25 minutes, and exhibited low pressures at the wellheads throughout the test (a maximum of 2 pounds per square inch [psi] was seen throughout the test). The results of the test were thus deemed favorable and installation of the temporary injection points continued using the same procedure.

### 2.2.7 Substrate Injection

A transfer pump was used to pump the prepared injectate consisting of EOS® and potable water through a manifold, which split the flow to allow for injection in up to four injection points simultaneously (Appendix C). Each of the four legs on the manifold was fitted with its own flow meter and ball valve, and connected to individual injection points with a hose that could be transferred from point to point. During injection, flow was regulated using the ball valves, and the volume injected into each injection point was measured and recorded using the flow meters. In total, 52,460 gallons of solution was injected into the subsurface via the temporary injection points. Because the solution was of a known concentration and well-mixed, the volume of EOS injected was determined to be 1,415 gallons. Details of the volumes injected into each point are provided in Appendix D.

Each temporary injection point was fitted with a pressure gauge and gate valve to monitor pressure at the wellhead during injection and allow for further control of the flow and pressure at the well. An air release valve was also fitted on each injection wellhead so that air in the hoses and well could be released and only the solution is injected into each injection point.

During injection, each injection point was monitored for flow rate (in gpm), flow totalizer (in gallons), pressure (in psi), and potential daylighting every 15 minutes. The totalizer readings were used to calculate the total volume of injectate (and mass of EOS®) injected into each well. Field data forms showing the data taken during injection at each well is provided as Appendix D.

Based on the JV II design parameters, each injection point was anticipated to receive injectate at a minimum estimated rate of 3–4 gpm under low pressure. Though pressure was kept at a minimum at the wellhead and the flow regulated to between 1.0 and 2.0 gpm (the lowest flow rate possible), daylighting could not be overcome at seven injection points: 4S, 6S, 8S, 12S, 13S, 26S, and 27D. After multiple attempts at injecting at each point, a batch of injectate (Batch 9) was mixed at twice the concentration of EOS® to reduce the volume of solution that needed to be injected into each injection by half. However, this volume was still unable to be injected without continued daylighting. Therefore, the remaining volume of the substrate mixture was injected into the nearest upgradient points until the specified volume of EOS® was injected into the site. Details of the injection points used as upgradient replacements are provided in Appendix D.

Daylighting occurred between 1 and 15 ft from the injection points; no daylighting occurred out of the borehole in which the injection points were installed (Appendix D). Additionally, injection points that exhibited daylighting did so at very low pressures, with all pressure readings between 0 and 10 psi before daylighting occurred. The daylighting was most likely caused by heterogeneities in the subsurface that created preferential pathways through which the injectate could reach the surface.

The drainage channel was visually inspected throughout and subsequent to injection activities to determine if the injectate was reaching the surface water. The injectate was not observed in the drainage channel. Photographs documenting the observations are provided in Appendix C.

## 2.2.8 Injection Point Abandonment

Once the injections were completed, all temporary injection points were abandoned. The initial procedure for temporary injection point abandonment included an attempt to remove the PVC well-casing by pulling it out of the ground using the Geoprobe drill rig. Removal of temporary injection point 23D was attempted using this procedure, however when the casing was pulled it snapped apart approximately 3 ft bgs. The possibility of PVC snapping above ground posed a potential safety issue. Furthermore, incompletely pulling the well can compromise the ability to properly seal the abandoned well. Removal of a second injection point (27D) was attempted and the casing was able to be pulled without snapping, however the expendable point at the end of the casing was unable to be driven out with a steel rod. Without removing the expendable point, the well casing would need to be pulled out completely before grouting begins, and the borehole could collapse and compromise the ability to seal the borehole.

The procedure was revised and the wells were abandoned in place by injecting a grout mix into each point using a tremie pipe, in accordance with VDEQ guidelines for well abandonment. The grout was injected from the bottom of the injection point up to the surface to ensure that the entire length of the injection point was grouted. The area around each point was then dug from 6 to 12 inches bgs and the well casing was cut and disposed. After cutting the well casing, the ground was restored to original grade. Before disposal, the cut well casing was decontaminated using potable water and Alquinox®. Decontamination water was placed in drums and labeled as IDW.

In accordance with VDEQ regulations, each of the four batches of grout mixture used in abandonment were made up of 6 gallons of water, one 94-pound sack of Portland cement, and 4 pounds of bentonite. The bentonite used in the grouting was sodium bentonite with 20 percent clay solids by weight of water.

## **2.2.9 Site Restoration**

Once injections were completed, the site was returned to pre-existing conditions. Materials were removed from the site and limited site restoration was completed.

### **2.2.10 Demobilization**

Upon completion of injection activities, all equipment, unused materials, temporary facilities, and all other miscellaneous items were removed from the site. A site walk was performed by the JV II Project Manager to ensure that the site was left in satisfactory condition before departure.

As part of the demobilization, the holding tanks used to mix the EOS® and water solution were rinsed clean using potable water, and the rinsate was injected into several temporary injection points that had already received injectate.

### **2.2.11 Investigation-derived Waste**

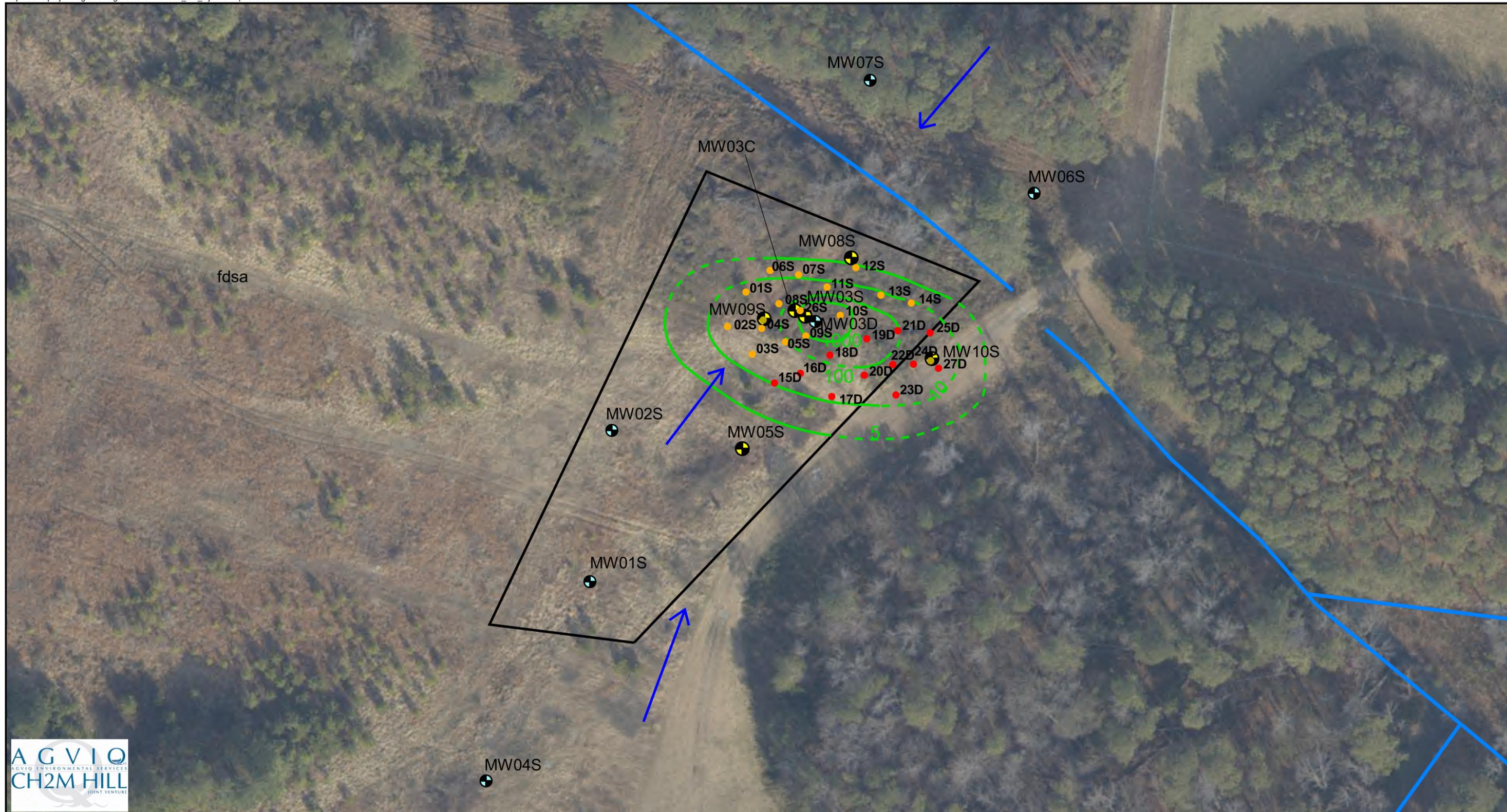
IDW consisted of injection point development purge water and decontamination fluids. IDW was collected as it was generated, containerized, and temporarily stored onsite in Department of Transportation (DOT) approved 55-gallon drums. The drums were labeled with weather-resistant labels as soon as IDW was placed inside. A total of four drums were generated during the project. Following characterization results, IDW will be disposed of at an approved facility in accordance with VDEQ and USEPA federal hazardous and solid waste regulations. All IDW management actions were documented in the field notes and disposal records will be kept on file.

**TABLE 2-1**

GPS Survey Locations

*Site 18 NTCRA Completion Report**Naval Station Norfolk**Norfolk, Virginia*

	<b>NORTHING</b>	<b>EASTING</b>
<b>Temporary Injection Point</b>		
27D	3503193.7818	12132950.6103
23D	3503176.5823	12132923.4232
24D	3503196.3185	12132934.6117
22D	3503196.1838	12132921.4108
20D	3503189.1946	12132903.3218
17D	3503175.7480	12132882.5138
25D	3503216.3240	12132945.3553
21D	3503217.7624	12132924.6036
19D	3503212.4086	12132904.8508
18D	3503201.9872	12132881.2133
16D	3503190.5137	12132862.4256
15D	3503184.3212	12132845.8636
14S	3503235.2920	12132933.2736
13S	3503240.1951	12132913.9225
10S	3503227.4219	12132887.8912
09S	3503214.3053	12132865.7628
11S	3503245.5897	12132879.4087
26S	3503230.5581	12132862.1687
12S	3503257.8235	12132897.9377
07S	3503253.3643	12132861.2840
06S	3503256.0266	12132843.1263
01S	3503242.3175	12132827.6607
02S	3503220.2762	12132815.9273
04S	3503219.1626	12132837.7298
03S	3503202.7190	12132831.6861
05S	3503210.4950	12132852.9255
08S	3503234.9288	12132848.5834
<b>Quality Control Monitoring Wells</b>		
MW09S	3503224.4409	12132838.7379
MW10S	3503198.5261	12132945.6800



**LEGEND**

- DPT Injection Location (6 to 16 feet below ground surface)
- DPT Injection Location (12 to 22 feet below ground surface)
- ⊕ Performance Monitoring Well
- ⊕ Monitoring Well
- GPS coordinates of monitoring wells

- ▭ Estimated Site Boundary
- ➔ Estimated Groundwater Flow Direction (October 2006)
- Total CVOCs Isoconcentration Contour (µg/L)  
(Dashed where inferred)
- Drainage Channel

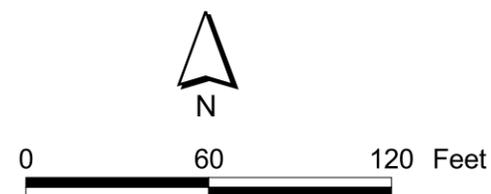


Figure 2-1  
ERD Injection Locations  
Site 18 NTCRA Completion Report  
Naval Station Norfolk  
Norfolk, Virginia

SECTION 3

# Path Forward

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Groundwater monitoring is scheduled to be completed at 3, 6, 9, and 12 months following the injection activities. Groundwater samples will be collected from six existing monitoring wells in accordance with the *Final Performance Monitoring Sampling and Analysis Plan, Site 18, Former Naval Magazine Waste Storage Area (JV II, 2008b)*.

SECTION 4

# References

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AGVIQ-CH2M HILL Joint Venture II (JV II). 2008a. *Final Non-time-critical Removal Action Work Plan, Site 18, Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. June.

JV II. 2008b. *Final Performance Monitoring Sampling and Analysis Plan, Site 18, Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. October.

Baker Environmental, Inc. (Baker). 1996. *Final Relative Risk Ranking System Data Collection Sampling and Analysis Report, Naval Base, Virginia*. January.

CH2M HILL. 2008. *Final Engineering Evaluation/Cost Analysis Site 18, Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. March.

CH2M HILL. 2007. *Final Site Investigation Summary Report Site 18 Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. November.

Environmental Science & Engineering, Inc. (ES&E). 1983. *Initial Assessment Study, Sewells Point Naval Complex, Norfolk, Virginia*. February.

**Appendix A**  
**Contractor Production Reports**

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## CONTRACTOR PRODUCTION REPORT

Report Number: 001

Date: 7-07-08

Contract number: N6247-03-D-0260

Delivery Order: WE- 04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Sunny	98	90

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	13.00
Site Preparation		0	Site QC/HSO	0.00
Site Preparation		0	Field tech	0.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	9.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>22.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	22.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	0.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD** **SAFETY REQUIREMENTS HAVE BEEN MET** YES

Tailgate and AHA for mobilize and setup done and review of health & safety plan

**SAFETY INSPECTIONS CONDUCTED**  
 Heavy equipment, Fire extinguishers and PPE

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**  
 Fork lift 0 hours used , Tractor with brush hog 6 hours used, 25 Kw generator 0 hours used

**REMARKS**

Started clearing the site about 80% complete  
 ,Received and set up site trailer

**PHOTO**

*Randy Johnson*

Date: 7-7-08

Prepared by: Site Superintendent

Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 002

Date: 7-08-08

Contract number; N6247-03-D-0260

Delivery Order; WE-04

**Title and Location; Non-time Critical Removal Naval Station Norfolk Site 18.**

WEATHER	Max. Temperature	Min. Temperature
Sunny	98	90

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	11.00
Site Preparation		0	Site QC/HSO	0.00
Site Preparation	CH2MHill	1	Field tech	2.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	9.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>22.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	22.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	22.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	44.00
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD** **SAFETY REQUIREMENTS HAVE BEEN MET** YES

Tailgate and AHA for mobilize

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PPE

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

96.6gal. Of diesel fuel

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 0 hours used , Tractor with brush hog 7 hours used, 25 Kw generator 0 hours used

**REMARKS**

Finished clearing the site 100% complete  
Started marking out well locations

**PHOTO**

*Randy Johnson*

Date: 7-8-08

Prepared by: Site Superintendent

Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 003

Date: 7-09-08

Contract number; N6247-03-D-0260

Delivery Order; WE-04

Title and Location; on-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Cloudy with light rain	85	77

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	11.00
Site Preparation		0	Site QC/HSO	0.00
Site Preparation	CH2MHill	1	Field tech	1.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	10.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>22.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	22.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	44.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	66.00
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD** **SAFETY REQUIREMENTS HAVE BEEN MET** YES

Tailgate and AHA for mobilize

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PPE

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

Supplies to build containment for drums

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 0 hours used , 25 Kw generator 0 hours used

**REMARKS**

Base utility came out to see if their are any under ground utilities on site

**PHOTO**

*Randy Johnson*

Date: 7-9-08

Prepared by: Site Superintendent

Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 004

Date: 7-10-08

Contract number: N6247-03-D-0260      Delivery Order: WE-04

**Title and Location:** Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Cloudy with light rain clearing up after noon	84	77

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	10.00
Site Preparation		0	Site QC/HSO	0.00
Site Preparation	CH2MHill	1	Field tech	1.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	10.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>21.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	21.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	66.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	81.00
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD**      **SAFETY REQUIREMENTS HAVE BEEN MET**      **YES**

Tailgate and AHA for mobilize

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PPE

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 2 hours used , 25 Kw generator 6 hours used

**REMARKS**

Finished marking well locations,  
 Cleaned and removed every thing from trailer to be demobed  
 Called generator off rent and to be removed from site

**PHOTO**

*Randy Johnson*

Date: 7-10-08

Prepared by: Site Superintendent

Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 005

Date: 7-14-08

Contract number: N6247-03-D-0260

Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Cloudy with light rain clearing up after noon	88	79

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	10.00
Site Preparation	Agviq	1	Site QC/HSO	10.00
Site Preparation	Sub contractors Sovereign	6	Field tech	60.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>80.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	80.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	81.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	161.00
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD	SAFETY REQUIREMENTS HAVE BEEN MET	YES
Tailgate, AHA for mobilize, Review Health and safety plan	YES	YES

**SAFETY INSPECTIONS CONDUCTED**  
 Heavy equipment, Fire extinguishers and PPE

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**  
 5 drums, 50 bags of sand

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**  
 Fork lift 2 hours used, Drill rig used 4 hours

**REMARKS**

Site meeting before getting started with work  
 Installed one well at 16' deep and one at 22' deep  
 Built decon pad  
 Built containment pad for IDW

**PHOTO**

*Randy Johnson*
Date: 7-14-08

Prepared by: Site Superintendent
Reviewed By:



**CONTRACTOR PRODUCTION REPORT**

Report Number: 006

Date: 7-15-08

Contract number: N6247-03-D-0260

Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	85	72

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	12.00
Site Preparation	Agviq	1	Site QC/HSO	10.00
Site Preparation	Sub contractors Sovereign	6	Field tech	56.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>78.00</b>

<b>JOB SAFETY</b> WAS A JOB SAFETY MEETING HELD THIS DATE? <small>(If YES attach copy of the meeting minutes)</small> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? <small>(If YES attach copy of completed OSHA report)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE? <small>(If YES attach statement or checklist showing inspection performed)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT? <small>(If YES attach description of if incident and proposed action)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	78.00
	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	161.00
	TOTAL WORK HOURS FROM START OF CONSTRUCTION	239.00
	<b>LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD</b>	

