Third Five-Year Review Report
FCX Statesville Site
Statesville, Iredell County, North Carolina
US EPA ID: NCD 095458527

Prepared for
United States Environmental Protection Agency
Region 4
Atlanta, Georgia
July 2016

Prepared by the
State of North Carolina
Department of Environment Quality

Approved by:

Franklin E. Hill, Director
Superfund Division
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8/18/16
Date

TABLE OF CONTENTS

SECTION **PAGE NO.**

TABLES **PAGE NO.**

FIGURES

APPENDICES

LIST OF ACRONYMS

AOC	Administrative Order on Consent
ANA	Accelerated Natural Attenuation
AROD	Record of Decision Amendment
BHC	Benzene hexachloride
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
CRQL	Contract Required Quantitation Limit
DCE	Dichloroethene
DDD	Dichlorodiphenyldichloroethane
DDT	Dichlorodiphenyltrichloroethane
EPA	United States Environmental Protection Agency
EPNG	El Paso Natural Gas Company
ESD	Environmental Services Division
FCX	Farmer's Cooperative Exchange
FS	Feasibility Study
FYR	Five-Year Review
GAC	Granular Activated Carbon
IC	Institutional Controls
MCL	Maximum Contaminant Level
MW	Monitoring Well
NC 2L	North Carolina Classifications and Water Quality Standards, Subchapter 2L
NCAC	North Carolina Administrative Code
NC DENR	North Carolina Department of Environment and Natural Resources
NC DEQ	North Carolina Department of Environmental Quality
NC DHR	North Carolina Department of Human Resources
NC DWQ	North Carolina Department of Water Quality

NCP	National Contingency Plan
NPL	National Priorities List
OCP	Organochlorine Pesticide
OU	Operable Unit
O&M	Operation and Maintenance
PCE	Tetrachloroethene
PCOR	Preliminary Close Out Report
ppb	Parts per Billion
PRP	Potentially Responsible Party
PTOW	Publicly Owned Treatment Works
RA	Remedial Action
ROA	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SVE	Soil Vapor Extraction
TBC	To Be Considered
TCE	Trichloroethene
µg/L	Microgram per Liter or ppb
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The 15.5-acre Site consists of the former Farmer's Cooperative Exchange (FCX) property, the former Burlington Industries Inc. (Burlington) property, and nearby properties contaminated by former textile manufacturing operations. The Site is located in a mixed industrial, commercial and residential area at the intersection of Phoenix Street and West Front Street (Highway 90), approximately 1.5 miles west of downtown Statesville, North Carolina.

FCX began operating at the Site as an agricultural supply distribution center around 1940 and continued to operate until declaring bankruptcy in 1986. The former FCX property served as a formulating, repackaging, warehousing and distribution center for pesticides, fertilizers and feed grains. The repackaging of liquid pesticides was discontinued in 1966, and dust repackaging was later discontinued in 1969. In 1966, approximately 10,000 pounds of dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and possibly liquid chlordane were allegedly disposed of on the property.

The original Burlington textile plant was constructed in 1927. From 1955 to 1977, Beaunit Mills operated the plant. In 1967, Beaunit Mills became an El Paso Natural Gas (EPNG) subsidiary. In July 1978, the plant was sold to Beaunit Fabrics Corporation and in 1981 Burlington Industries purchased the plant from Beaunit Fabrics. Burlington operated the plant until its closure in May 1994. Various VOCs were released or formed beneath the textile plant during textile manufacturing operations.

The Site consists of three operable units (OUs). OUl addresses contaminated groundwater at the former FCX property; OU2 addresses contaminated soil at the former FCX property; and OU3 addresses contaminated soil and groundwater associated with the former Burlington property. The remedy for OU1 is monitored natural attenuation (MNA), which is being actively monitored by the North Carolina Department of Environmental Quality (NC DEQ). The remedy for OU2 included excavation and on-site treatment of contaminated soil with thermal desorption, followed by backfilling the treated soil into the excavations inside the existing warehouses. The remedy for OU3 currently includes soil vapor extraction (SVE), air sparging (AS), and angled injection technology to mitigate volatile organic compound (VOC) migration to surface water.

This is the third FYR for the Site. The triggering action for this review is the previous FYR report dated September 21, 2011. The FCX Statesville FYR is a statutory review.

The remedies at the FCX Statesville Site currently protect human health and the environment. There are no known current exposure routes to contaminated soil or groundwater. Contaminated soils have been mitigated through source removal and groundwater is not used as a potable source of water and active remediation of VOCs in soil and groundwater using AS/SVE. Annual groundwater monitoring for MNA at OU1 and active remediation of AS/SVE with the new implementation of angled injection technology at OU3 are being successfully employed. Continued groundwater and surface water monitoring are necessary to ensure the protectiveness of the site-wide remedy at the Site, as stated in the decision documents. However, to ensure long-term protectiveness, Institutional Controls (ICs) in the form of land use restrictions need to be fully implemented.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: FCX Statesville Site		
EPA ID: NCD 095458527		
Region: 4	**State:** NC	**City/County:** Statesville, Iredell County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** 09 / 21 / 2001

REVIEW STATUS
Lead agency: US EPA **If "Other Federal Agency" was selected above, enter Agency name:**
Author name (Federal or State Project Manager): Nile Testerman / Stephanie Grubbs
Author affiliation: North Carolina Department of Environmental Quality
Review period: 01 / 01 / 2016 – 7 / 21 / 2016
Date of site inspection: 02 / 16 / 2016
Type of review: Statutory
Review number: 3 (Third)
Triggering action date: 09 / 08 / 2011
Due date *(five years after triggering action date)*: 09 / 08 / 2016

Five-Year Review Summary Form (continued)

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the Five-Year Review:				
OU1, OU2				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 03	**Issue Category:** Institutional Controls (ICs)			
	Issue: ICs have not been fully implemented for the impacted property parcels purchased by El Paso Natural Gas Company located north of the former Burlington textile property.			
	Recommendation: ICs in the form of deed restrictions need to be fully implemented on contaminated properties surrounding the Site.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/NC DEQ	09/ 08 /2017

Protectiveness Statement(s)		
Operable Unit: OU1	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):* -
Protectiveness Statement: The remedy at OU1 is protective of human health and the environment. The NC DEQ is actively monitoring the groundwater to assess the performance of the MNA remedy and institutional controls are in place to prohibit groundwater use.		
Operable Unit: OU2	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):* -
Protectiveness Statement: The remedy at OU2 is protective of human health and the environment. Contaminated soils have been removed and institutional controls are in place to ensure the protection of human health.		

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU3	Protective	-

Protectiveness Statement:
The remedy at OU3 currently protects human health and the environment because there are no exposure pathways to contaminated soils or groundwater. Groundwater and surface water contamination is actively being addresses by the additional implementation of angled injection technology. Ongoing monitoring of the groundwater and surface water as stated in the decision documents is occurring and several properties with institutional controls, in the form of land use restrictions, are in place for soil and groundwater. Institutional controls need to be fully implemented on impacted property parcels purchased by El Paso Natural Gas Company located north of the former Burlington textile property.

Sitewide Protectiveness Statement

Protectiveness Determination:	*Addendum Due Date:*
Protective Protectiveness	-

The remedies at the FCX Statesville Site currently protect human health and the environment. There are no known current exposure routes to contaminated soil or groundwater. Contaminated soils have been mitigated through source removal and groundwater is not used as a potable source of water. Annual groundwater monitoring for MNA at OU1 and active remediation of AS/SVE with the new implementation of angled injection technology at OU3 are being successfully employed. Continued groundwater and surface water monitoring are necessary to ensure the protectiveness of the Site as stated in the decision documents. However, to ensure long-term protectiveness, institutional controls need to be fully implemented on impacted property parcels purchased by El Paso Natural Gas Company located north of the former Burlington textile property.

Environmental Indicators

- Current human exposures at the Site are under control.

Are Necessary Institutional Controls in Place?

☐All ☐Some ☒None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?

☒Yes ☐No

Has the Site Been Put into Reuse?

☒Yes ☐No

1.0 Introduction

The purpose of conducting a Five-Year Review (FYR) is to determine whether the remedy implemented at a Site is protective of human health and the environment. The methods, findings, and conclusions of this review are documented in the FYR report. In addition, FYR reports identify issues found during the review, if any, and identify recommendations to address them.

The Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP; Title 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The North Carolina Department of Environmental Quality (NC DEQ), Division of Waste Management, Superfund Section, on behalf of the EPA, has conducted a FYR of the FCX Statesville Site (FCX or Site) (US EPA ID# NCD 095458527). The review was conducted from January 2016 through September 2016 and the results of the review are documented in this report. The methods, findings, conclusions, and significant issues found during the review are documented in this FYR report. This FYR was performed in a manner consistent with the latest the EPA Comprehensive FYR Guidance (EPA, 2001).

The Site consists of three operable units (OUs). OU1 addresses contaminated groundwater at the former Farmer's Cooperative Exchange (FCX) property); OU2 addresses contaminated soil at the former FCX property; and OU3 addresses contaminated soil and groundwater at the former Burlington Industries, Inc. (Burlington) property. The purpose of this FYR is to evaluate the three remedies at the Site, collectively referred to as the site-wide remedy, and to determine if the site-wide remedy remains protective of human health and the environment.

This is the third FYR for the Site. The triggering action for this review is the previous FYR report dated September 21, 2011. The FCX Statesville FYR is a statutory review. A statutory review is conducted when "upon completion of the remedial action, hazardous substances, pollutants, or contaminants will remain on Site above levels that allow for unlimited use and unrestricted exposure" (EPA

Comprehensive Five-Year Review Guidance, June 2001, Section 1.3.1). In accordance with CERCLA §121 and the NCP, a statutory review is triggered by the initiation of the first remedial action that leaves hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure.

The next FYR for the FCX Site will be due within five years of the signature/approval date of this FYR.

2.0 Site Chronology

Table 1 lists the Site chronology for selected events for the Site.

Table 1: Chronology of Site Events

Event	Date
North Carolina Department of Environment and Natural Resources (NC DENR, which is currently NC DEQ) discovered contamination.	February 1986
NC DENR (currently NC DEQ) completed Preliminary Assessment	April 1986
NC DENR (currently NC DEQ) completed Site Inspection	June 1987
EPA proposed Site to National Priorities List (NPL)	June 1988
EPA initiated emergency removal	January 1989
EPA listed Site on NPL	February 1990
EPA initiated combined Remedial Investigation/Feasibility Study (RI/FS) for OU1	November 1990
EPA conducted removal assessment	September 1991
EPA issues an Administrative Order on Consent (AOC) with Burlington Industries and EPNG	June 1993
Potentially Responsible Party (PRP) initiated RI/FS for OU3	June 1993
EPA combined RI/FS for OU2	July 1993
EPA combined RI/FS for OU1	September 1993
EPA issued ROD for OU1	September 1993
EPA completed Ecological Risk Assessment	June 1994
EPA issued ROD for OU2	November 1994
PRP completed RI/FS for OU3	September 1996
EPA initiated Remedial Action (RA) for OU1	September 1996
EPA initiated RA for OU2	September 1997
EPA completed Site-wide consent decree	March 1998
PRP initiated RA for OU3	June 2000
PCOR completed	September 2001
EPA completed RA for OU2	December 2002
ROD amendment signed for OU1	September 2006
Explanation of Significant Difference (ESD) issued for OU3	September 2006
First FYR completed	September 2006

Event	Date
EPA issued Site-wide consent decree	July 2009
PRP submitted OU3 surface water assessment study	May 2010
PRP submitted OU3 AS pilot study	November 2010
PRP submitted vapor intrusion assessment report and source area characterization workplan	April 2011
Second FYR completed	September 2011
PRPs proposed an new treatment technology for OU3	2011
Injection workplan for OU3	March 2015
ESD issued for OU3	August 2015
Full-scale injection begins	October 2015
August 2015 Surface Water Monitoring Report	January 2016

3.0 Background

3.1 Site Description

The 15.5-acre Site consists of the former FCX property, the former Burlington property, and nearby properties contaminated by the former textile manufacturing operations, including the impacted property parcels located north of the former textile property. The Site is located in a mixed industrial, commercial and residential area at the intersection of Phoenix Street and West Front Street (Highway 90), approximately 1.5 miles west of downtown Statesville, North Carolina. Figure 1 shows the Site location map.

The former FCX property is approximately 5.5 acres in size. The coordinates of the former FCX property are latitude 35°47'11" North, longitude 80°54'58" West. Prior to the late 1960s, the main structures on the former FCX property included a U-shaped building used for pesticide operations, and several buildings on the eastern half of the property used for the milling and bagging of feed grains. A small office building was also present near the southeastern corner of the property. During the late 1960's, most of these buildings (with the exception of the small office building) were demolished. A large brick warehouse was constructed on Site around 1969 and1970, and a smaller metal warehouse painted blue was constructed in 1982. An asphalt parking lot was paved between the warehouses and West Front Street. The majority of the former FCX property to the east of the two warehouses is covered with gravel, and contains a large reinforced slab and smaller concrete tractor trailer pads. The former FCX property is fenced except for the paved parking lot and loading dock area along West Front Street.

The former Burlington property is approximately 10 acres in size. Two large buildings, a warehouse and the main building cover the majority of the former Burlington property. The former Burlington property is bounded on the north by a residential neighborhood, to the south by the Norfolk-Southern Railroad and the former FCX property, to the west by an unspecified industrial plant, and to the east by Phoenix Street. The former Burlington property is fenced except for the front parking area between the former plant and Phoenix Street. Figure 2 is a detailed Site map of the former FCX property and Burlington textile properties.

3.2 Site Topography, Geology, and Hydrogeology

The Site lies within the Blue Ridge-Inner Piedmont Geologic Belt. This Belt generally consists of metamorphic rocks including gneiss and schist, as well as gradations of these two types. Granitic intrusions are also common in the area. Soils in the general area belong to the Lloyd Association. These soils are characterized as deep, well-drained soils with a subsoil of dark red clay. The Site gently slopes to the south at the former FCX property, and slopes to the north at the northern end of the former Burlington property.

Groundwater at the Site occurs in an unconfined to semi-confined aquifer consisting of overburden hydraulically interconnected with the underlying fractured bedrock. The groundwater gradients indicate that groundwater in the shallow, intermediate and bedrock portions of the aquifer appear to be flowing both to the north and to the south (beneath the FCX property) from the Burlington property. During wetter periods of the year, groundwater may intersect the ground surface around the Site and become overland or surface water flow. The RA Report indicates the FCX property is located on a hilltop topographic setting. Such a hilltop location is generally characterized as a groundwater recharge zone. In groundwater recharge zones, groundwater flow usually has a downward component, and the migration of contaminants into deeper parts of the aquifer may be enhanced in such areas.

3.3 Land and Resource Use

The Site is located in a mixed industrial, commercial, and residential area at the intersection of Phoenix Street and West Front Street, approximately 1.5 miles west of downtown Statesville, North Carolina.

In December 2009, Sun Associates, LLC purchased the former FCX property at auction. The owner purchased the property with the understanding that land use restrictions would be instated after purchase. A Declaration of Perpetual Land Use Restrictions was issued on the property. Land use restrictions, including restricting any use of groundwater and restricting the use of the property for mining, extraction of coal, oil, gas, or any other minerals or non-mineral substances, were added in 2009. The property remains fenced and locked and the on-site warehouse is currently used for storage. The former Burlington property houses the Site's remedial systems. Prior to 2010, the building had been rented as a warehouse. The lease ended, and the property is currently vacant.

A restrictive covenant prohibiting the use of groundwater as a potable water source and the use of the property for mining, extraction of coal, oil, gas or any other minerals or non-mineral substances has been placed on four parcels associated with the former Burlington property: parcels 4734273387.000, 4734178234.000, 4734186147.000 and 4834173327.000. Parcels 4734273387.000 and 4834173327.000 are not owned by EPNG but were associated with the former Burlington plant.

The City of Statesville's Municipal Code (Section 23-276) requires all residents to use city-supplied water. The use of private water wells within city limits is only permitted upon request and with permission from the Iredell County Health Department.

3.4 History of Contamination

FCX began operating at the Site as an agricultural supply distribution center around 1940 and continued to operate until declaring bankruptcy in 1986. The former FCX property served as a formulating, repackaging, warehousing and distribution center for pesticides, fertilizers and feed grains. The repackaging of liquid pesticides was discontinued in 1966, and dust repackaging was later discontinued

in 1969.

In 1966, approximately 10,000 pounds of dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and possibly liquid chlordane were allegedly buried in two adjacent, 10-foot-deep trenches. The material was supposedly a mixture of powders and liquids in a variety of packaging, including paper bags, glass jars and other types of typical consumer packaging. After burial, the trenches were covered with six feet of on-site soils and a reinforced 8-inch thick concrete slab was poured over the area. This was followed by construction of the upper portion of the current warehouse. According to a former FCX employee, it is possible that the trenches were destroyed soon after burial, during extensive construction-related grading. Testimony from former employees of the construction company responsible for much of the past site demolition and construction indicated that they were instructed to place various bagged and bottled pesticides in a hole located in the vicinity of the current northeast corner of the lower portion of the warehouse. Other former employees indicated that an additional pit, possibly a product mixing pit, was originally located in the horseshoe-shaped building.

The original Burlington textile plant was constructed in 1927. From 1955 to 1977, Beaunit Mills operated the plant. In 1967, Beaunit Mills became an EPNG subsidiary. In July 1978, the plant was sold to Beaunit Fabrics Corporation and, in 1981; Burlington Industries purchased the plant from Beaunit Fabrics. Burlington operated the plant until its closure in May 1994. Various VOCs were released or formed beneath the textile plant during textile manufacturing operations.

3.5 Initial Response

Southern States Cooperative, the North Carolina Department of Human Resources (NC DHR, formerly NC DENR and currently NC DEQ) and EPA Emergency Response, all had conducted investigations prior to the RI on the former FCX property. The investigation in February 1986 resulted from a pre-purchase environmental evaluation on behalf of Southern States Cooperative. Groundwater and soil samples were collected as a part of the evaluation. Nine pesticides were detected in soils, of which chlordane and 4,4-DDT were found in the highest concentrations. Pesticides and volatile compounds were detected in the groundwater samples and gamma-benzenehexachloride (BHC) was the prominent pesticide found in three of the wells, including an up-gradient well. Other isomers of BHC, as well as a possible metabolite of endrin ketone, were also detected. Trichlorofluoromethane and tetrachloroethane (PCE) were the VOCs detected at the highest concentrations.

In May 1986, NC DHR conducted a Site Inspection. Pesticides were identified in a sample from a monitoring well, fluorocarbons were identified in the up-gradient well, chlorinated solvents were identified in another monitoring well, as well as in the deep well on the Carnation property, east and west of the warehouse. Caprolactum, a component of nylon manufacturing, was detected in all on-site monitoring well samples. The soil sampling data revealed that, in addition to chlordane, DDT and dieldrin were also found at several locations in the vicinity of the warehouse. These compounds were also detected in the soil sample from the yard of the residence across West Front Street from the warehouse.

In September 1986, FCX filed a voluntary petition under the provisions of Chapter 11 of the U.S. Bankruptcy Code. The EPA, NC DEQ and FCX entered into a settlement agreement, whereby FCX established a trust to settle its liability at the former FCX property. A bankruptcy court permitted FCX to abandon the property and Sun Associates, LLC purchased the property at auction in December 2009.

The Site was proposed for inclusion on the NPL on June 24, 1988. In January 1989, EPA Emergency Response conducted an emergency sampling investigation at the Site. Extensive exploratory borings were drilled through the main warehouse in an attempt to locate the alleged trenches mentioned by former FCX employees. However, the efforts to locate the trenches were unsuccessful. No pesticides were detected in any samples collected outside the warehouse building. Further, no evidence of the alleged burial was observed in any of the approximately thirty borings completed through the floor of the upper warehouse building. Four groundwater monitoring wells were installed at two locations at the Site in August 1989. Pesticides were detected in all groundwater samples except for the cluster of wells in the site's northeast corner. The Site was finalized on the NPL on February 21, 1990.

3.6 Basis for Taking Action

A qualitative baseline risk assessment (BRA) for the former FCX property was completed in July 1993. The BRA defined and summarized unacceptable potential risks posed by the contamination described in the RI for the property. In summary, under previous land use conditions, no unacceptable carcinogenic or non-carcinogenic risks to human health were identified based on direct contact exposure. However, several future land use scenarios, including residential, were identified that pose unacceptable carcinogenic and non-carcinogenic potential risks. These potential risks included the ingestion or inhalation of groundwater contaminated with pesticides and VOCs on the former FCX property by a future child or adult resident, and the dermal contact or ingestion of surface soil contaminated with pesticides and PCP by a future child or adult resident.

Potential risks to environmental receptors at or near the Site were evaluated based on surface water and sediment sampling data collected on-site or from surface water near the Site. A review of the toxicity of the chemicals of potential concern to potential ecological receptors was also conducted. Use of the Site by terrestrial receptors such as birds and small mammals, particularly the area presently covered by the two warehouses and parking lot, was considered unlikely given the lack of trees or other vegetative cover at the Site. Based on a qualitative analysis, terrestrial wildlife communities in the low-lying and wooded areas near the former FCX property are not likely to be significantly impacted.

During the extensive sampling for the RI and based on the observed groundwater flow direction and pattern of groundwater contamination, it was concluded that the source of VOC contamination was on the former Burlington property. Based on this information, the EPA signed an Administrative Order on Consent (AOC) with Burlington and EPNG on June 25, 1993. Under the terms of the AOC, a separate RI/FS was conducted to characterize the extent of VOC contamination associated with the former Burlington property.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with Applicable or Relevant and Appropriate Requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(f)(5)(i) of the NCP. The nine criteria include:

1. Overall Protectiveness of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment

5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

Due to the complexity of the Site, the EPA divided the remedial actions into three different OUs. OUl addresses the groundwater contamination beneath the former FCX property and to the south of the FCX property; OU2 addresses the soil contamination on the former FCX property; and OU3 addresses soil and groundwater contamination associated with the former Burlington property.

4.1.1 OU1- 1993 ROD and 2006 ROD Amendment

1993 ROD OU1

The EPA issued and signed the Record of Decision (ROD) for OU1 on September 29, 1993, to address groundwater contamination at the FCX portion of the Site. The major threat was determined to be groundwater emanating from beneath the Site and the remedy was designed to address that concern. Remedial Action Objectives (RAOs) for OUl included:

- Contain the off-site migration of contaminated groundwater from the former FCX property and to the south of the FCX property.
- Restore the aquifer to its unlimited use(s) by pumping and treating contaminated groundwater.

The major components of the remedy selected in the 1993 OUl ROD include:

- Extraction of groundwater at the former FCX property that is contaminated above federal MCLs or North Carolina Groundwater Standards (NC 2L), whichever are more protective. Table 2 is a list of 19 compounds of concern (COCs) and the ROD remediation goals.□
- On-site treatment of extracted groundwater via chemical precipitation/filtration and carbon adsorption.
- Discharge of treated groundwater to the local publicly-owned treatment works (POTW).
- Monitoring of groundwater entering and exiting the treatment system, as well as monitoring of the groundwater quality across the Site for an estimated 30 years.
- The use of deed restrictions in the affected area to prohibit the consumption of contaminated groundwater.

2006 ROD Amendment OU1

The 1993 OUl ROD was amended through a ROD Amendment (AROD) issued September 11, 2006. The purpose of this AROD is to change the OUl groundwater remedy documented in the 1993 ROD from pump-and-treat technology to MNA. The RAOs remain the same. However, changing the remedy from pump-and-treat to MNA eliminated the hydraulic containment of the remaining pesticides in groundwater. The decision to change the OU1 groundwater remedy from pump-and-treat technology to MNA was based on groundwater data collected during the OU1 remedial action since 1998. Groundwater data from 1998 to 2005 indicated a trend of decreasing pesticide concentrations to levels approaching the remediation levels established in the Site's 1993 ROD.

The AROD not only changed the remedy selected in the 1993 ROD from pump-and-treat to MNA, but removed metals, VOCs and the compound bis(2-ethylhexyl)phthalate as COCs from the OU1 remedy. VOCs were removed as COCs from the OU1 remedy since VOCs are being addressed under the OU3 remedy. The metals and bis(2-ethylhexyl)phthalate were removed as COCs because they were not considered to be site-related.