Tailgate, AHA for mobilize, Review Health and safety plan	<b>SAFETY REQUIREMENTS HAVE BEEN MET</b>	<b>YES</b>
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<b>SAFETY INSPECTIONS CONDUCTED</b>
Heavy equipment, Fire extinguishers and PPE

<b>EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB</b>
96.2 Gal. of diesel fuel

<b>CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY</b>
Fork lift 2 hours used, Drill rig used 10 hours

**REMARKS**

Installed ten of the shallow wells number 11s we had to move 2' to the south we hit something at 8' and the drill would not go through it. The rest of the wells 13s, 12s, 7s, 6s, 1s, 2s, 3s, 4s, and 9s went smoothly. We purged # 18d extracted about 4gal of water and #14s extracted about 3.5gal of water and completed a test injection using water we were able to pump the water at 12GPM in each well for 15 minutes (14S and 18D)

**PHOTO**

Prepared by: *Randy Johnson* Date: 7-15-08  
 Prepared by: Randy Johnson 7/15/2008 Reviewed By:



# CONTRACTOR PRODUCTION REPORT

Report Number: 007

Date: 7-16-08

Contract number: N6247-03-D-0260 Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	83	68

**WORK PERFORMED TODAY**

WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	12.00
Site Preparation	Agviq	1	Site QC/HSO	10.00
Site Preparation	Sub contractors Sovereign	4	Field tech	44.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00
<b>Total Work Hours</b>				<b>66.00</b>

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<table border="1"> <tbody> <tr> <td>TOTAL WORK HOURS ON JOB SITE THIS DATE</td> <td>66.00</td> </tr> <tr> <td>CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT</td> <td>239.00</td> </tr> <tr> <td>TOTAL WORK HOURS FROM START OF CONSTRUCTION</td> <td>305.00</td> </tr> </tbody> </table>	TOTAL WORK HOURS ON JOB SITE THIS DATE	66.00	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	239.00	TOTAL WORK HOURS FROM START OF CONSTRUCTION	305.00
TOTAL WORK HOURS ON JOB SITE THIS DATE	66.00							
CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	239.00							
TOTAL WORK HOURS FROM START OF CONSTRUCTION	305.00							
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO							
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO							
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO							

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD SAFETY REQUIREMENTS HAVE BEEN MET YES**

Tailgate, AHA for mobilize, Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 2 hours used , Drill rig used 10 hours

**REMARKS**

We purged # 1S, 2S,3S,4S,6S,7S,8S,9S,11S,12S,and 13S. extracted about 1gal of water out of each well.Instaled wells 8S,10S 15D,16D,17D,19D and 20D. Started Injecting EOS into wells 9S 1010gal. 1S 1630gal. 7S 910gal. 3S 1130gal. and 14S 210gal. 14S started day lighting used some portland cement to plug where the EOS was coming up. The tottal for the day is 4890 gal

**PHOTO**


 Date: 7-16-08  
 Prepared by: Randy Johnson 7/16/2008 Reviewed By:



# CONTRACTOR PRODUCTION REPORT

Report Number: 008

Date: 7-17-08

Contract number; N6247-03-D-0260 Delivery Order: WE-04

Title and Location; Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	84	69

**WORK PERFORMED TODAY**

WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	11.00
Site Preparation	Agviq	1	Site QC/HSO	11.00
Site Preparation	Sub contractors Sovereign	4	Field tech	44.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00

		Total Work Hours	66.00
<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> (If YES attach copy of the meeting minutes)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> (If YES attach copy of completed OSHA report)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	66.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> (If YES attach statement or checklist showing inspection performed)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> (If YES attach description of if incident and proposed action)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	305.00
			TOTAL WORK HOURS FROM START OF CONSTRUCTION
			371.00

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD SAFETY REQUIREMENTS HAVE BEEN MET YES**

Tailgate, AHA , Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 1 hours used , Drill rig used 11 hours

**REMARKS**

We purged # 15D, 16D,17D,10S,20D,and19D. extracted 9gal of water out of these wells. Instaled wells 25D,21D,27D,24D,22D,23D,26S and 5S.Well # 26 was changed from a deep to a shallow well and was moved to a different location Continued Injecting EOS into wells 9S 480gal. 1S 140gal. 7S 1140gal. 3S 920gal, 14S 1010gal 6S 90gal,10S 850gal,13S 320gal and 17D 1670gal. The tottal for the day is 6620 gal

**PHOTO**



# CONTRACTOR PRODUCTION REPORT

Report Number: 009

Date: 7-18-08

Contract number: N6247-03-D-0260 Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	85	70

**WORK PERFORMED TODAY**

WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	11.00
Site Preparation	Agviq	1	Site QC/HSO	11.00
Site Preparation	Sub contractors Sovereign	2	Field tech	22.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00

		<b>Total Work Hours</b>		44.00
<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> (If YES attach copy of the meeting minutes)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	44.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> (If YES attach copy of completed OSHA report)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	371.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> (If YES attach statement or checklist showing inspection performed)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	415.00
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> (If YES attach description of if incident and proposed action)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD SAFETY REQUIREMENTS HAVE BEEN MET YES**

Tailgate, AHA , Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

Fork lift 1 hours used , Drill rig used 0 hours

**REMARKS**

We purged # 27D, 24D,25D,21S,22D,23D,26S,and5S. extracted 11gal of water out of these wells. Continued Injecting EOS into wells 1S 280gal. 5S 1240gal. 6S 240gal. 10S 1200gal, 13S 130gal 14S 350gal,17D 380gal,21D 2050gal and 23D 2050gal. The total for the day is 7920 gal and the total for the week 19430.Wells complet # 23D,21D,17D,10S,7S,3S and1S

**PHOTO**

*Randy Johnson*

Date: 7-18-08

Prepared by: Randy Johnson

7/18/2008

Reviewed By:



# CONTRACTOR PRODUCTION REPORT

Report Number: 010

Date: 7-21-08

Contract number; N6247-03-D-0260

Delivery Order: WE-04

Title and Location; Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	90	77

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	12.00
Site Preparation	Agviq	1	Site QC/HSO	11.00
Site Preparation	Sub contractors Sovereign	2	Field tech	19.50
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00

			<b>Total Work Hours</b>	42.50
<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	42.50
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	415.00
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	457.50
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD	SAFETY REQUIREMENTS HAVE BEEN MET	YES
Tailgate, AHA , Review Health and safety plan		

**SAFETY INSPECTIONS CONDUCTED**  
Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**  
Fork lift 1 hours used called off rent

**REMARKS**  
  
Continued Injecting EOS into wells 2S 440gal. 5S 810gal. 6S 20gal. 9S 560gal, 11S 1180gal, 12S 130gal, 14S 480gal, 16D 70gal, 20D 2050gal 27D 440 gal and 24D 1910gal. The total for the day is 8090 gal and the total for the job 27520. Wells compleat # 23D, 21D, 17D, 10S, 7S, 3S, 5S, 9S, 20D, 14S and 1S

**PHOTO**

Prepared by: *Randy Johnson* Date: 7-21-08  
7/21/2008 Reviewed By:



# CONTRACTOR PRODUCTION REPORT

Report Number: 011

Date: 7-22-08

Contract number; N6247-03-D-0260

Delivery Order; WE-04

Title and Location; Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear	94	79

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	12.00
Site Preparation	Agviq	1	Site QC/HSO	11.00
Site Preparation	Sub contractors Sovereign	2	Field tech	20.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00

			<b>Total Work Hours</b>	43.00
<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	43.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	457.50
	<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	500.50
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD	SAFETY REQUIREMENTS HAVE BEEN MET	YES
Tailgate, AHA , Review Health and safety plan		

**SAFETY INSPECTIONS CONDUCTED**  
Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**  
Fork lift 0 hours used called off rent

**REMARKS**  
Continued Injecting EOS into wells 2S 1610gal. 4S 160gal. 6S 40gal. 8S 480gal, 11S 870gal, 12S 10gal, 13S 70gal, 16D 1980gal, 18D 70gal 19D 120 gal, 24D 140gal, 25D 2050gal, 26S 170gal and 27D 100gal. The total for the day is 7990 gal and the total for the job 35510. Wells complete # 23D, 21D, 17D, 10S, 7S, 3S, 5S, 9S, 20D, 14S, 2S, 11S, 16D, 24D, 25D and 1S. We are having trouble with day lighting in wells 27D, 8S, 26S, 6S, 12S, and 13S. we are trying to slow gpm. down also using Portland cement in the area where day lighting is coming up.

**PHOTO**

Prepared by: *Randy Johnson* Date: 7-22-08  
7/22/2008

Reviewed By:



### CONTRACTOR PRODUCTION REPORT

Report Number: 012

Date: 7-23-08

Contract number: N6247-03-D-0260 Delivery Order: WE- 04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Clear until 3:30 pm rain storm	92	80

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	11.00
Site Preparation	Agviq	1	Site QC/HSO	10.50
Site Preparation	Sub contractors Sovereign	1	Field tech	10.50
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	11.00
Site Preparation		0	Laborer	0.00

<b>JOB SAFETY</b>			<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<b>Total Work Hours</b>	43.00
			(If YES attach copy of the meeting minutes)		<b>TOTAL WORK HOURS ON JOB SITE THIS DATE</b>	43.00
			<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT</b>	500.50
			(If YES attach copy of completed OSHA report)		<b>TOTAL WORK HOURS FROM START OF CONSTRUCTION</b>	543.50
			<b>WAS TRENCING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
			(If YES attach statement or checklist showing inspection performed)			
			<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
			(If YES attach description of if incident and proposed action)			

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD** SAFETY REQUIREMENTS HAVE BEEN MET **YES**

Tailgate, AHA, Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**  
Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

**REMARKS**

Continued Injecting EOS into wells 4S 1020gal. 6S 120gal. 8S 50gal, 12S 10gal, 13S 170gal, 15D 1040gal, 18D 1930gal 19D 340 gal, 22D 2050gal, 26S 280gal and 27 70gal. The total for the day is 7080 gal and the total for the job 42580. Wells complete # 23D, 21D, 17D, 10S, 7S, 3S, 5S, 9S, 20D, 14S, 2S, 11S, 16D, 24D, 25D 18D 22D and 1S. With direction from the project team due to day lighting will inject at twice the concentration of EOS in wells that have day lighted if possible, and inject into near up gradient well if not.

**PHOTO**

Prepared by: *Randy Johnson* Date: 7/23/2008 Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 013

Date: 7-24-08

Contract number: N6247-03-D-0260      Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Fair	84	71

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	10.50
Site Preparation	Agviq	1	Site QC/HSO	10.00
Site Preparation	Sub contractors Sovereign	1	Field tech	10.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	10.50
Site Preparation		0	Laborer	0.00

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <small>(If YES attach copy of the meeting minutes)</small>				Total Work Hours	41.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <small>(If YES attach copy of completed OSHA report)</small>				TOTAL WORK HOURS ON JOB SITE THIS DATE	41.00
	<b>WAS TRENCING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <small>(If YES attach statement or checklist showing inspection performed)</small>				CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	543.50
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <small>(If YES attach description of if incident and proposed action)</small>				TOTAL WORK HOURS FROM START OF CONSTRUCTION	584.50

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD**      **SAFETY REQUIREMENTS HAVE BEEN MET**      **YES**

Tailgate, AHA, Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Heavy equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

**REMARKS**

Continued Injecting EOS into wells 4S 510gal, 6S 460gal, 8S 560gal, 12S 1630gal, 13S 500gal, 15D 1010gal, 19D 1550 gal, 26S 340gal and 27D 370gal. The total for the day is 6930 gal and the total for the job 49510. Wells complete # 23D, 21D, 17D, 10S, 7S, 3S, 5S, 9S, 20D, 14S, 2S, 11S, 16D, 24D, 25D 18D 22D 15D 19D and 1S. Started injecting in to the nearest up gradient wells because of the day lighting issues as well as using 2x concentrate

**PHOTO**

*Randy Johnson*      Date: 7-24-08

Prepared by: Randy Johnson      7/24/2008      Reviewed By:



## CONTRACTOR PRODUCTION REPORT

Report Number: 014

Date: 7-25-08

Contract number: N6247-03-D-0260      Delivery Order: WE- 04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Fair	86	73

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	8.50
Site Preparation	Agviq	1	Site QC/HSO	8.00
Site Preparation	Sub contractors Sovereign	1	Field tech	8.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation	Agviq	1	Equipment Op.	8.50
Site Preparation		0	Laborer	0.00

<b>JOB SAFETY</b>	<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<b>Total Work Hours</b> 33.00
	<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		TOTAL WORK HOURS ON JOB SITE THIS DATE 33.00
	<b>WAS TRENCING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT 584.50
	<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		TOTAL WORK HOURS FROM START OF CONSTRUCTION 617.50

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD**      **SAFETY REQUIREMENTS HAVE BEEN MET**      **YES**

Tailgate, AHA, Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

**REMARKS**

Continued Injecting EOS into wells 4S 330gal, 6S 120gal, 8S 940gal, 12S 270gal, 13S 870gal, 26S 1260gal and 27D 1070gal. The total for the day is 4860 gal and the total for the job 54390. Wells complete # 23D, 21D, 17D, 10S, 7S, 3S, 5S, 9S, 20D, 14S, 2S, 11S, 16D, 24D, 25D 18D 22D 15D 19D, 4S, 8S, 12S, 13S, 26S, 27D, and 1S. Continued injecting in to the nearest up gradient wells because of the day lighting issues as well as using 2x concentrate. Wells we are having trouble with day lighting are 12S, 27D, 8S, 26S, 6S, & 13S

**PHOTO**

*Randy Johnson*

Date: 7-25-08  
7/25/2008

Reviewed By:

Prepared by: Randy Johnson



## CONTRACTOR PRODUCTION REPORT

Report Number: 015

Date: 7-28-08

Contract number: N6247-03-D-0260

Delivery Order: WE-04

Title and Location: Non-time Critical Removal Naval Station Norfolk Site 18.

WEATHER	Max. Temperature	Min. Temperature
Fair	88	75

WORK PERFORMED TODAY				
WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HOURS
Site Preparation	Agviq	1	Site Supervisor	10.00
Site Preparation	Agviq	1	Site QC/HSO	6.00
Site Preparation	Sub contractors Sovereign	2	Field tech	14.00
Site Preparation		0	Project Manager	0.00
Site Preparation		0	Foreman-CP	0.00
Site Preparation		0	Equipment Op.	0.00
Site Preparation		0	Laborer	0.00

JOB SAFETY	SAFETY REQUIREMENTS HAVE BEEN MET	YES	Total Work Hours	30.00
<b>WAS A JOB SAFETY MEETING HELD THIS DATE?</b> <small>(If YES attach copy of the meeting minutes)</small> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TOTAL WORK HOURS ON JOB SITE THIS DATE	30.00
<b>WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?</b> <small>(If YES attach copy of completed OSHA report)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	617.50
<b>WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE?</b> <small>(If YES attach statement or checklist showing inspection performed)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			TOTAL WORK HOURS FROM START OF CONSTRUCTION	647.50
<b>WAS HAZARDOUS MATERIAL/WASTE RELEASED TO THE ENVIRONMENT?</b> <small>(If YES attach description of if incident and proposed action)</small> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				

**LIST SAFETY ACTIONS TAKEN AND MEETINGS HELD**

Tailgate, AHA, Review Health and safety plan

**SAFETY INSPECTIONS CONDUCTED**

Equipment, Fire extinguishers and PEP

**EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB**

**CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY, INCLUDE NUMBER OF HOURS USED TODAY**

**REMARKS**

Continued Injecting EOS into wells 6S 960gal. The total for the day is 960 gal and the total for the job 55350. All Wells complete. Well location were surveyed with GPS. Decomed backer tanks and started getting supplies off site

**PHOTO**



*Randy Johnson*
Date: 7-28-08  
 Prepared by: Randy Johnson 7/28/2008 Reviewed By:

**Appendix B**  
**Contractor Quality Control Reports**

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# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260			Report #: CQCR-01	Date: July 14, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and injection well installation</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Pre Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Preformed & Who Preformed Test - None  None
	Workmanship is Satisfactory	X				
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Preformed & Who Preformed Test  None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
DETAILS PHASE 2 ACTIVITIES: A H&S briefing was held on site Two 6k baker tanks arrive. The tanks are set-up and and plumbed for injection activities. All drilling tools were decontaminated prior to drilling activities. The tools will be decontaminated following and prior to injection well installation.						
All work and materials are in compliance with the contract, plans and specifications.						
On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.						
<i>Robert S. Brown</i>					Date: July 14, 2008	

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260		Report #: CQCR-02		Date: July 15, 2008	
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT	
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and injection well installation</b>	
	The Submittals Have Been Approved	X			
	Materials Comply With Approved submittals	X			
	Materials Stored Properly	X			
	Preliminary Work Was Done Correctly	X			
	Testing Plan Has Been Reviewed	X			
	Work Method and Schedule Discussed	X			
	Job Safety / Hazard Analysis Addressed	X			
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Pre Task Safety Sheet for the days activities</b>	Testing Performed & Who Performed Test - None
	Sample Has Been Prepared / Approved	N/A			None
	Workmanship is Satisfactory	X			
	Test Results are Acceptable	N/A			
	Work is in Compliance With the Contract	X			
	Work Complies with Safety Requirements	X			
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>	Testing Performed & Who Performed Test
					None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)				REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)	
None				None	
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Drilling activities continue. Well installation procedures are observed by site geologist to ensure compliance with construction requirements. The tools are decontaminated following and prior to injection well installation. All work and materials are in compliance with the contract, plans and specifications.					
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>					

*Robert S. Brown*

Date: July 15, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260		Report #: CQCR-03		Date: July 16, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and injection well installation</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Pre Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Preformed & Who Preformed Test - None      None
	Workmanship is Satisfactory	X				
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Preformed & Who Preformed Test   None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Drilling activities continue. Well installation procedures are observed by site geologist to ensure compliance with construction requirements. The tools are decontaminated following and prior to injection well installation. All work and materials are in compliance with the contract, plans and specifications.						
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>						

*Robert S. Brown*

Date: July 16, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260		Report #: CQCR-03		Date: July 17, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and injection well installation</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Pre Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Preformed & Who Preformed Test - None      None
	Workmanship is Satisfactory	X				
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Preformed & Who Preformed Test  None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Drilling activities continue. Well installation procedures are observed by site geologist to ensure compliance with construction requirements. The tools are decontaminated following and prior to injection well installation. All work and materials are in compliance with the contract, plans and specifications.						
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>						

*Robert S. Brown*

Date: July 17, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260				Report #: CQCR-05	Date: July 18, 2008	
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Pre Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Preformed & Who Preformed Test - None  None
	Workmanship is Satisfactory	X				
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Preformed & Who Preformed Test  None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)				REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)		
None				None		
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. Injection will continue until 2,050 gallons of solution are injected into each well. Drilling activities are complete. Drillers decontaminate all equipment, clean their site and demob all equipment.						
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>						

*Robert S. Brown*

Date: July 18, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260			Report #: CQCR-06	Date: July 21, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Performed & Who Performed Test - None
	Workmanship is Satisfactory	X				None
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Performed & Who Performed Test
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. <span style="float: right;">All work</span> and materials are in compliance with the contract, plans and specifications.						
On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.						

*Robert S. Brown*

Date: July 21, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260			Report #: CQCR-07	Date: July 22, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Performed & Who Performed Test - None  None
	Workmanship is Satisfactory	X				
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Performed & Who Performed Test  None
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
DETAILS PHASE 2 ACTIVITIES: A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. All work and materials are in compliance with the contract, plans and specifications.						
On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.						

*Robert S. Brown*

Date: July 22, 2008

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. N62467-03-D-0260			Report #: CQCR-08	Date: July 23, 2008		
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT		
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>		
	The Submittals Have Been Approved	X				
	Materials Comply With Approved submittals	X				
	Materials Stored Properly	X				
	Preliminary Work Was Done Correctly	X				
	Testing Plan Has Been Reviewed	X				
	Work Method and Schedule Discussed	X				
	Job Safety / Hazard Analysis Addressed	X				
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		
	Sample Has Been Prepared / Approved	N/A				Testing Preformed & Who Preformed Test - None
	Workmanship is Satisfactory	X				None
	Test Results are Acceptable	N/A				
	Work is in Compliance With the Contract	X				
	Work Complies with Safety Requirements	X				
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		
						Testing Preformed & Who Preformed Test
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None			None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. Because we cannot inject sufficient volume into some wells (12S, 27D, 8S, 26S, 6S & 13S) due to daylighting, we will mix a double concentration batch (3 drums EOS/3000 gallon water) and inject as much as we can into these wells. If we cannot inject 1000 gallons, we will inject standard mix into nearby upgradient wells to get sufficient B						
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>						

*Robert S. Brown*

Date: July 23, 2008

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DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. <b>N62467-03-D-0260</b>				Report #: <b>CQCR-09</b>		Date: <b>July 24, 2008</b>	
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT			
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>			
	The Submittals Have Been Approved	X					
	Materials Comply With Approved submittals	X					
	Materials Stored Properly	X					
	Preliminary Work Was Done Correctly	X					
	Testing Plan Has Been Reviewed	X					
	Work Method and Schedule Discussed	X					
	Job Safety / Hazard Analysis Addressed	X					
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		Testing Preformed & Who Preformed Test - None	
	Sample Has Been Prepared / Approved	N/A				None	
	Workmanship is Satisfactory	X					
	Test Results are Acceptable	N/A					
	Work is in Compliance With the Contract	X					
	Work Complies with Safety Requirements	X					
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		Testing Preformed & Who Preformed Test	
						None	
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)				REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None				None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. Because we cannot inject sufficient volume into some wells (12S, 27D, 8S, 26S, 6S & 13S) due to daylighting, we will mix a double concentration batch (3 drums EOS/3000 gallon water) and inject as much as we can into these wells. If we cannot inject 1000 gallons, we will inject standard mix into nearby upgradient wells to get sufficient B							
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<i>Robert S. Brown</i>						Date: July 24, 2008	

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GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

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(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. <b>N62467-03-D-0260</b>				Report #: <b>CQCR-10</b>		Date: <b>July 25, 2008</b>	
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT			
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>			
	The Submittals Have Been Approved	X					
	Materials Comply With Approved submittals	X					
	Materials Stored Properly	X					
	Preliminary Work Was Done Correctly	X					
	Testing Plan Has Been Reviewed	X					
	Work Method and Schedule Discussed	X					
	Job Safety / Hazard Analysis Addressed	X					
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		Testing Preformed & Who Preformed Test - None	
	Sample Has Been Prepared / Approved	N/A				None	
	Workmanship is Satisfactory	X					
	Test Results are Acceptable	N/A					
	Work is in Compliance With the Contract	X					
	Work Complies with Safety Requirements	X					
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		Testing Preformed & Who Preformed Test	
						None	
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)				REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None				None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site The tanks are filled with water from the fire hydrant and three drums of EOS added to each 6k tank. The tanks are mixed at ~100 gpm for a minimum 2- hours before injection begins. Injection will continue until 2,050 gallons of solution are injected into each well. Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. Because we cannot inject sufficient volume into some wells (12S, 27D, 8S, 26S, 6S & 13S) due to daylighting, we will mix a double concentration batch (3 drums EOS/3000 gallon water) and inject as much as we can into these wells. If we cannot inject 1000 gallons, we will inject standard mix into nearby upgradient wells to get sufficient							
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<i>Robert S. Brown</i>						Date: July 25, 2008	

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

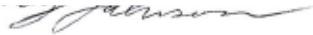
DATE

# CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Contract No. <b>N62467-03-D-0260</b>				Report #: <b>CQCR-11</b>		Date: <b>July 28, 2008</b>	
PHASE	(BLANK - NOT APPLICABLE)	YES	NO	IDENTIFY SPECIFICATION SECTION, DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT			
<b>PREPARATORY</b>	Plans and Specs have Been Reviewed	X		<b>Task 2 - Injection Activities</b>  <b>Preparatory phase for site preparation and well injection</b>			
	The Submittals Have Been Approved	X					
	Materials Comply With Approved submittals	X					
	Materials Stored Properly	X					
	Preliminary Work Was Done Correctly	X					
	Testing Plan Has Been Reviewed	X					
	Work Method and Schedule Discussed	X					
	Job Safety / Hazard Analysis Addressed	X					
<b>INITIAL</b>	Preliminary Work Was Done Correctly	X		<b>Task 2 - Injection Activities</b>  <b>Review Task Safety Sheet for the days activities</b>		Testing Preformed & Who Preformed Test - None	
	Sample Has Been Prepared / Approved	N/A				None	
	Workmanship is Satisfactory	X					
	Test Results are Acceptable	N/A					
	Work is in Compliance With the Contract	X					
	Work Complies with Safety Requirements	X					
<b>FOLLOW-UP</b>	Work Complies with Contract as Approved Initial Phase	X		<b>Task 2 - Injection Activities</b>  <b>See Details Below.</b>		Testing Preformed & Who Preformed Test	
						None	
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)				REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
None				None			
<b>DETAILS PHASE 2 ACTIVITIES:</b> A H&S briefing was held on site  Injection wells continue to be monitored for flow rate and daylighting every 15 minutes. Because we cannot inject sufficient volume into some wells (12S, 27D, 8S, 26S, 6S & 13S) due to daylighting, we will mix a double concentration batch (3 drums EOS/3000 gallon water) and inject as much as we can into these wells. If we cannot inject 1000 gallons, we will inject standard mix into nearby upgradient wells to get sufficient EOS volume into the general area of the wells. Because we are injecting 0.5 total volume mixture from this batch (but same amount of EOS) this is not expected to im							
<small>On behalf of the contractor, I certify that this report is completed and correct and equipment and material used and work preformed during this reporting period is in compliance with the contract drawings and specification to the best of my knowledge ex.</small>							
						Date: July 28, 2008	

**CONTRACTOR QUALITY CONTROL REPORT**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)



QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT (Use Second Page if Necessary)

GOVERNMENT QUALITY ASSURANCE MANAGER

DATE

**Appendix C**  
**Site Photographs**

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**PHOTOGRAPH 1**  
Site Clearing



**PHOTOGRAPH 2**  
Site Clearing



**PHOTOGRAPH 3**  
Site Clearing



**PHOTOGRAPH 4**  
Site Clearing



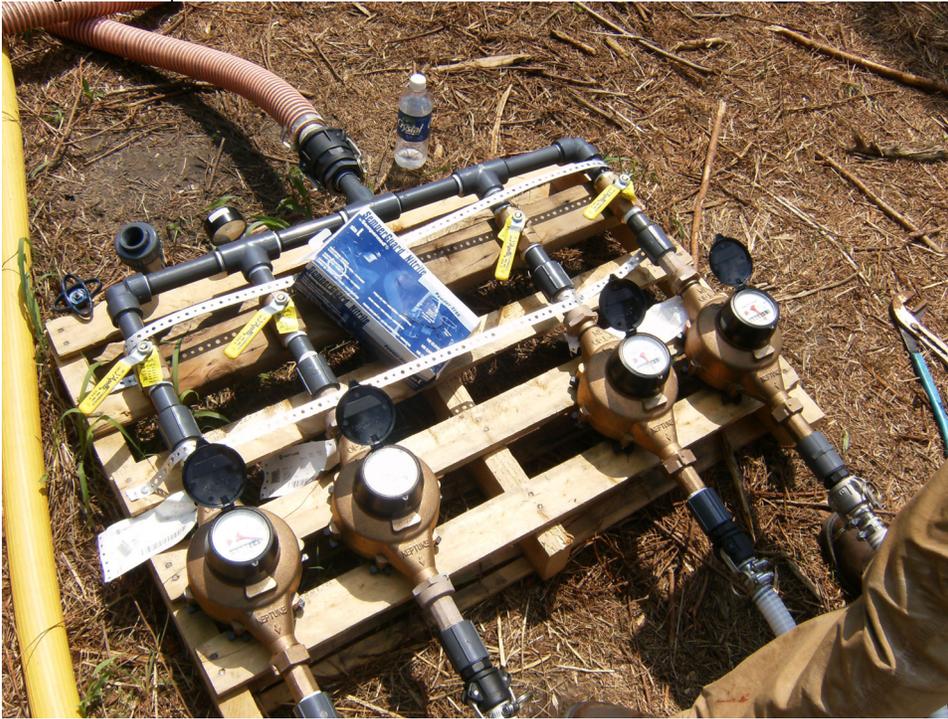
**PHOTOGRAPH 5**  
Mixing Tank Setup



**PHOTOGRAPH 6**  
Mixing Tank Setup



**PHOTOGRAPH 7**  
Mixing Tank Setup



**PHOTOGRAPH 8**  
Mixing Tank Setup



**PHOTOGRAPH 9**  
Injection Point Installation and Locations



**PHOTOGRAPH 10**  
Injection Point Installation and Locations



**PHOTOGRAPH 11**  
Injections



**PHOTOGRAPH 12**  
Injections



**PHOTOGRAPH 13**  
Drainage Channel



**PHOTOGRAPH 14**  
Drainage Channel



**PHOTOGRAPH 15**  
Drainage Channel



**Appendix D**  
**Subcontractor ERD Injection Implementation**  
**Report**

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# SOVEREIGN CONSULTING INC.

*Environmental services executed safely and consistently...*

## ENHANCED REDUCTIVE DECHLORINATION (ERD) INJECTION IMPLEMENTATION REPORT

*FINAL*

SITE 18 – NAVAL STATION NORFOLK, NORFOLK, VA

Norfolk, VA

AGVIQ/CH2M Hill Joint Venture II (JV II)  
Prime Contract No.: N62467-03-D-0260

*Prepared for:*

AGVIQ/CH2M Hill Joint Venture II (JV II)  
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*Prepared by:*

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405 Oakmeads Crescent  
Virginia Beach, Virginia 23462

**IMPLEMENTATION REPORT**

October 2008

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3.0	Mobilization.....	2
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## FIGURES

- Figure 1** – Naval Station Norfolk - Site 18 Map  
**Figure 2** – Temporary Injection Point Locations

## TABLES

- Table 1** – Temporary Injection Point Installation Details  
**Table 2** – Injectate Batch Summaries  
**Table 3** – Temporary Injection Point Injectate Volumes with EOS  
**Table 4** – Daylighted Injection Point Injection Details

## APPENDICES

- Appendix A** – Batch Preparation Forms  
**Appendix B** – Injection Detail Forms

## 1.0 INTRODUCTION

Sovereign Consulting, Inc. (Sovereign) has prepared this Enhanced Reductive Dechlorination (ERD) Implementation Report under AGVIQ LLC, Subcontract No. AV08-2020. The purpose of this report is to present the results of the injection of ERD substrate at Site 18 in Naval Station Norfolk (NSN) in Norfolk, Virginia (see Figure 1).

Injection of ERD substrate was chosen as a non-time critical removal action (NTCRA) to promote the biodegradation of the contaminants in groundwater. This action is intended to reduce contaminant concentrations at previously identified hot spot areas, to below action levels. The NTCRA involves injecting 27 injection locations with a mix of Edible Oil Substrate 598® (EOS 598®, EOS, or ERD substrate) and potable water to address the plume which is approximately 11,000 square feet in area. Design parameters for the NTCRA were provided by JV II. The scope of work for the NTCRA was provided in the July 2008 *Enhanced Reductive Dechlorination Work Plan*, prepared by Sovereign.

The work scope presented in the ERD Work Plan was implemented between July 14-30, 2008. Work completed includes the installation and abandonment of 27 temporary injection points, injection of 1,415 gallons of EOS and 51,045 gallons of water into the subsurface, and mobilization and demobilization from the site. The following sections describe the implementation of this work scope.

## 2.0 SITE PREPARATION

The injection area is located in a grassy, brush-covered area with a few small trees and is not currently in use. Prior to mobilization to the site by Sovereign, JV II performed limited site clearing activities to ensure access to necessary work areas and clear brush and weeds.

JV II also performed utility mark-outs to identify all utilities in the work area to ensure that no utility lines are damaged during drilling, and staked out all temporary injection point locations.

Prior to mobilization Sovereign identified a JV II approved area to stage the 27 55-gallon drums of EOS 598® (EOS) that were provided and delivered to the site by JV II. The EOS 598® is the specified ERD substrate to be injected and is a product of EOS Remediation, Inc. Each 55-gallon drum contains approximately 52.5 gallons (420 lbs) of substrate. The drums of ERD substrate were stored on site during the injection event in the work staging area.

A staging area for investigation-derived waste (IDW) was prepared by JV II before work commenced.

### **3.0 MOBILIZATION**

Mobilization consisted of locating the necessary equipment and materials onsite and preparing the work and decontamination staging areas. Equipment and materials that were located on site include the drill rig, holding tanks, decontamination supplies (lined berm and steam cleaner), gasoline-powered generator, EOS drums, hose, and miscellaneous supplies.

A GeoProbe 6600 drill rig was brought onsite by A-Zone Environmental on the day drilling commenced and was taken offsite when drilling was complete. Similarly, the GeoProbe 6600 drill rig was brought onsite for injection point abandonment and was taken offsite when abandonment was complete. Before drilling commenced, a temporary decontamination pad was constructed that housed the steam cleaner for decontamination of the GeoProbe rods before and after each temporary injection point installation and before demobilizing from the site.

A work staging area was prepared for staging the holding tanks, power generator, hose, and miscellaneous equipment and supplies (pumps, manifold) for injection, and remained in use for the duration of the project. This area was also used to stage the drums of the ERD substrate.

### **4.0 TEMPORARY INJECTION POINT INSTALLATION**

As discussed in Section 2.0, locations of the 27 temporary injection points were to be staked out by JV II prior to Sovereign's mobilization to the site. Field adjustments of injection point locations were made by JV II as necessary. A total of 15 shallow temporary injection points screened from 6-16 bgs and 12 deep temporary injection points screened from 12-22 feet bgs were installed. The final locations of the temporary injection points, as determined by GPS, are shown on Figure 2. Installation details of the temporary injection points are listed in Table 1. Drilling was performed by A-Zone Environmental, and completed over a period of four (4) days.

Each of the 27 injection points was advanced using direct push technology (DPT) methods with a Geoprobe 6600 drill rig. Temporary well points were constructed of flush joint, threaded 1-inch diameter Schedule 40 PVC, with 10 feet of 0.02-inch slot screen.

The DPT methodology used for temporary injection point installation is described here:

- Place 3.6" expendable point into 3.25" expendable point holder.
- Drive 3.25" casing to desired depth.
- Lower 1-inch diameter PVC screen and riser down the casing.

- Retract the outer 3.25” casing using the 3.25” rod grip puller, while holding the well down, and install silica sand pack around the screen. Install the sand pack to a depth of 1 foot above the screen.
- Install a bentonite seal for two (2) feet above the sand pack.
- Grout in a Portland cement seal to the surface.
- Finish with a stick-up well cover.

During drilling of injection points 14S and 11S, the drilling rods appeared to hit an obstruction and could not easily advance, so the boring locations were moved approximately three (3) feet and two (2) feet, respectively, in order to more easily advance the drilling rods. The boreholes that were not used for injection points were filled with grout.

After installation and grouting, the temporary injection points were allowed to set overnight and developed using a peristaltic pump by purging a minimum of one (1) gallon of water from each well, or until the pumped water was clear of sediment and turbidity. Details on the volume purged from each temporary injection point during development are shown on Table 1. Development water was pumped into 55-gallon drums and labeled as IDW for disposal by JV II.

All drilling equipment was decontaminated via steam cleaning before starting work, in between boring locations, and after the job was completed before leaving the job site. Water generated during decontamination was pumped into 55-gallon drums and labeled as IDW for disposal by JV II.

## **5.0 ERD INJECTIONS**

The following sections describe the implementation process and results for injection of the ERD substrate, including injection testing, mixing of the injectate (EOS and water), and the actual injection of the injectate solution.