The new MNA remedy as described in the 2006 AROD requires:

- Baseline groundwater sampling for parameters needed to track the progress of natural attenuation.
- Annual monitoring of chemical and natural attenuation parameters to document reduction of pesticide concentration and mass and to evaluate the progress being made toward achieving the remediation levels established in the AROD. The frequency of monitoring will be evaluated and modified if needed. Table 3 is groundwater remediation goals as specified in the AROD.
- Use of institutional controls to prohibit the installation and use of drinking water wells on the former FCX property, including implementation of restrictive covenant(s) pursuant to North Carolina law and/or deed notice(s)), as well as monitoring compliance with the City of Statesville's ordinance (Municipal Code Section 23-276). The institutional controls would prohibit the installation and use of water wells within City limits without authorization from the Iredell County Health Department, until which time the groundwater is deemed safe for drinking water purposes by the EPA and NC DEQ.

Table 2: Groundwater Remediation Goals as Specified in the 1993 ROD for OU1

CONTAMINANT	MCLs	NC 2L	Remediation Goal
Metals (µg/L)			
Beryllium	4	-	4
Chromium	100	50	50
Manganese	200	50	50
Vanadium	200	50	50
Organochlorine Pesticides (µg/L)			
Alpha-chlordane	2	0.027	0.027
Gamma-chlordane		0.027	0.027
Dieldrin	[c]		0.1
Heptachlor epoxide	0.2	0.038	0.038
Alpha-BHC	-	-	0.01
Beta-BHC	-	-	0.01
Gamma-BHC (Lindane)	0.2	0.027	0.027
Bromodichloromethane	100	-	100
Chloroform	100	0.19	0.19
Chloromethane	-	-	0.01
VOCs (µg/L)			
1,1-Dichloroethane	-	-	1
1,1-Dichloroethene	7	7	7
PCE	5	0.7	0.7
Trichloroethene (TCE)	5	2.8	2.8
Bis(2-ethylhexyl)phthalate	6	-	6

MCL – Maximum Contaminant Level
NC 2L - NC Groundwater Standard or NC 2L Groundwater Standard
"-" No federal MCL or State Standard has been established
[a] *Based on Hazard Quotient (HQ) = 1. as calculated in the BRA.*
[b] *If no federal MCL or state standard exists, the quantitation limit will be used*
[c] *Removed as a COC by 2006 OUl ROD Amendment.*

Table 3: Groundwater Remediation Goals as Specified in the 2006 AROD for OU1

CONTAMINANT	MCLs	NC 2L	CRQL	Remediation Goal
Organochlorine Pesticides (µg/L)				
Chlordane	2	0.1	0.1	0.1
Dieldrin	-	0.0022	0.1	0.1 [a]
Heptachlor epoxide	0.2	0.0038	0.05	0.05
Alpha-BHC	-	-	0.01	0.01 [a]
Beta-BHC	-	-	0.01	0.01 [a]
Gamma-BHC (Lindane)	0.2	0.20	0.05	0.02

MCL – Maximum Contaminant Level
NC 2L - NC Groundwater Standard or NC 2L Groundwater Standard
"-" No federal MCL or NC 2L has been established
[a] *If no federal MCL or NC 2L exists, the quantitation limit is used.*

4.1.2 OU2- 1994 ROD

The OU2 ROD was signed on November 22, 1994. The OU2 remedy addressed the soil contamination on the former FCX property. Table 4 shows the specified soil remediation levels as stated in the OU2 ROD. The OU2 RI and BRA indicate that elevated levels of the site-related contaminants DDT, DDD, gamma-BHC (lindane), endrin, dieldrin, chlordane and PCP were present in the soil at the Site. The OU2 remedy was designed to address these contaminants and to reduce the risks associated with site-related contamination in the surface soil, as well as reduce the amount of total pesticides in the surface and subsurface soil that could be a source of groundwater contamination. RAOs for OU2 include:

- Reducing levels of PCP in the surface soil (top one foot)
- Reduce the amount of total pesticides in surface and subsurface soil as a source of groundwater contamination.

Remedial components as stated in the 1994 ROD included:

- Demolishing existing buildings and structures and transporting the demolition rubble to an appropriate disposal facility. Excavating approximately 6,945 cubic yards of contaminated soil and stockpiling the soil on site in preparation for treatment.
- Treating the contaminated soil on-site using thermal desorption and base catalyzed decomposition. □
- Backfilling the excavated areas with the treated soil.
- Re-grading and seeding the Site with grass to minimize the potential for erosion and to enhance the appearance of the Site.

The 1994 OU2 ROD also selected remedial goals for two contaminants, total pesticides (consisting of gamma-BHC, endrin, dieldrin, chlordane, DDT and DDD) and PCP. See Table 4 below.

Table 4: Soil Remediation Goals as Specified in the 1994 ROD for OU2

Contaminant	Remediation Goal (µg/L)
Total Pesticides [a]	1,000
PCP [b]	3,200
[a] Defined as gamma-BHC (Lindane), endrin, dieldrin, chlordane, DDT and DDD. [b] Applies only to the top one foot of soil.	

4.1.3 OU3- 1996 ROD, 2006 ESD, and 2015 ESD

1996 ROD OU3

The OU3 remedy addresses the portion of the soils and groundwater contamination associated with the former Burlington property. The OU3 ROD, issued on September 30, 1996, designed a remedy to address these concerns and included the follow RAOs:

- Minimize the potential for infiltration of VOCs from the soil into the groundwater. □
- Reach groundwater remediation levels for groundwater COCs. □

The remedial components required by the 1996 OU3 ROD included: □

Soil □

- Treatment of soil contaminated with VOCs using soil vapor extraction (SVE) technology in order to reduce and minimize the potential adverse impacts to groundwater on and around the former Burlington property. □

No cleanup levels were established for on-site contaminated soil since the majority of the contaminated soil was located beneath the former Burlington textile plant, and posed no risk to human health due to direct contact exposure. The objective of a soil RA would be to minimize the potential for infiltration of VOCs from the soil into the groundwater. □

Groundwater

- Treatment of groundwater COCs, mainly VOCs, using air sparging (AS) technology, to meet federal MCLs or the NC 2L, whichever are more protective (Table 5). □
- Monitoring of groundwater entering and exiting the treatment system, as well as monitoring of the groundwater quality on and around the textile facility, for evidence that natural attenuation is happening, for an estimated 30 years or until the performance standards have been met.
- The use of ICs, including deed restrictions, in the affected area to prohibit the consumption of contaminated groundwater associated with the property currently owned and operated by Burlington, will be determined during the remedial design (RD).

Table 5: Groundwater Remediation Goals as Specified in the 1996 ROD for OU3

CONTAMINANT	REMEDIATION GOAL (µg/L)
Aluminum	50-200
Arsenic	50
Barium	2,000
Iron	300
Lead	15
Manganese	50
Bis(2-ethylhexyl)phthalate	3
Carbon tetrachloride	0.3
Chloroform	0.19
1,1-dichloroethene (DCE)	7
cis-1,2-dichloroethene (cDCE)	70
1,2-dichloropropane	0.5
Methylene chloride	5
PCE	7
1,1,2-trichloroethane	5
Trichloroethene	2.8
Vinyl chloride	0.015

2006 ESD OU3

Groundwater monitoring on and around the former Burlington property began in 1998 and was conducted on a semi-annual basis, as required by the OU3 ROD. Groundwater sampling data indicated that natural attenuation was occurring within the areas being addressed by the OU3 remedial action. However, there were areas of the VOC plume on and around the former Burlington property where possible upward trends or no significant or conclusive trends in VOC concentrations were observed. These trends prompted discussions about potential enhancements for the OU3 remedy and resulted in the OU3 Explanation of Significant Differences (ESD), issued in September 2006. The 2006 ESD outlined four remedy changes:

1) The 2006 OU3 ESD included accelerated natural attenuation (ANA) in selected areas throughout the Site, as needed, where MNA is not significantly reducing VOC concentrations. The objective of using ANA to enhance the OU3 remedy at the Site is to accelerate the natural attenuation of VOCs by injecting electron donors and, possibly, bacteria (i.e., microbial injection) into the groundwater.

2) The 2006 ESD also contains a list of COCs updated since the OU3 ROD. This list is based on a site COC re-evaluation. The EPA removed the inorganics aluminum, arsenic, barium, iron, lead and manganese and the compound bis(2-ethylhexyl)phthalate from the list of COCs because they were deemed to not be site-related.

3.) The remedial enhancements, as identified in the 2006 ESD, include the use of the most current SW-846 Methods for VOC analysis. □
4.) The 2006 ESD outlines the need for a distinction between the original OU3 remedy and the modified OU3 remedy (based on the ESD). ANA will be instated along with continued MNA and AS/SVE. □

Table 6: Updated Groundwater Remediation Goals as Specified in the 2006 ESD for OU3

CONTAMINANT	REMEDIATION GOAL (µg/L)
Carbon tetrachloride	0.269
Chloroform	70
1,1-dichloroethene	7
cis-1,2-dichloroethene	70
1,2-dichloropropane	0.51
Methylene chloride	4.6
PCE	0.7
1,1,2-trichloroethane	5
Trichloroethene	2.8
Vinyl chloride	0.015

2015 ESD OU3

In August 2015, an ESD for OU3 was written to implement angled injection technology to address VOC contamination in the surface water in the Northern Drainage Area. Based on results from a 2014 pilot study, the EPA and NC DEQ approved adding the use of full-scale angled injection in the Northern Area to the existing AS/SVE remedy.

4.2 Remedy Implementation

OU1

RA activities at OU1 began on September 30, 1996, and were completed on January 14, 1999. Activities included:

- Construction of the on-site groundwater treatment system, consisting of a 300-gallon influent equalization tank, a 1,200-gallon clarifier, two sand filters with a backwash trickle tank and two granulated activated carbon units.
- A small shelter housing the pump-and-treat system.
- A total of 10 on-site groundwater extraction wells installed and plumbed into the treatment system.

The construction of the OU1 groundwater pump-and-treat system was completed and became operational and functional in 1998. Groundwater data collected from the Site indicated the system was no longer effective in reducing the low levels of pesticides remaining in groundwater. As result of these

findings, on September 11, 2006, the EPA issued the AROD for OU1. The AROD calls for the discontinuation of the pump-and-treat remedy and the instatement of MNA and ICs to restrict groundwater and land use were implemented in 2009.

OU2

RA activities for OU2 began on September 30, 1997, and were completed on December 30, 2002. OU2 RA activities included:

- Instead of demolishing the warehouses, the EPA made the decision to leave the buildings in place. Once the floors were removed, the contaminated soil was excavated and stockpiled inside before being treated on-site with thermal desorption;
- Excavation and stockpiling of an estimated 15,164 tons of pesticide-contaminated soil inside the warehouses;
- Construction of the thermal desorption system;
- Stack testing of the system as well as ambient air sampling;
- Thermal soil treatment followed by testing of the treated soil;
- Backfilling, rehydration and compaction of the treated soil into the excavated areas;
- Base catalyzed decomposition treatment of the liquid residual resulting from the thermal treatment of the soil followed by testing of the treated residual;
- Decontamination of the warehouses; re-pouring of the concrete floors; and
- Demobilization of the equipment.

Following the base catalyzed decomposition treatment; the liquid residual was drummed and transported off-site to an EPA-approved disposal facility. The OU2 ROD required a bench-scale treatability study to measure the amount of dechlorination resulting from the treatment of the liquid residual with the base catalyzed decomposition process. The Treatability Study showed the one-ppm total pesticide cleanup level was achieved prior to backfilling the treated soil into the excavations and restoring the reinforced concrete floors inside the warehouses.

OU3

The RA for OU3 was initiated with the approval of the PRP's RD/RA work plan. The MNA portion of the OU3 remedy began in 1998. Construction of the AS/SVE system was completed on August 31, 2000, and a pre-certification inspection was conducted on September 21, 2000. The active source area remediation began on February 1, 2001, with the startup of the Phase I SVE system as part of the AS/SVE performance test.

On November 20, 2002, a Declaration of Perpetual Land Use Restrictions was issued for a portion of OU3. The declaration states that any surface or underground water located upon the surface or within the subsurface of the restricted property shall not be used as a source of potable water and that the restricted property shall not be used for mining or extraction of coal, oil, gas or any other minerals or non-mineral substances.

The AS/SVE system underwent a Phase II expansion in 2003. On June 26, 2003, the Phase II AS/SVE system was initiated and finally operational. Monitoring of groundwater was anticipated for 30 years.

An ESD was issued on September 8, 2006, to enhance the OU3 remedy with the use of ANA, which involves the injection of electron donors and possibly adding microbes. The use of ANA was anticipated to expedite the process of remediating the VOC contamination in groundwater on and around the former Burlington property.

In January 2006, the PRP submitted a Pre-Design Investigation Report for ANA at OU3. The report recommended the preparation of a Phase 1 design for electron donor injection and a focused feasibility study to select the specific electron donor, and that resulting recommended injections follow approval of the design. Three rounds of post-injection groundwater sampling were performed, which took place in September 2007, December 2007 and April 2008.

The post-injection groundwater data downgradient of the injection rows were not conclusive, but within the 12-month monitoring period following the injections, both primary and secondary evidence of reductive dechlorination were observed. A bench scale microcosm test performed in 2008 and 2009 indicated that the absence of electron donors throughout the PCE-impacted area, naturally acidic conditions and a limited presence of indigenous strains of dehalococcoides would present significant challenges to widespread success of an ANA program at the Site. No other monitoring data showed significant impacts from ANA injections and the final phases of the project were not implemented.

In 2011, a new treatment reagent for this area was proposed. The Trap & Treat® BOS-100 ® product is essentially granular activated carbon (GAC) that is impregnated with an iron salt and then heated to produce a large surface area of reactant within the pore spaces of the activated carbon. In 2013, EPNG conducted an angled injection pilot study. The pilot study was completed and subsequent monitoring of the streambed piezometers indicated that the BOS-100 ®, the injecting agent, was effective in treating groundwater prior to entry in the Northern streambed. The source of the PCE was from the former Burlington Industries textiles facility, adjacent to the FCX property, where PCE was used in dry-cleaning operations. The injections intend to mitigate the migration of PCE dissolved in groundwater into surface water at the Site.

Between October and November 2015, the full-scale BOS-100 ® angled injection remedy was implemented in the Northern Drainage Area. Post-injected monitoring began in December 2015.

Soil vapor and indoor-air sampling to assess the potential for vapor intrusion has been performed on multiple occasions both north and south of the former Burlington property. Based on the soil vapor data there is currently no apparent vapor intrusion risk in the remaining areas surrounding the site, including residential areas north, east, and south as well as commercial properties to the west. The April 2011 Soil Vapor/ Soil Gas Assessment Report concluded that the investigation of the vapor intrusion pathway was finished and that no further assessment or monitoring is warranted.

4.3 System Operation/Operation and Maintenance

Operation and Maintenance (O&M)

OU1

Currently, the NC DEQ conducts Site O&M activities at OU1. NC DEQ performs annual sampling of ten monitoring wells existing on site. Sampling is conducted as part of the O&M phase of the continued MNA of organochlorine pesticide (OPC) contamination in groundwater. Prior to a request in June 2013 by the NC DEQ for a reduction in sampling to annually, the NC DEQ sampled semi-annually.

OU2

No O&M activities occur for OU2. Contaminated soils have been removed from the Site.

OU3

AECOM Technical Services on behalf of EPNG conducts all O&M activities for OU3. Both groundwater and surface water samples are collected. Groundwater is sampled on a semi-annual basis and surface water on a quarterly basis as requested by the NC Division of Water Quality in 2012. As of 2015, the full-scale BOS-100 ® angled injection remedy was implemented in the Northern Drainage Area. Future Annual Remedial Action Progress Reports will document the sampling procedures and results, including laboratory reports and summary tables, for groundwater and surface water samples collected during the annual reporting period. Surface water sampling results will also continue to be reported quarterly to NCDEQ at the request of the NC DEQ DWR.

Site O&M activities performed during 2014 included monthly onsite O&M, as needed condensate management, and several miscellaneous maintenance activities including automatic tank drain valve replacement, replacement of the system HMI computer with a touchscreen, and completion of an arc flash survey for site electrical components. PCE effluent concentrations are such that granular activated carbon (GAC) treatment is not required for regulatory purposes and the generation of nuisance odors is implausible. GAC vessel replacement was not required during the reporting period and is not anticipated in the future at the Site. The volume of condensate removed from the drip trap sand liquid separator during the reporting period was 921 gallons. Below is a summary from the AS/SVE performance data:

- Since AS/SVE operations began in 2001, the system has removed an estimated total PCE mass of 6,479kg. An estimated 56 kg were removed during the 2014 reporting period.
- The SVE and AS equipment operated 94.6 percent during that target operating period. This percentage was primarily affected by temporary shut downs during O&M activities and groundwater sampling.
- 2014 SVE inlet vapor concentrations have decreased since 2013 but remain above pre-system expansion levels.
- Prior to the AS pilot test, SVE system PCE removal had followed a conventional logarithmic decay pattern and did not appear to be removing meaningful amounts of VOCs from the subsurface. Following reconfiguration of the AS/SVE system to utilize wells AS-25, AS-26, and AS-27, mass removal increased in late 2009, and subsequently remained relatively stable from 2010 to 2012. After the system expansion in 2013, a substantial increase in removal was observed. Throughout 2014, PCE removal decreased from the previous reporting period but remained elevated above levels prior to the system expansion.

Semi-annual groundwater monitoring is performed to provide data to assess the stability of the plume. Site O&M activities performed include monthly on-site O&M, these activities might include condensate management, regular maintenance activities including AS/SVE flow measurements and system adjustments, potential equipment/valve replacement, and repair/replacement of computer and electrical components. In addition, AECOM, in December 2015, distributed fact sheets and held meetings with neighbors and council members to inform all about the full-scale injection work.

5.0 Progress Since Last Five-Year Review

This is the third FYR for the FCX Statesville Site. The Protectiveness Statement for the First FYR indicated the Site was protective of human health and the environment. The protectiveness statement in the 2011 report stated:

> *"The remedy at OU1 is protective of human health and the environment. Groundwater is sampled to assess the ongoing performance of the MNA remedy, and institutional controls have been added to the property deed to prohibit groundwater use.*
>
> *The remedy at OU2 is protective of human health and the environment. Contaminated soil has been removed, and institutional controls are in place to ensure the protection of human health.*
>
> *The remedy at OU3 currently protects human health and the environment in the short term because there are no complete exposure pathways for soils or groundwater and the vapor intrusion pathway does not currently pose an unacceptable risk. Surface water contamination is located primarily within the fenced property owned by PRP and a remedial action is being evaluated to address the surface water contamination. In order for the remedy to be protective in the long term, the following actions need to be taken: implement institutional controls on all impacted parcels; develop and implement a remedy to address the surface water contamination; and determine if the remedy needs to be modified in order to achieve performance standards for groundwater. The PRP has implemented work plans to address these actions.*
>
> *Because the remedial actions at all OUs are currently protective, the Site's remedy is protective of human health and the environment."*

In 2013, EPNG conducted an angled injection pilot study. The pilot study was completed and subsequent monitoring of the streambed piezometers indicated that the BOS-100 ®, the injecting agent, was effective in treating groundwater prior to entry in the Northern streambed. The source of the PCE was from the former Burlington Industries textiles facility, adjacent to the FCX property, where PCE was used in dry-cleaning operations. The injections intend to treat the PCE dissolved in groundwater before it discharges into the Northern Drainage Area at the Site.

Between October and November 2015, the full-scale BOS-100 ® angled injection remedy was implemented in the Northern Drainage Area. Post injected monitoring began in December 2015. As of this FYR report submittal, analytical results and a remedial action report of the full-scale injection action were not available.

Table 7: Summary of Progress on Recommendations from the Second FYR in 2011

Recommendation	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action (if applicable)
Determine whether it is necessary to update appropriate site documents to include land use controls.	EPA and State	9/30/2012	Ongoing. However, ICs are in place for several properties.	-
Determine if the remediation goals should be updated to the current North Carolina standards and whether the remedies can achieve these levels.	EPA and State	9/30/2012	Ongoing. Of the six OU1 COCs for which remediation goals are in place, current ARARs are more stringent for dieldrin, heptachlor epoxide Alpha-BHC and Beta-BHC.	-
Continue evaluating contaminant trends to ensure pesticide concentrations in OUl groundwater decrease over time and to ensure that OU1 groundwater contamination is confined to the wells located on the former FCX property, and does not spread over time.	EPA and State	9/30/2012	Completed. As part of the RA, this is not a Site issue. Completed annually.	-
Develop and implement a remedy to address downgradient surface water contamination.	PRP	9/30/2012	Completed. Injection Work Plan to mitigate the migration of PCE dissolved in groundwater into surface water at the Site.	March 2015
Identify and implement supplemental remedial technologies and modifications to the remedy, as needed.	PRP	9/30/2012	Completed. Injection Work Plan completed (3/2015) Full implementation of angled injection technology (12/2015)	March 2015 December 2015

6.0 Five-Year Review Process

6.1 Administrative Components

The NC DEQ Superfund Section performed the FYR process for the FCX Statesville Site. Nile Testerman (Environmental Engineer, NC DEQ) and Stephanie Grubbs (Hydrogeologist, NC DEQ Contractor) were responsible for gathering and reviewing data for this review and compiling all the information into the FYR Report for the EPA. Telephone and/or email discussions/interviews with Ken Mallary, EPA Remedial Project Manager were conducted. Other activities conducted for this review include document review (Appendix A), completion of a Site Inspection Checklist (Appendix B), a public notice submitted to the local newspaper (Appendix C), interview documentation (Appendix D), and the FYR Report preparation.

6.2 Community Involvement

(Will complete once received) The EPA conducts all community involvement activities regarding the remedial activities for the Site. On (*?????, 2016*) an ad was placed in The (*local newspaper*) announcing the FYR for the FCX Statesville Site had been initiated. A copy of this ad is included in Appendix C. After the FYR has been approved and signed by the EPA, a notice will be placed in (*local newspaper*) announcing the release of the final FYR Report and copies will be placed for the public to view at: the EPA Record Center, 11th Floor, 61 Forsyth Street, SW, Atlanta, GA 30303; the information repository located at Iredell County Public Library, 201 North Trade Street, Statesville, North Carolina; and on the EPA website (http://www.epa.gov/superfund/index.htm).

6.3 Document Review

This FYR consisted of a review of relevant documents including but not limited to the RODs; ROD Amendment; ESD; PCOR; Groundwater Sampling O&M reports, Remedial Action Reports; Groundwater Sampling Report; and Applicable groundwater cleanup standards and other ARARs, as listed in the ROD Amendment, were also reviewed and checked for updates. See Appendix A for a complete list of documents reviewed.

6.4 Institutional Control Review

The OU1 remedy, as amended in the AROD, calls for ICs to prohibit the installation and use of drinking water wells on the former FCX property, including implementation of restrictive covenant(s) pursuant to North Carolina law and/or deed notice(s), as well as monitoring compliance with the City of Statesville's ordinance (Municipal Code Section 23-276). The City of Statesville's Municipal Code (Section 23-276) requires all residents to use city-supplied water. The use of private water wells within city limits is only permitted upon request and with permission from the Iredell County Health Department.

The ICs would prohibit the installation and use of water wells within city limits without authorization from the Iredell County Health Department, until which time the groundwater is deemed safe for drinking water purposes by the EPA and NC DENR. On December 2, 2009, Sun Associates, LLC purchased the former FCX property at auction. The owner purchased the property with the understanding that land use restrictions would be instated after purchase and a Declaration of Perpetual Land Use Restrictions was issued on the property. Land use restrictions, including restricting any use of groundwater and restricting the use of the property for mining, extraction of coal, oil, gas, or any other

minerals or non-mineral substances, were added in 2009.

On November 2002 and April 2008, Declarations of Perpetual Land Use Restrictions were issued for four parcels associated with the former Burlington property, OU3, that granted related parties access to the Site for remedial purposes, restricted groundwater and surface water use and restricted the construction of a building on the property without a properly conducted vapor intrusion assessment or the installation of a vapor intrusion mitigation system. The land use restrictions were not called for in a decision document for OU3.

A restrictive covenant prohibiting the use of groundwater as a potable water source and the use of the property for mining, extraction of coal, oil, gas or any other minerals or non-mineral substances has been placed on four parcels associated with the former Burlington property: parcels 4734273387.000, 4734178234.000, 4734186147.000 and 4834173327.000. Parcels 4734273387.000 and 4834173327.000 are not owned by EPNG but were associated with the former Burlington plant. Several surrounding properties contaminated by Site operations are still without ICs. The PRPs are working with the EPA and NC DEQ to implement ICs on these properties.