### **5.1 INJECTION TEST**

On the second day of drilling, an injection test was performed on two temporary injection points to ensure that the installation method being used provided injection points with a suitable injection capacity. A holding tank was filled with potable water from the hydrant for use during the test. Temporary injection points 18D and 14S were used for the test. The test showed that the injection points were able to receive water at an

average rate of 9-11 gpm each for a period of 25 minutes, and exhibited low pressures at the wellheads throughout the test (a maximum of 2 psi was seen throughout the test). The results of the test were thus deemed favorable and installation continued using the same procedure.

## 5.2 INJECTATE PREPARATION

Design parameters provided by JV II called for one 55-gallon drum (approximately 52.5 gallons, or 420 lbs) of EOS to be injected, along with 2,000 gallons of potable water, per injection location. The EOS and water were to be pre-mixed, so use of chase water was not necessary. Two (2) 6,500-gallon polyethylene holding tanks were used to prepare batches of injectate.

To prepare a batch of injectate, a tank was first filled with 6,000 gallons of potable water. The amount of water used to fill a tank was determined by direct measurement using the total tank volume. While the hydrant used to fill the tank was fitted with a flow meter, the flow meter attached to the hydrant was found to be inaccurate and was not used as the final determination of the volume of water in the tank. In accordance with the JV II design parameters, three (3) 55-gallon drums of the EOS were then pumped into the holding tank, or one (1) drum per 2,000 gallons of water.

Before injection, the EOS and water solution was recirculated by a sump pump, ensuring that a minimum of two (2) volumes of the solution (water and EOS) were recirculated before beginning injection. A recirculation hose on the injection pump also aided in the mixing of the injectate and continued the mixing throughout the injection process. When batch-mixed injectate could not be used during the day it was created and the solution was left in the tank overnight, the injectate was recirculated the following day. A minimum of two (2) volumes of the remaining solution were recirculated before resuming injections.

The injectate preparation procedure was repeated nine (9) times in order to prepare injectate for the 27 injection points. In order to accommodate injection into points that had difficulty due to daylighting (see Section 5.3), and at the direction of the JV II Project Manager, the last batch of injectate was made using 3,000 gallons of water mixed with three (3) 55-gallon drums of EOS, yielding a solution with twice the concentration of EOS.

A summary of details in the preparation and injection of each batch is shown on Table 2. Field data forms showing batch preparation details are included as Appendix A.

### 5.3 ERD SUBSTRATE INJECTION

A transfer pump was used to pump the prepared injectate through a manifold, which split the flow to allow for injection in up to four (4) injection points simultaneously. Each of the four (4) legs on the manifold had its own flow meter and ball valve, and connected to individual injection points with a hose that could be transferred from point to point. During injection, flow was regulated using the ball valves, and the volume injected into each injection point was tracked using the flow meters. In total, 52,460 gallons of solution was injected into the injection points. Because the solution was of a known concentration and well-mixed, the volume of EOS injected could be determined. In total, 1,415 gallons of EOS were injected into the injection points. Details of the volumes injected into each point are shown on Table 3.

Each injection point was fitted with a pressure gauge and gate valve to monitor pressure at the wellhead during injection and allow for further control of the flow and pressure at the well. An air release valve was also fitted on each injection wellhead so that air in the hoses and well could be released and only the solution is injected into each injection point.

During injection, each injection point was monitored for flow rate (in gpm), flow totalizer (in gallons), pressure (in psi), and potential daylighting every 15 minutes. The totalizer readings were used to calculate the total volume of injectate (and mass of EOS) injected into each well. Field data forms showing the data taken during injection at each well is provided as Appendix B.

Based on the JV II design parameters, each injection point was expected to receive injectate at a minimum estimated rate of 3-4 gpm under low pressure. Though pressure was kept at a minimum at the wellhead and the flow regulated to between 1.0-2.0 gpm (the lowest flow rate possible), daylighting could not be overcome at seven (7) injection points: 4S, 6S, 8S, 12S, 13S, 26S, and 27D. After multiple attempts at injecting at each point, under direction of the JV II Project Manager, a batch of injectate (Batch 9) was mixed at twice the concentration of EOS. This cut the volume of solution that needed to be injected into each injection point in half. However, the necessary volume was still not able to be injected at higher concentration. The remaining volume was injected into the nearest upgradient points, under direction of the JV II Project Manager, until the full volume of the solution was injected. Details of what injection points were used as upgradient replacements are found in Table 4.

It should be noted that daylighting occurred between 1-15 ft. from the injection points - no daylighting occurred out of the borehole in which the injection points were installed. Additionally, injection points that exhibited daylighting did so at very low pressures, with all pressure readings between 0-10 psi before daylighting occurred. The daylighting was most likely caused by heterogeneities in the subsurface that created preferential pathways through which the injectate could reach the surface.

## 6.0 TEMPORARY INJECTION POINT ABANDONMENT

Once the injections were completed, all temporary injection points were abandoned. The initial procedure for temporary injection point abandonment included an attempt to remove the PVC well-casing by pulling it out of the ground using the Geoprobe drill rig. Temporary injection point 23D was attempted using this procedure, but when the casing was pulled it snapped apart approximately three (3) feet bgs. The possibility of PVC snapping above ground poses a possible safety issue, and incompletely pulling the well casing out compromises the grout seal present in the well. A second injection point (27D) was attempted and the casing was able to be pulled without snapping, but the expendable point at the end of the casing was unable to be driven out with a steel rod. Without removing the expendable point, the well casing must be pulled out completely before grouting begins, and the borehole could collapse and compromise the ability to seal the borehole.

These concerns were relayed to the JV II Project Manager, who advised us to proceed with the abandonment by abandoning the injection points in place. The revised procedure for abandoning the wells involved injection of a grout mix into each point using a tremie pipe, in accordance with Virginia Department of Environmental Quality (VADEQ) guidelines for well abandonment. The grout was injected from the bottom of the injection point up to the surface to ensure that the entire length of the injection point was grouted. The area around each point was then dug from 6-12” bgs and the well casing cut and disposed. After cutting the well casing, the ground was restored to original grade. Before disposal, the cut well casing was decontaminated using potable water and Alquinox. Decontamination water was placed in drums and labeled as IDW.

In accordance with VADEQ regulations, each of the four (4) batches of grout mixture used in abandonment were made up of six (6) gallons of water, one (1) 94-pound sack of Portland cement, and four (4) pounds of bentonite. The bentonite used in the grouting was sodium bentonite with 20% clay solids by weight of water.

## 7.0 DEMOBILIZATION

Upon completion of injection activities, all equipment, unused materials, temporary facilities, and all other miscellaneous items were removed from the site. Before departing from the site it was restored as nearly as possible to its original condition. A site walk was performed by the JV II Project Manager to ensure that the site was left in satisfactory condition before departure.

As part of the demobilization, the holding tanks used to mix the EOS and water solution were rinsed clean using potable water, and the rinsate injected into several temporary injection points that had already received injectate.

## **7.1 Potable Water Use**

The on-site hydrant was used for potable water throughout the project. The total potable water used during the project was calculated to be approximately 52,500 gallons, including water used for injection, decontamination, and rinsing the tanks after injections were completed.

## **7.2 Investigation-derived Waste**

IDW consisting of injection point development purge water and decontamination fluids was collected throughout the project. IDW was containerized onsite in DOT approved 55-gallon drums for removal and disposal by JV II after job completion. Weather-resistant labels were placed on the drums as soon as IDW was placed in them. In total four (4) drums were generated during the project.

Trash generated during implementation was bagged in heavy-duty plastic trash bags and removed from the site.

## **8.0 DISCUSSION**

Implementation of the scope of work and design parameters set forth in the Work Plan was successful. The primary objective of the Work Plan was to inject 52.5 gallons of EOS and 2,000 gallons of water in each of the temporary injection points.

Due to daylighting issues experienced at seven (7) of the injection points (4S, 6S, 8S, 12S, 13S, 26S, and 27D) it was agreed to by the JV II Project Manager that additional injections of the EOS mixture would be performed at a higher concentration of EOS and into the nearest upgradient injection points, until the full volume of the EOS was injected, so that the total designed injection volume of substrate into the remedial area was achieved. Details of the injection points used as upgradient replacements are found in Table 4. In addition, Table 3 presents the total volume of EOS injected at each point.

# **FIGURES**



**LEGEND**

 Approximate Fire Hydrant Location

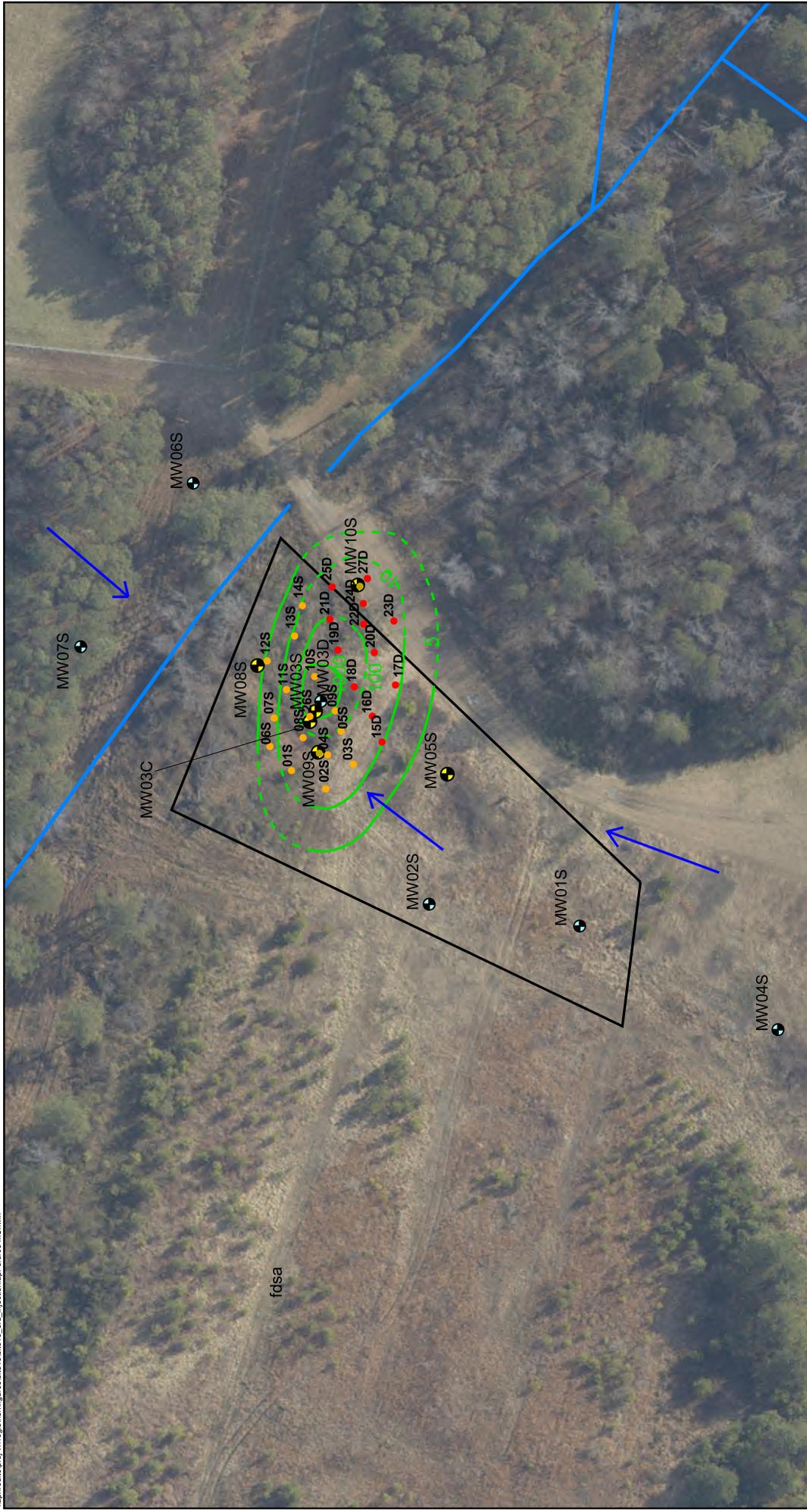


0 100 200 Feet



Figure 1  
Site 18  
Naval Station Norfolk  
Norfolk, Virginia

February 2005 Aerial Photography



**LEGEND**

- DPT Injection Location (6 to 16 feet below ground surface)
- DPT Injection Location (12 to 22 feet below ground surface)
- Performance Monitoring Well
- Monitoring Well
- GPS coordinates of monitoring wells

- Estimated Site Boundary
- ➔ Estimated Groundwater Flow Direction (October 2006)
- Total CVOCs Isoconcentration Contour (ug/L)  
(Dashed where inferred)
- Drainage Channel



Figure 2  
ERD Injection Locations  
Site 18 NTCRA Completion Report  
Naval Station Norfolk  
Norfolk, Virginia

# **TABLES**

**Table 1**  
**Temporary Injection Point Installation Details**  
**Site 18 - Naval Station Norfolk**  
**Norfolk, VA**

<b>Injection Point</b>	<b>Install Date (2008)</b>	<b>Total Depth (ft-bgs)</b>	<b>Screen Interval (ft-bgs)</b>	<b>Sand Pack (ft-bgs)</b>	<b>Bentonite (ft-bgs)</b>	<b>Purge Volume (gal)</b>
1S	7/15	16	6-16	5-16	3-5	1.0
2S	7/15	16	6-16	5-16	3-5	1.0
3S	7/15	16	6-16	5-16	3-5	1.0
4S	7/15	16	6-16	5-16	3-5	1.0
5S	7/17	16	6-16	5-16	3-5	2.0
6S	7/15	16	6-16	5-16	3-5	1.0
7S	7/15	16	6-16	5-16	3-5	1.0
8S	7/16	16	6-16	5-16	3-5	1.0
9S	7/15	16	6-16	5-16	3-5	1.0
10S	7/16	16	6-16	5-16	3-5	1.5
11S	7/15	16	6-16	5-16	3-5	1.0
12S	7/15	16	6-16	5-16	3-5	1.0
13S	7/15	16	6-16	5-16	3-5	1.0
14S	7/14	16	6-16	5-16	3-5	2.5
15D	7/16	22	12-22	11-22	9-11	1.0
16D	7/16	22	12-22	11-22	9-11	1.0
17D	7/16	22	12-22	11-22	9-11	2.0
18D	7/14	22	12-22	11-22	9-11	4.0
19D	7/16	22	12-22	11-22	9-11	1.0
20D	7/16	22	12-22	11-22	9-11	1.0
21D	7/17	22	12-22	11-22	9-11	1.0
22D	7/17	22	12-22	11-22	9-11	1.0
23D	7/17	22	12-22	11-22	9-11	1.0
24D	7/17	22	12-22	11-22	9-11	2.0
25D	7/17	22	12-22	11-22	9-11	1.0
26S	7/17	16	6-16	5-16	3-5	2.0
27D	7/17	22	12-22	11-22	9-11	1.0

**Table 2**  
**Injectate Batch Summaries**  
**Site 18 - Naval Station Norfolk**  
**Norfolk, VA**

<b>Batch</b>	<b>Preparation Date (2008)</b>	<b>Injection Dates (2008)</b>	<b>55-gal Drums of EOS</b>	<b>Volume of Water (gal)</b>	<b>Total Volume (gal)</b>
1	7/15	7/16-7/17	3	5,990	6,140
2	7/15	7/17-7/18	3	5,830	5,980
3	7/17	7/18	3	5,970	6,120
4	7/18	7/18-7/21	3	6,040	6,190
5	7/21	7/21-7/22	3	6,110	6,260
6	7/21	7/22-7/23	3	6,260	6,410
7	7/22	7/23-7/24	3	6,290	6,440
8	7/23	7/24-7/25	3	5,680	5,830
9	7/24	7/24-7/25	3	2,920	3,070

**Table 3**  
**Temporary Injection Point Injectate Volumes with EOS**  
**Site 18 - Naval Station Norfolk**  
**Norfolk, VA**

<b>Injection Point</b>	<b>Injectate Volume with 2.5% EOS (gallons)</b>	<b>Injectate Volume with 5% EOS (gallons)</b>	<b>Total Volume of Injectate (gallons)</b>	<b>Total Volume of EOS (gallons)</b>
1S	2,430	150	2,580	69.6
2S	2,050	70	2,120	55.9
3S	2,240	510	2,750	82.4
4S	1,720	80	1,800	48.0
5S	2,980	650	3,630	108.2
6S	510	40	550	15.0
7S	2,050	0	2,050	52.5
8S	530	130	660	19.9
9S	2,110	0	2,110	54.0
10S	2,370	0	2,370	60.7
11S	3,680	150	3,830	101.6
12S	150	0	150	3.8
13S	680	70	750	20.8
14S	2,050	0	2,050	52.5
15D	2,050	0	2,050	52.5
16D	2,050	0	2,050	52.5
17D	2,050	0	2,050	52.5
18D	2,050	0	2,050	52.5
19D	2,090	450	2,540	75.6
20D	2,050	0	2,050	52.5
21D	2,050	0	2,050	52.5
22D	2,050	0	2,050	52.5
23D	2,050	0	2,050	52.5
24D	2,200	540	2,740	82.8
25D	2,050	0	2,050	52.5
26S	450	140	590	18.4
27D	650	90	740	21.1
<b>TOTAL</b>	<b>49,390</b>	<b>3,070</b>	<b>52,460</b>	<b>1,415</b>

**Injectate = potable water and EOS mixture**

**Table 4**  
**Daylighted Injection Point Injection Details**  
**Site 18 - Naval Station Norfolk**  
**Norfolk, VA**

<b>Injection Point</b>	<b>Upgradient Point</b>	<b>Injectate Volume with 2.5% EOS (gallons)</b>	<b>Injectate Volume with 5% EOS (gallons)</b>	<b>Total Volume of Injectate (gallons)</b>	<b>Total Volume of EOS (gallons)</b>
<b>4S</b>		1720	50	1770	46.5
	3S	0	120	120	6.0
<b>Total</b>		<b>1720</b>	<b>170</b>	<b>1890</b>	<b>52.5</b>
<b>6S</b>		510	40	550	15.1
	1S	380	150	530	17.2
	2S	0	70	70	3.5
	3S	0	130	130	6.5
	4S	0	30	30	1.5
	5S	0	120	120	6.0
	8S	0	40	40	2.0
<b>Total</b>		<b>890</b>	<b>580</b>	<b>1470</b>	<b>51.8</b>
<b>8S</b>		530	90	620	18.1
	5S	400	470	870	33.7
<b>Total</b>		<b>930</b>	<b>560</b>	<b>1490</b>	<b>51.8</b>
<b>12S</b>		150	0	150	3.8
	11S	1600	150	1750	48.5
<b>Total</b>		<b>1750</b>	<b>150</b>	<b>1900</b>	<b>52.3</b>
<b>13S</b>		680	70	750	20.9
	10S	320	0	320	8.2
	19D	40	450	490	23.5
<b>Total</b>		<b>1040</b>	<b>520</b>	<b>1560</b>	<b>52.6</b>
<b>26S</b>		450	140	590	18.5
	3S	190	260	450	17.9
	5S	530	60	590	16.6
	9S	60	0	60	1.5
<b>Total</b>		<b>1230</b>	<b>460</b>	<b>1690</b>	<b>54.5</b>
<b>27D</b>		650	90	740	21.1
	24D	150	540	690	30.8
<b>Total</b>		<b>800</b>	<b>630</b>	<b>1430</b>	<b>52.0</b>

# **APPENDIX A**

Jorge Montoy - Sovereign

Batch # 1

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

**Note:** Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/15

HYDRANT		
	Time	Totalizer
Start	12:30	915,200
End	12:00	920,700
Total Gallons in Tank		5,500

JCM

Note: Actually 6,000 gallons, directly measured in tank. Flow meter not calibrated.

7/16  
55-gal Drums of EOS in Tank 3

7/16

RECIRCULATION SUMP	
Start Time	10:30
End Time	12:45
Flow Rate	150 gpm
Gallons Recirculated	> 16,000

- Also use Injection pump to recirculate water

TOTAL VOLUMES RECIRCULATED ~2.6

Injected 7/16-7/17, 6,140 gallons injected.

George Montoya Sovereign.

Batch # 2

Injectate Batch Preparation Form  
Site 18 - Norfolk Naval Station  
Enhanced Reductive Dechlorination Injection

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/15/08

Tank already contains 1,500 gal water

HYDRANT		
	Time	Totalizer
Start	11:50	912,100
End	12:30	915,200
Total Gallons in Tank		4600

7/16 920,700 → 921,600

Note: Actually 6,000 gallons, directly measured in tank.

7/16/08 55-gal Drums of EOS in Tank 3

7/16

RECIRCULATION SUMP	
Start Time	7:40
End Time	10:10
Flow Rate	90
Gallons Recirculated	13,506

TOTAL VOLUMES RECIRCULATED ~2.25

Total injected: <sup>8/18</sup> JCM ~~6,100 gal~~ 7/17 - 7/18  
5,980 gal

Batch #3

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/17/08

HYDRANT		
	Time	Totalizer
Start	11:15	921,600
End	12:30	927,000
Total Gallons in Tank		6,000

- Measured directly in tank after using some water for cleaning EOS drums.

7/17 55-gal Drums of EOS in Tank 3

7/18

RECIRCULATION SUMP	
Start Time	7:10
End Time	9:00
Flow Rate	120 gpm
Gallons Recirculated	13,200

TOTAL VOLUMES RECIRCULATED ~2.1

Total 6,120 gallons injected, 7/18

Batch #4

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

**Note:** Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/18/08

HYDRANT		
	Time	Totalizer
Start	11:00	927,000
End	12:00	932,300
Total Gallons in Tank		6,000

*- Directly measured.*

55-gal Drums of EOS in Tank 3

RECIRCULATION SUMP	
Start Time	13:50
End Time	16:40
Flow Rate	90
Gallons Recirculated	15,300

TOTAL VOLUMES RECIRCULATED 2.5

Inject 7/18-7/21.

Total Volume injected = 6,190 gallons.

Batch #5

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/21/08

HYDRANT		
	Time	Totalizer
Start	7:40	937,300
End	8:50	937,600
Total Gallons in Tank		6,000

Directly measured in tank.

55-gal Drums of EOS in Tank 3

RECIRCULATION SUMP	
Start Time	10:00
End Time	11:10
Flow Rate	90 gpm
Gallons Recirculated	22,500

TOTAL VOLUMES RECIRCULATED ~3.4

7/21-7/22 Injected 6,260 gallons

Batch # 6

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/21/08

HYDRANT		
	Time	Totalizer
Start	14:21	937,600
End	15:30	943,188
Total Gallons in Tank		6000

Directly measured in tank

55-gal Drums of EOS in Tank 3

7/22

RECIRCULATION SUMP	
Start Time	0600
End Time	1140
Flow Rate	90 gpm
Gallons Recirculated	~25,050

stopped for an hour in middle

TOTAL VOLUMES RECIRCULATED ~4.2

7/22-7/23 injected ~~6,520~~ <sup>JAM 7/18</sup> 6,410 gallons.

Batch # 7

**Injectate Batch Preparation Form  
Site 18 - Norfolk Naval Station  
Enhanced Reductive Dechlorination Injection**

**Note:** Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/22/08

HYDRANT		
	Time	Totalizer
Start	12:45	943,180
End	13:55	948,890
Total Gallons in Tank		6,000

= measured directly  
in tank

55-gal Drums of EOS in Tank 3

7/23

RECIRCULATION SUMP	
Start Time	6:30
End Time	10:15
Flow Rate	90 gpm
Gallons Recirculated	~17,600

TOTAL VOLUMES RECIRCULATED ~3.9

7/23-7/24 6,400 gallons injected.

Batch # 8

**Injectate Batch Preparation Form  
Site 18 - Norfolk Naval Station  
Enhanced Reductive Dechlorination Injection**

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/23/08

HYDRANT		
	Time	Totalizer
Start	13:40	948,890
End	14:45	954,200
Total Gallons in Tank		6,000

Measured visually in tank

55-gal Drums of EOS in Tank 3

7/24

RECIRCULATION SUMP	
Start Time	07:15
End Time	08:50
Flow Rate	130 gpm
Gallons Recirculated	~13,000

TOTAL VOLUMES RECIRCULATED ~2.1

Injected 5,830 gal.

7/24-7/25

Batch #9

Concentrated batch

**Injectate Batch Preparation Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Note: Form to be used when preparing a batch of injectate in a tank to ensure proper proportions and mixing.

Date 7/24

HYDRANT		
	Time	Totalizer
Start	954,200	0850
End	956,700	0930
Total Gallons in Tank		3,000

usually inspected.

55-gal Drums of EOS in Tank 3

RECIRCULATION SUMP	
Start Time	0950
End Time	1250
Flow Rate	90 gpm
Gallons Recirculated	16,200

TOTAL VOLUMES RECIRCULATED ~2.6

Injected 3,070 gallons

7/24-7/25

# **APPENDIX B**

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/16  
 Well ID ID-18 15

7/16  
 7/18

	Time	Totalizer
Start	14:00	66
End	17:33	2910
Total Gallons Injected		2050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
14:03	3.0	75	0	n	valve just cracked
14:12	3.4	92	0	n	
14:16	7.2	124	1	n	opened valve more
14:22	8.2	170	1	n	
14:32	8.0	270	1	n	
14:52	8.0	458	2	n	
15:04	8.0	612	2	n	
15:20	STOP TO GET MORE GAS FOR PUMP				
16:11	Restart pump				
16:12	7.0	950	0	n	
16:31	7.0	1080	2	n	
16:49	6.5	1190	2	n	
17:04	5.4	1280	3	n	
17:17	5.0	1340	5	n	
17:33	7.5	1420	5	n	valued up
18:00	9.0	1640	4	n	
18:10		1690			shut off: Day 1 total 1630gal
7/17/08 07:40	Reopened the valve				
07:59	2.5	1720	2.5	n	
08:16	2.5	1770	3	n	8 ft. from well
08:32	1.5	1790	1	n	valued back and stopped
08:48	1.6	1800	0	n	
09:01	1.0	1820	0	n	saw a little daylighting ~8ft from well, closed valve to shut off
09:16	n/a	1820			
10:45	n/a			y/n	Reopen valve slightly then close
Total pumped: 1760 gallons will return to well later					
17:20	2.6	2290	1	n	Crack open valve
17:30	1.0	2300	-	y	Shut off because of daylighting
1770 gallons total pumped					
7/18/08 10:00	1.5	2630	0	n	
10:08	2.0	2650	0	n	
10:22	2.2	2690	0	n	
10:33	3.0	2730	0	n	
10:51	2.2	2780	0	n	
11:05	3.0	2820	0	n	
11:19	3.0	2870	0	n	
11:33	3.2	2910	0	n	DONE. Shut off 2050 gallons injected

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/21/08  
 Well ID SP-18 2S

	Time	Totalizer
Start	15:55	5430
End	16:49	7520
Total Gallons Injected		2,050

7/21

7/22

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
15:55	4.0	5430	0	n	Batch # 5
1610	4.0	5490	4	n	
1625	4.0	5540	5	n	
1640	3.0	5580	5	n	
1654	3.0	5620	5	n	
1713	2.7	5680	5	n	
1730	3.4	5740	5	n	
1745	4.0	5800	2	n	Stop 3 min to refuel
1800	3.6	5860	3	n	
1810	-	5870	-	-	Shut off for day
0701	3.4	5870	2	n	
0716	3.0	5910	2	n	
0730	3.0	5950	2	n	
0745	3.0	5990	3	n	
0800	3.0	6040	3	n	
0815	3.0	6080	4	n	
0831	3.4	6120	4	n	
0845	2.6	6150	6	n	valved up
0900	3.0	6190	5	n	
0913	3.0	6230	5	n	
0930	-	6270	5	n	Stop while another well is used
0947	3.6	6310	5	n	Restart
1005	3.7	6370	5	n	
1020	3.0	6410	5	n	
1035	3.0	6450	5	n	
1050	2.8	6480	5	n	
1105	2.0	6510	5	n	
1120	2.8	6560	5	n	
1135	2.0	6580	3	n	-tank almost empty
1140	-	6590	-	n	Done with Batch #5
1153	3.0	6590	7	n	Start Batch #6
1209	3.6	6600	6	n	Valved up
1225	3.2	6660	6	n	
1240	3.2	6710	6	n	
1254	3.2	6770	6	n	
1312	3.2	6820	5	n	
1325	3.0	6860	5	n	
1340	3.0	6890	6	n	Stop for 2 min to refuel
1355	3.0	6920	5	n	
1417	3.0	6960	5	n	
1432	4.0	7010	7	n	
1448	4.0	7080	8	n	
1502	4.0	7140	8	n	
1517	3.5	7190	8	n	
1532	4.0	7250	8	n	

840 gallons

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/16/08  
 Well ID ED-18 35

7/16  
 7/17

	Time	Totalizer
Start	12:55	00190
End	12:55	02240
Total Gallons Injected.		2050

7/16 JDM

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
<del>13:00</del>					
13:00	3	204	11	n	stopped valve to fix minor leak
13:10	3.5	223	9	n	
13:20	3.1	260	9	n	
13:24	3.2	285	9	n	
13:35	3.2	319	9	n	
13:49	3.0	348	9	n	
13:58	3.0	370	9	n	
14:10	2.0	409	8	n	
14:20	3.0	435	8	n	
14:37	2.4	472	8	n	
14:53	3.4	555	10	n	
15:08	4.8	640	10	n	
15:20	STOP TO GET MORE GAS FOR PUMP				
16:11	Restart pump				
16:14	4.0	800	10	n	
16:36	3.8	890	9	n	
16:53	3.8	960	9	n	
17:08	3.5	1010	9	n	
17:16	2.8	1040	9	n	
17:34	6.2	1120	11	n	valved up
18:00	5.0	1290	12	n	
18:16		1320			Shut off Day 1 total 1,130
07:40	Reopened the valve				
08:01	2.0	1380	6	n	
08:20	2.5	1410	6.5	n	
08:36	2.5	1450	10	n	
08:51	2.5	1490	10	n	
09:03	2.0	1520	10	n	
09:17	2.2	1554	10	n	
09:32	2.2	1584	10	n	
09:47	2.0	1620	10	n	
09:50	-	1630	-	n	Shut off to switch tanks.
10:05	2.2	1670	10	n	Restart with Batch #2
10:25	2.0	1660	6	n	
10:40	1.8	1680	5	n	
10:52	1.8	1700	7.5	n	
11:05	3.5	1750	10	n	
11:20	3.5	1800	10	n	
11:35	3.5	1860	8	n	
11:50	3.5	1910	7	n	
12:10	3.5	1980	10	n	
12:30	4.0	2060	11	n	
12:45	5.0	2170	11	n	
12:55	7.0	2240	11	n	DONE, shut off. 2,050 gallons injected

7/17/08

DONE, shut off. 2,050 gallons injected

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date JP-18 45 ↙  
 Well ID 7/22/08

7/22  
 7/25

	Time	Totalizer
Start	16:50	7,520
End	09:36	14,586
Total Gallons Injected		2,056

7/22

7/23

7/24

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
16:50	3.5	7,520	0	n	
17:00	3.0	7,560	5	n	
17:15	2.5	7,590	5	n	
17:32	3.0	7,640	5	n	
17:45	3.0	7,680	5	n	
18:00	-	7,710	-	n	Shut off for day
07:07	3.0	7,710	5	n	
07:22	3.0	7,750	5	n	
07:37	3.0	7,790	5	n	
07:53	2.0	7,820	6	n	
08:09	2.0	7,850	6	n	
08:23	3.0	7,880	6	n	
08:37	3.0	7,920	9	n	
08:52	3.0	7,970	9	n	
09:10	3.0	8,020	8	n	Stop 4 minutes due to shut off to try other well. 500 gallons pumped
13:00	2.0	8,790	3	n	
13:15	2.0	8,820	2	n	Retard 3 min
13:30	2.0	8,850	3	n	
13:45	2.0	8,870	4	n	
14:00	2.0	8,900	5	n	
14:14	3.0	8,960	5	n	
14:30	3.0	8,980	5	n	
14:43	2.0	9,010	5	n	
15:00	2.0	9,040	5	n	
15:18	2.6	9,080	6	n	
16:16	2.6	9,040	5	n	Lightning; no readings until past. While waiting in car fuel ran out, restart 1402.
16:25	3.2	9,200	6	n	
16:40	3.2	9,250	6	n	
16:55	3.0	9,290	5	n	
17:15	3.0	9,350	7	n	Lightning beginning
17:52	-	9,500	-	n	Done for day.
07:26	2.8	9,500	5	n	
07:35	2.8	9,540	5	n	
07:50	2.8	9,570	2	n	
08:05	2.8	9,620	2	n	
08:23	3.0	9,680	2	n	
08:30	-	9,700	-	n	Complete batch #7
08:40	3.2	9,700	2	n	Begin Batch #8
08:57	3.2	9,740	2	n	
09:17	4.0	9,820	2	n	
09:31	3.8	9,870	5	n	
09:47	3.6	9,920	5	n	
10:02	3.2	9,950	6	n	
10:17	-	10,100	-	n	

Shut off due to daylighting 6 ft. from well  
 500 + 1220 = 1720 gallons pumped.

# 45 continued

45

Time Flow Total Pressure Daylighting

7125 Begin injection of Batch # 9 (2x concentration)

0720 1.4 14380 4 n

0735 1.4 14400 2 n

0755 — 14430 3 n

7. Shut off due to daylighting.

$50 \times 2 + 1720 = 1820$  gallons

Inject into 38 with batch # 9 (2x conc.)

0820 2.0 14460 3 n

0830 4.0 14480 3 n

0847 2.0 14500 3 n

0902 2.0 14520 4 n

0917 7.0 14550 4 n

0936 — 14580 4 n

stop to refuel pump.

$120 \times 2 + 1820 = 2060$

**DONE.**

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/18/08  
 Well ID SP-18 55

7/18  
 7/21

	Time	Totalizer
Start	1150	2910
End	1225	4960
Total Gallons Injected		2,050

7/18

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
11:52	3.0	2920	0	n	
1205	3.0	2970	0	n	
1220	4.0	3040	0	n	
1235	4.0	3100	0	n	
1252	4.0	3160	0	n	
1309	4.0	3230	0	n	
1325	4.0	3290	0	n	
1339	4.0	3340	0	n	
1352	4.0	3390	0	n	
1408	4.0	3460	0	n	
1422	4.0	3510	0	n	
1437	4.0	3570	0	n	
1451	4.0	3620	0	n	
1505	4.2	3680	0	n	
1523	4.2	3750	0	n	
1539	4.2	3800	0	n	Stop 3 min to refuel
1555	4.0	3860	2	n	
1609	4.0	3910	3	n	
1624	-	3940	0	n	Stop injection to switch tank
1640	2.5	3940	2.2	n	Begin injecting Satoh #1
1650	2.0	3960	2.4	n	
1705	3.0	4010	2	n	
1720	2.0	4020	2	n	
1735	3.0	4090	2	n	
1750	3.0	4130	2	n	
1800	-	4150	2.5	n	Shut well off for day
808	3.5	4150	0	n	
818	3.5	4200	0	n	
837	3.2	4240	0	n	
0848	3.5	4290	0	n	
0858	-	4330	0	n	Stop for 5 min for Refueling
0918	3.4	4380	0	n	
0937	3.2	4440	0	n	
0949	3.2	4480	0	n	
1002	3.2	4520	0	n	
1016	3.2	4570	0	n	
1035	3.2	4630	0	n	Stop for 3 min to refuel
1052	3.2	4670	0	n	
1114	3.2	4740	3	n	
1128	3.2	4790	5	n	
1140	3.0	4820	6	n	
1155	3.0	4866	6	n	
1210	3.0	4900	7	n	
1225	-	4960	7	n	

7/21

DONE, shut off. 2,050 gal injected.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/17/08  
 Well ID 18-18 6S

7/17  
 7/18

	Time	Totalizer
Start	17:35	2,300
End	0945	12,030
Total Gallons Injected		2,050

	Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
7/17	17:36	2.0	2310	12	n	
	17:39	4.0	2320	12	n	
	17:50	-	2390	-	-	shut down for day
7/18	07:30	1.0	2390	0	n	Restart
	07:46	2.0	2426	3	n	valve up
	08:02	2.2	2450	5	n	
	08:17	2.0	2480	5	n	
<u>Stop</u>	08:32	-	2510	-	n	Stop to switch tanks
	09:00	2.5	2510	4	n	Restart with Batch #3
	09:17	3.0	2560	1	n	
	09:31	2.0	2620	1	y	Daylighting 14 ft from well valve bank
	09:46	1.0	2630	1	n	stop 3 min
	09:58	1.0	2630	-	n	stop 3 min to fuel, decide to start new well, will restart at later time. 330 gallons pumped
7/21	11:14	3.0	5250	1	n	
	11:20	-	5270	-	y	Daylighting 14 ft from well. Shut off well, start after granting hole. 350 gallons pumped so far.
7/22	09:33	3.0	6270	2	n	
	09:45	3.0	6310	2	y	shut off, 40 + 350 = 390 gallons pumped so far.
7/23	09:13	1.6	8020	0	n	
	09:25	1.6	8090	0	n	
	09:40	1.6	8060	0	n	
	10:00	1.0	8085	0	n	slow near end of tank
	10:10	-	8080	-	n	stop to switch tanks
	10:22	1.6	8080	0	n	Restart with Batch #7
	10:37	1.8	8110	1	y	
	10:52	-	8140	-	y	shut off due to daylighting = 120 + 390 = 510 gallons pumped. Batch #9
7/24	13:04	2.0	10240	0	n	
	13:20	1.8	10280	0	y	switch wells due to daylighting. 510 + 40 x 2 = 590 gallons
	S.w. well to injecting into 18-18 Batch #8.					
	14:20	2.0	10450	0	n	
	14:40	3.0	10510	1	n	
	14:54	2.8	10590	0	n	
	15:10	3.0	10580	1	n	stop 3 min to refuel
	15:30	2.0	10620	2	n	
	15:45	2.0	10656	2	n	
	16:00	2.0	10688	3	n	
	16:15	2.0	10710	4	n	
	16:30	2.0	10720	4	n	

# 65 continued

65

Time Flow Total Pressure Daylighting

1646	2.0	10760	0	n
1703	3.0	10830	0	y

shutoff due to daylighting.  $380 + 390 = 770$  gallons

7/25

Injecting into 1S with batch #9.