Figure 3 is a map of the ICs placed on the properties. Table 8 and 9 are IC Evaluation Summaries.

Table 8: OU1 and OU2 Institutional Controls Evaluation Summary

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels	IC Objective	Instrument in Place	Notes
Ground-water	Yes	Yes	4734167712.000	Restrict use of groundwater for any purpose.	2009 Declaration of Perpetual Land Use Restriction.	Water may be used for remedial and monitoring purposes.
Soil	Yes	No	4734167712.000	Property may not be used for mining or extraction of coal, gas, or any other mineral or non-mineral substance.	2009 Declaration of Perpetual Land Use Restriction.	Remediation equipment on the property may not be moved, destroyed, altered, or disturbed in any way without prior approval in writing from NC DEQ.

Table 9: OU3 Institutional Controls Evaluation Summary

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels	IC Objective	Instrument in Place
Ground-water	Yes	No	4734273387.000 4734178234.000 4734186147.000 4834173327.000	Surface and groundwater may not be used as a source of potable drinking water.	2002 and 2008 Declaration of Perpetual Land Use Restriction.
Soil	Yes	No	4734273387.000 4734178234.000 4734186147.000 4834173327.000	Property may not be used for mining or extraction of coal, gas, or any other mineral or non-mineral substance.	2002 and 2008 Declaration of Perpetual Land Use Restriction.

6.5 ARAR Review

6.5.1 Current Applicable ARARs

It is the EPA's policy that ARARs are generally "frozen" at the time of the ROD signature unless a "new or modified requirement calls into question the protectiveness of the selected remedy". 55 Fed. Reg. 8757 (March 8, 1990). The NC Classifications and Water Quality Standards Applicable to the Groundwater of North Carolina, NC 2L Groundwater Standards were last amended on April 1, 2013. The 2006 OU1 AROD and the 2006 OU3 ESD updated COCs and cleanup goals. Cleanup goals were compared to current Federal MCLs and North Carolina standards (Tables 7 and 8). Of the six OU1 COCs for which remediation goals are in place, the current 2013 NC 2Ls are more stringent for dieldrin, heptachlor epoxide, Alpha-BHC and Beta-BHC. For OU3, current ARARs have not changed or are less stringent for the 10 OU3 COCs for which remediation goals are in place.

Table 10: Groundwater Remediation Goals as Specified in the 2006 AROD for OU1 compared to Current NC 2L, MCLs, and CRQLs

CONTAMINANT	2006 ROD Amendment Groundwater Remediation Goal (µg/L)	Current NC 2L (As of April 1, 2013) (µg/L)	Current Federal MCLs (µg/L)	Current Federal Contract Required Quantitation Limit (CRQL) (µg/L)	ARAR change?
Chlordane	0.1	0.1	2	0.05	No
Dieldrin	0.1 [a]	0.002	0.2	0.1	**Yes**
Heptachlor epoxide	0.05	0.004	0.2	0.05	**Yes**
Alpha-BHC	0.01 [a]	0.006	-	0.05	**Yes**
Beta-BHC	0.01 [a]	0.02	-	0.05	**Yes**
Gamma-BHC (Lindane)	0.02	0.03	0.2	0.05	Yes

Notes:
[a] *If no federal MCL or NC 2L exists the time of the AROD, the quantitation limit is used.*
[b] NC 2L - North Carolina Administrative Code, Title 15A, Subchapter 2L, Classifications and Water Quality Standards Applicable to the Groundwater of North Carolina.
Bold font indicates the NC 2L Groundwater Standard is more stringent than the RG.
- Indicates that no information is available for that compound.

Table 11: Groundwater Remediation Goals as Specified in the 2006 ESD for OU3 compared to Current NC 2Ls, MCLs, and CRQLs

CONTAMINANT	2006 ESD Groundwater Remediation Goal (µg/L)	Current NC 2L (As of April 1, 2013) (µg/L)	Current Federal MCLs (µg/L)	Current Federal Contract Required Quantitation Limit (CRQL) (µg/L)	ARAR change?
Carbon tetrachloride	0.269	0.3	5	0.5	Yes
Chloroform	70	70	-	5	No
1,1-dichloroethene	7	7	7	-	No
cis-1,2-dichloroethene	70	70	70	5	No
1,2-dichloropropane	0.51	0.6	5	0.5	Yes
Methylene chloride	4.6	5	-	0.5	Yes
PCE	0.7	0.7	5	0.5	No
1,1,2-trichloroethane	5	-	5	0.5	No
Trichloroethene	2.8	3	5	0.5	Yes
Vinyl chloride	0.015	0.03	2	0.5	Yes

Notes:
Bold font indicates the NC 2L Groundwater Standard is more stringent than the RG.
- Indicates that no information is available for that compound.

6.6 Data Review

Soil.

With the soil remediation complete, no additional soil sampling has been conducted.

Groundwater.

OU1

Personnel from the Superfund Section of the NC DEQ conduct the annual groundwater sampling investigation at the FCX Site. Ten groundwater monitoring wells are sampled during the annual O&M phase of the FCX-Statesville OU1 MNA remedy.

During the most recent sampling event in 2015, ten organochlorine pesticides (OCP) compounds, including all six of the OU1 ROD specified compounds (alpha-BHC, beta-BHC, Lindane, gamma-Chlordane, Dieldrin, and Heptachlor epoxide) were detected in samples from two of the FCX wells (MW-1, and MW-3). Observed concentrations for alpha-BHC, beta-BHC, Dieldrin, and Lindane

exceeded their respective remediation goals (RGs) in the sample collected from monitoring well MW-1. The site RG for beta-BHC was exceeded in sample MW-3. A NC 2L exceeding concentration of Heptachlor epoxide and a minor detection of gamma-Chlordane were also detected in sample MW-3. In addition, four other pesticides not identified as ROD compounds (Endosulfan I, Endosulfan sulfate, Endrin, and Endrin ketone) were also detected in samples MW-2, MW-3, MW-5S, and MW-9. Figure 4 is a map of the OU1 well locations.

A general downward trend in the constituent concentrations was historically evident in monitoring well MW-1. However, there was a slight increase in three of the constituents (alpha-BHC, beta- BHC, and Lindane) from the December 2009 sampling event to the July 2010. This trend was repeated during the December 2010 sampling event. Results of the November 2014 sampling event indicate a sharp increase in Dieldrin concentration but stabilization in alpha-BHC, beta-BHC and Lindane concentrations.

Constituent concentrations were relatively stable in monitoring well MW-2, with the exception of a general upward trend in Endrin and Endrin ketone concentrations. Monitoring well MW-3 saw a decrease in all detected constituents with a marked decrease in beta-BHC and Lindane concentrations since the last sampling event.

Monitoring well MW-9, which historically had never exhibited any detectable contaminant concentrations, unexpectedly showed elevated levels of both ROD and non-ROD specified OCP during the July 2010 sampling event. Significant increases of two non-ROD compounds, Endrin and Endrin ketone were demonstrated in the monitoring well MW-9 sample during the November 2014 sampling event.

Four of the wells with detectable concentrations of OCP (MW-1, MW-2, MW-3, and MW-5S) are located in close proximity to and generally down gradient of the former FCX-Statesville structure on the North side of West Front Street. Monitoring well MW-9 is located upgradient and adjacent to the northeast corner of the former FCX-Statesville structure. No pesticides were detected in any of the samples collected from wells located down gradient and south of West Front Street.
It should be noted that the property is currently operated in a warehousing type of capacity and that improvements to the general condition of the Site have been made. In particular, debris has been removed from the drainage ditch along the railway easement and the gutter system for the building has been repaired. These two improvements now facilitate the proper drainage of site runoff and alleviate the problem of pooling surface water at the location of monitoring well MW-9. Figure 5 is a site map of OU1 with November 2014 pesticide concentrations.

Appendix E is a copy of the most recent NC DEQ OU1 MNA O&M Report, including all tables and figures of the Site layout and well locations.

OU3

The Annual Remedial Action Progress Report is submitted by AECOM, which summaries the work conducted for OU3 at the Site. The most recent report, Annual Remedial Action Progress Report- 2014, was submitted in June 2015. Semi-annual groundwater monitoring is performed to provide data to assess the stability of the plume. During this reporting period, groundwater samples were collected during April 2014 and October 2014 and analyzed for VOCs, natural attenuation parameters field measurements, and/or laboratory-analyzed natural attenuation parameters. Seventy-nine monitoring wells were sampled between April 22 and April 25, 2014 and thirty-three monitoring wells were

sampled between October 14 and October 16, 2014. Figure 6 and 7 are Monitoring and Remediation Well locations. Appendix F contains this report.

The strongest indications of natural attenuation at the Site include decreasing PCE concentration trends and the prevalence of PCE daughter products. In general, biological attenuation parameter results suggest that, although natural bioremediation of PCE is occurring to some extent, decreasing PCE concentration trends likely primarily result from active PCE mass reduction within the source area and physical attenuation processes, such diffusion and dispersion, within the dissolved plume that extends into, these areas are discussed below in more detail:

- Source Area Saprolite wells,
- North Area Saprolite and Transition Zone wells,
- South Area Saprolite and Transition Zone wells, and
- Bedrock wells.

Source area PCE concentration decreases can generally be attributed to the operation of the AS/SVE system. TCE and cDCE are recognized as common products of PCE degradation. Both constituents were also detected in the source area. Vinyl chloride, the final chlorinated constituent in the most common PCE dechlorination pathway, was below the laboratory method detection limit (MDL) for all source area wells sampled in 2014 except for well MP-8. In general, concentrations of PCE daughter products are much lower than the corresponding source area PCE concentrations. Carbon tetrachloride (CT) was detected at nine source area wells above the NC 2L standard. These wells are all generally located in the southeastern section of the source area. The primary degradation product of CT is chloroform, which was detected in many of the source area wells below the NC 2L standard. Other VOCs that were detected above the NC 2L standards in the source area include: 1,1,2,2 tetrachloroethane, 1,2 dichloropropane, and bromodichloromethane. In addition, maximum source area well concentrations for 1,4 dioxane, which was analyzed for the first time during 2014, were 219 µg/L and 11.8 µg/L in wells EW-16 and EW-13, respectively. As such, these compounds are considered to be secondary COCs.

Within the Northern Area Saprolite wells, the highest PCE concentrations outside of the source area have historically been detected in saprolite wells W-19S, MP-16, and MP-17 and transition zone wells W-30T, IW-4T, IW-5T, and IW-6T. These wells are located near the centerline of the dissolved phase plume directly downgradient (north) of the source area. Historical results in downgradient northern plume wells W-37S, W-37T, W-38S, W-38T, and W-39S demonstrate that as groundwater moves further north of the source area within the saprolite and the transition zone, PCE concentrations are reduced via physical and biological processes. It is suspected that the majority of PCE mass within the north area plume is intercepted by vertical groundwater flow into the Northern Drainage Area.

PCE concentrations within the South Area are generally lower than concentrations observed in the north area, likely resulting from the relative location of the north-south hydraulic divide and the generally stronger northward hydraulic gradients. PCE has not been detected above 1,000 µg/L in any South Area monitoring well during the period of record. During 2014, TCE was detected above the NC 2L standard in samples collected from both W-3S and W-5S and cDCE and vinyl chloride were detected above their NC 2L standards in W-5S. Chlorinated ethanes 1,1,1 trichloroethane and 1,1 dichloroethane have historically been detected at higher concentrations in W-5S than in any other monitoring well on-site. April 2014 concentrations of 1,1,1 trichloroethane and 1,1 dichloroethane in MW-5S have decreased significantly from historical maximums but remain above their respective NC 2L standards. As may be expected, the highest PCE concentrations in bedrock during 2014 were observed in monitoring wells relatively close to the source area, including IW-1 (118 µg/L), W-28I (99.5 µg/L), IW-3 (43.4 µg/L), and

W-5I (44.2 µg/L). Concentrations in the remaining monitoring wells sampled during 2014 are generally lower by an order of magnitude or more, reflecting diffusion, dispersion, and chemical and biological degradation of PCE as groundwater in bedrock flows away from source area. Historical PCE concentration data for bedrock monitoring well samples demonstrate a widespread decreasing trend on all sides of the building. Of the 21 bedrock monitoring wells sampled during 2014, 14 have exhibited an appreciable decrease in PCE concentration during the period of record. Of the seven remaining wells, four wells have consistently exhibited low or non- detect PCE concentrations including results at or below the NC 2L standard during 2014. In contrast, monitoring wells W-5I, W-10I, and IW-3 have exhibited generally stable PCE concentrations during the period of record and exhibited concentrations of 206 µg/L, 7.6 µg/L, and 84.3 µg/L, respectively, during 2014. The highest historical PCE concentrations in bedrock were observed in W-28I (4,300 µg/L) and W-30I (2,300 µg/L), which exhibited PCE concentrations of 99.5 µg/L and 10.7 µg/L, respectively, during 2014. Other VOCs detected above the NC 2L standard in bedrock were limited to TCE in W-5I, W-20I, W-28I, W-42I, and IW-1; vinyl chloride in W-5I, W-20I, W-33I, and W-42I; 1,1 dichloroethane in W-5I and W-42I; 12DCP in W-20I, W-20D, W-30I, and W-33I; and 1,2, dichloroethane and 1,1,2 trichloroethane in well W-1I.

Surface Water.

OU3

Surface water monitoring activities are conducted by AECOM. These activities are conducted in accordance with the 2010 request from NC DEQ, Division of Water Quality (DWQ) to conduct surface water sampling on a quarterly schedule.

Most recently, surface water samples were collected from 12 discrete locations during the August 2015 quarterly surface water monitoring event. Figure 8 is a map of surface water sampling locations. Sample locations, URS-SW-D, URS-SW-D2, URS-SW-E, URS-SW-F, URS-SW-02, URS-SW-03, URS-SW-05, URS-SW-16, URS-SW-22 and URS-SW-T4 are located in the Northern Drainage Feature. Sample location URS-SW-15 is an overland flow from groundwater seepage prior to discharge into the Northern Drainage Feature. Sample location URS-SW- 09 is in the Southern Drainage Area.

Figure 9 presents the location of the pilot test initiated in October 2013 in which an angled injection of BOS-100® injection media was applied to create a permeable reactive barrier (PRB) designed to break down PCE and other chlorinated compounds from groundwater before any enter the Northern Drainage Feature.

The following conclusions can be made based upon this most recent data:

- Analytical data for URS-SW-05, the downstream sample location, remain near or below detectable concentrations levels for PCE and its degradation products.
  PCE was detected above NC 2B standards (3.3 µg/L) in surface water within the Northern Drainage Feature at sampling locations URS-SW-16 (6.9 micrograms per liter [µg/L]), URS-SW-22 (4.6 µg/L), URS-SW-E (9.8 µg/L), and URS-SW-F (6.5 µg/L). Concentrations of PCE were detected below NC 2B standards in surface water samples collected at URS-SW-T4 (0.7 J µg/L), URS-SW-03 (1.8 µg/L), URS-SW-D (1.6 µg/L), and URS-SW-D2 (1.8 µg/L).
- No concentrations of TCE, cDCE, or VC were identified above NC 2B in surface water samples collected within the Northern Drainage Feature.
- Although long-tem PCE concentration trends in surface water are difficult to assess due to the

seasonal fluctuations, the most recent PCE results for URS-SW-D, URS-SW-D2, URS-SW-3, and URS-SW-15 provide evidence of a decreasing trend in this area.

- PCE was detected in the Southern Drainage Area at location URS-SW-09 at an estimated concentration of 0.72 µg/L, which does not exceed NC 2B.

Appendix G contains the August 2015 Surface Water Monitoring Report-January 2016, which includes Surface Water Analytical Results (Appendix G-Table 1) and Historical Surface Water Analytical Results (Appendix G-Table 2), along with a Surface Water Assessment map with sampling locations and injection area (Appendix G-Figure 1).

6.7 Site Inspection

The Site inspection of the FCX Statesville Site was conducted on February 16, 2016. Attending the Site visit was: Ken Mallary (RPM, EPA), Nile Testerman (Environmental Engineer, NC DEQ), Conan Fitzgerald (AECOM), Amanda Taylor (AECOM), and Joe Wiley (Kinder Morgan/EPNG).

As stated in the Site Inspection Checklist, all the monitoring wells were in good condition, easily located and properly secured/locked. The extraction system pipelines, valves, and other components are in good condition and all required well equipment is properly operating All monitoring data was submitted on time and of acceptable quality. Under the Site Inspection Checklist Section XI: Overall Observations, it was noted: *OU1 MNA is working and no receptors impacted. OU3 AS/SVE is working. Full-scale angle injections has been installed; however, not enough data to indicate if remedy is protective of down gradient receptor (stream).* See Appendix B for the completed Site Inspection Checklist.

6.8 Interviews

The EPA is responsible for contacting and interviewing the community surrounding the Site for concerns, comments, and/or questions regarding the remediation at the Site for the FYR. A public notice was placed in the local newspaper informing the community of this review. The public notice is included in Appendix C.

The following persons were interviewed as part of this FYR regarding the activities and implementation of the remedial actions at the FCX Statesville Site. Only a portion of the interview is stated below. For the complete interview statement see Appendix D.

Ken Mallary, EPA RPM:
What is your overall impression of the project? *My overall impression of the project is the NCDEQ continues to do a good job with the OU1 remedy, and AECOM continues to do a good job with the OU3 remedy.*

What effects have site operations had on the surrounding community? *To my knowledge, the site operations have had little to no effect on the surrounding community. AECOM has been in contact with a few nearby residents periodically who are interested in the angled injection work.*

Have any problems or difficulties been encountered which have impacted construction progress or implementability? *Heavy rain during the past few months has hindered the collection and evaluation of data to determine the effectiveness of the angled injection work.*

Nile Testerman, NC DEQ RPM:
What is your overall impression of the project? *Both active operable units are being managed well and the project continues to move forward.*

Do you feel well informed about the site's activities and progress? *Yes. Our office receives monthly updates on the status of OU3.*

What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? *OU1-Monitoring data indicate general downward concentration and little movement of the pesticide contamination. OU3-The effectiveness of the latest remedial activities is being evaluated.*

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes, the remedial action continues to operate as designed. Soil remediation has been completed at the Site. Long-term groundwater monitoring is occurring as directed by the OU1 AROD and active AS/SVE and angled injection are occurring at OU3.

In order to be protective of human health and to preserve the effectiveness of the remedy, ICs must be implemented and maintained. The groundwater remedy is considered a long-term RA and although several properties have ICs in place, ICs have not been fully implemented on the surrounding properties where contamination has migrated.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy still valid?

Yes. The NC 2L Groundwater Standards on which several of the remedial goals are based were last amended on April 1, 2013. Some of the chemical-specific ARARs have changed for the COCs since the RGs were designated. For OU1, four of the compounds currently have NC 2Ls more stringent that the 2006 AROD RGs. These compounds include, dielrin (RG of 0.1 µg/L, new NC 2L of 0.002 µg/L), heptachlor epoxide (RG 0.05 µg/L, NC 2L of 0.004 µg/L), Alpha-BHC (0.01 µg/L, NC 2L 0.006 µg/L), and Beta-BHC (0.01 µg/L, NC 2L of 0.02 µg/L). The NC DEQ is comparing the groundwater analytical results to both the current NC 2Ls and the AROD RGs in the annual reports. A review of these standards should eventually be conducted when concentration of COCs are close to the RGs. For OU3, none of the new current NC 2L standards are more stringent than the 2006 ESD groundwater RGs. CERCLA requires that the remedy comply with any promulgated standard that is more stringent than any federal standard.

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. Currently, no human exposure pathways exist to contaminated soil or groundwater.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No additional information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

According to documents, the site inspection, and interviews, the exposure pathway to contaminated soil has been mitigated. There are no known current exposure routes to contaminated soil or groundwater. Long-term groundwater monitoring is occurring as directed by the AROD for OU1. The OU3 groundwater and surface water are actively being remediated through AS/SVE and angled injection technology. Routine monitoring will continue to assess the remedies at OU1 and OU3. For long-term protectiveness at the Site, ICs need to be fully implemented at the surrounding contaminated properties.

8.0 Issues, Recommendations and Follow-up Actions

Table 12: Issues and Recommendations

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 03	**Issue Category:** Institutional Controls			
	Issue: ICs have not been fully implemented for the impacted property parcels purchased by El Paso Natural Gas Company located north of the former Burlington textile property.			
	Recommendation: Institutional controls in the form of deed restrictions need to be fully implemented on contaminated properties surrounding the Site.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/NC DEQ	09/ 08 /2017

9.0 Protectiveness Statement

The remedies at the FCX Statesville Site currently protect human health and the environment. There are no known current exposure routes to contaminated soil or groundwater. Contaminated soils have been mitigated through source removal and groundwater is not used as a potable source of water. Annual groundwater monitoring for MNA at OU1 and active remediation of AS/SVE with the new implementation of angled injection technology at OU3 are being successfully employed. Continued groundwater and surface water monitoring are necessary to ensure the protectiveness of the Site as stated in the decision documents. However, to ensure long-term protectiveness, institutional controls need to be fully implemented on impacted property parcels purchased by El Paso Natural Gas Company located north of the former Burlington textile property.

10.0 Next Review

The next FYR for the FCX Statesville Site will be due within five years of the signature/ approval date of this FYR.