0800	2.0	14430	2	n
0819	2.0	14460	-	y

shutoff due to daylighting.

$30 \times 2 + 970 = 1030$  gallons

~~Inject into 3S with batch #9.~~

~~0736 4.0 14680 6 n~~

wrong sheet - JCU

Inject into 2S with Batch #9

1045	2.0	14150	0	n
1058	-	14180	-	y

stop to reback.

shutoff, groundwater saturated, water table up to surface with EOS surrounding the well.  $30 \times 2 + 1,030 = 1,090$  gallons so far

7/28

Batch #9

3S

Time	Flow	Total	Pressure	Daylighting
0805	1.2	15030	0	n
0820	1.2	15050	3	n
0835	1.4	15080	3	n
0852	1.4	15106	3	n
0907	2.0	15140	6	n
0913	-	15160	-	y

shutoff due to daylighting.

$130 \text{ gallons} \times 2 = 260$  injected

7/28

Batch #9

2S

Time	Flow	Total	Pressure	Daylighting
0805	1.2	14180	1	n
0820	2.0	14210	1	n
0830	-	14220	1	y

shutoff due to daylighting.

$40 \times 2 = 80$  gallons injected.

65 continued on following page

7/20 Batch #9 ~~4~~ S

Batch #9 S

Time Flow Total Pressure Daylighting

Time Flow Total Pressure Daylighting

0805	1.2	11880	2	~
0820	2.0	11910	-	Y

Shutoff due to daylighting.  
30 x 2 = 60 gallons injected.

0805	1.2	11470	0	n
0820	1.4	11490	0	n
0835	1.6	11520	0	n
0852	1.4	11550	0	n
0907	1.4	11570	2	n
0919	1.4	11590	-	Y

Stanton Well 55

0856	2.0	11910	2	n
0907	1.8	11930	4	n
0920	2.0	11970	6	n
0935	2.4	12010	8	n
0945	-	12036	-	n

DONE. 120 gallons pumped

Shutoff due to daylighting.  
120 gallons x 2 = 240 gallons injected

Injectants Well 85

0923	1.4	11590	1	n
0935	1.4	11610	3	n
0945	-	11630	-	n

DONE. 40 gallons pumped

RINSE OF TANK INJECTION BELOW

150	Extra water/rinse
Time	Total
0940	15160
1030	15230
1055	15290
1110	15320
1142	15370
1200	15410
Shut off for lunch.	
1315	15440
1318	15440
DONE empty	

240	
Time Total	
0940 14230	
1030 14290	
1055 14350	
1110 14410	
1140 14510	
Switch to 230	
1142 14520	
1200 14560	
Shut England.	
1315 14590	
1318 14600	

55	
Time Total	
0945 12030	
1030 12090	
1055 12120	
1110 12210	
1142 12280	
1200 12320	
Shut England.	
1315 12350	
1318 12360	

170	
Time Total	
1000 11630	
1030 11690	
1055 11740	
1110 11780	
1143 11830	
1200 11850	
Shut to dash	
1315 11870	
1318 11880	

RINSE OF TANK

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/16/08  
 Well ID I.P.18 75

7/16  
 7/17

	Time	Totalizer
Start	13:15	240
End	17:20	2290
Total Gallons Injected		2050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
13:19	3.5	255	3	n	Fixed small leak. Valve only cracked open.
13:27	3.2	282	2.5	n	
13:34	3.2	319	2.5	n	
13:48	6.8	393	5	n	Value opened slightly.
13:59	6.8	428	5	n	
14:08	7.2	480	5	n	
14:20	6.4	553	5	n	
14:32	6.8	640	5	n	
14:51	2.0	728	2	send	Valved back because of possible daylighting in 1064 from well
15:06	2.5	780	2	n	
15:20	STOP TO GET MORE GAS FOR PUMP				
16:11	Restart + Pump				
16:12	3.0	890	2	n	
16:34	2.5	930	1	n	
16:51	2.5	970	1	n	
17:06	2.0	1010	2	n	
17:20	3.0	1040	3.5	n	opened valve slightly
17:34	2.0	1070	3.5	n	
18:00	2.0	1140	4	n	
18:10		1150			Shut off Day 1 total 910 gal
7/17/08 07:40	Reopened the valve				
07:59	1.5	1240	0	n	
08:18	1.8	1270	0	n	
08:34	3.0	1310	1	n	
08:50	2.5	1340	2	n	
09:02	2.5	1370	2	n	
09:16	2.0	1400	2.5	n	
09:31	2.2	1430	2.5	n	
09:46	2.2	1465	2.5	n	
09:50		1470		n	shut off to switch tank. restart with switch #2
10:08	2.2	1480	2.5	n	
10:25	2.0	1510	1	n	
10:40	2.0	1540	1	n	
10:57	2.4	1560	2	n	opened valve slightly
11:09	2.0	1590	2.5	n	
11:20	2.0	1620	2.5	n	
11:35	2.9	1660	2	n	
11:56	2.0	1685	2	n	
12:10	2.0	1720	2	n	
12:30	1.8	1750	2	n	
12:45	2.5	1790	2	n	
13:00	2.5	1840	2	n	
13:15	2.0	1870	2	n	
13:30	2.0	1900	2	n	
13:47	2.0	1950	2	n	
14:00	2.2	1980	3.5	n	valued up slightly (see to vose)

75 continued

Stop 5 minutes to refuel

14:22 3.0 <sup>gal</sup>/<sub>min</sub> 2030 gal 4 psi no

14:38 2.0 2060 5 psi no

14:54 2.5 2100 4 psi no

15:13 1.5 2130 2.5 psi no

15:22 1.5 2145 2.5 psi no

15:36 1.2 2160 2.5 psi no

15:52 1.0 2170 1 psi no

16:04 <1 2170 4 psi no valued up

16:19 <1 2180 2 psi no

16:37 1.0 2210 2 psi no

16:50 1.0 2220 2 psi no valued up

17:05 2.0 2250 4 psi no

Stop 5 minutes to refuel

17:20 2.4 2290 4 psi no DONE. Shutoff.

Total of 2050 gallons injected into well.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/22/08  
 Well ID IP-18 85

7/22  
 7/25

	Time	Totalizer
Start	1416	7570
End	1116	11290
Total Gallons Injected		7,050

	Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
7/22	1416	2.5	7570	0	n	
	1432	3.0	7620	0	n	
	1448	3.0	7670	2	n	
	1502	3.0	7710	2	n	
	1517	3.0	7750	5	n	
	1532	3.0	7790	6	n	
	1546	2.4	7820	6	n	
	1601	3.2	7880	6	n	
	1616	2.4	7910	6	n	stop 2 min to refuel
	1630	2.8	7950	7	n	
	1645	3.0	7990	8	n	
	1700	-	8050	-	y	Shutoff due to daylighting 3ft. from well. 480 gallons pumped so far.
7/23	1056	1.6	8140	2	n	
	1110	1.6	8170	2	n	
	1127	1.0	8180	-	y	Shutoff due to daylighting. 50+480 = 530 gallons pumped.
7/24						Pump into 55 in place of 85.
	1050	2.0	10070	0	n	
	1059	2.4	10100	0	n	
	1113	2.8	10140	0	n	
	1130	2.4	10170	0	n	stop 2 min to refuel
	1146	2.4	10210	0	n	
	1200	2.2	10240	0	n	
	1215	2.4	10280	0	n	
	1230	2.4	10310	0	n	
	1749	2.6	10350	2	n	
	1750	-	10360	-	n	Switch to actual 85, with Concentrated Batch #9. Total of 530+290 = 820 gallons injected
	2x concentrated	1303	1.8	10360	0	n
1320		1.8	10380	0	n	
1340		1.4	10410	3	n	
1357		1.4	10450	-	y	Shutoff due to daylighting. 90x2 + 820 = 1000 gallons.
7/25						Pump into 55 in place of 85
	1639	1.6	10710	2	n	
	1646	2.0	10750	1	n	
	1702	2.0	10780	1	n	
	1720	-	10820	-	n	Shutoff for day 1,010 gallons

7/25 Begin injecting Batch #9 (2x concentrated).  
 0720 1.8 10820 3 n  
 0735 1.8 10850 3 n  
 0755 1.8 10880 3 n  
 0815 2.0 10920 3 n  
 0830 2.0 10940 3 n

# 85 continued

85

11296

Time	flow	Total	Pressure	Daylighting	
0847	2.0	10960	4	✓	stop to refuel
0902	2.0	10990	3	✓	
0918	1.6	11010	4	✓	
0932	1.6	11030	6	✓	
0950	2.0	11070	6	✓	
1009	2.2	11110	6	✓	
1020	2.0	11140	7	✓	
1046	2.0	11180	7	✓	
1100	2.2	11230	9	✓	stop to refuel
1116	-	11290	10	✓	

DONE

$$470 \times 2 + 1110 = \frac{2,050}{\text{gallons}}$$

✓

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/16/08  
 Well ID IP-18 95

7/16  
 7/16  
 JCM

	Time	Totalizer
Start	14:33	260
End	1743	7466
Total Gallons Injected		2,050

7/16

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
14:35	4.2	270	0	n	
14:52	4.4	335	0	n	
15:07	4.4	400	0	n	
15:20	STOP TO GET MORE 615 FOR PUMP				
16:11	Restart pump				
16:12	4.0	590	0	n	
16:29	4.0	660	0	n	
16:47	6.0	770	3	n	
17:02	5.5	850	3	n	
17:18	5.2	940	5	n	
17:30	7.5	1010	5	n	
18:00	6.0	1220	7	n	
1616		1276			Shut off Day 1 total: 1010 gal
07:40	Reopened the valve				
07:55	3.0	1360	2	n	
08:14	3.0	1420	3	n	
08:30	3.5	1480	4	n	
08:45	3.5	1530	5	n	
09:00	3.5	1590	5	n	
09:16	3.5	1650	5	n	
09:31	3.5	1700	0	yes	Daylighting seen 9ft from well. Shut valve closed
09:35	n/a	1750			1490 Gallons injected - will return to complete at later time
12:27	2.6	4960	0	n	
12:40	2.0	4980	0	n	
12:53	2.2	5010	0	n	
13:07	2.0	5040	0	n	
13:20	2.0	5064	0	n	
13:34	2.0	5090	0	n	
13:41	2.6	5120	0	n	
14:07	3.0	5150	3	n	Stop for 3 min to ref
14:19	2.0	5160	1	n	Start batch #5
14:40	3.2	5200	2	n	Valved it up
14:55	3.2	5260	0	n	
15:10	3.4	5320	0	n	
15:25	3.6	5370	2	n	
15:40	3.2	5420	1	y	Daylight about 5ft away
		5430			Shut off valve taking last
					Total 1970 gallons pumped
17:15	2.0	7380	0	n	Restart
17:30	2.0	7410	0	n	Stop 3 min to refill
17:43	3.0	7460	0	n	DONE.

7/17/08

7/21/08

2,050 gallons injected.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/17/08  
 Well ID IP-18 105

7/17  
 7/18

	Time	Totalizer
Start	13:29	2240
End	15:10	4290
Total Gallons Injected		2050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
13:26	2.8	2245	6	n	
13:40	3.0	2290	6	n	
13:47	3.0	2310	6	n	
14:00	3.0	2330	6	n	
14:22	4.0	2410	4	n	Valved up 4 (lightly) Stop 5 minutes to reface
14:38	4.0	2470	6	n	
14:56	4.5	2560	6	n	
15:15	5.0	2650	5	n	
15:23	5.0	2690	6	n	
15:36	5.0	2770	2	n	
15:52	5.0	2850	-	y/n	valved back to stop daylighting 12ft towards creek
16:04	1.0	2860	2	n	
<del>16:10</del>	<del>2.0</del>	<del>2890</del>	<del>2.5</del>	<del>n</del>	<del>use of daylighting</del>
16:20	2.0	2890	2.5	n	
16:37	2.0	2920	2.5	n	
16:50	2.2	2950	2.0	n	
17:05	2.0	2980	2.0	n	
	stop 5 minutes to reface				
17:22	2.2	3020	2.0	n	
17:38	2.2	3060	2.0	n	
17:50	-	3090	-	-	Shutdown for day
07:30	1.0	3090	0	n	Restart
07:46	2.0	3120	1	n	valved up
08:03	2.6	3170	1	n	
08:16	2.2	3200	2	n	
08:32	-	3240	-	n	stop to switch tanks
09:00	3.0	3290	2	n	Restart with batch #3
09:17	2.8	3300	2	n	
09:30	2.2	3310	2	n	
09:46	3.0	3360	2	n	
10:08	3.0	3400	2	n	
10:22	3.0	3440	2	n	stop 5 min to reface
10:35	2.2	3480	1	n	
10:53	2.6	3520	1	n	
11:06	3.0	3550	1	n	
11:20	2.4	3580	2	n	
11:34	3.0	3620	1.5	n	
11:50	3.0	3660	1	n	
12:05	2.5	3690	2	n	
12:20	3.0	3740	2	n	
12:35	3.0	3790	2	n	
12:52	3.0	3840	2	n	
13:11	3.4	3910	2	n	
13:26	3.2	3970	2.5	n	
13:39	3.6	4000	2.5	n	

wrote on wrong sheet  
 (JAM)

7/18

# IOS continued

10-S  
2250

Time	Flow Rate	Totalizer	well head Pressure PSI	Daylighting
1353	4.0	4050	2	n
1409	3.5	4100	2.5	n
1423	3.0	4140	2	n
1439	3.5	4190	2	n
1452	3.5	4240	2	n
1506	3.5	4290	2	n

Shut off, done injecting  
2,050 gallons

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/21/08  
 Well ID SI-18 11S

7/21  
 7/22

	Time	Totalizer
Start	11:28	5270
End	12:58	7000
Total Gallons Injected		3050

7/21

7/22

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
11:28	3.0	5270	0	n	
11:40	3.0	5320	2	n	
11:55	3.0	5360	3	n	
12:10	3.0	5400	4	n	
12:23	3.0	5450	5	n	
12:40	3.0	5490	5	n	
12:53	3.0	5530	5	n	
13:07	2.5	5580	6	n	
13:20	2.5	5620	6	n	
13:34	2.8	5660	5.5	n	
13:51	2.5	5700	5	n	
14:07	3.5	5760	2	n	Stop for 3min to refuel
14:09	3.0	5770	0	n	Start batch #5
14:40	3.0	5850	0	n	
14:55	3.0	5890	1	n	
15:10	3.5	5940	0	n	
15:25	3.8	5980	0	n	
15:40	3.4	6030	0	n	
15:55	3.0	6070	0	n	
16:10	3.7	6110	0	n	
16:25	3.0	6150	2	n	
16:40	3.0	6190	2	n	
16:54	3.0	6230	2	n	
17:13	3.0	6280	2	n	
17:30	3.0	6320	2	n	
17:45	4.0	6380	1	n	Stop 3min to refuel
18:00	3.0	6430	2	n	
18:10	-	6450	-	-	Shut off for day
07:01	3.0	6460	0	n	
07:16	3.0	6490	0	n	
07:30	3.0	6530	2	n	
07:45	3.0	6570	2	n	
08:00	3.0	6620	3	n	
08:15	3.0	6660	3	n	
08:31	3.0	6700	3	n	
08:45	2.8	6730	3	n	valued up
09:00	3.0	6770	4	n	
09:13	3.0	6820	5	n	
09:30	-	6870	5	n	Stop while another well is tried. 1600 gallons pumped
10:24	3.4	6950	6	n	
10:35	3.4	6990	6	n	
10:50	4.0	7050	6	n	
11:05	3.6	7100	6	n	
11:20	3.0	7150	5	n	

(see other side)

# 11 S continued

7400

Time	Flow	Totalizer	Pressure	Daylighting?	
11:35	2.6	7180	2	n	
11:40	-	7190	-	n	Tank almost empty Done with Batch # 5
11:53	3.0	7190	6	n	Start Batch # 6
12:10	3.0	7240	4	n	
12:25	3.0	7280	5	n	
12:46	3.6	7320	5	n	
12:54	3.4	7380	6	n	
12:58		7400	-	n	Done 2050 gal injected

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/21/08  
 Well ID IP-18 125

	Time	Totalizer
7/21	Start 10:31	5120
7/22	End 11:10	11170
Total Gallons Injected		2050

	Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)		
7/21	10:31	3.8	5120	5.2	n	
	10:35	3.8	5130	5.2	n	Stop for 2 min to refuel
	10:52	4.0	5180	4	n	
	11:08	-	5250	-	y	Daylighting about 1 ft from well, shut off. Will reset later. 130 gallons pumped
7/22	0934	2.5	6870	2	n	
	0940	-	6880	-	y	Shut off due to daylighting 1 ft from well. Total 10 + 130 gallons = 140 gallons pumped
7/23	0931	1.5	8500	2	y	Daylighting almost immediately. 10 + 140 = 150 gallons pumped.
			8510			Per instruction from CH2M/Aquatic will inject into IIS, nearest upgradient well.
7/24	0720	3.6	12610	3	n	
	0735	3.6	12660	3	n	
	0750	3.9	12710	2	n	
	0805	3.9	12760	2	n	
	0823	3.6	12830	2	n	
	0830	-	12850	-	n	Complete Batch #7
	0840	3.8	12850	2	n	Begin Batch #8
	0856	3.8	12910	2	n	
	0916	3.6	12980	2	n	
	0931	4.0	12990	3	n	Stopped, had to valve up
	0947	4.0	13060	5	n	
	1002	4.0	13120	5	n	
	1024	4.0	13200	6	n	
	1043	3.8	13270	6	n	
	1058	3.8	13320	6	n	
	1113	3.8	13370	6	n	
	1130	3.8	13470	6	n	Stop 2 min to refuel
	1145	3.8	13470	6	n	
	1200	3.8	13500	6	n	Stopped, had to valve up
	1215	4.0	13560	6	n	
	1230	3.8	13600	6	n	
	1245	3.8	13646	7	n	
	1250	-	13670	-	n	Shut off to try other wells. 1060 + 156 = 1210 gallons injected
Continue with IIS, Batch #8						
	1420	3.6	13810	6	n	
	1440	3.6	13880	6	n	
	1455	3.6	13920	6	n	
	1510	3.0	13968	6	n	stop 3 min to refuel
	1530	4.0	14030	7	n	
	1545	4.0	14090	7	n	
	1600	3.0	14120	7	n	
	1615	4.0	14180	7	n	
	1630	3.0	14220	7	n	

# 125 continued

11650

125

Time	Flow	Total	Pressure	Daylighting
1646	3.5	14270	6	n
1702	3.5	14310	6	n
1730	-	14380	-	n

shut off for day  $570 + 1210 = 1780$

7/25

Inject into 11 S with batch #9 (2x cone.)

10 <del>17</del>	3.5	11320	3	n	11460
1046	3.0	11380	5	n	
1100	3.0	11430	7	n	stop to recheck
1116	-	11470	-	n	$150 \times 2 + 1780 = 2,080$ gallons

**OBNE**

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/17/08  
 Well ID IP-18 13S

7/17  
 7/25

	Time	Totalizer
Start	16:36	2830
End	20:15	11,320
Total Gallons Injected		2,050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (Y/N)	Comments/ Adjustments
7/17 16:38	3.7	2840	0	n	Valve only cracked open
16:50	4.0	2896	0	n	opened valve slightly
17:05	4.0	2960	1	n	
17:22	4.0	3030	6	n	to refuel
17:35	5.0	3110	4	n	
17:50	-	3150	-	-	Shut down for day
7/18 07:30	1.0	3150	0	n	Restart
0746	2.0	3180	2.5	n	valved up
0802	3.0	3240	5	n	
0810	<1.0	3250	2	Y → n	Daylighting 9 ft. from well a way from catch, valved back
0816	<1.0	3255	2	n	
0832	-	3270	-	n	Stop to switch tanks
0900	1.0	3270	2	n	Restart with Batch # 3
0915	<1	3280	0	n	STOP injection to plug hole where daylighting occurred, will retry at later time. Total injected: 440 gallons
7/22 0945	2.0	6880	0	n	
0954	2.0	6900	0	n	
1003	2.0	6970	1.5	n	
1020	2.0	6950	1.5	Y	Shut off for day later - daylighting 70 + 490 = 560 gallons injected
7/23 0752	1.5	8330	0	n	
0809	2.0	8370	0.6	n	
0823	1.5	8390	1	n	
0837	1.5	8420	3	n	
0852	1.5	8440	3	n	
0910	1.5	8470	4	n	Stop 4 min to refuel
0925	1.5	8490	3	Y	Daylighting trickling out slightly. Shut off + stop later. 70 + 510 = 580 all is pumped cone.
7/24 1325	2.0	10280	0	n	
1340	1.6	10310	1	n	
1357	-	10350	-	Y	Shut off due to daylighting. 70 x 2 + 680 = 1820 gallons so far.
Switch to pumping 10S, Batch # 8					
1420	3.0	10350	2	n	
1440	3.0	10410	3	n	
1455	3.0	10440	3	n	
1610	3.0	10480	3	n	Stop 3 min to refuel
1530	3.0	10530	4	n	
1545	3.0	10570	4	n	
1600	3.0	10610	2	n	
1615	3.5	10670	-	Y	Shut off due to daylighting. 320 + 820 = 1140 gallons injected.

see other side

21140 gallons injected

# 135 Continued

135

Restart pumping into 190.

Time	Flow	Total	Pressure	Daylighting
1713	2.9	10830	3	✓
1730	—	10870	—	✓

shut off for day - 1200 gallons.

7/25 Begin injecting into 190 with Batch #9 (2x conc.).

0720	3.0	10870	0	✓
0739	3.0	10910	2	✓
0755	3.0	10960	2	✓
0815	3.0	11010	3	✓
0830	2.8	11040	3	✓
0847	2.8	11080	4	✓
0902	2.8	11120	4	✓
0918	2.8	11160	3	✓
0937	2.8	11190	4	✓
0950	2.8	11240	4	✓
1009	3.0	11300	5	✓
1015	—	11320	—	✓

stop to refuel

$$456 \times 2 + 1200 = 2,100 \text{ gallons}$$

DONE

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/16/08  
 Well ID IP-18 145

7/16  
 7/21

	Time	Totalizer
Start	12:45	00050
End	1078	5120
Total Gallons Injected		2,058

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
12:50	1.2	110	2	n	
13:00		260			STOP INJECTION. DAYLIGHTING IS OFF FROM WELL. DAYLIGHTING IN DIRECTION OF CREEK ROUTED OLD BORE HOLE WHERE DAYLIGHTING OCCURRED DEBRIS IN AREA SURROUNDING WELL - MAY HAVE OTHER BURIED DEBRIS. 210 Gallons total.
11:26	3.8	1820	1	n	Valve cracked open
11:35	4.0	1850	1	n	
11:56	4.0	1920	2	n	
12:10	3.5	1990	2	n	
12:30	2.5	2040	2	n	
12:45	4.0	2100	2	n	
13:00	4.7	2170	2	n	
13:15	4.0	2230	2	n	
13:30	7.0	2270	2	n	
13:47	3.0	2340	2	n	
14:00	4.0	2390	2.5	n	
14:22	3.0	2480	2.5	n	stop 5 minutes to refuel
14:38	3.6	2510	2.5	n	
14:52	3.8	2550	2.5	n	
15:11	3.5	2620	2.5	n	
15:22	3.2	2650	2.5	n	
15:36	3.0	2700	2.5	n	
15:52	2.0	2770	2.5	n	
16:05	4.0	2800	2.5	n	
16:10	n/a	2830			shut off because of daylighting in ft to water creek. Total of 1010 + 210 = 1220 gallons in well so far
15:11	3.0	4290	0	n	
15:25	3.0	4320	0	n	
15:41	3.0	4360	0	n	stop 3 min to refuel
15:56	3.0	4400	0	n	
16:11	3.0	4440	0	n	
16:24	-	4460	0	n	stop injection to switch tank
16:40	3.2	4460	1.4	n	begin injecting batch #14
16:50	3.0	4490	1.4	n	
17:05	3.0	4510	1.7	n	
17:20	3.0	4590	1.4	n	
17:35	-	4640	-	n	shut off well for day. Total of 350 + 1220 = 1570 gallons injected so far.

7/16  
 7/17

7/18

7/21

705	2.0	4640	0	n
818	3.5	4690	0	n
832	3.5	4740	0	n
0849	4.0	4790	0	n
0858	-	4830	0	n
0919	3.8	4890	0	n

stop for 5min for refueling  
 (see other side)

# 145 continued

145

5120

Time	Flowrate	Totalizer	Pressure	Daylighting
0938	3.0	4940	0	n
0950	3.0	4990	0	n
1002	3.0	5030	0	n
1017	3.0	5080	0	n
1028	-	5120	1	n

DONE. 2050 gallons injected.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/23/08  
 Well ID SP-18 15 D

7/23  
 7/24

	Time	Totalizer
Start	11:37	8190
End	12:50	10240
Total Gallons Injected		2050

7/23

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
1137	3.5	8190	2	n	
1144	3.0	8220	2	n	
1158	4.0	8270	3	n	
1212	3.5	8320	4	n	
1226	3.5	8370	4	n	
1250	3.0	8440	6	n	
1315	3.0	8520	6	n	refuel - 3 min
1320	2.0	8560	6	n	
1349	3.0	8600	6	n	
1400	3.2	8650	6	n	
1415	3.0	8670	7	n	
1430	3.0	8710	7	n	
1445	3.0	8740	7	n	
1500	2.6	8790	7	n	
1518	3.6	8840	8	n	
1610	3.5	8910	8	n	Lightning, no reading until past. W
1625	3.6	8980	8	n	the waiting in car fuel ran out, restart 11:02.
1640	3.0	9030	8	n	
1655	3.0	9070	7	n	
1715	3.0	9130	7	n	
1752	-	9230	-	n	Done for day.
0720	3.4	9230	7	n	
0735	3.4	9280	3	n	
0750	3.4	9330	3	n	
0805	3.5	9390	2	n	
0823	3.8	9440	2	n	
0830	-	9500	-	n	Complete Batch #7
0840	3.6	9500	0	n	Begin Batch #8
0857	3.4	9550	0	n	
0916	3.4	9620	0	n	
0931	3.4	9670	0	n	
0947	4.0	9670	2	n	Stopped, had to blow up
1002	4.0	9750	4	n	
1024	4.6	9830	6	n	
1043	3.6	9880	6	n	
1058	3.2	9930	6	n	
1113	3.2	9970	6	n	
1130	3.6	10070	6	n	Stop 2 min to refuel
1146	3.0	10060	6	n	
1200	3.0	10100	5	n	
1215	3.0	10140	5	n	
1230	3.0	10170	5	n	
1244	3.6	10220	6	n	
1250	-	10240	-	n	DONE. 2050 gallons injected.

7/24

10240

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/21/08  
 Well ID IP-18 160

7/21  
 7/22

	Time	Totalizer
Start	1747	7460
End	1718	9510
Total Gallons Injected		2,050

7/21  
 7/22

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
1747	4.5	7460	0	n	Batch #5
1800	4.6	7510	0	n	
1810	-	7530	-	-	shut off for day
0701	4.0	7530	0	n	
0715	4.0	7590	0	n	
0730	4.0	7640	0	n	
0745	4.0	7690	0	n	
0800	4.0	7750	0	n	
0815	4.0	7800	1	n	
0831	4.0	7850	1	n	
0845	3.5	7890	1	n	
0900	3.5	7940	1	n	
0913	3.5	7980	1	n	Stop 7 min to refill
0935	3.5	8040	1	n	
0950	4.5	8090	1	n	
1005	3.5	8130	2	n	
1021	3.9	8180	2	n	
1035	3.0	8210	2	n	
1050	3.0	8260	2	n	
1105	3.5	8280	2	n	
1120	3.5	8350	4	n	
1135	3.0	8390	1	n	
1140	-	8400	-	n	Tank almost empty Renew with Batch #5
1153	3.8	8400	6	n	Start Batch #6
1204	3.8	8460	3	n	
1225	3.8	8520	2	n	
1240	4.0	8580	3	n	
1254	4.0	8650	3	n	
1312	3.8	8710	2.5	n	
1325	3.8	8750	3	n	
1340	3.8	8800	3	n	Stop for 2 min to refill
1355	3.5	8840	3	n	
1418	3.5	8920	3	n	
1432	3.5	8970	3	n	
1448	3.5	9030	3	n	
1502	3.8	9080	2	n	
1517	3.0	9120	3	n	
1532	3.0	9170	3	n	
1546	3.0	9220	3	n	
1601	4.0	9280	3	n	Stop flowing had to open valve more stop 2 min to refill
1616	4.0	9280	3	n	
1630	3.8	9330	3	n	
1645	3.0	9370	3	n	
1700	4.0	9440	3	n	
1715	3.6	9490	3	n	
1718	-	9510	-	n	

DONE. 2,050 gallons injected.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/17/08  
 Well ID IP-18 17D

7/17  
 7/17

	Time	Totalizer
Start	10:35	1750
End	9:40	3800
Total Gallons Injected		2050

7/17

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
10:38	1.0	1754	0	n	
10:40	2.0	1760	0.5	n	Value barely cracked open
10:50	5.0	1780	2.5	n	open valve slightly
11:05	4.0	1850	5	n	responsive & lightly
11:20	4.0	1910	6	n	
11:35	4.0	1960	7	n	
11:50	3.6	2010	7	n	
12:10	2.0	2050	6	n	
12:30	1.8	2080	6	n	
12:45	4.0	2140	10	n	valued up slightly
13:00	5.0	2220	10	n	
13:15	6.0	2310	10	n	
13:30	5.0	2380	10	n	
13:47	5.0	2460	11	n	
14:00	4.0	2510	11	n	
	Stop 5 minutes		to recheck		
14:22	4.0	2590	11	n	
14:38	4.0	2650	11	n	
14:50	3.5	2680	11	n	
15:08	3.0	2740	11	n	
15:22	3.0	2770	11	n	
15:36	2.5	2800	11	n	
15:52	1.0	2830	11	n	valued up
16:05	4.0	2880	11	n	
16:19	8.0	2970	11	n	valued back - too high flow
16:39	6.0	3090	10	n	
16:50	4.0	3130	9	n	
17:05	6.0	3220	10	n	
	Stop 5 minutes		to recheck		
17:22	6.0	3290	10	n	
17:38	5.0	3370	11	n	
17:50	-	3420	-	-	shut down for day
07:30	3.0	3420	3	n	restart
07:46	4.0	3470	6	n	valued up
08:02	4.0	3520	9	n	
08:16	2.0	3550	10	n	
08:32	-	3610	-	n	stop to switch tanks
08:40	5.0	3610	7	n	restart with switch #3
08:15	5.0	3690	7	n	
09:30	4.5	3750	6	n	
09:40	-	3800	-	n	DONE. 2050 Gallons injected.

7/18

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/22/08  
 Well ID IP-18180

7/22  
 7/23

	Time	Totalizer
Start	17:23	9510
End	17:00	11560
Total Gallons Injected		2,050

7/22  
 7/23

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
17:23	3.7	9510	0	n	
1731	3.5	9590	0	n	
1745	3.0	9580	0	n	
1800	-	9630	-	n	Shut off for day
0707	3.0	9630	0	n	
0722	3.0	9670	0	n	
0737	3.0	9720	0	n	
0757	3.0	9760	0	n	
0809	3.5	9810	1	n	
0823	3.5	9860	1	n	
0837	3.5	9910	2	n	
0852	3.5	9960	3	n	
0910	3.5	10020	5	n	Stop at min tank level
0925	3.5	10070	3	n	
0940	3.5	10130	3	n	
1000	2.0	10180	3	n	Slow near end of tank
1010	-	10160	-	-	Stop to switch tanks
1022	3.0	10160	2	n	Restart with Batch #7
1037	3.5	10210	0	n	
1052	4.0	10300	0	n	
1110	4.0	10370	0	n	
1127	3.8	10430	0	n	
1144	3.8	10490	0	n	
1158	3.8	10540	0	n	
1212	3.8	10580	0	n	
1226	3.5	10620	0	n	
1250	3.8	10710	2	n	
1315	4.0	10810	2	n	Refuel - 3 min
1330	4.0	10970	2	n	
1345	3.8	10920	3	n	
1400	3.8	10970	3	n	
1415	3.8	11030	3	n	
1430	4.0	11070	3	n	
1443	4.0	11120	3	n	
1500	4.0	11200	3	n	
1518	4.0	11260	3	n	
1610	4.0	11360	3	n	Lightning, no reading until past while
1625	4.0	11430	2	n	car fuel ran out. Restart
1640	4.0	11490	2	n	19:00
1707	-	11560	-	n	NOTE: 2,050 gallons injected.

was trying to  
 car fuel ran  
 out. Restart  
 19:00

Appendix A  
Injection Data Form  
Site 18 - Norfolk Naval Station  
Enhanced Reductive Dechlorination Injection

~~7/22/08~~

Date 7/22/08  
Well ID IP-18 19D

7/22  
7/24

	Time	Totalizer
Start	1704	8050
End	1615	13420
Total Gallons Injected		2050

7/22

7/23

7/24

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
17:04	3.2	8050	0	n	Batch #6
17:15	3.0	8080	0	n	
17:37	3.0	8136	1	n	
17:45	3.0	8170	3	n	
18:00	-	8216	-	n	Shutoff for day
07:07	3.0	8210	1	n	
07:22	3.0	8250	1	n	
07:37	3.0	8300	3	n	
07:50	-	8330	-	n	330 gallons pumped. Shutoff to try other well.
17:00	3.0	11560	5	n	Batch #7
17:15	4.0	11630	5	n	Lightning beginning
17:52	-	11780	-	n	Done for day.
07:20	3.2	11780	2	n	
07:35	4.0	11820	2	n	
07:50	4.0	11886	2	n	
08:05	4.0	11940	2	n	
08:23	4.6	12020	1	n	
08:30	-	12050	-	n	Complete Batch #7
08:40	3.6	12050	0	n	Begin Batch #8
08:56	3.6	12100	0	n	
09:16	3.2	12160	0	n	
09:31	4.0	12220	2	n	JCM
09:47	4.0	12280	3	n	
10:02	4.0	12340	4	n	
10:24	4.0	12420	4	n	
10:43	3.8	12480	4	n	
10:58	3.8	12530	4	n	
11:12	3.6	12580	4	n	
11:30	3.8	12660	4	n	Stop 2 min to recheck
11:45	4.0	12650	5	n	Gate stuck, had to valve up
12:00	4.0	12716	5	n	
12:15	4.0	12800	5	n	
12:30	3.2	12840	5	n	
12:45	4.6	12880	5	n	
12:50	-	12920	-	n	Shutoff to try other wells.
14:20	3.6	13010	5	n	280 + 1360 = 1640 injected
14:46	3.6	13080	5	n	Batch #8 complete
14:55	4.0	13140	5	n	
15:10	3.6	13190	5	n	stop 3 min to recheck
15:36	3.6	13260	5	n	
15:45	4.0	13320	5	n	
16:00	3.6	13370	5	n	
16:19	-	13420	-	n	0.002. 2,050 gallons injected.