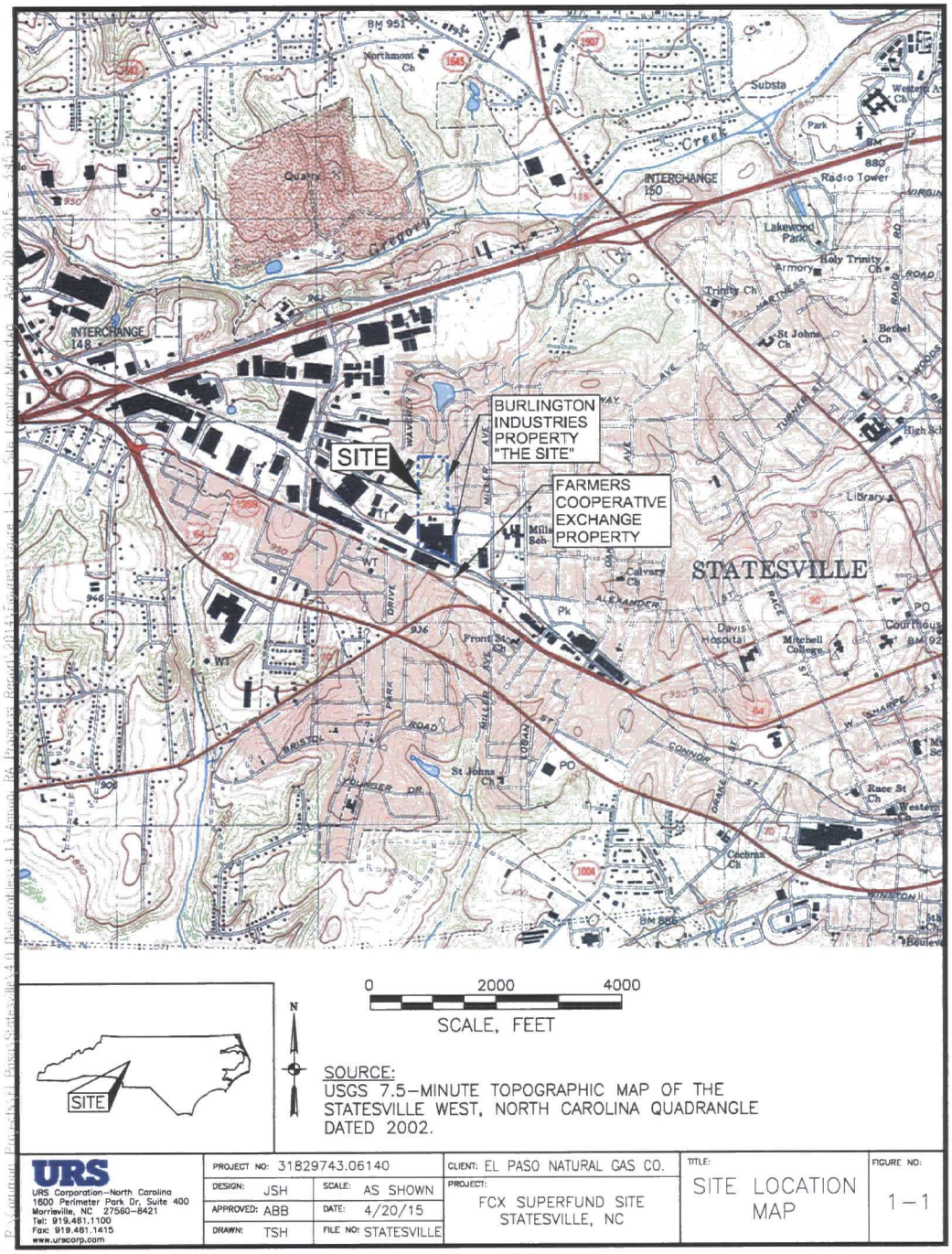

BURLINGTON INDUSTRIES PROPERTY "THE SITE"
FARMERS COOPERATIVE EXCHANGE PROPERTY
SITE
STATESVILLE
INTERCHANGE 148
INTERCHANGE 150
0 2000 4000
SCALE, FEET
N
SITE
SOURCE:
USGS 7.5-MINUTE TOPOGRAPHIC MAP OF THE STATESVILLE WEST, NORTH CAROLINA QUADRANGLE DATED 2002.
URS
URS Corporation-North Carolina
1600 Perimeter Park Dr, Suite 400
Morrisville, NC 27560-8421
Tel: 919.461.1100
Fax: 919.461.1415
www.urscorp.com
PROJECT NO: 31829743.06140
DESIGN: JSH
SCALE: AS SHOWN
APPROVED: ABB
DATE: 4/20/15
DRAWN: TSH
FILE NO: STATESVILLE
CLIENT: EL PASO NATURAL GAS CO.
PROJECT: FCX SUPERFUND SITE STATESVILLE, NC
TITLE: SITE LOCATION MAP
FIGURE NO: 1-1

FIGURE 1

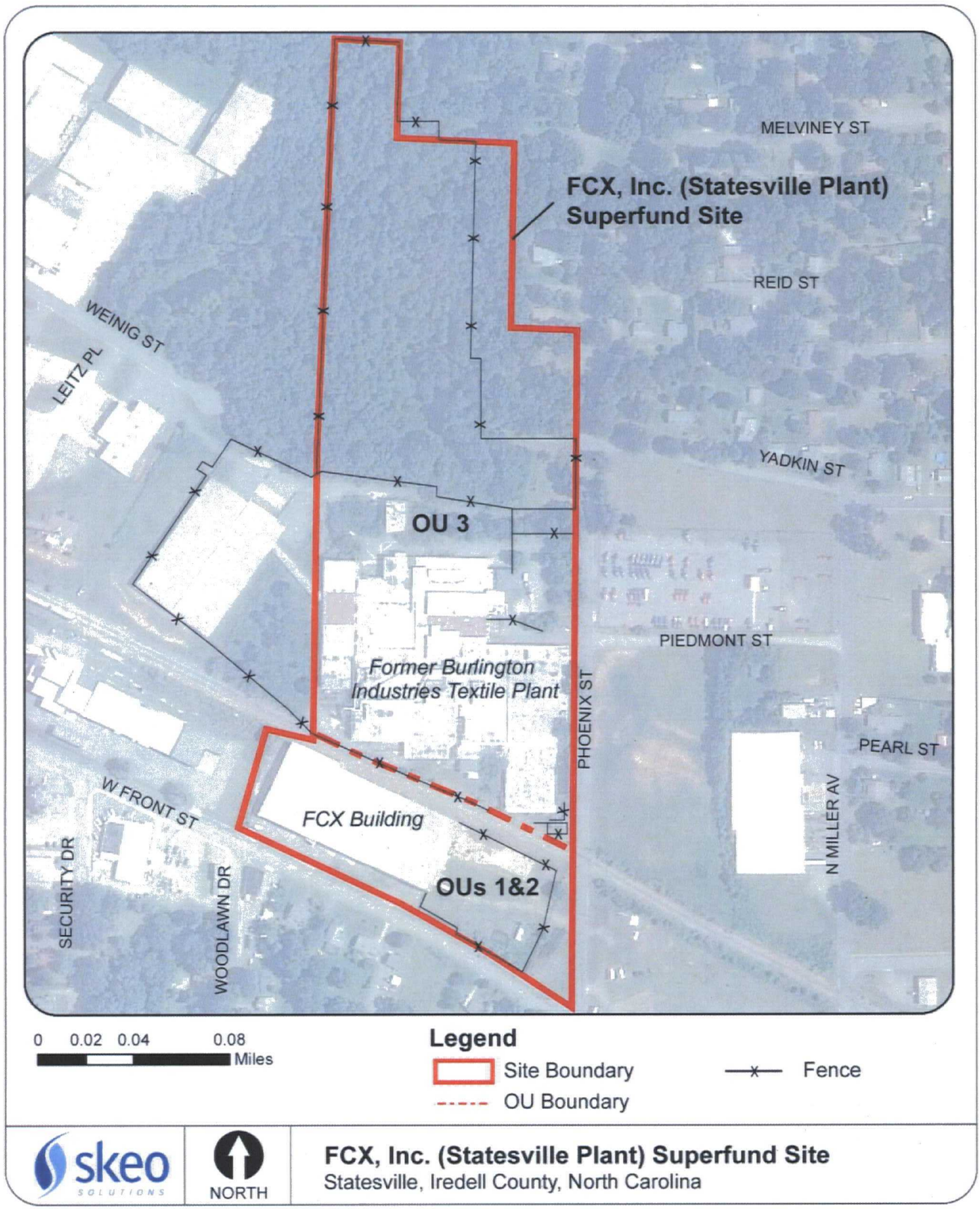

MELVINEY ST
FCX, Inc. (Statesville Plant)
Superfund Site
REID ST
WEINIG ST
LEITZ PL
YADKIN ST
OU 3
PIEDMONT ST
Former Burlington
Industries Textile Plant
PHOENIX ST
PEARL ST
W FRONT ST
FCX Building
N MILLER AV
SECURITY DR
WOODLAWN DR
OUs 1&2
0 0.02 0.04 0.08
Miles
Legend
Site Boundary
Fence
OU Boundary
skeo
SOLUTIONS
NORTH
FCX, Inc. (Statesville Plant) Superfund Site
Statesville, Iredell County, North Carolina

FIGURE 2

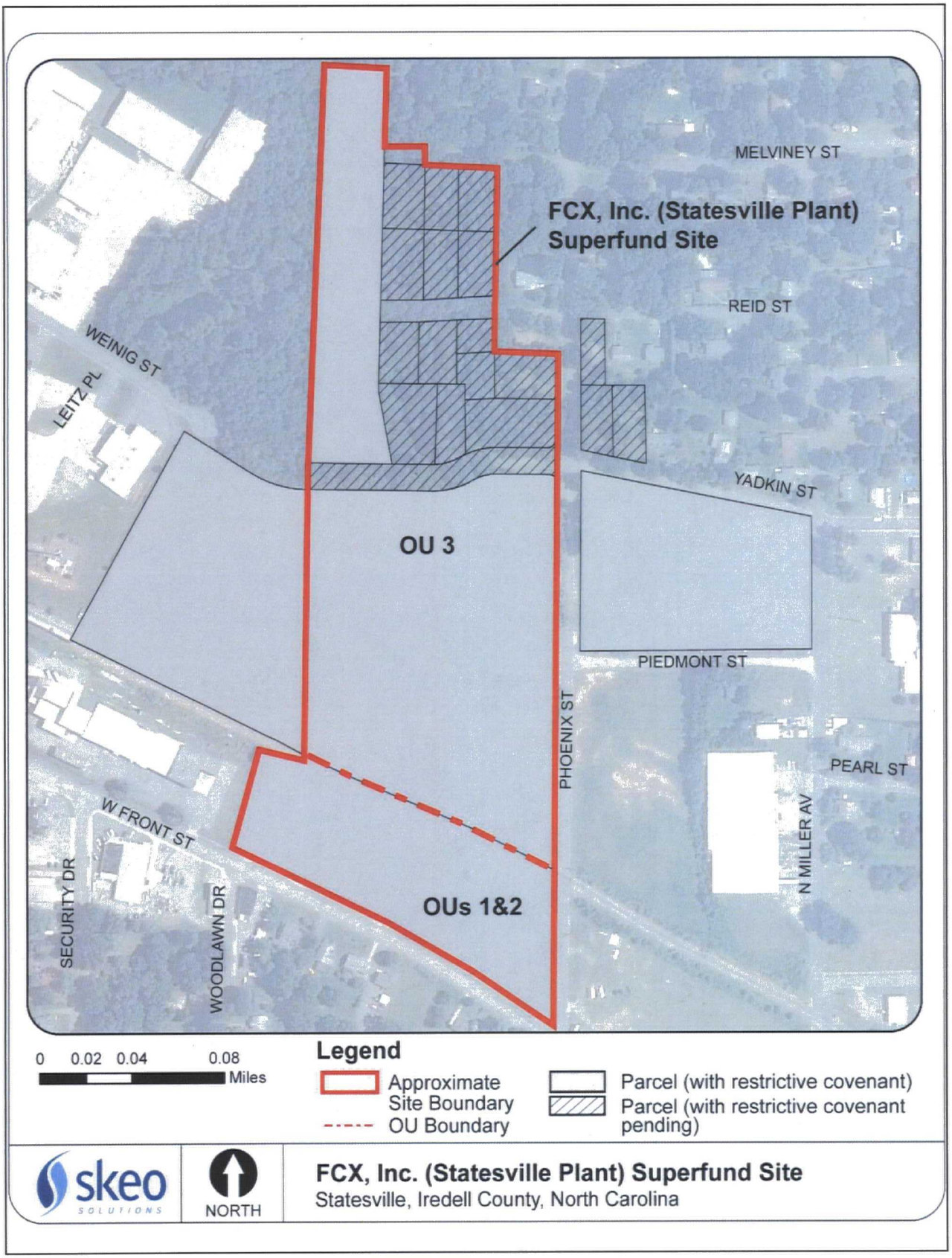

MELVINEY ST
FCX, Inc. (Statesville Plant)
Superfund Site
REID ST
WEINIG ST
LEITZ PL
YADKIN ST
OU 3
PIEDMONT ST
PHOENIX ST
PEARL ST
W FRONT ST
N MILLER AV
SECURITY DR
WOODLAWN DR
OUs 1&2
0 0.02 0.04 0.08
Miles
Legend
Approximate Site Boundary
OU Boundary
Parcel (with restrictive covenant)
Parcel (with restrictive covenant pending)
skeo
SOLUTIONS
NORTH
FCX, Inc. (Statesville Plant) Superfund Site
Statesville, Iredell County, North Carolina

FIGURE 3

Site Map with Monitoring Well Locations	
Site Name:	FCX-Statesville Superfund Site
Site Number:	NCD 095 458 527
Scale:	1:2,000
Date:	2005 Aerial Image, March 17, 2010 map
Figure 2	Prepared by:

FIGURE 4

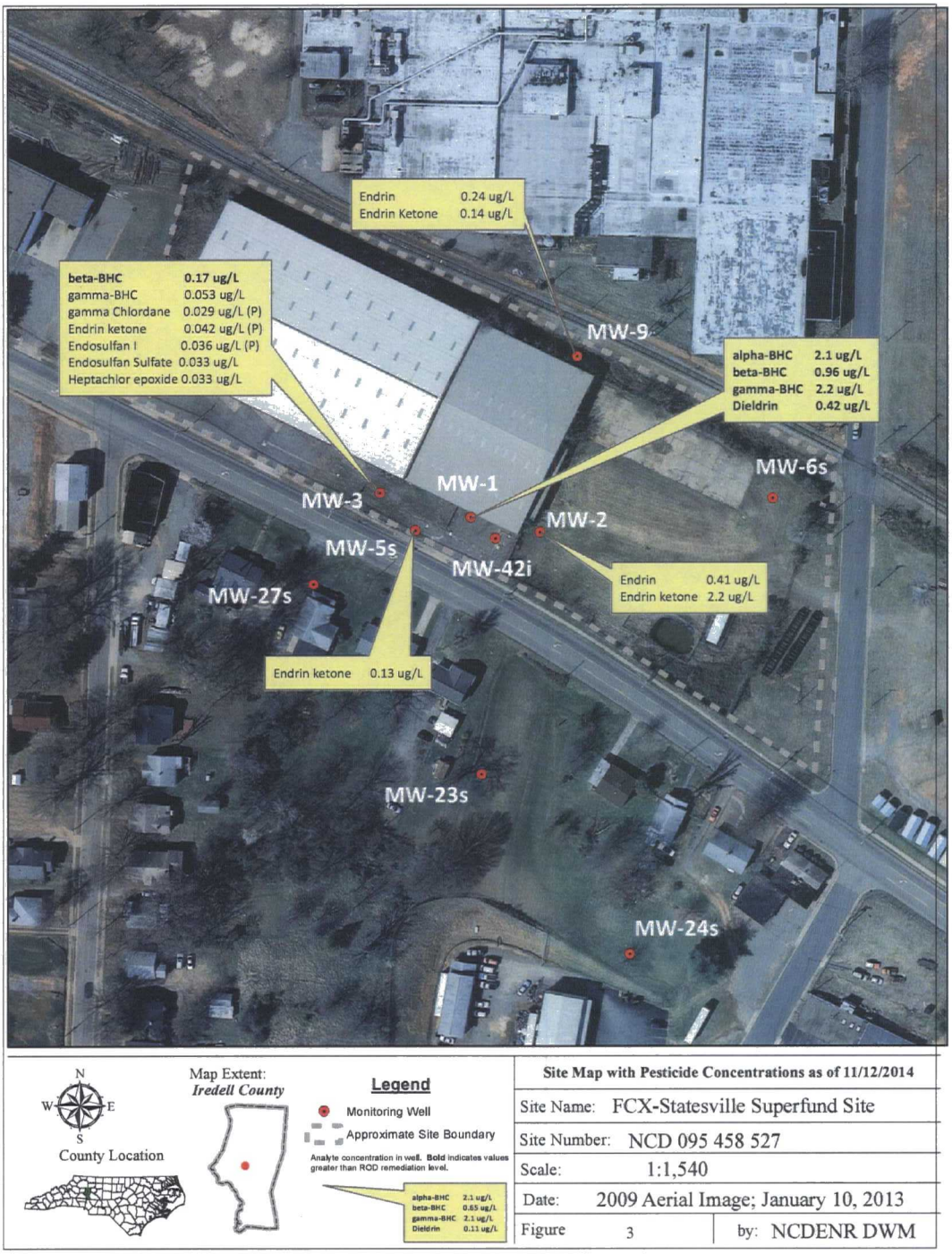

Endrin 0.24 ug/L
Endrin Ketone 0.14 ug/L
beta-BHC 0.17 ug/L
gamma-BHC 0.053 ug/L
gamma Chlordane 0.029 ug/L (P)
Endrin ketone 0.042 ug/L (P)
Endosulfan I 0.036 ug/L (P)
Endosulfan Sulfate 0.033 ug/L
Heptachlor epoxide 0.033 ug/L
MW-9
alpha-BHC 2.1 ug/L
beta-BHC 0.96 ug/L
gamma-BHC 2.2 ug/L
Dieldrin 0.42 ug/L
MW-6s
MW-1
MW-3
MW-2
MW-5s
MW-42i
Endrin 0.41 ug/L
Endrin ketone 2.2 ug/L
MW-27s
Endrin ketone 0.13 ug/L
MW-23s
MW-24s
N
W
E
S
County Location
Map Extent:
Iredell County
Legend
Monitoring Well
Approximate Site Boundary
Analyte concentration in well. Bold indicates values greater than ROD remediation level.
alpha-BHC 2.1 ug/L
beta-BHC 0.65 ug/L
gamma-BHC 2.1 ug/L
Dieldrin 0.11 ug/L
Site Map with Pesticide Concentrations as of 11/12/2014
Site Name: FCX-Statesville Superfund Site
Site Number: NCD 095 458 527
Scale: 1:1,540
Date: 2009 Aerial Image; January 10, 2013
Figure 3
by: NCDENR DWM

FIGURE 5

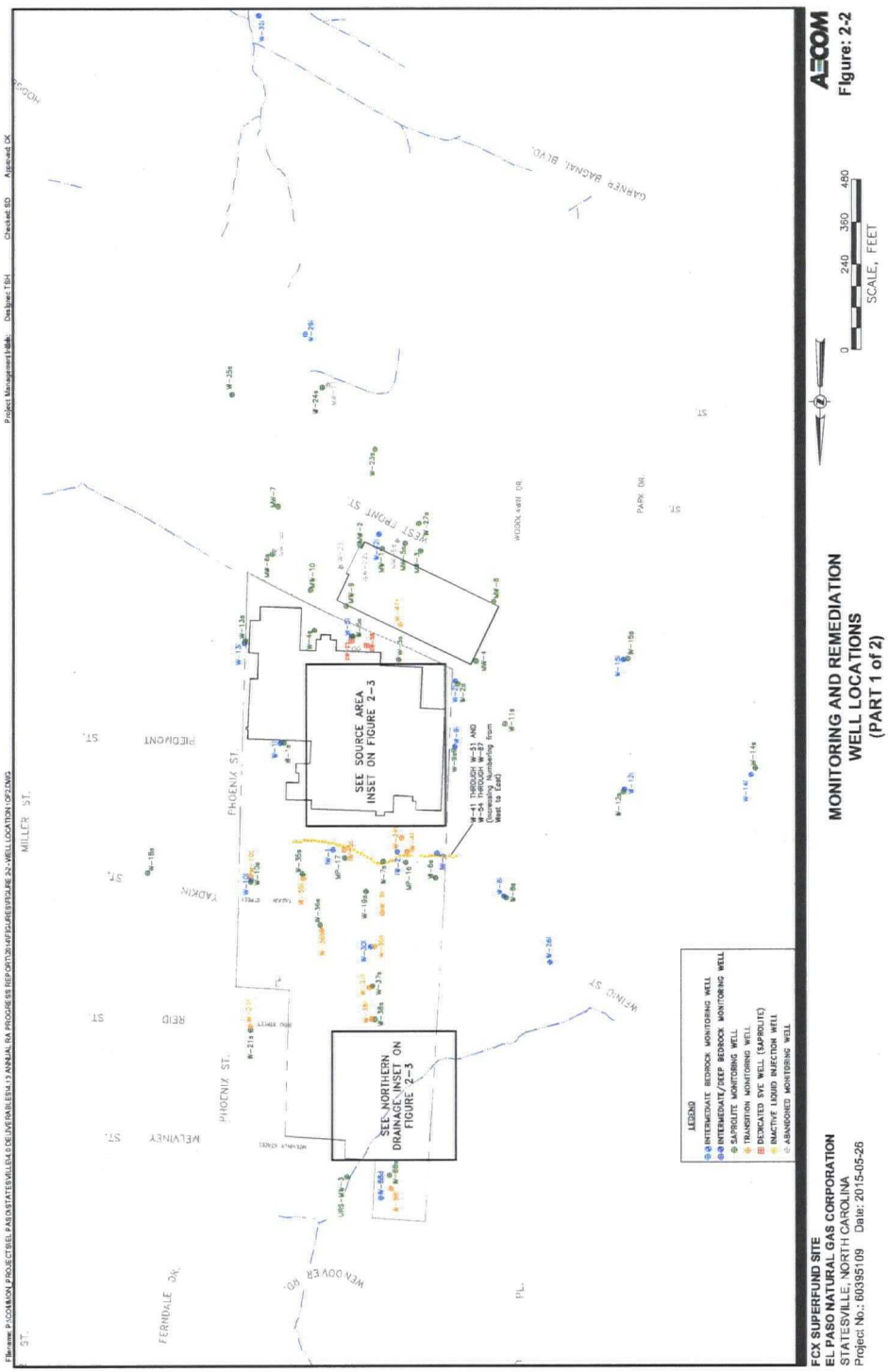
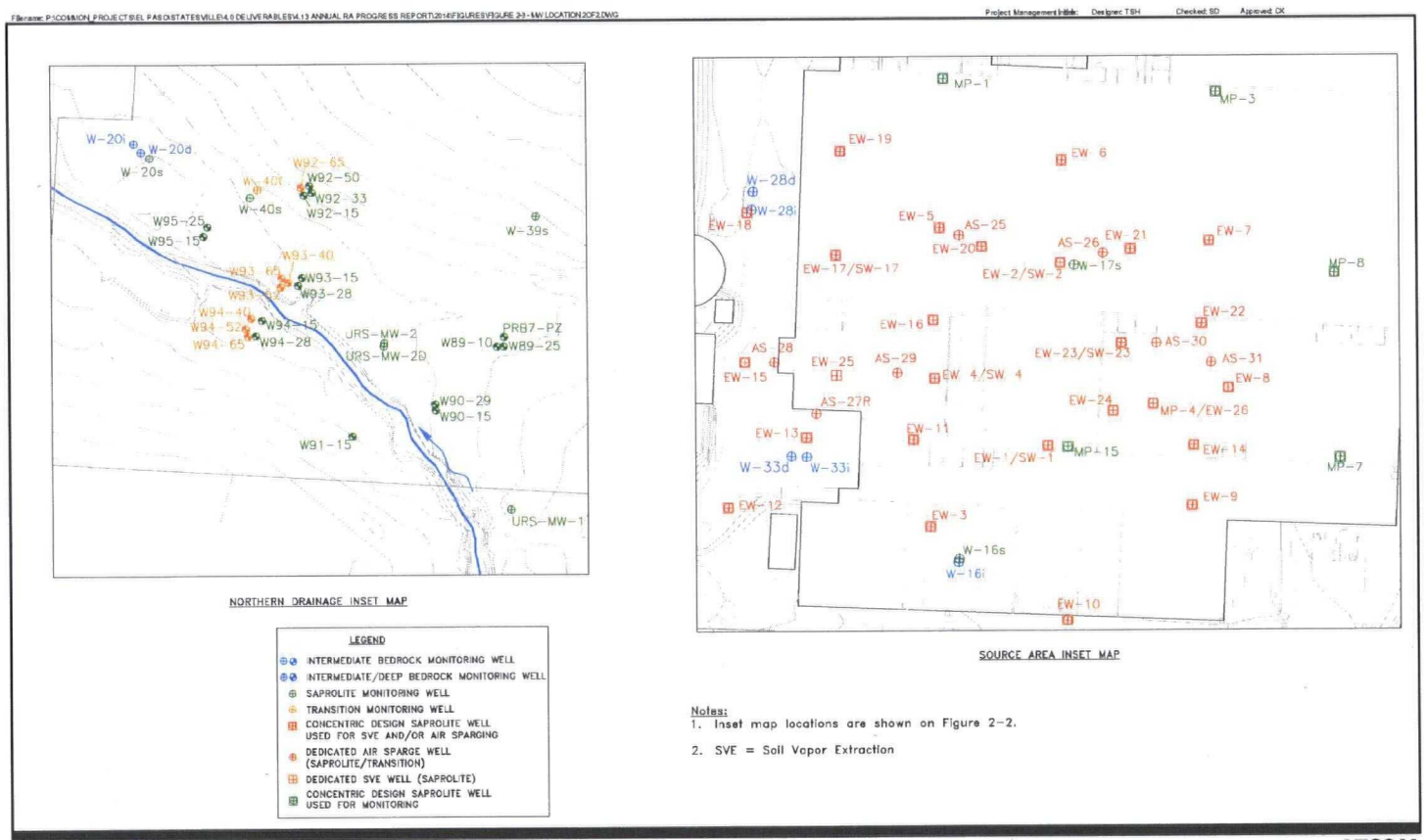

SEE SOURCE AREA INSET ON FIGURE 2-3
SEE NORTHERN DRAINAGE INSET ON FIGURE 2-3
W-41 THROUGH W-31 AND W-34 THROUGH W-37 (Clockwise Numbering from West to East)
LEGEND
INTERMEDIATE BEDROCK MONITORING WELL
INTERMEDIATE/DEEP BEDROCK MONITORING WELL
SAPROLITE MONITORING WELL
TRANSITION MONITORING WELL
DEDICATED SVE WELL (SAPROLITE)
INACTIVE LIQUID INJECTION WELL
ABANDONED MONITORING WELL
MILLER ST.
PIEDMONT ST.
PHOENIX ST.
TADKIN ST.
REID ST.
MELVINEY ST.
FERNDALE DR.
WEN DOVER RD.
GARNER BAGNAL BLVD.
WEST FRONT ST.
WILSON HEIGHTS DR.
PARK DR.
MTNG ST
0
240
360
480
SCALE, FEET
AECOM
Figure: 2-2
MONITORING AND REMEDIATION WELL LOCATIONS (PART 1 of 2)
FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

FIGURE 6

FIGURE 7



FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

MONITORING AND REMEDIATION WELL LOCATIONS (PART 2 of 2)

0 60 90 120
SCALE, FEET

AECOM
Figure: 2-3

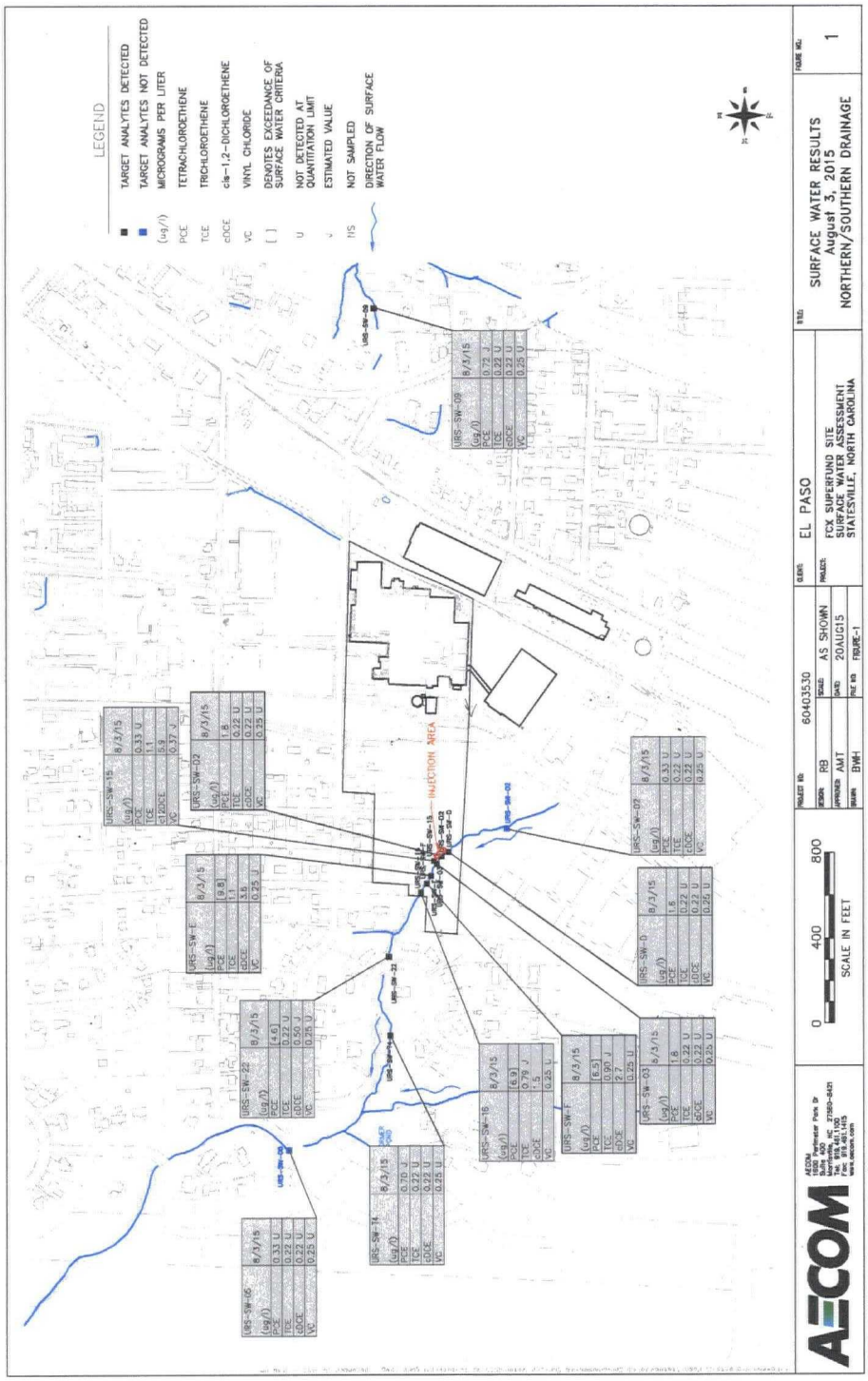

LEGEND
TARGET ANALYTES DETECTED
TARGET ANALYTES NOT DETECTED
(ug/l) MICROGRAMS PER LITER
PCE TETRACHLOROETHENE
TCE TRICHLOROETHENE
cDCE cis-1,2-DICHLOROETHENE
VC VINYL CHLORIDE
[ ] DENOTES EXCEEDANCE OF SURFACE WATER CRITERIA
U NOT DETECTED AT QUANTITATION LIMIT
J ESTIMATED VALUE
NS NOT SAMPLED
DIRECTION OF SURFACE WATER FLOW
INJECTION AREA
SURFACE WATER RESULTS
August 3, 2015
NORTHERN/SOUTHERN DRAINAGE
EL PASO
FCX SUPERFUND SITE
SURFACE WATER ASSESSMENT
STATESVILLE, NORTH CAROLINA
AECOM
0
400
800
SCALE IN FEET

FIGURE 8

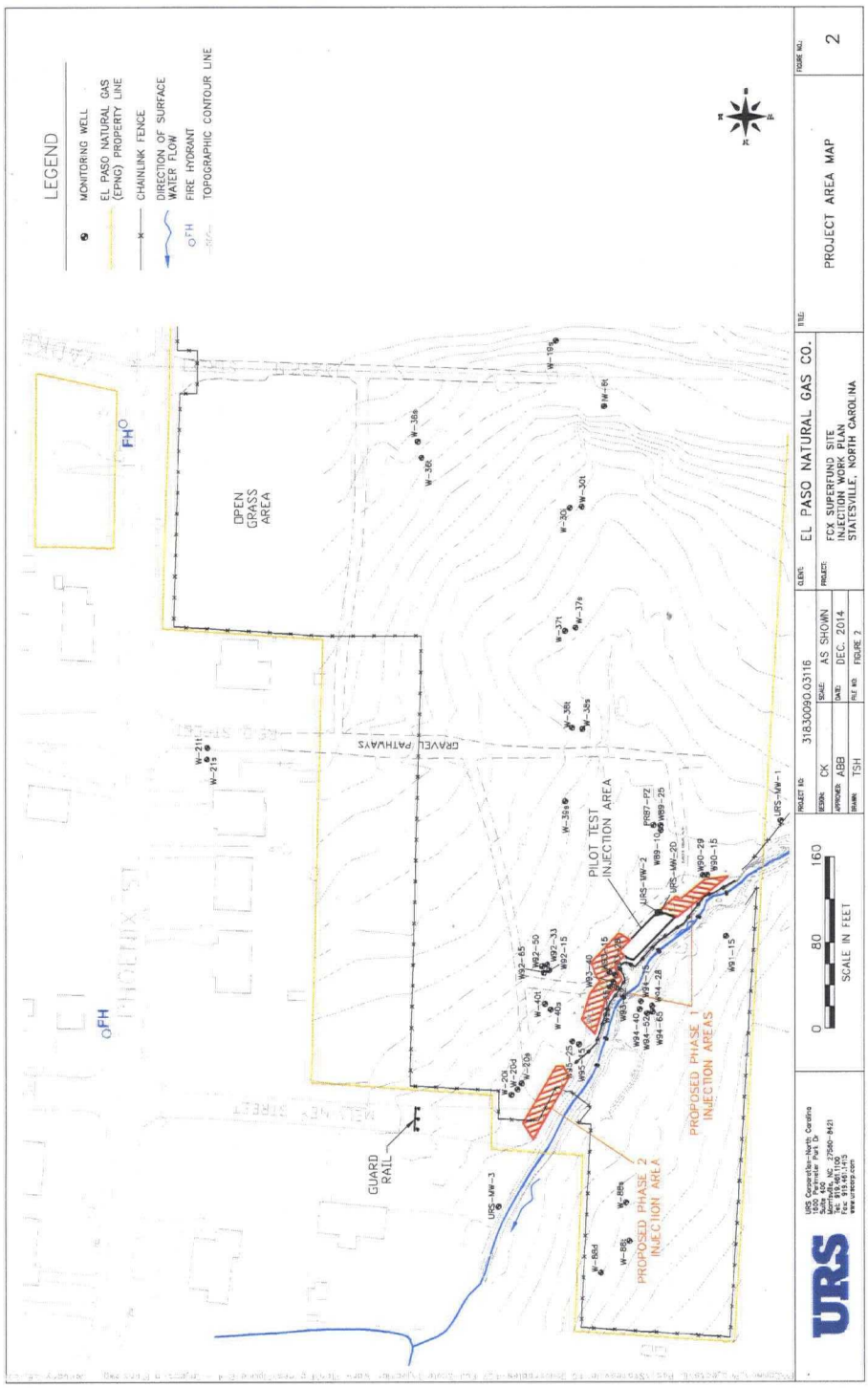

LEGEND
MONITORING WELL
EL PASO NATURAL GAS (EPNG) PROPERTY LINE
CHAINLINK FENCE
DIRECTION OF SURFACE WATER FLOW
FIRE HYDRANT
TOPOGRAPHIC CONTOUR LINE
OPEN GRASS AREA
GRAVEL PATHWAYS
PILOT TEST INJECTION AREA
PROPOSED PHASE 1 INJECTION AREAS
PROPOSED PHASE 2 INJECTION AREA
GUARD RAIL
FH
SCALE IN FEET
0
80
160
URS
EL PASO NATURAL GAS CO.
FCX SUPERFUND SITE
INJECTION WORK PLAN
STATESVILLE, NORTH CAROLINA
PROJECT AREA MAP
FIGURE NO.
2

FIGURE 9

APPENDIX A
List of Documents Reviewed

List of Documents Reviewed
FCX Statesville Site
Third Five-Year Review Report

US EPA, Region IV. September 1993. Record Of Decision, Operable Unit One, FCX- Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. November 1994. Record of Decision, Operable Unit Two, FCX- Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. September 1996. Record of Decision, Operable Unit Three, FCX- Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. September 2001. Preliminary Close-Out Report, FCX-Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. August 2006. Explanation of Significant Difference, Operable Unit Three, FCX-Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. August 2006. Final Amendment to the 1993 Record Of Decision for Operable Unit One, FCX-Statesville Superfund Site, Statesville, North Carolina.

US EPA, Region IV. September 2006. Superfund Five-Year Review Report, FCX- Statesville Superfund Site, Statesville, Iredell County, North Carolina.

US EPA, Region IV. September 2011. Superfund Five-Year Review Report, FCX- Statesville Superfund Site, Statesville, Iredell County, North Carolina.

NC DENR. May 2014. OU-1 Monitored Natural Attenuation Operations & Maintenance Monitoring Well Sampling Report. FCX-Statesville Superfund Site, Statesville, Iredell County, North Carolina.

NC DENR. February 2015. OU-1 Monitored Natural Attenuation Operations & Maintenance Monitoring Well Sampling Report. FCX-Statesville Superfund Site, Statesville, Iredell County, North Carolina.

AECOM. June 2015. Annual Remedial Action Progress Report- 2014. FCX-Statesville Superfund Site, Statesville, Iredell County, North Carolina.

US EPA, Region IV. August 2015. Explanation of Significant Difference, Operable Unit Three Remedial Action. FCX-Statesville Superfund Site, Statesville, Iredell County, North Carolina

APPENDIX B
Site Inspection Checklist

I. SITE INFORMATION	
Site name: FCX Statesville	**Date of inspection:** Feb 16 2016
Location and Region: Statesville NC Region IV	**EPA ID:** NCD095458527
Agency, office, or company leading the five-year review: NC Superfund	**Weather/temperature:** 50 degrees Sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- X Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- X Other Air sparging and SVE
- X Monitored natural attenuation
- ☐ Groundwater containment
- X Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

Ken Mallary EPA
Conan Fitzgerald AECOM
Caleb Krouse AECOM
Amanda Taylor AECOM
Joe Wiley Kinder Morgan

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - X O&M manual — X Readily available — X Up to date — ☐ N/A
   - X As-built drawings — X Readily available — X Up to date — ☐ N/A
   - X Maintenance logs — X Readily available — X Up to date — ☐ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — X Readily available — X Up to date — ☐ N/A
   - X Contingency plan/emergency response plan — X Readily available — X Up to date — ☐ N/A

   Remarks_____

3. **O&M and OSHA Training Records** — **X** Readily available — X Up to date — ☐ N/A

   Remarks_____

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

7. **Groundwater Monitoring Records** — **X** Readily available — X Up to date — ☐ N/A

   Remarks_____ In office _____

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Water (effluent) — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — X N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☐ Contractor for PRP
   - ☐ Federal Facility in-house
   - ☐ Contractor for Federal Facility
   - ☐ Other_____

2. **O&M Cost Records**
   - ☐ Readily available ☐ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate_____ ☐ Breakdown attached

   Total annual cost by year for review period if available

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map X Gates secured ☐ N/A
   Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks Up to date

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes X No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes X No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Self Reporting sent to NC DEQ
Frequency Annual
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date X Yes ☐ No ☐ N/A
Reports are verified by the lead agency X Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes X No ☐ N/A
Violations have been reported ☐ Yes ☐ No X N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate X ICs are inadequate ☐ N/A
Remarks Additional IC's required

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map x No vandalism evident
Remarks

2. **Land use changes on site** x N/A
Remarks

3. **Land use changes off site** X N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable X N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks _____

_____

VII. LANDFILL COVERS ☐ Applicable X N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_____
   _____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____
   _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
   Areal extent_____
   Remarks_____
   _____

B. Benches ☐ Applicable ☐ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

C. Letdown Channels ☐ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
   Areal extent_____ Depth_____
   Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type_____ Areal extent_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Areal extent_____ Depth_____
   Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks_____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS X Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map X Settlement not evident
   Areal extent_____ Depth_____
   Remarks Angled Injuections of BOS 100. Not a typical barrier wall.

2. **Performance Monitoring** Type of monitoring Surface water
   ☐ Performance not monitored
   Frequency Sampling just started ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines X Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** X Good condition X All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** X Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** X Readily available X Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System X Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping X Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   X Good condition ☐ Needs Maintenance
   X Sampling ports properly marked and functional
   X Sampling/maintenance log displayed and up to date
   X Equipment properly identified
   ☐ Quantity of groundwater treated annually_____
   ☐ Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A X Good condition ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A X Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   X N/A ☐ Good condition ☐ Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   X N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   X Properly secured/locked X Functioning X Routinely sampled X Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   X Is routinely submitted on time X Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained X Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
X Properly secured/locked X Functioning X Routinely sampled X Good condition
X All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
OU1 State managed. MNA is remedy and groundwater is monitored annually. Data indicates contamination is on site and slowly declining.
OU3 is PRP lead. Air Sparging and SVE used in source area and angled injection used to protect downgradient receptor (stream) Angled injections just installed and data collection just began.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
OU1 MNA is working. No receptors impacted
OU3 Air sparging and SVE working . Full scale angle injections has been installed; however, not enough data to indicate if remedy is protective of down gradient receptor (stream).

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.
None

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
None

APPENDIX C
Public Notice

The U. S. Environmental Protection Agency, Region 4
Announces a Five-Year Review for
the FCX, Inc. (Statesville Plant) Superfund Site,
Statesville, Iredell County, North Carolina

Purpose/Objective: The United States Environmental Protection Agency (EPA) is conducting a Five-Year Review of the remedies for the FCX, Inc. (Statesville Plant) Superfund site (the Site) in Statesville, North Carolina. The purpose of the Five-Year Review is to ensure that the selected cleanup actions effectively protect human health and the environment.

Site Background: The Site consists of the 5.5-acre former FCX property and the 15-acre former Burlington Industries property. The Site is located in a mixed residential and commercial area at the intersection of Phoenix Street and West Front Street (Highway 90), approximately 1.5 miles west of downtown Statesville, North Carolina. Statesville is located in Iredell County approximately 60 miles north of Charlotte. Around 1940, FCX began operating at the Site as an agricultural supply distribution center; activities included formulating, repackaging, storing and distributing pesticides, fertilizers and feed grains. Activities continued until FCX declared bankruptcy in 1986. Testimony from previous employees indicates that 5,000 to 10,000 pounds of DDT, DDE, and possibly liquid chlordane, were disposed of in two on-site trenches, buried under six feet of soil, and later covered with a concrete slab and warehouse. From 1986 to 1990, several environmental studies were performed at the former FCX property. These studies indicated the presence of pesticide contamination in the soil, and both pesticide and volatile organic compound (VOC) contamination in the ground water. Site investigations detected an additional contaminant source originating from the Burlington Industries textile plant, located immediately to the north of the FCX property. EPA proposed the Site for listing on the National Priorities List (NPL) in June 1988 and the Site was finalized on the NPL on February 21, 1990.

Cleanup Actions: EPA designated three operable units (OUs) to address the Site's soil and ground water contamination. EPA signed the OU1 and OU2 Records of Decision (RODs) in September 1993 and November 1994, respectively, to address ground water and soil contamination on and south of the former FCX property. The OU3 ROD was signed in September 1996 to address VOC contamination on and around the former Burlington Industries property. Since 1998, the OU1 remedy has addressed contaminated ground water at the former FCX property and south of the FCX property. In 2006, a ROD Amendment was issued to change the OU1 ground water remedy from pump-and-treat technology to monitored natural attenuation. Completed in 2001, the OU2 remedy addressed the pesticide soil contamination on the former FCX property. The OU3 remedy uses air sparging, soil vapor extraction and monitored natural attenuation to address soil and ground water contaminated with VOCs on and around the former Burlington property. An Explanation of Significant Differences (ESD) was issued in September 2006 to enhance the OU3 remedy with accelerated natural attenuation. Another ESD was issued in August 2015 to enhance the OU3 remedy by adding angled injection to address VOCs in shallow groundwater in the northern drainage area.

Five-Year Review Schedule: The National Contingency Plan requires that remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure be reviewed every five years to ensure the protection of human health and the environment. The third of the Five-Year Reviews for the Site will be completed by September 2016.

EPA Invites Community Participation in the Five-Year Review Process: EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedies and to ensure that the remedies remain protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process are asked to contact:

Ken Mallary, EPA Remedial Project Manager
Phone: (404) 562-8802
E-mail: mallary.ken@epa.gov

Angela Miller, EPA Community Involvement Coordinator
Phone: (404) 562-8561
E-mail: miller.angela@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional site information is available at the Site's local document repository, located at Iredell County Public Library, 135 E. Water Street, Statesville, NC 28677 and online at: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0404225

APPENDIX D
Interviews

FXC Statesville Site
Statesville, Iredell County, NC
EPA ID: NCD 095458527
Superfund Five-Year Review Report

Interview Questionnaire
Completed by Ken Mallary, US EPA RPM

1. What is your overall impression of the project? (general sentiment) My overall impression of the project is the NCDEQ continues to do a good job with the OU1 remedy, and AECOM continues to do a good job with the OU3 remedy.

2. What effects have site operations had on the surrounding community? To my knowledge, the site operations have had little to no effect on the surrounding community. AECOM has been in contact with a few nearby residents periodically who are interested in the angled injection work.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. No.

4. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. No.

5. Do you feel well informed about the site's activities and progress? Yes – NCDEQ and AECOM have kept me informed about the progress being made with the OU1 and OU3 remedies.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? My comment to NCDEQ and AECOM is to keep up the good job they are doing at the Site.

7. What is the current status of construction (*e.g.*, budget and schedule)? Construction completion was achieved for the Site back in 2001. Both the OU1 and OU3 remedies have been in operation for many years.

8. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? One issue that was raised during the 2011 Five Year Review was to address levels of tetrachoroethene (or PCE) in surface water in a section of the northern drainage area. After Kinder Morgan's consultant AECOM successfully completed a pilot study in 2014, EPA wrote an ESD in 2015 to approve the use of angled injection using BOS-100™ to the existing OU3 remedy. The angled injection remedial action work has been completed, and data will be evaluated in 2016 to determine the effectiveness of the angled injection remedy.

9. Have any problems or difficulties been encountered which have impacted construction progress or implementability? Heavy rain during the past few months has hindered the collection and evaluation of data to determine the effectiveness of the angled injection work.

10. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)? No.

11. Is the remedy functioning as expected? How well is the remedy performing? I believe the OU1 and OU3 remedies continue to perform as expected.

12. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Yes. Levels of pesticides have been reduced due to the operation of the pump-and-treat system, as well as removal of the soil contamination during the OU2 remedy. Levels of VOCs in groundwater have been reduced over time due to removal of VOCs in the source area on the former textile property during the OU3 remedy.

13. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. No. The OU1 remedy and the OU3 remedy do not require a continuous O&M presence. The OU1 remedy requires groundwater sampling on a yearly basis. The OU3 remedy is monitored from a remote location, and maintenance activities conducted on short notice if needed.

FXC Statesville Site
Statesville, Iredell County, NC
EPA ID: NCD 095458527
Superfund Five-Year Review Report

Interview Questionnaire
Completed by Nile Testerman, NCDEQ RPM

1. What is your overall impression of the project? (general sentiment) Both active operable units are being managed well and the project continues to move forward.

2. What effects have site operations had on the surrounding community? At the moment site operations have little impact on the surrounding community.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. No concerns.

4. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. None

5. Do you feel well informed about the site's activities and progress? Yes. Our office receives monthly updates on the status of OU3.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? None.

7. What is the current status of construction (*e.g.*, budget and schedule)? The impact of the latest remedial activities (angled injections of BOS 100) are being monitored,

8. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? No.

9. Have any problems or difficulties been encountered which have impacted construction progress or implementability? No.

10. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)? No. The effectiveness of the latest remedial activities is being evaluated.

11. Is the remedy functioning as expected? How well is the remedy performing? Unsure as the effectiveness of the latest remedial activities is being evaluated.

12. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? OU1-Monitoring data indicate general downward concentration and little movement of the pesticide contamination. OU3-The effectiveness of the latest remedial activities is being evaluated.

13. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. No continuous on-site presence. The PRPs perform site visits more than once per month for OU3. Our office perform site visits on a semiannual basis for OU1.

APPENDIX E

NC DEQ O&M Report for OU1- 2015

North Carolina Department of Environment and Natural Resources
Division of Waste Management, Superfund Section
217 West Jones Street
Raleigh, NC 27603

OU-1 Monitored Natural Attenuation Operation & Maintenance Monitoring Well Sampling Report FCX-Statesville Superfund Site

Statesville, North Carolina
Dates of Study: November 12, 2014
NCD 095 458 527

NCDENR Remedial Project Manager: Nile Testerman
NC Superfund Section
217 West Jones Street
1646 Mail Service Center
Raleigh, NC 27699

NCDENR Operation & Maintenance Project Manager: Doug Rumford
NC Superfund Section
217 West Jones Street
1646 Mail Service Center
Raleigh, NC 27699

February 2015

TABLE OF CONTENTS

1.0 Introduction

On November 12, 2014, personnel from the Superfund Section of the Waste Management Division, North Carolina Department of Environment and Natural Resources (NCDENR) conducted a groundwater sampling investigation at the FCX-Statesville National Priorities List (NPL) Site located in Statesville, North Carolina. The work performed included annual sampling of ten monitoring wells existing on site. Sampling was conducted as part of the Operation & Maintenance (O&M) phase of the continued Monitored Natural Attenuation (MNA) of organochlorine pesticide contamination in groundwater.

Federally Funded (Fund-financed) remediation at this site consists of efforts to restore groundwater quality to conditions protective of human health and the environment. At such sites, the Remedial Action phase consists of active groundwater treatment and/or other remedial measures, until completion or for a maximum period of ten years. The subsequent Operation and Maintenance (O&M) phase consists of continued operations to support and confirm the effectiveness of the Remedial Action.

Pursuant to Section 300.510 (c) (1) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the State must assume responsibility for O&M at Fund-financed sites. This activity was undertaken by the State of North Carolina following completion of the ten-year Remedial Action (RA) period by the U.S. Environmental Protection Agency (USEPA) Region IV.

2.0 Background

The FCX-Statesville (FCX) Site is located at the intersection of Phoenix Street and West Front Street (Highway 90), approximately 1.5 miles west of downtown Statesville, Iredell County, North Carolina (Figure 1). The site consists of the former FCX property and the former Burlington Industries textile plant property to the north. The neighborhood is mixed residential and commercial.