**Appendix A**  
**Injection Data Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Date 7/21/08  
 Well ID IP-18 200

7/21  
 7/21

	Time	Totalizer
Start	805	5330
End	1714	7380
Total Gallons Injected		2050

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
805	4.5	5330	0	n	
818	4.5	5390	0	n	
832	4.5	5460	0	n	
847	4.5	5530	0	n	
858	-	5580	0	n	Stop for 5min for refueling
0917	4.4	5660	0	n	
0937	4.2	5740	0	n	
0948	4.4	5800	0	n	
1002	4.2	5860	0	n	
1016	4.0	5920	0	n	
1035	4.2	6010	0	n	Stop for 3min to refuel
1052	4.2	6070	2	n	
1114	4.2	6160	5	n	
1124	4.0	6200	6	n	
1146	4.0	6250	6	n	
1155	3.8	6290	6	n	
1210	3.5	6340	6	n	
1223	3.5	6390	6	n	
1240	3.5	6440	6	n	
1253	3.5	6490	6	n	
1307	3.8	6540	7	n	
1320	3.5	6580	7	n	
1334	3.8	6620	7	n	
1351	3.8	6680	7.5	n	
1407	4.0	6740	4	n	Stop for 3min to refuel
1419	4.0	6760	2	n	Start batch #5
1440	4.0	6790	0	n	
1454	4.0	6870	0	n	
1510	4.0	6920	0	n	
1525	4.2	6980	0	n	
1540	4.0	7040	2	n	
1555	4.0	7100	2	n	
1610	4.0	7150	3	n	
1625	3.8	7200	3	n	
1640	4.0	7260	3	n	
1654	3.8	7310	3	n	
1714	-	7380	3	n	DONE. Shut off. 2050 gallons pumped

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/18/08  
 Well ID IP-18 210

7/18

	Time	Totalizer
Start	9:30	3280
End	18:00	5330
Total Gallons Injected		2050

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
9:32	2.0	3290	0	n	valve cracked
9:46	4.0	3350	0	n	valve open
10:07	4.5	3440	0	n	stop 3 min to recheck
10:22	4.0	3490	0	n	
10:34	4.0	3550	0	n	
10:49	4.0	3610	0	n	
11:03	4.5	3670	0	n	
11:18	4.0	3720	0	n	
11:32	4.5	3780	0	n	
11:50	4.0	3860	0	n	
12:09	3.0	3910	0	n	
12:20	4.0	3960	0	n	
12:35	4.0	4050	0	n	
12:52	4.0	4110	0	n	
13:08	4.0	4180	0	n	
13:24	4.0	4250	0	n	
13:37	4.0	4310	0	n	
13:51	4.0	4370	0	n	
14:07	4.2	4430	0	n	
14:21	4.2	4500	0	n	
14:35	4.2	4560	0	n	
14:50	4.0	4620	0	n	
15:04	4.0	4680	0	n	
15:22	4.0	4750	0	n	
15:38	4.0	4810	0	n	stop 3 min to recheck
15:54	4.0	4880	2.5	n	
16:08	4.0	4930	3	n	
16:24	-	4970	2	n	stop injection to switch tanks
16:48	2.0	4970	2	n	begin with batch #4
16:56	4.0	5010	2	n	
17:05	4.0	5080	3	n	
17:20	4.0	5130	3	n	
17:35	5.0	5200	3	n	
17:50	5.0	5280	3	n	
18:00	-	5330	5	n	DONE. SHUT WELL OFF 2,050 total gallons pumped.

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/12/08  
 Well ID IP-18 220

7/123  
 7/123

	Time	Totalizer
Start	0742	10560
End	1752	12610
Total Gallons Injected		2,050

Time	Flow Rate	Totalizer Reading	Wellhead Pressure	Daylighting	Comments/ Adjustments
	(gal/min)	(gal)	(psi)	(y/n)	
0742	3.0	10560	2	n	
0754	3.0	10600	1	n	
0809	4.0	10650	1	n	
0823	3.5	10700	3	n	
0837	3.5	10750	4	n	
0852	3.5	10800	4	n	
0910	3.5	10850	4	n	Stop 4 min to refuel
0925	3.5	10900	4	n	
0940	3.5	10950	4	n	
1000	1.0	10970	4	n	slow near end of tank
1005	-	10980	-	n	Stop to switch tanks
1022	3.0	10980	8	n	Restart with batch # 7
1037	3.5	11030	2	n	
1052	4.0	11140	0	n	
1110	4.0	11220	0	n	
1127	4.0	11290	2	n	
1144	4.0	11350	2	n	
1158	4.0	11400	2	n	
1217	4.0	11450	2	n	
1226	3.8	11500	2	n	
1250	3.8	11580	3	n	
1315	3.8	11660	3	n	Refuel - 3 min
1330	3.5	11700	4	n	
1345	4.0	11760	4	n	
1400	4.0	11820	5	n	
1418	4.0	11880	5	n	
1430	4.0	11930	8	n	
1443	4.0	11980	5	n	
1500	4.0	12050	5	n	
1518	4.0	12110	5	n	
1516	4.0	12200	4	n	Lightning, no readings until p.m.
1625	4.0	12270	4	n	
1630	4.0	12330	4	n	
1655	4.0	12390	4	n	
1715	4.0	12470	5	n	Lightning beginning.
1752	-	12610	-	n	DONE. 2,050 gallons injected.

while waiting  
 in car fuel  
 ran out, refuel  
 16.02

**Appendix A**  
**Injection Data Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Date 7/18/08  
 Well ID TP-18 230

	Time	Totalizer
Start	9:50	3800
End	18:05	5850
Total Gallons Injected		2050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
9:51	3.0	3805	0	n	
10:08	5.0	3890	0	n	Stop 3 min to refuel
10:21	4.5	3950	0	n	
10:34	4.5	4010	0	n	
10:48	4.5	4080	0	n	
11:02	5.5	4150	1	n	
11:16	6.0	4210	1	n	
11:30	4.5	4260	0	n	
11:50	4.0	4340	0	n	
12:05	1.0	4350	0	n	valved up, needed more pressure
12:20	4.5	4430	0	n	valved back slightly
12:39	4.2	4490	0	n	
12:52	4.0	4560	0	n	stop 3 min to refuel
13:07	4.0	4620	0	n	
13:23	4.2	4690	1	n	
13:36	4.0	4750	1	n	
13:49	4.0	4810	1	n	
14:04	4.2	4880	0	n	
14:20	4.0	4940	1	n	
14:34	4.0	5000	1	n	
14:49	4.0	5060	1	n	
15:03	4.0	5120	1	n	
15:21	4.0	5200	0	n	
15:37	4.0	5260	0	n	Stop 3 min to refuel
15:53	4.4	5320	0	n	
16:09	4.0	5380	3	n	
16:24	-	5420	0	n	stop injection to switch tanks
16:40	-	5470	5	n	Begin with Batch #4
16:50	4.0	5470	6	n	
17:05	4.5	5540	5	n	
17:20	4.6	5600	6	n	
17:35	4.0	5660	7	n	
17:50	5.0	5740	7	n	
18:05	-	5850	8	n	SHUTOFF WELL - DONE 21050 gallons pumped.

Appendix A  
Injection Data Form  
Site 18 - Norfolk Naval Station  
Enhanced Reductive Dechlorination Injection

Date 7/21/08  
Well ID IP-18 240

7/21  
7/22

	Time	Totalizer
Start	0935	6290
End	0735	8340
Total Gallons Injected		

7/21

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
0935	4.5	6290	0	n	
0947	4.0	6340	0	n	
1001	4.0	6390	0	n	
1016	4.0	6450	0	n	
1035	4.0	6530	0	n	Stop for 3min to refuel
1052	3.8	6580	0	n	
1114	3.8	6670	2	n	
1126	4.0	6720	2	n	
1140	4.0	6770	2	n	
1155	3.8	6820	2	n	
1210	4.0	6890	3	n	
1223	3.8	6930	3	n	
1246	3.5	6980	3	n	
1253	3.2	7030	4	n	
1307	3.5	7080	4	n	
1320	4.0	7130	4	n	
1334	4.0	7180	4	n	
1357	3.5	7240	4	n	
1407	4.0	7310	0	n	Stop for 3min to refuel
1419	4.0	7330	0	n	Start batch #5
1440	4.0	7430	0	n	
1455	4.0	7500	0	n	
1510	3.8	7550	0	n	
1525	4.0	7600	0	n	
1540	3.8	7660	0	n	
1555	3.8	7710	0	n	
1610	3.8	7760	1	n	
1625	3.8	7810	1	n	
1640	3.8	7860	1	n	
1654	3.8	7910	1	n	
1713	3.8	7970	0	n	
1730	3.8	8030	0	n	
1745	4.2	8100	0	n	stop 3min to refuel
1800	4.2	8170	1	n	
1810		8200	-	-	Shut off for day
0701	4.0	8200	0	n	
0715	4.0	8260	0	n	
0735	4.0	8340	-	n	00NE Shut off. 2,056 gallons injected.

7/22

**Appendix A**  
**Injection Data Form**  
**Site 18 - Norfolk Naval Station**  
**Enhanced Reductive Dechlorination Injection**

Date 7/22/08  
 Well ID 51-1825D

7/22  
 7/22

	Time	Totalizer
Start	0830	8440
End	1757	10490
Total Gallons Injected		2,050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
08:30	4.0	8440	1	n	
0845	4.0	8500	3	n	
0900	4.0	8550	3	n	
0913	4.0	8590	3	n	
0935	3.6	8640	4	n	stop 2 min to refuel
0956	3.4	8680	5	n	
1005	3.4	8770	6	n	
1021	4.0	8790	6	n	
1035	4.0	8840	7	n	
1050	4.0	8890	6	n	
1109	4.0	8940	6	n	
1120	4.2	9010	6	n	
1135	2.0	9040	3	n	Tank almost empty
1140	—	9050	—	n	Done with Batch #5
1153	4.0	9050	5	n	Start Batch #6
1209	4.0	9136	6	n	
1223	4.5	9216	6	n	
1240	4.5	9280	6	n	
1254	4.2	9360	7	n	
1312	4.5	9430	6	n	
1325	4.4	9480	6	n	
1340	4.2	9530	6	n	Stop for 2min to refuel
1355	4.0	9570	6	n	
1418	4.0	9640	7	n	
1432	3.5	9680	6	n	
1448	3.0	9740	6	n	
1502	3.5	9780	6	n	
1517	4.5	9800	8	n	valved up
1532	4.2	9870	8	n	
1546	4.0	9930	8	n	
1601	4.0	9990	8	n	
1616	4.0	10050	7	n	stop for 2min to refuel
1630	4.0	10110	7	n	
1645	4.0	10170	7	n	
1700	4.0	10240	7	n	
1715	4.0	10300	7	n	
1731	4.0	10380	7	n	
1745	4.0	10440	8	n	
1757	—	10490	—	n	DONE. 2,050 gallons pumped

**Appendix A**  
 Injection Data Form  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/22  
 Well ID IP-8 26S

	Time	Totalizer
Start	1300	7400
End	1520	11850
Total Gallons Injected		2050

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
7/22 1300	3.0	7400	5	n	
1312	3.0	7430	5	n	
1325	3.0	7470	5	n	
1340	3.4	7510	4	n	Stop for 2 min to refill
1355	-	7570	-	y	Daylighting 10' from well Shut off
<hr/>					
7/23 0939	1.4	8510	1	n	
1000	2.0	8520	0	n	slow near end of tank
1010	-	8536	-	n	stop to switch tanks
1022	1.6	8530	2	n	Restart with Batch #7
1037	1.6	8550	0	n	
1053	1.6	8580	0	n	
1110	1.6	8610	1	n	
1127	1.2	8630	4	n	
1143	1.6	8660	1	n	
1158	1.0	8670	1	n	
1217	1.6	8690	3	n	
1226	1.8	8720	3	n	
1251	1.8	8786	2	n	
1254	-	8790	2	n	Turn off. Will restart later with higher con concentration. 280+170=450 gallons injected
<hr/>					
Pump into 9S in place of 26S.					
7/24 1022	2.6	10010	0	n	
1025	2.8	10020	0	n	
1043	2.6	10070	0	y	Daylighting in 5ft. from well. 60+456=516 gallons pumped x concentration
<hr/>					
Begin injecting with Batch #9					
1307	2.0	13676	2	n	
1320	1.8	13700	2	n	
1346	1.8	13746	2	n	
1357	2.0	13786	2	n	
1409	-	13810	-	y	Daylighting began. Shut off. 140 x 2 @ 510 = 790 gallons volume
<hr/>					
Run on well 9S Batch #8.					
1627	1.6	14710	-	y	Shut off immediately due to daylighting.
<hr/>					
Inject into 3S with Batch #9					
7/25 0936	2.0	14580	6	n	
0950	2.0	14600	6	n	
1005	2.0	14630	7	n	
1020	2.0	14660	7	n	
1040	2.0	14690	7	n	
1100	2.0	14720	10	n	stop to refill
1117	2.4	14780	10	n	
1130	2.0	14810	11	n	
1142	-	14840	+	n	

2,600 gallons  
 x 2 = 5,200 gallons

Simultaneously inject into 5S with Batch # 9.

1117	2.0	11290	9	n	60 gallons x 2 = 120 gallons
1130	2.0	11320	9	n	
1142	-	11350	-	n	

Solac  $790 + 520 + 120 = 1330$  gallons

Begin injecting into 3S and 5S with Batch # 8.

3S

Time	flow	total	pressure	daylighting
1200	2.0	14840	11	n
1216	2.0	14880	11	n
1232	2.2	14920	11	n
1250	-	15036	-	y

shut off due to daylighting 15ft from well.  
190 gallons injected.

5S

Time	flow	total	pressure	daylighting
1200	2.0	11350	8	n
1216	2.0	11390	6	n
1232	2.2	11420	6	n
1250	3.5	11480	7	n
1320	2.2	11550	7	n
1335	2.0	11580	7	n
1350	2.0	11610	7	n
1400	2.8	11640	8	n
1412	2.8	11680	8	n
1425	2.8	11710	8	n
1440	3.0	11760	9	n
1455	3.0	11806	9	n
1510	3.6	11850	9	n
1520	3.0	11880	9	n

**DONE.** 2,050 gallons injected

26S continued

**Appendix A**  
**Injection Data Form**  
 Site 18 - Norfolk Naval Station  
 Enhanced Reductive Dechlorination Injection

Date 7/21/08  
 Well ID SP-18 270

7/21  
 7/25

	Time	Totalizer
Start	809	5850
End	1021	14150
Total Gallons Injected		2060

Time	Flow Rate (gal/min)	Totalizer Reading (gal)	Wellhead Pressure (psi)	Daylighting (y/n)	Comments/ Adjustments
07/21 805	5.0	5850	4	n	
818	5.5	5920	5	n	
832	5.5	6000	5	n	
0846	6.0	6080	5	n	
0858	5.5	6140	5	n	Stop for 5 min for refueling
0916	6.0	6230	6	n	
0928	0	6290	-	y	Daylighting about 3' away, shutoff Total of 1400 gallons pumped.
7/22 0738	2.0	8340	3	n	Restart Batch #5
0745	2.8	8300	3	n	
0800	3.0	8400	4	n	
0815	3.0	8446	4	y	shutoff to re-try later. Total of 100+440 = 540 gallons pumped.
7/23 0707	3.2	10490	3	n	
0722	2.6	10530	4	n	
0737	-	10560	-	y	shutoff due to daylighting. 20+540 = 560 gallons pumped
7/24 1307	1.8	12920	0	n	Batch #8.
1320	1.4	12940	0	n	
1346	1.4	12970	0	n	
1357	1.2	12990	2	n	
1409	-	13010	2	n	shutoff. Total 90x2 + 610 = 1790 gallons
1627	2.4	13420	0	n	in safe
1645	-	13466	-	y	Batch #9 shutoff well due to daylighting.
Injection of 240 gal in place at 270					
1645	3.6	13460	-	n	
1707	4.0	13520	1.5	n	
1730	-	13610	-	n	shutoff for day - 980 gallons
Begin injection of Batch #9 (2x conc).					
7/25 0720	3.6	13610	0	n	
0725	3.6	13660	2	n	
0755	3.4	13720	2	n	
0815	3.2	13780	2	n	
0836	3.4	13836	2	n	
0845	3.4	13870	3	n	Stop for fuel pump
0902	3.4	13910	2	n	
0918	3.0	13960	2	n	
0932	3.0	14000	3	n	
0950	3.0	14050	3	n	
1604	3.6	14110	3	n	
1021	-	14150	-	n	

**DONE** 540x2 + 980 = 2060 gallons