FCX, Inc. repackaged and distributed agricultural chemicals on a 5-acre site from 1940 to 1985. Liquid and powdered pesticides were repackaged at the site until 1969. According to FCX, Inc., more than 5 tons of pesticides were buried under the facility's concrete warehouse floor prior to 1969. Spills also occurred in areas where pesticides were handled. FCX, Inc., filed for Chapter 11 bankruptcy status and began liquidating its assets in September 1985

From 1986 to 1990, on-site investigations revealed pesticide contamination in soil, and pesticide and volatile organic compound (VOC) contamination in groundwater. The Hazard Ranking System (HRS) was utilized to quantify a numerical score for the Site and qualify it for proposal and placement on the NPL. The Site was proposed for addition to the NPL in June 1988 with finalized listing occurring in February 1990.

The EPA conducted a Remedial Action/Feasibility Study (RI/FS) on site from 1991-1993. RI results indicated that VOCs in groundwater originated beneath the former Burlington property, north of the former FCX property. The EPA signed an Administrative Order on Consent (AOC) with Burlington Industries and El Paso Natural Gas Company (EPNG) to conduct a separate RI/FS to characterize the VOC contamination.

After expanding the site to include both the former FCX and former Burlington properties, the EPA divided the Site into three separate operable units (OUs), each with specific remedies. Operable Unit 1 consisted of pesticide-contaminated groundwater beneath the former FCX property and properties to the south. OU-1 groundwater remediation consisted of active remediation by extraction, treatment and discharge (pump-and-treat) combined with monitored natural attenuation for a period of 30 years. EPA signed the Record of Decision (ROD) for OU-1 in September 1993. Remediation commenced in 1998. The OU-2 and OU-3 ROD's were signed in November 1994 and September 1996, respectively, with OU-2 addressing soil contamination on the former FCX property and OU-3 addressing VOC contamination on and around the former Burlington property.

In September 2006, EPA amended the OU-1 groundwater remedy, removing active (pump and treat) remediation and leaving MNA in place. The Amendment additionally removed metals, VOCs, and semi-volatile organic compounds (SVOCs) as OU-1 Contaminants of Concern (COCs). The OU-3 remedy uses air sparging (AS), soil vapor extraction (SVE), and MNA technology to address soil and groundwater contaminated with VOC's on and around the former Burlington property. By May 2012, pesticide contaminant concentrations in groundwater appeared to have stabilized. Therefore on June 3, 2012, EPA approved a revision to the Sampling and Analysis Plan (SAP) such that the scope of work would be changed to allow for future groundwater sampling events to be conducted on an annual basis.

3.0 Previous sampling Results

EPA sampling in March and August 2008 detected four of the six pesticides identified in the ROD: alpha-BHC, beta-BHC, gamma-BHC and Dieldrin. ROD contaminants gamma-chlordane and heptachlor epoxide were not present, but delta-BHC and endrin ketone were each detected in one sample.

At Station MW1 (sample MW102GW) concentrations of the four detected ROD contaminants each exceeded their respective groundwater Remediation Goals (RGs). The sample also contained Delta-BHC (0.29 ug/l). At Station MW2 (sample MW202GW), alpha- and beta-BHC exceeded RGs. Gamma-BHC was detected below its RG. The sample also contained endrin ketone (0.92 ug/l). At Station MW3 (sample MW302GW), beta-BHC exceeded its RG. Gamma-BHC was detected below its RG.

The first sampling event conducted by NCDENR subsequent to assuming the responsibility for O&M by the State of North Carolina was performed during December 10-14, 2009. Laboratory analytical results from this event validated the historical data for ROD specified compounds provided by the USEPA. However, five additional pesticides not identified as ROD compounds; delta-BHC, 4,4'-DDE, Endrin, Endrin ketone, and Toxaphene, were also detected in samples MW-1, MW-2, and MW-3. Delta-BHC was detected in samples MW-1 and MW-3 at levels exceeding the North Carolina Administrative Code 2L (NCAC 2L) groundwater standard. Toxaphene was detected in sample MW-3 at a concentration that exceeded its NCAC 2L standard; 4,4'-DDE was also detected in this sample, however, a North Carolina groundwater standard does not exist for comparison.

4.0 Field Activities

4.1 Scope of Work and Sampling Protocols

Ten groundwater monitoring wells are presently specified for MNA sampling. Sample locations are illustrated in Figure 2 and summarized in Table 1. The Hydrasleeve no-purge sampling method consists of lowering one or more Hydrasleeve polyethylene bags (on a weighted tether) into a monitoring well's screened interval. Following a groundwater equilibration period (minimum two days), the unit is withdrawn from the well, filling the Hydrasleeve and "coring" a standing groundwater volume from the screen interval. Hydrasleeve units compatible with on-site monitoring wells measure 1.75 inch diameter and 36 inches or 48 inches in length; when filled, they produce sample volumes of 1.25 L or >1.5 L, respectively.

Monitoring well MW-23S characteristically contains a standing water column measuring approximately 3 to 6 feet, an interval considered marginally sufficient for Hydrasleeve sampling. Therefore, the alternative sampling method for this well is to install a pre-cleaned length of sample tubing into the screen interval. Following the groundwater equilibration period, the well will then be micro-purge sampled using a surface peristaltic pump.

During the December 14, 2010 sampling event, it was discovered that the weighted anchor attached to the tether holding the suspended Hydrasleeve in well MW-24S had become lodged within the well casing. After repeated attempts to dislodge the anchor, a determination was made to proceed with micro-purge sampling using the surface peristaltic pump. Future sampling of monitoring well MW-24S will be conducted via this method until such time as the weighted tether can be dislodged.

All groundwater samples were collected and handled in accordance with the **EPA Region 4** ***SESD Field Branches Quality System and Technical Procedures.*** Because the monitoring wells are allowed to pre-equilibrate with minimal pre-sample purging, no groundwater field parameter measurements (temperature, pH, conductivity, turbidity) were conducted. The Site Health and Safety Plan is included in Appendix A while the field activity notes and sampling log are included in Appendix B.

The following procedures were used during sample collection for all direct field measurements and sampling activities:

Measurement Procedures

SESDPROC-105-R2, Groundwater Level and Well Depth Measurement
SESDPROC-110-R3, Global Positioning System

Environmental Sampling Procedures

SESDPROC-305-R3, Groundwater Sampling
SESDPROC-203-R3, Pump Operation

4.2 Sample Analysis

Sample analysis was conducted in accordance with the SESD *Analytical Support Branch Laboratory Operations and Quality Assurance Manual, February 2008*. Samples were analyzed by EPA Method 8081 for organochlorine pesticides, including the following pesticides specified in the ROD:

alpha-BHC
beta-BHC
gamma-BHC (Lindane)
gamma chlordane
dieldrin
heptachlor epoxide.

4.3 Quality Control/Quality Assurance

Field quality control/quality assurance for this investigation consisted of one duplicate sample, collected at monitoring well MW-42I. The duplicate sample was identified MW-42I Duplicate. Matrix Spike/Duplicate samples were also collected from this location. No pesticides were detected in either the primary or duplicate sample. Based on these results, sample handling was apparently consistent and there were no apparent adverse impacts on sample quality as a result of either sample handling or analysis.

EON Products recently modified the design of their "Hydrasleeve" sampling equipment to include a rigid PVC "Top Collar", to enhance the performance of the device (now re-named "Supersleeve"). As a result, during the November 2014 sampling event, NC Superfund Section sampling personnel discovered that replacement samplers could no longer be "stacked" vertically within the inner casing of MW42i. Only one replacement sampler was installed at this monitoring well. Therefore, during future sampling events, duplicate and MS/MSD samples will instead be collected by peristaltic pump micro-purge, at monitoring wells MW23s and MW24s, respectively.

4.4 RGs and Investigation derived waste

Site-specific groundwater Remediation Goals designated by the amended OU-1 ROD include 0.01 ug/l for alpha-BHC and beta-BHC; 0.20 ug/l for dieldrin and gamma-BHC (Lindane); 0.50 ug/L for heptachlor-epoxide; and 0.10 ug/L for gamma-chlordane (as total chlordane). The sampling methods specified above do not generate a significant volume of purge water. The sampling materials (spent hydrasleeves and transfer tubing) will be disposed as solid waste.

The Sampling and Analysis Plan (SAP) for the Site O&M was developed, and groundwater sampling performed in accordance with the NC Superfund Section Quality Assurance Program Plan (Program Plan) and Quality Assurance Standard Operating Procedures (QASOP). The QASOP adopts by reference the Field Branches Quality System and Technical Procedures, U. S. Environmental Protection Agency, Region 4. The Program Plan is derived directly from the EPA-Approved NC Department of Environment and Natural Resources QA Project Plan for Data, 2008.

5.0 Investigation Results and Summary of Groundwater Analytical Data

The objective of this groundwater sampling investigation was to generate organochlorine pesticide results for the six pesticide compounds listed in the ROD for the Site. During the performance of the O&M sampling event at the former FCX Site, groundwater samples were collected from the utilized monitoring wells as described in Section 4.1. The observed concentrations were then compared to the established Remediation Goals for each compound.

The identification data and location of the wells sampled for this event are indicated on Table 1 and Figure 2 respectively. The summary of results for the Organochlorine Pesticide Analytical Data, and the RG for each of the site specific contaminants of concern, are found in Table 2. The laboratory Report of Analysis for all samples submitted to Shealy Environmental Services in included as Appendix C. The following discussion pertains to samples collected at stations MW-1, MW-2, MW-3, MW-5S, and MW-9. No organochlorine pesticides were detected in any of the other monitoring wells sampled for this investigation (MW-6S, MW-23S, MW-24S, MW27S, & MW-42I). Table 3, "OU-1 Historical Groundwater Analytical Results", summarizes the current as well as previous USEPA and NCDENR events sampling data; this data is also illustrated in Figures 4 through 8. All analytical results for the November 12, 2014 sampling event are illustrated on Figure 3.

5.1 ROD Compounds

All six of the pesticides identified in the ROD, alpha-BHC, beta-BHC, gamma-BHC (Lindane), gamma-Chlordane, Dieldrin, and Heptachlor epoxide were detected in samples collected during this investigation. The groundwater sample collected from monitoring well MW-1 contained ROD pesticide compounds alpha-BHC, beta-BHC, Dieldrin, and Lindane, at concentrations above the site RG. Monitoring well MW-3

contained ROD pesticide compound beta-BHC at a concentration above the site RG in groundwater while Lindane and Heptachlor epoxide were also detected at levels exceeding the NCAC 2L but below the site RG. A minor concentration of ROD pesticide compound gamma-Chlordane was also detected in the MW-3 sample.

5.2 Other Organochlorine Pesticide Compounds

Endosulfan I, Endosulfan sulfate, Endrin, and Endrin ketone were also detected in samples collected during this investigation. As no RG's for these compounds had been established in the ROD, the detected concentrations for each will be compared to the applicable NCAC 2L groundwater standard.

Samples MW-3, MW-5S, and MW-9 each contained elevated levels of Endrin ketone at concentrations being below the NCAC 2L. Endrin ketone was found to exceed the NCAC 2L standard in sample MW-2. Laboratory analysis revealed the presence of Endrin in samples MW-2 and MW-9 at concentrations below the NCAC 2L. The groundwater sample collected from monitoring well MW-3 contained detectable concentrations of Endosulfan I and Endosulfan sulfate.

6.0 Conclusions

Ten groundwater monitoring wells were sampled during the annual O&M phase of the FCX-Statesville OU-1 MNA remedy. The collected groundwater samples were submitted to Shealy Environmental Services and analyzed for organochlorine pesticides.

Ten organochlorine pesticide compounds, including all six of the OU-1 ROD specified compounds (alpha-BHC, beta-BHC, Lindane, gamma-Chlordane, Dieldrin, and Heptachlor epoxide) were detected in samples from two of the FCX wells (MW-1, and MW-3). Observed concentrations for alpha-BHC, beta-BHC, Dieldrin, and Lindane exceeded their respective RGs in the sample collected from monitoring well MW-1. The site RG for beta-BHC was exceeded in sample MW-3. A NC2L exceeding concentration of Heptachlor epoxide and a minor detection of gamma-Chlordane were also detected in sample MW-3. In addition, four other pesticides not identified as ROD compounds (Endosulfan I, Endosulfan sulfate, Endrin, and Endrin ketone) were also detected in samples MW-2, MW-3, MW-5S, and MW-9.

A general downward trend in the constituent concentrations was evident in monitoring well MW-1 during the sampling period of March 18, 2008 through July 7, 2010. However, there was a slight increase in three of the constituents (alpha-BHC, beta-BHC, and Lindane) from the December 2009 sampling event to the July 2010. This trend was repeated during the December 2010 sampling event. Results of the November 2014 sampling event indicate a sharp increase in Dieldrin concentration but a stabilization in the alpha-BHC, beta-BHC and Lindane concentrations.

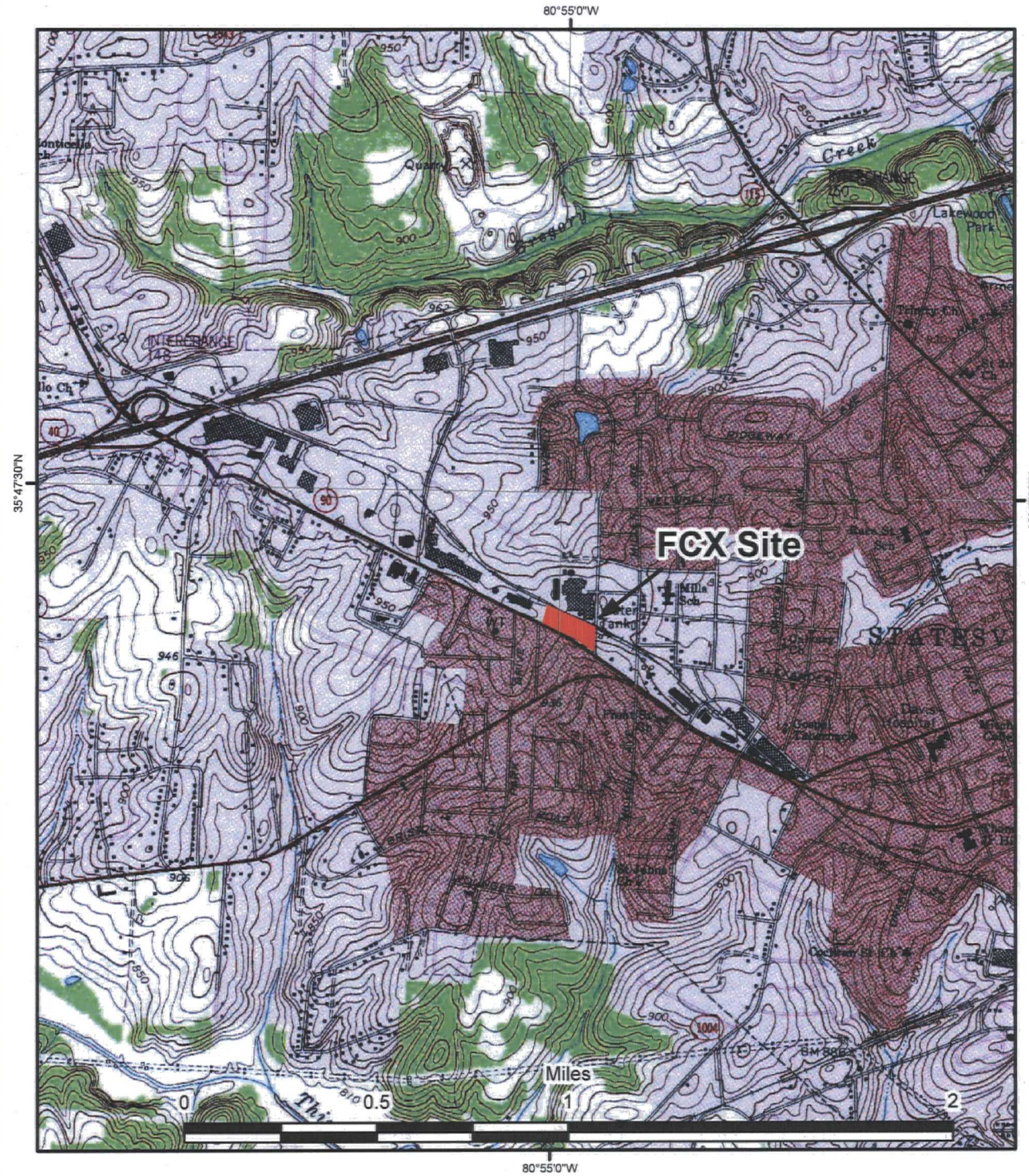
Constituent concentrations were relatively stable in monitoring well MW-2, with the exception of a general upward trend in Endrin and Endrin ketone concentrations. Monitoring well MW-3 saw a decrease in all detected constituents with a marked decrease in beta-BHC and Lindane concentrations since the last sampling event.

Monitoring well MW-9, which historically had never exhibited any detectable contaminant concentrations, unexpectedly showed elevated levels of both ROD and non-ROD organochlorine pesticides during the July 2010 sampling event. Significant increases of two non-ROD compounds, Endrin and Endrin ketone were demonstrated in the monitoring well MW-9 sample during the November 2014 sampling event.

Four of the wells with detectable concentrations of organochlorine pesticides (MW-1, MW-2, MW-3, and MW-5S) are located in close proximity to and generally down-gradient of the former FCX-Statesville structure on the North side of West Front Street. Monitoring well MW-9 is located upgradient and adjacent to the northeast corner of the former FCX-Statesville structure. No pesticides were detected in any of the samples collected from wells located down-gradient and south of West Front Street.

It should be noted that the property is currently operated in a warehousing type of capacity and that improvements to the general condition of the site have been made. In particular, debris has been removed from the drainage ditch along the railway easement and the gutter system for the building has been repaired. These two improvements now facilitate the proper drainage of site runoff and alleviate the problem of pooling surface water at the location of monitoring well MW-9. Also, site access is now fully restricted due to repairs made to the perimeter fencing.

FIGURES



N
W E
S

Map Extent:
Iredell County

County Location

Legend

Approximate Site Boundary

General Site Location	
Site Name:	FCX-Statesville Superfund Site
Site Number:	NCD 095 458 527
Scale:	1:23,288
Date:	1993 USGS Topo Quad. Statesville West March 17, 2010 map
Figure 1	Prepared by:

N
W E
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County Location

Map Extent:
Iredell County

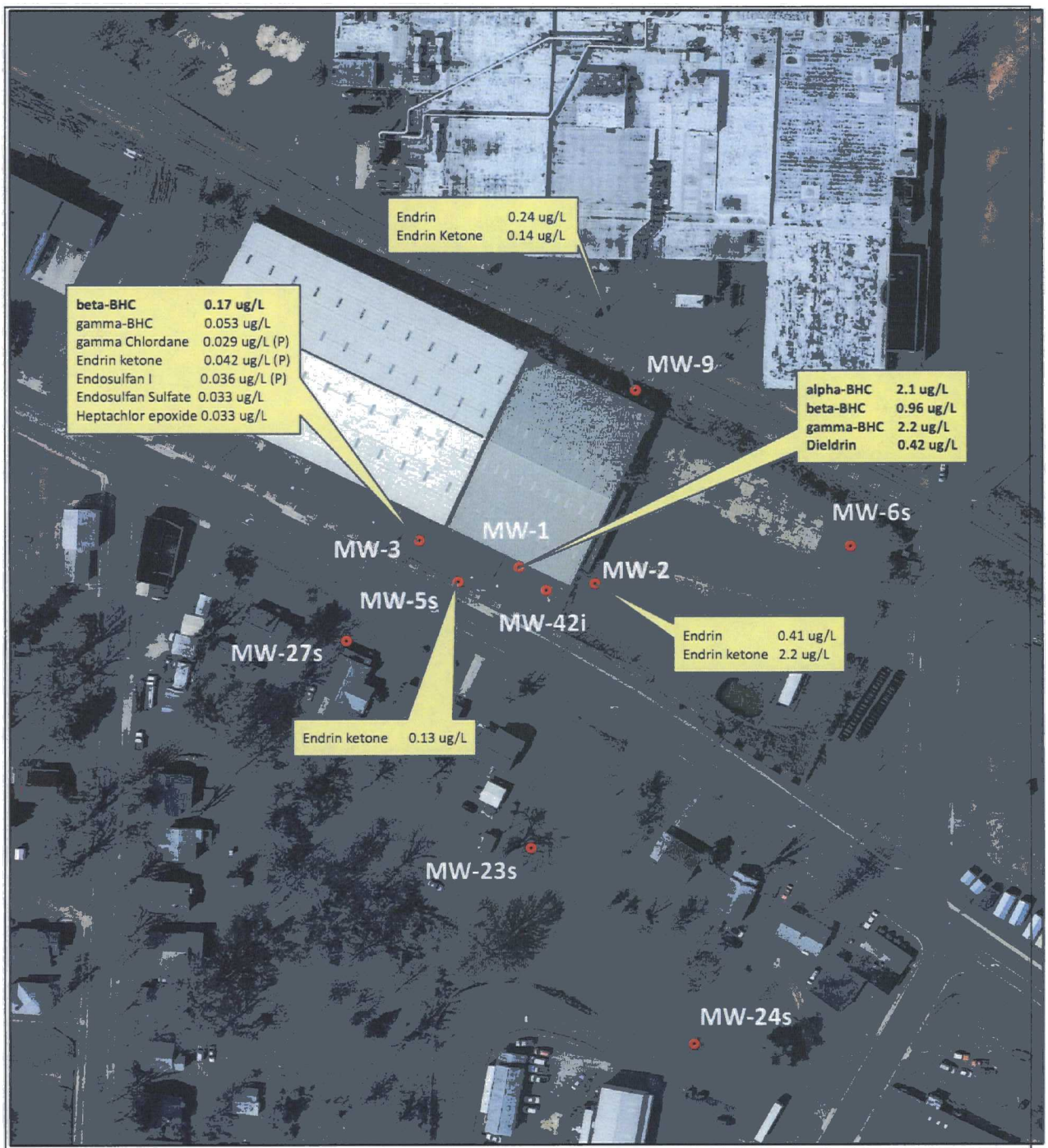
Legend

Monitoring Well

Approximate Site Boundary

Site Map with Monitoring Well Locations

Site Name:	FCX-Statesville Superfund Site
Site Number:	NCD 095 458 527
Scale:	1:2,000
Date:	2005 Aerial Image, March 17, 2010 map
Figure	2
Prepared by:	



N
W E
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County Location

Map Extent:
Iredell County

Legend

Monitoring Well

Approximate Site Boundary

Analyte concentration in well. **Bold** indicates values greater than ROD remediation level.

alpha-BHC	2.1 ug/L
beta-BHC	0.65 ug/L
gamma-BHC	2.1 ug/L
Dieldrin	0.11 ug/L

Site Map with Pesticide Concentrations as of 11/12/2014

Site Name: FCX-Statesville Superfund Site

Site Number: NCD 095 458 527

Scale: 1:1,540

Date: 2009 Aerial Image; January 10, 2013

Figure 3 | by: NCDENR DWM

Figure 4
Monitoring Well MW-1 Constituent Concentrations

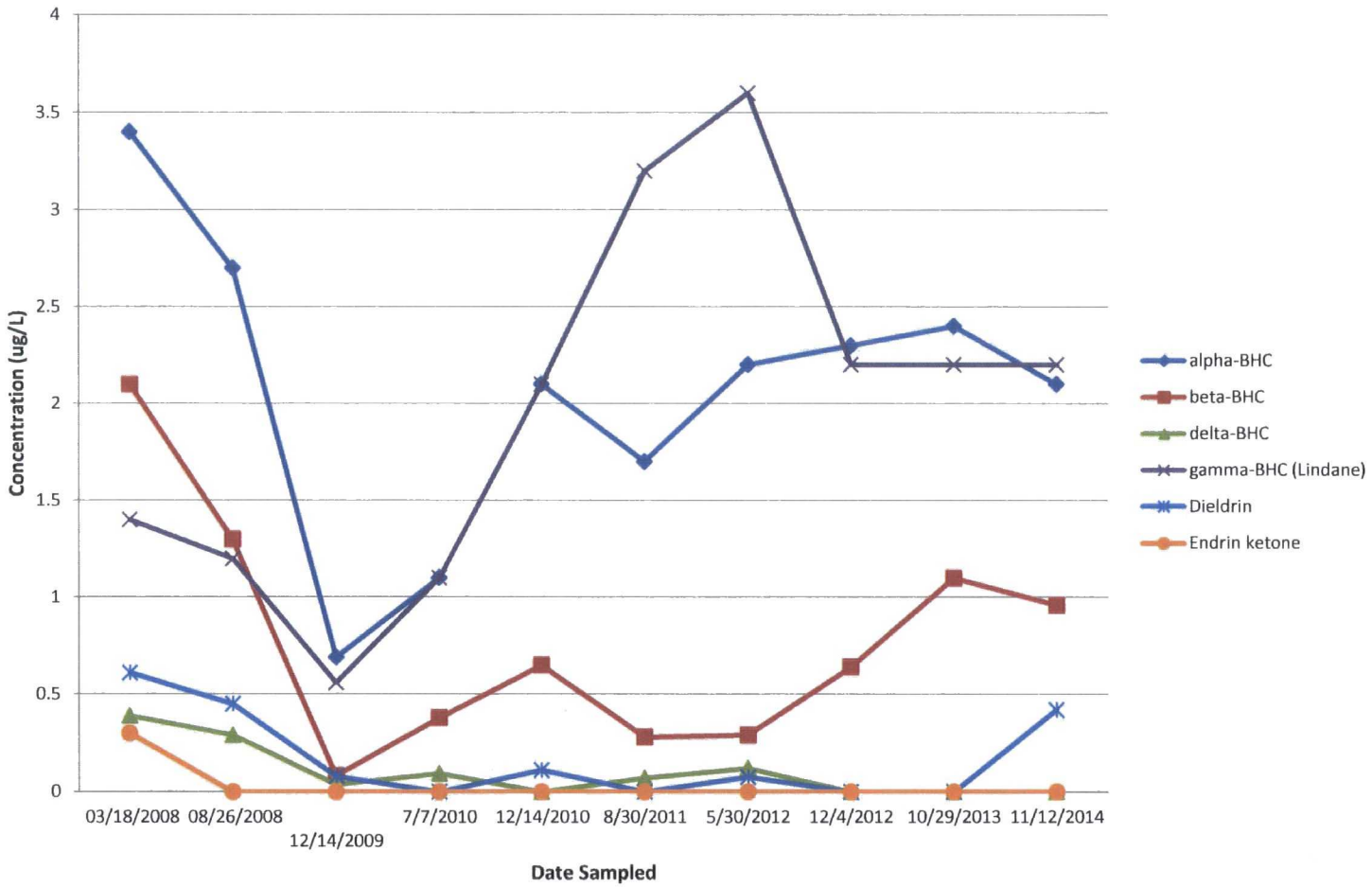


Figure 5
Monitoring Well MW-2 Constituent Concentrations

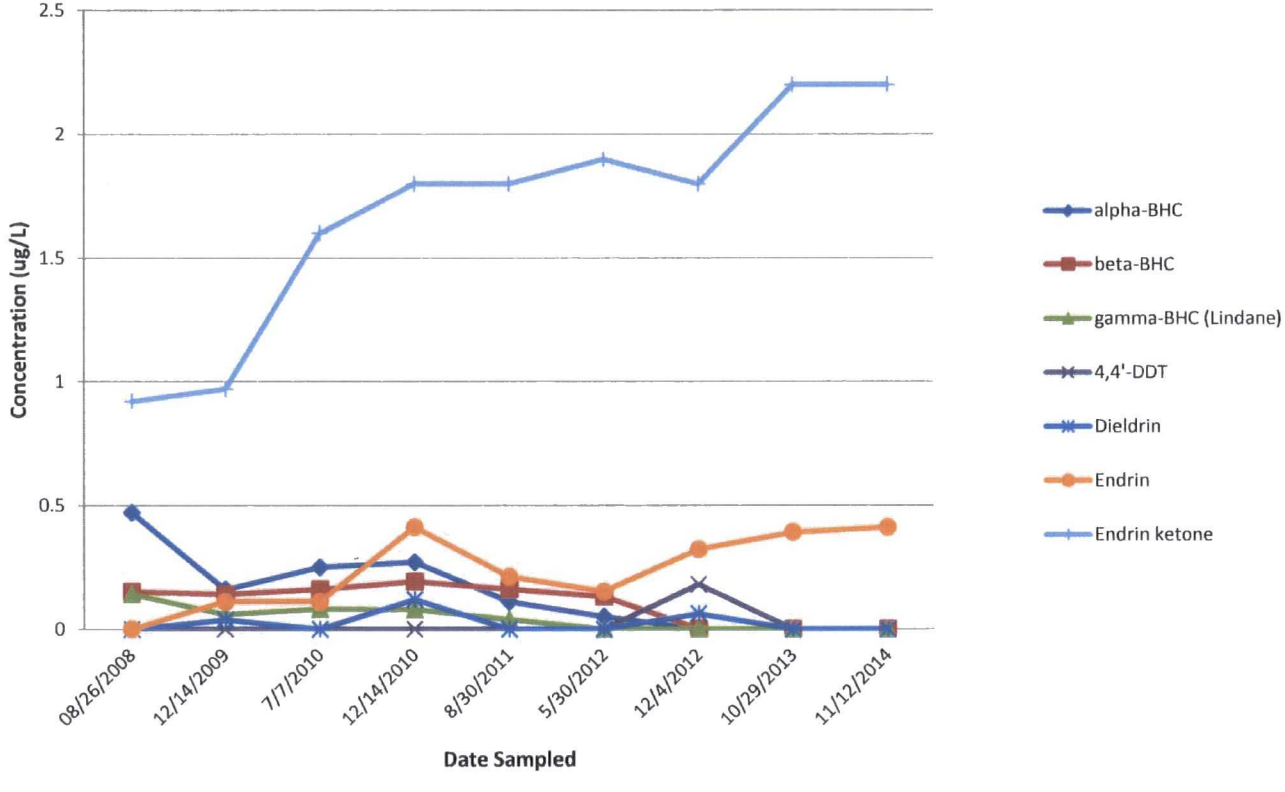


Figure 6
Monitoring Well MW-3 Constituent Concentrations

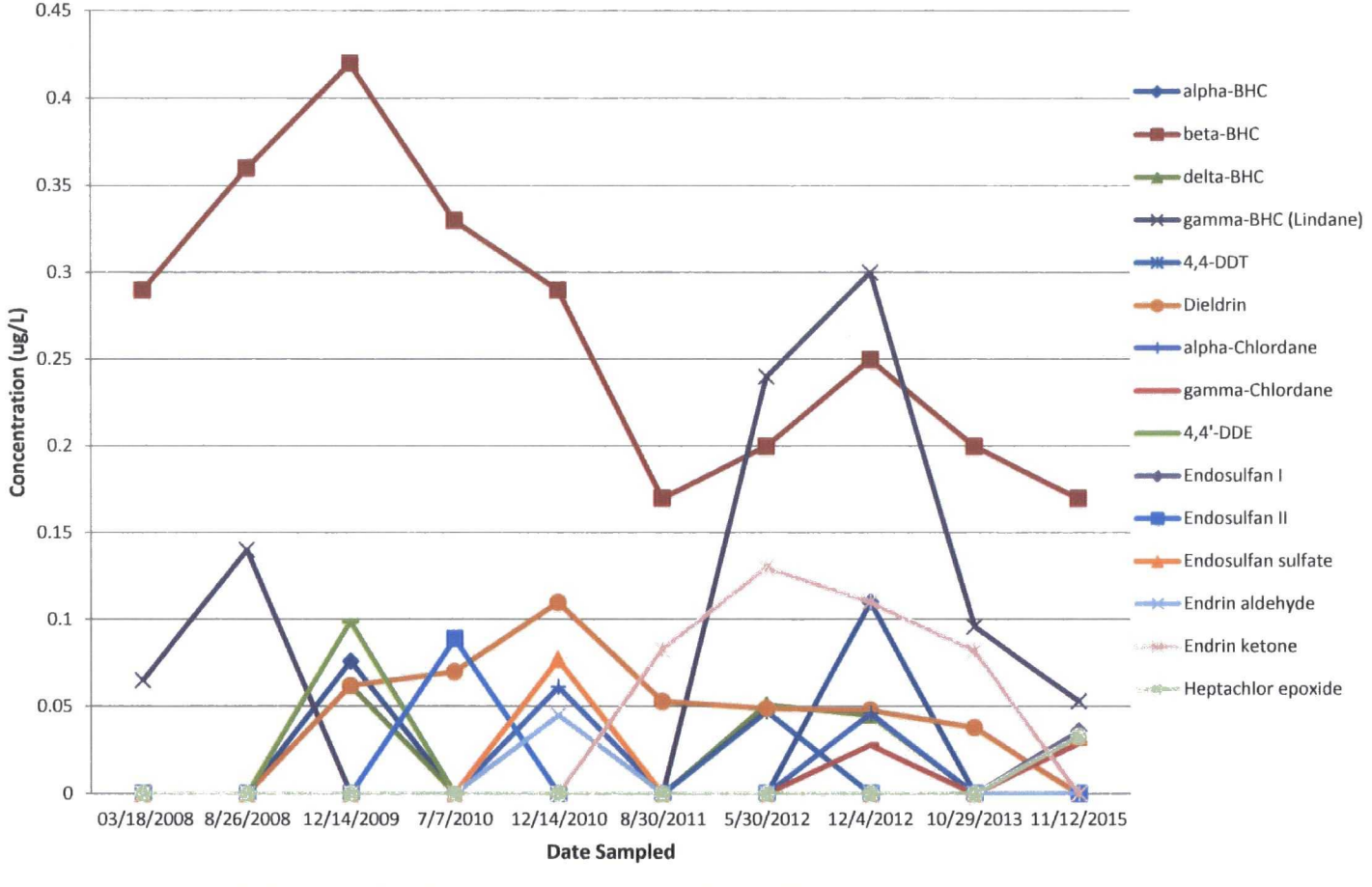


Figure 7
Monitoring Well MW-5s Concentrations

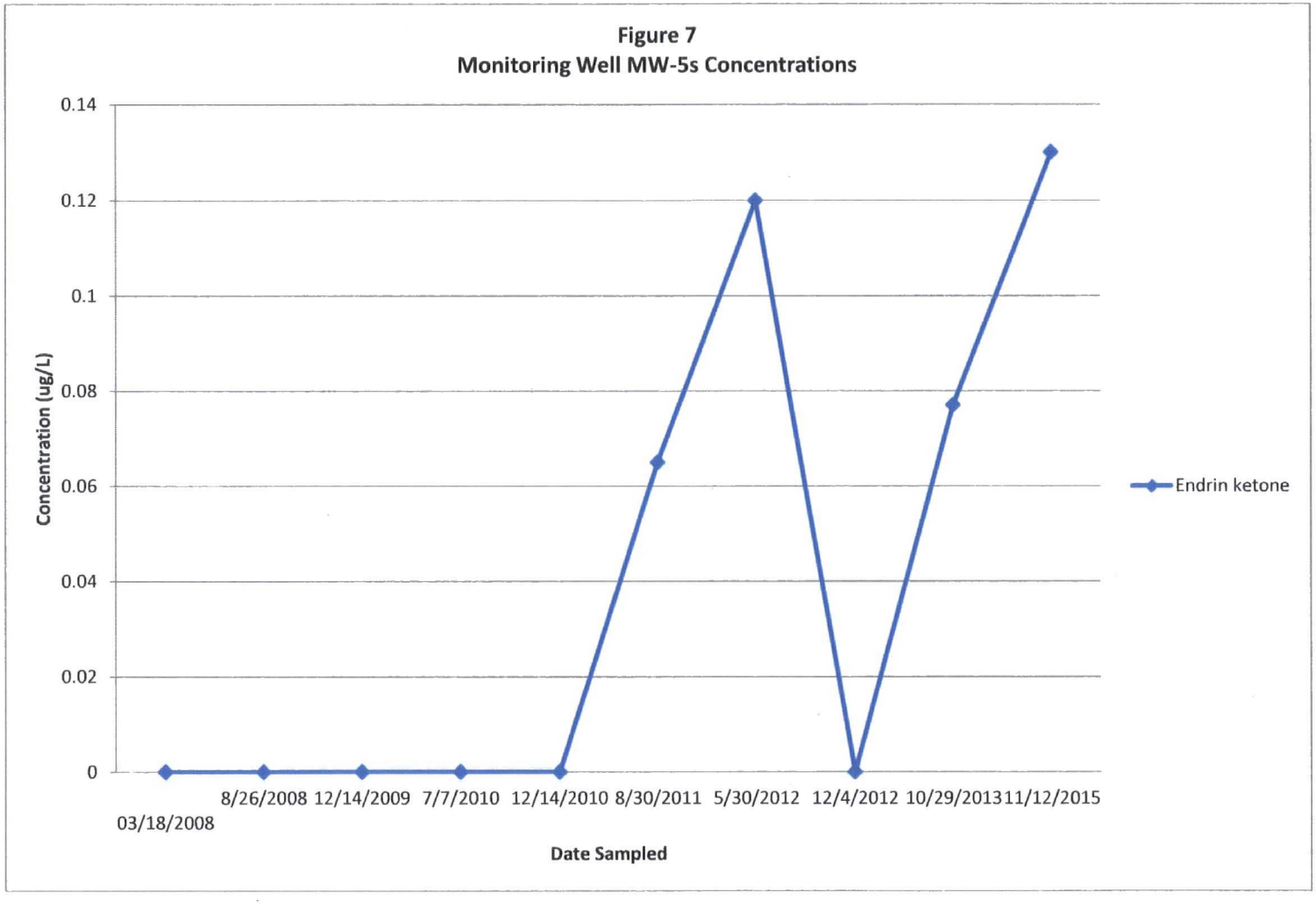
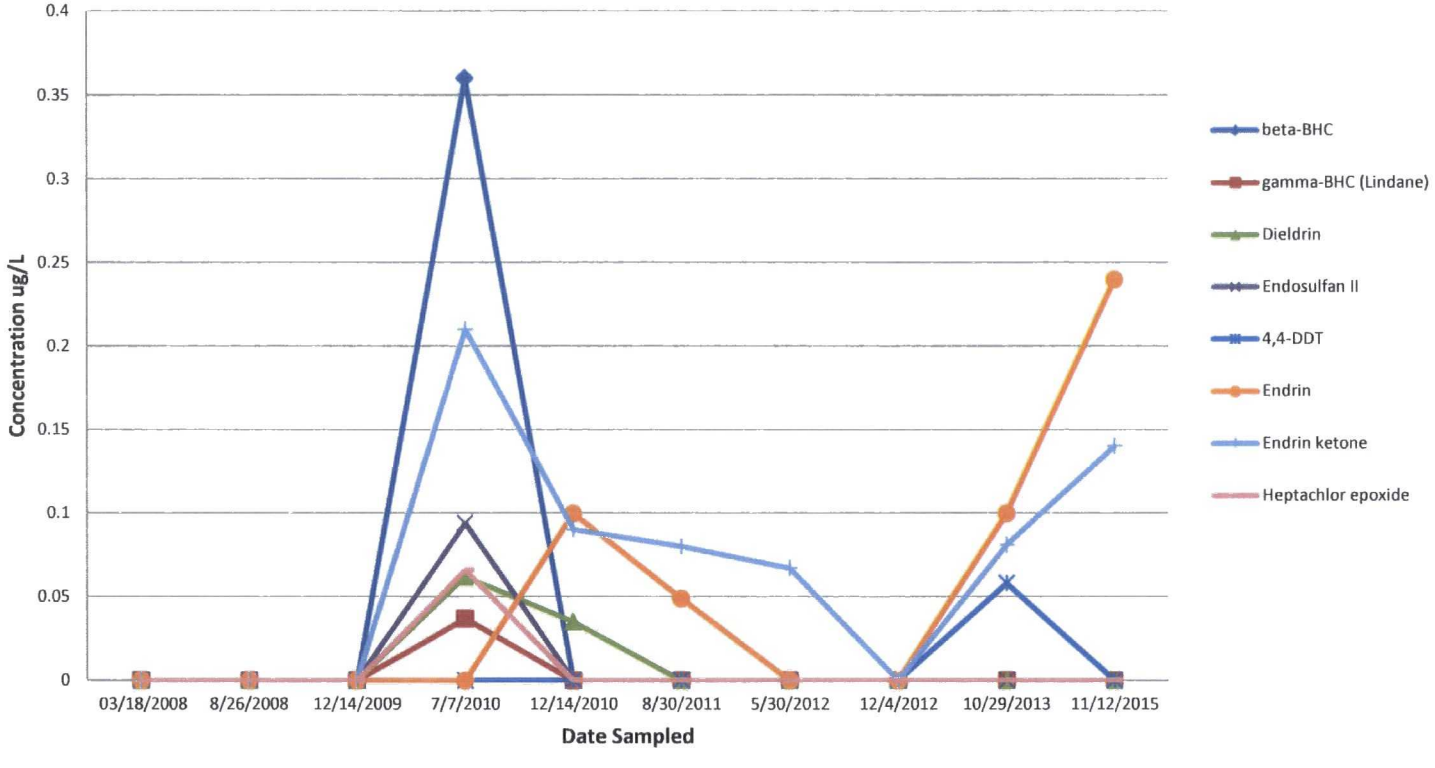


Figure 8
Monitoring Well MW-9 Constituent Concentrations



TABLES

Table 1
OU-1 Operation & Maintenance Summary of Sampling Locations
FCX-Statesville Site

Well ID	DENR Sample ID (Dec. 2010)	EPA Sample ID (April 2009)	Depth to Water (ft bgs) 11/12/2014	Casing Stick-Up (ft)	Total Depth (ft bgs)	Sampling Method
MW-1	MW-1	MW103GW	NS	2.30	40.90	Hydrasleeve no-purge
MW-2	MW-2	MW203GW	29.38	2.05	48.65	Hydrasleeve no-purge
MW-3	MW-3	MW303GW	N/A	1.80	48.75	Hydrasleeve no-purge
MW-5S	MW-5S	MW5S03GW	25.35	2.50	40.37	Hydrasleeve no-purge
MW-6S	MW-6S	MW6S03GW	27.56	4.35	50.29	Hydrasleeve no-purge
MW-9	MW-9	MW903GW	29.90	3.50	41.75	Hydrasleeve no-purge
W-23S	MW-23S	W23S03GW	16.15	Flush Mount	21.0	Peristaltic micro-purge
W-24S	MW-24S	W24S03GW	5.18	Flush Mount	20.82	Peristaltic micro-purge
W-27S	MW-27S	W27S03GW	NS	Flush Mount	41.46	Hydrasleeve no-purge
W-42I	MW-42I	W42I03GW	30.94	Flush Mount	88.50	Hydrasleeve no-purge

ft bgs : feet below ground surface
NS : not surveyed

Table 2
OU-1 Operation and Maintenance Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-1 11/12/2014	MW-2 11/12/2014	MW-3 11/12/2014	MW-5S 11/12/2014	MW-6S 11/12/2014	MW-9 11/12/2014	MW-42I 11/12/2014	MW-42I Dup 11/12/2014	MW-23S 11/12/2014	MW-24S 11/12/2014	MW-27S 11/12/2014
Pesticide Method 8081B (ug/L)													
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	**2.1**	-	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	**0.96**	-	**0.17**	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	**2.2**	-	0.053	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	0.029 P	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	**0.42**	-	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	0.036 P	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	0.033	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	0.41	-	-	-	0.24	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	2.2	0.042 P	0.13	-	0.14	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	0.033	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-	-	-

Notes:

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-1 03/18/2008	MW-1 08/26/2008	MW-1 12/14/2009	MW-1 7/7/2010	MW-1 12/14/2010	MW-1 8/30/2011	MW-1 5/30/2012	MW-1 12/4/2012	MW-1 10/29/2013	MW-1 11/12/2014
Pesticide Method 8081B (ug/L)												
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	**3.4**	**2.7**	**0.69**	**1.1**	**2.1**	**1.7**	**2.2**	**2.3**	**2.4**	**2.1**
beta-BHC*	0.02	0.01	**2.1**	**1.3**	**0.082**	**0.38**	**0.65**	**0.28**	**0.29**	**0.64**	**1.1**	**0.96**
delta-BHC	0.02	N/A	0.39	0.29	0.035	0.093	-	0.07	0.12	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	**1.4**	**1.2**	**0.56**	**1.1**	**2.1**	**3.2**	**3.6**	**2.2**	**2.2**	**2.2**
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	**0.61**	**0.45**	0.079	-	**0.11**	-	0.074	-	**0.68**	**0.42**
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	0.3	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-	-

Notes:

^ = Sample containers received by laboratory broken, no sample analysis

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-2 03/18/2008	MW-2 08/26/2008	MW-2 12/14/2009	MW-2 7/7/2010	MW-2 12/14/2010	MW-2 8/30/2011	MW-2 5/30/2012	MW-2 12/4/2012	MW-2 10/29/2013
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	**0.46**	**0.47**	**0.16**	**0.25**	**0.27**	**0.11**	**0.05**	-	-
beta-BHC*	0.02	0.01	**0.14**	**0.15**	**0.14**	**0.16**	**0.19**	**0.16**	**0.13**	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	0.15	0.14	0.059	0.081	0.079	0.039	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	0.18	-
Dieldrin*	0.002	0.1	-	-	0.037	-	**0.12**	-	-	0.062	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	0.11	0.11	0.41	0.21	0.15	0.32	0.39
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	0.92	0.92	0.97	1.6	1.8	1.8	1.9	1.8	2.2
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

^ = Sample containers received by laboratory broken, no sample analysis

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-2 11/12/2014	MW-3 03/18/2008	MW-3 08/26/2008	MW-3 12/14/2009	MW-3 7/7/2010	MW-3 12/14/2010	MW-3 8/30/2011	MW-3 5/30/2012	MW-3 12/4/2012
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	**0.076 P**	-	-	-	-	**0.11 P**
beta-BHC*	0.02	0.01	-	**0.29**	**0.36**	**0.42**	**0.33**	**0.29**	**0.17**	**0.2**	**0.25**
delta-BHC	0.02	N/A	-	-	-	0.062 P	-	-	-	0.051	0.045
gamma-BHC (Lindane)*	0.03	0.2	-	**0.065**	**0.14**	-	-	-	-	**0.24**	**0.3**
alpha-Chlordane	0.1	N/A	-	-	-	-	-	0.061	-	-	0.046 P
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	0.028 P
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	0.099 P	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	0.047	-
Dieldrin*	0.002	0.1	-	-	-	0.062	0.07	**0.11**	0.053	0.049	0.048
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	0.089 P	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	0.077 P	-	-	-
Endrin	2.0	N/A	0.41	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	0.045	-	-	-
Endrin ketone	2.0	N/A	2.2	-	-	0.16	0.22	0.17	0.083	0.13 P	0.11
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	**0.056**	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	15	-	-	-	-	-

Notes:

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P = The relative percent difference (RPD) between two GC columns exceeds 40%

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-3 10/29/2013	MW-3 11/12/2014	MW-5S 3/18/2008	MW-5S 08/26/2008	MW-5S 12/14/2009	MW-5S 7/7/2010	MW-5S 12/14/2010	MW-5S 8/30/2011	MW-5S 5/30/2012
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	**0.2**	**0.17**	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	0.096	0.053	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	0.029 P	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	0.038	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	0.036 P	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	0.033	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	0.082 P	0.042 P	-	-	-	-	-	0.065	0.12
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	0.033	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

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P = The relative percent difference (RPD) between two GC columns exceeds 40%

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-5S 12/4/2012	MW-5S 10/29/2013	MW-5S 11/12/2014	MW-6S 3/18/2008	MW-6S 08/26/2008	MW-6S 12/14/2009	MW-6S 7/7/2010	MW-6S 12/14/2010	MW-6S 8/30/2011
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	0.077	0.13	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-6S 5/30/2012	MW-6S 12/4/2012	MW-6S 10/29/2013	MW-6S 11/12/2014	MW-9 3/18/2008	MW-9 08/26/2008	MW-9 12/14/2009	MW-9 7/7/2010	MW-9 12/14/2010
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	**0.36**	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	0.037	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	0.062	0.035
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	0.094 P	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	0.1
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	0.21	0.09
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	**0.066 P**	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

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P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-9 8/30/2011	MW-9 5/30/2012	MW-9 12/4/2012	MW-9 10/29/2013	MW-9 11/12/2014	MW-23S 3/18/2008	MW-23S 8/26/2008	MW-23S 12/14/2009	MW-23S 7/7/2010
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	0.058	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	0.049	-	-	0.1	0.24	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	0.08	0.067 P	-	0.081	0.14	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-23S 12/14/2010	MW-23S 8/30/2011	MW-23S 5/30/2012	MW-23S 12/4/2012	MW-23S 10/29/2013	MW-23S 11/12/2014	MW-24S 3/18/2008	MW-24S 8/26/2008	MW-24S 12/14/2009
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-24S 7/7/2010	MW-24S ^ 12/14/2010	MW-24S 8/30/2011	MW-24S 5/30/2012	MW-24S 12/4/2012	MW-24S 10/29/2013	MW-24S 11/12/2014	MW-27S 3/18/2008	MW-27S 8/26/2008
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

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NCAC 2L = NorthCarolina Administrative Code groundwater standard

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Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-27S 12/14/2009	MW-27S 7/7/2010	MW-27S 12/14/2010	MW-27S 8/30/2011	MW-27S 5/30/2012	MW-27S 12/4/2012	MW-27S 10/29/2013	MW-27S 11/12/2014	MW-42I 3/18/2008
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

^ = Sample containers received by laboratory broken, no sample analysis

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

Table 3
OU-1 Historical Groundwater Analytical Results

FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-42I Dup 3/18/2008	MW-42I 8/26/2008	MW-42I Dup 8/26/2008	MW-42I 12/14/2009	MW-42I Dup 12/14/2009	MW-42I 7/7/2010	MW-42I Dup 7/7/2010	MW-42I 12/14/2010	MW-42I Dup 12/14/2010
Pesticide Method 8081B (ug/L)											
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-

Notes:

^ = Sample containers received by laboratory broken, no sample analysis

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

Table 3
OU-1 Historical Groundwater Analytical Results
FCX-Statesville Site

CONSTITUENT	NCAC 2L (ug/L)	ROD Remediation Level (ug/L)	MW-42I 8/30/2011	MW-42I Dup 8/30/2011	MW-42I 5/30/2012	MW-42I Dup 5/30/2012	MW-42I 12/4/2012	MW-42I Dup 12/4/2012	MW-42I 10/29/2013	MW-42I Dup 10/29/2013	MW-42I 11/12/2014	MW-42I Dup 11/12/2014
Pesticide Method 8081B (ug/L)												
Aldrin	N/A	N/A	-	-	-	-	-	-	-	-	-	-
alpha-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-	-
beta-BHC*	0.02	0.01	-	-	-	-	-	-	-	-	-	-
delta-BHC	0.02	N/A	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)*	0.03	0.2	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	0.1	N/A	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane*	0.1	0.1	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	0.1	N/A	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	N/A	N/A	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.1	N/A	-	-	-	-	-	-	-	-	-	-
Dieldrin*	0.002	0.1	-	-	-	-	-	-	-	-	-	-
Endosulfan I	40	N/A	-	-	-	-	-	-	-	-	-	-
Endosulfan II	40	N/A	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	N/A	N/A	-	-	-	-	-	-	-	-	-	-
Endrin	2.0	N/A	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	2.0	N/A	-	-	-	-	-	-	-	-	-	-
Endrin ketone	2.0	N/A	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.008	N/A	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide*	0.004	0.05	-	-	-	-	-	-	-	-	-	-
Methoxychlor	40	N/A	-	-	-	-	-	-	-	-	-	-
Toxaphene	0.03	N/A	-	-	-	-	-	-	-	-	-	-

Notes:

^ = Sample containers received by laboratory broken, no sample analysis

NCAC 2L = NorthCarolina Administrative Code groundwater standard

N/A = No criteria available

- = Not detected above the practical quantitation limit (PQL)

ug/L = micrograms per liter

Bold indicates results exceed ROD remediation level

Shaded cells indicate detection above NCAC 2L

P = The relative percent difference (RPD) between two GC columns exceeds 40%

* = Record of Decision (ROD) identified compound

APPENDIX F

Annual Remedial Action Progress Report for OU3- 2014

AECOM

Submitted to
El Paso Natural Gas Company
1001 Louisiana Street
Houston, TX 77252-2511

Submitted by
AECOM Technical Services of
North Carolina, Inc.
1600 Perimeter Park Drive
Suite 400
Morrisville, NC

Annual Remedial Action Progress Report - 2014

FCX (Statesville) Superfund Site (OU3)
Statesville, North Carolina

AECOM Project No. 60395109
June 2015

Table of Contents

Table of Contents (Continued)

List of Appendices

List of Tables

List of Figures

List of Acronyms

µg/L	Micrograms per Liter
12DCP	1,2 dichloropropane
ACM	Asbestos-Containing Material
ANA	Accelerated Natural Attenuation
AS	Air Sparge
AS/SVE	Air Sparging and Soil Vapor Extraction
B & C	Brown and Caldwell
bgs	Below Ground Surface
cDCE	cis-1,2-Dichloroethylene
COC	Constituent of Concern
CSM	Conceptual Site Model
CT	Carbon Tetrachloride
CY	Calendar Year
DHHS	Department of Health and Human Services
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DPT	Direct Push Technology
DWQ	Division of Water Quality
DWR	Division of Water Resources
EPA (or USEPA)	Environmental Protection Agency
EPNG	El Paso Natural Gas
ESD	Explanation of Significant Difference
FCX	Farmers Cooperative Exchange
f/cc	fiber per cubic centimeter
FS	Feasibility Study
GAC	Granular Activated Carbon
HRC-X™	Hydrogen Release Compound - Extended
IDW	Investigation-derived Waste
kg	Kilograms
L	Liter
MDL	Method Detection Limit
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
NAP	Natural Attenuation Parameters\
NC 2B standard	North Carolina Surface Water Quality Standard
NC 2L standard	North Carolina Groundwater Quality Standard
NCAC 15A	North Carolina Administrative Code Title 15A
NCDENR	North Carolina Department of Environment and Natural Resources
NIOSH	National Institute of Occupational Safety and Health
ORP	Oxidation-reduction Potential
OU3 (or OU-3)	Operable Unit 3
PCE	Perchloroethene (Tetrachloroethene)
PDI	Preliminary Design Investigation
PRB	Permeable Reactive Barrier
PVC	Polyvinyl Chloride
PWR	Partially Weathered Rock
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RI	Remedial Investigation
ROD	Record of Decision
scfm	standard cubic feet per minute
SF	square feet
SIM	Selective Ion Mode
SM	Standard Method

List of Acronyms (continued)

SVE	Soil Vapor Extraction
TCE	Trichloroethene
TOC	Total Organic Carbon
TSS	Total Suspended Solids
UIC	Underground Injection Control
URS	URS Corporation – North Carolina
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1 Introduction

This Annual Remedial Action Progress Report presents a summary of work conducted for Operable Unit Three (OU-3) at the FCX-Statesville Superfund Site (Site) between January 2014 and December 2014.

1.1 OU-3 Location

The FCX Superfund Site is located at the corner of West Front Street and Phoenix Street in Statesville, North Carolina as identified in **Figure 1-1**. Operable Units OU-1 and OU-2 are associated with pesticide contamination at the former FCX Site, and are not directly discussed in this report. These two operable units are being addressed by the United States Environmental Protection Agency (USEPA) Region IV and are not the responsibility of El Paso Natural Gas Company (EPNG). OU-3 consists of impacts associated with releases of chlorinated volatile organic compounds (VOCs), predominantly perchloroethylene (PCE), from the former Burlington Industries Textile Site at 201 Phoenix Street, shown on **Figure 1-2**. According to the Record of Decision (ROD), OU-3 consists of the extent of chlorinated constituents in soil and groundwater beneath the Site and in groundwater north and south of the Site (USEPA, September 1996). OU-3 is being addressed by EPNG.

1.2 OU-3 Remedy Background

The remedy prescribed in the ROD for OU-3 includes groundwater plume monitored natural attenuation (MNA) and active source control by means of air sparging and soil vapor extraction (AS/SVE). The AS/SVE system was installed in two phases between 2001 and 2003 and was expanded in 2009 and 2013. Historical and 2014 operations of the AS/SVE system are discussed in **Section 4**.

An Explanation of Significant Difference (ESD) for OU-3 was promulgated on September 8, 2006 (USEPA, September 2006). The ESD added Accelerated Natural Attenuation (ANA) to the ongoing MNA and AS/SVE remedies at the Site. The Phase I design for implementation of ANA was issued in March 2007 (B & C, March 2007). The design document included an updated groundwater monitoring plan which was implemented in calendar year (CY) 2007. The updated groundwater monitoring plan allows for future modification including the adjustment of monitoring wells, sample frequency, and analysis from event to event, as appropriate to monitor the stability of the constituent of concern (COC) plume.

In addition to presenting results of the April and October 2014 groundwater monitoring events, this document summarizes other work conducted during 2014 in support of the OU-3 remedial action including:

- AS/SVE System Progress Report 2014 (**Section 4**),
- Surface Water and Streambed Porewater Monitoring,
- Full-Scale Permeable Reactive Barrier (PRB) Injection Planning and Design, and
- Former Burlington Industries Building Asbestos Removal.

1.3 Project Team

Field work conducted for this project in 2014 was implemented by URS – North Carolina (URS) on behalf of EPNG. AECOM Technology Corporation (AECOM) and URS Corporation (URS) have officially combined as of October 20, 2014. As of January 5, 2015, URS will now be referred to as AECOM. This report has been generated by AECOM Technical Services of North Carolina, Inc. (AECOM). The intended audience is the USEPA and the North Carolina Department of Environment and Natural Resources (NCDENR).

1.4 Report Organization

In addition to this Introduction (**Section 1**), this report is organized into the following four sections:

- **Section 2** presents Site background information, including summaries of the geology and hydrogeology, and a summary of the conceptual site model (CSM).
- **Section 3** presents the 2014 groundwater monitoring data.
- **Section 4** presents a summary of the performance of the existing AS/SVE system.
- **Section 5** provides a summary of other tasks conducted during 2014 and planned tasks for 2015.
- **Section 6** lists references cited.

Tables, Figures, and Appendices are included following **Section 6**.

2 Site Geology, Hydrogeology, and CSM Summary

2.1 Geology

The Site is underlain by residual soils and saprolite formed through the physical and chemical weathering of the parent bedrock, which has been classified as gneiss and schist. Saprolite is defined as weathered bedrock that is in-situ and mimics the fabric of its parent material. The Site lithology and hydrogeology are extensively characterized in the CSM for the Site (URS, November 2008). For the purposes of this discussion, Site soils will refer to the interval beginning at the ground surface that extends to the top of the partially weathered rock (PWR) and are referenced as saprolite. The saprolite consists of reddish brown clay interspersed with sandy silts and silty sands. The contact with the underlying PWR appears gradational in the majority of the boring locations at the Site. PWR is compositionally the same as the unconsolidated saprolite, but contains more competent materials (i.e. rock fragments). The PWR zone is underlain by a transition zone that is mainly defined by auger refusal, the presence of rock fragments in the macro-core or auger cuttings, and rock fragments that are too fractured to be cored. The transition zone is underlain by fractured rock and finally by competent bedrock. The thickness of saprolite varies significantly across the Site, with observations ranging from 16 feet near the far downgradient monitoring point to the north (location W-31), to greater than 115 feet in a bedrock trough indicated north of the facility but south of the unnamed tributary to Gregory Creek (Northern Drainage Feature). In the Site area, the transition zone is generally comprised of greenish gray to light brown gravelly silt and/or sand. Generally in the Piedmont, the transition zone will be the most transmissive zone for groundwater. A conceptual geologic cross-section illustrating the various geologic zones is presented as **Figure 2-1**.

2.2 Hydrogeology

2.2.1 Groundwater Occurrence

Consistent with the typical groundwater systems of the Piedmont, the water bearing units at the Site form an upper groundwater system that includes saprolite, transition zone, and the underlying fractured gneiss and schist which generally becomes more competent with depth. The vast majority of monitoring wells are screened in the geologic units that comprise the upper groundwater system (i.e., the saprolite, transition zone, and intermediate bedrock). However, a few wells penetrated over 100 feet into the bedrock and monitor fractures that are more likely part of the lower groundwater system (i.e., wells W-20d, W-28d, and W-33d). **Table 2-1** presents a summary of wells at the Site. **Figure 2-2** and **Figure 2-3** illustrate monitoring well locations for the various units.

In 2014, depth to groundwater was measured in April and October as is presented on **Tables 2-2a** and **2-2b**, respectively. Groundwater generally occurs at depths ranging from approximately 1 foot below ground surface (bgs) or less near the surface water drainages north and south of the Site (e.g., W-20s and W-30t) to greater than 40 feet bgs (e.g., W-9i, W-15s, W-15i, W-16s, W-16i, W-17s, W-28i, and W-28d) in wells screened in the saprolite and transition units near the former Burlington Industries Building. Groundwater occurs at the greatest depths in the saprolite of this area. This is consistent with the limited infiltration that occurs as a result of the impermeable surfaces, which cover a large area, and the storm water collection system, which routes precipitation away from the building. Hydrostatic head in the bedrock zone has been observed to vary widely with groundwater occurring under artesian conditions at W-29i, to a depth of more than 48 feet bgs at well W-28d. During 2014, the maximum observed depth to groundwater was slightly more than 47 feet bgs at well W-15i.

2.2.2 Groundwater Flow

Precipitation enters the Site groundwater systems by percolating downward to the water table (i.e., phreatic surface) within the saprolite through unpaved areas, cracks in pavement and potentially through leaks in the storm water and sanitary sewer systems. This recharge sustains the lateral flow of groundwater toward discharge zones manifested as seeps or streams.

The water table in the saprolite and transition zones at the Site generally mimics the overlying topography. The general direction of lateral groundwater flow in the upper saprolite beneath the facility has historically been inferred as northward toward the intermittent tributary of the Northern Drainage Feature. South of the facility, the general direction of lateral groundwater flow in the saprolite has historically been inferred as southward toward the intermittent tributary of Third Creek (Southern Drainage Feature). Available potentiometric surface data from bedrock wells at the Site indicate the saprolite,

transition zone, and bedrock are interconnected hydrogeologic units. Lateral groundwater flow in bedrock has historically been inferred as toward the north and south (i.e., Gregory Creek and Third Creek, respectively) based on monitoring well water levels measurements.

2.3 Conceptual Site Model (Summary)

The following presents the major components of the CSM for the Site, including a general description of suspected PCE fate and transport across the Site. A discussion of suspected PCE fate and transport at the Site in the context of specific COC monitoring data, including 2014 and historical groundwater sampling results is presented in **Section 3**.

Releases of PCE and other chlorinated VOCs are inferred to have occurred from the source areas described in the previous section during a period of time when an active dry cleaning process was part of textile manufacturing activities (i.e., during the period between approximately 1961 and 1975).

The releases of PCE and, to a limited extent, other chlorinated VOCs have migrated predominantly in a vertical direction through the soil profile, with vadose zone soil impacts generally limited to the immediate vicinity of these former source areas. During the Remedial Investigation (RI), published in 1996, elevated concentrations of PCE and trichloroethylene (TCE) were detected in the soils and groundwater in the saprolite zone, with groundwater PCE concentrations in the major source areas exceeding 10,000 micrograms per liter (µg/L). The vertical mobility of PCE at this Site was likely exacerbated by the low organic carbon content in the saprolite, which limits retardation (sorption), as well as vertical profile heterogeneities in shallow saprolite soils.

Once Burlington Industries operations were deactivated, the addition of source material into the saturated zone ceased and downward vertical hydraulic driving heads were diminished. Since the majority of the source area is covered by impermeable surfaces (e.g., buildings and pavement), the infiltration of water, and thus the resulting flux to groundwater, has been limited. A source area investigation performed in 2011 indicated that, after approximately ten years of soil vapor extraction (SVE) operation, very little PCE mass remained in the vadose zone of the Site, further limiting the potential for additional PCE to enter groundwater. A remedial system expansion completed in 2013 was intended to improve mass removal in the few areas where PCE was detected in the vadose zone, while also enhancing groundwater treatment through expanded air sparging operations.

The historical releases of PCE and other chlorinated VOCs and dissolution of non-aqueous phase PCE has resulted in the development of a dissolved groundwater plume that has spread to the north and south of the release areas. Vertical hydraulic gradients in groundwater are mainly downward within the source area, facilitating the migration of dense non-aqueous phase liquid (DNAPL) and dissolved phase impacts into the fractured bedrock. Despite these gradients, the highest PCE concentrations in groundwater remain in the saprolite and transition zones. Fracturing within the bedrock unit appears limited and decreases with depth. Groundwater monitoring wells completed at a depth within the bedrock unit contain among the lowest concentrations of PCE at the Site.

Groundwater flows towards surface water features to the north and south of the Site, which include Gregory and Third Creeks and tributaries to these creeks. While vertical gradients are downward over the majority of the Site, upward gradients are observed near two surface water features referred to as the Northern and Southern Drainages, indicating groundwater from the Site is discharging to these drainages. This is consistent with the presence of a seepage area adjacent to the Northern Drainage Feature and the historic detections of PCE and its degradation products in the discharge from this seep. Based on historical PCE analytical data for groundwater; surface water; and streambed sediment porewater, as well as previous groundwater flow net analysis, the majority of PCE mass within the north area plume is suspected to be intercepted by vertical groundwater flow into the Northern Drainage Feature.

Soil gas has been sampled extensively on all sides of the former Burlington Industries Building. Data collected from 2007 to 2010 demonstrate that vapor intrusion is not a concern for any structures in the vicinity of the Burlington Industries Building. Assessment work at the N.B. Mills Elementary school in August and September of 2008 provided evidence that vapor intrusion is not occurring at the school. EPNG elected to perform two rounds of follow-up monitoring at the school in June and December 2010 to verify previously assessed conditions. In addition to samples collected near the school, samples were collected in areas north, west and south of the former Burlington Industries Building. Data gathered during semi-annual vapor sampling in 2009 and 2010, in combination with historical vapor sample data, demonstrate that concentrations of target compounds are stable and that vapor intrusion does not pose an actionable risk at the Site. Investigation of the vapor intrusion pathway has been completed and, absent a significant change in the disposition of the shallow groundwater plume, no further

assessment or monitoring is warranted. URS received agency authorization in 2012 to abandon the majority of off-site soil gas monitoring points. Soil gas monitoring points were abandoned in 2013 as documented in the Vapor Intrusion Abandonment Activities letter to the USEPA (URS, December 2013).

3 Groundwater Monitoring

3.1 Groundwater Sampling Approach

3.1.1 Groundwater Wells

Table 2-1 includes a summary of groundwater wells at the OU-3 Site. The locations of these wells are identified on **Figure 2-2** or **Figure 2-3**. Semi-annual groundwater monitoring is performed to provide data to assess the stability of the plume. During this reporting period, groundwater samples were collected during April 2014 and October 2014 and analyzed for VOCs, natural attenuation parameters field measurements, and/or laboratory-analyzed natural attenuation parameters. Methods of field and laboratory parameter analyses are summarized in **Table 3-1**. Water quality parameters measured in the field include: pH, temperature, specific conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP). Laboratory-analyzed MNA parameters include: alkalinity, chloride, nitrate, sulfate, and total organic carbon (TOC). Purge water developed during sampling events was disposed of according to the investigation-derived waste (IDW) handling procedures identified in Appendix J of the Quality Assurance Project Plan (QAPP) (URS, April 2009).

3.1.2 Groundwater Gauging

Table 2-1 includes a summary of groundwater wells at the OU-3 Site. The locations of these wells are identified on **Figure 2-2** or **Figure 2-3**. Semi-annual groundwater monitoring is performed to provide data to assess the stability of the plume. During this reporting period, groundwater samples were collected during April 2014 and October 2014 and analyzed for VOCs, natural attenuation parameters field measurements, and/or laboratory analyzed natural attenuation parameters. Methods of field and laboratory parameter analyses are summarized in **Table 3-1**. Water quality parameters measured in the field include: pH, temperature, specific conductivity, dissolved oxygen (DO) and oxidation-reduction potential (ORP). Laboratory analyzed MNA parameters include: alkalinity, chloride, nitrate, sulfate and total organic carbon (TOC). Purge water developed during sampling events was disposed of according to the investigation-derived waste (IDW) handling procedures identified in Appendix J of the QAPP (URS, April 2009).

3.1.3 Groundwater Sampling Procedures

Seventy-nine (79) monitoring wells were sampled between April 22 and April 25, 2014 and thirty-three (33) monitoring wells were sampled between October 14 and October 16, 2014. During the 2014 sampling events, most monitoring wells were sampled with passive sampling techniques. In these cases, GeoInsight Hydrasleeve™ brand samplers were utilized. Procedures for installation and sampling of Hydrasleeve™ samplers were consistent with the project QAPP (URS, April 2009). Hydrasleeves™ were installed a minimum of 48 hours prior to sampling. Samples were collected directly from the Hydrasleeve™. Subsequent to retrieval of the Hydrasleeves™, the wells were fitted with a new Hydrasleeve™ for additional sampling in October 2014 or later.

Field measurements of pH, specific conductance, temperature, DO, and ORP were collected using a portable water quality multimeter calibrated in the field in accordance with the manufacturer's instructions. The water quality meter was deployed to the appropriate screen interval in accordance with the Hydrasleeve™ sampling procedures described in the project QAPP (URS, April 2009). For well screen intervals too deep to be reached by the water quality meter cord, a disposable polyethylene bailer was used to collect a sufficient quantity of water for aboveground water quality parameter measurement. Water quality parameter readings were allowed to stabilize before being recorded on field data sheets.

Hydrasleeve™ sampling was not viable for monitoring well W-29i, which has historically exhibited artesian conditions. Monitoring well W-29i was sampled on April 23, 2015 by using a custom well-plug attached to ¼-inch tubing. The well was allowed to purge through the tubing under natural hydrostatic pressure. Purge water was directed into a flow-through cell to allow periodic water quality parameter measurements. Once field parameters stabilized, in accordance with stabilization criteria outlined in the project QAPP, the well was sampled via the discharge tubing.

All field measurements were recorded on field data sheets. The field data sheets are included as **Appendix B**. Representative field parameter measurements obtained at each well are summarized on **Table 3-2.**

Non-dedicated sampling equipment was decontaminated using a Liquinox™/distilled water solution followed by a distilled water rinse consistent with the project QAPP (URS, April 2009). Waste generated during the sampling event (i.e., purge water, decontamination water) and spent personal protective equipment (PPE) was contained for proper disposal. Manifests for purge water and decontamination residual disposal are included as **Appendix C.**

At the time of collection, the groundwater sample containers were appropriately labeled, placed on ice in a cooler, and shipped by FedEx to Accutest Laboratories (Accutest) in Orlando, Florida. Analytical results for natural attenuation parameters and VOCs are summarized in **Tables 3-2** and **3-3**, respectively. Groundwater samples collected in the field remained in the custody of a project representative until the samples were relinquished to FedEx. Shipments of samples to the laboratory included a completed chain-of-custody record to maintain documentation of personnel that had control of the samples. The results of the groundwater natural attenuation analyses are discussed in **Section 3.2**

3.1.4 Laboratory Analytical Methods

Groundwater samples collected during the 2014 sampling events were analyzed by Accutest, a North Carolina-certified laboratory. Accutest has a quality control (QC) program in place that is comparable to the USEPA Contract Laboratory Program, to ensure the reliability and usability of the analyses performed. Analytical procedures for Accutest are documented as standard operating procedures for the laboratory. These include the minimum calibration, quality assurance/quality control (QA/QC), and analytical and reporting requirements for each procedure. The groundwater samples collected and shipped to Accutest were analyzed for one or more of the following parameters: VOCs using USEPA Method 8260B (USEPA, December 1996), chloride, nitrate, and sulfate using USEPA Method 300 (USEPA, August 1993), alkalinity using SM19 2320B (Clesceri et al., 1998), and TOC by SM19 5310B.

Sampling and analysis QA/QC were assessed by the collection and analyses of field and laboratory QA/QC samples during each groundwater monitoring event in accordance with the QAPP. Field QA/QC samples included equipment blanks, trip blanks, and duplicates. Laboratory QA/QC samples included method blanks and matrix spike/matrix spike duplicates as appropriate for the methods used. The validation of laboratory-generated analytical data was conducted in accordance with the QAPP. The data review process was modeled after *Data Validation Standard Operating Procedures for Contract Laboratory Program RAS* (USEPA, October 1999) and *Contract Laboratory Program National Functional Guideline for Organic and Inorganic Data Review* (USEPA, October 1999 and October 2004, respectively). Validation of the laboratory data is included in **Appendix D** with laboratory analytical summary data sheets for the samples.

3.2 Groundwater Natural Attenuation Parameter Results

Groundwater sample analytical results and field measurements for natural attenuation parameters are summarized in **Table 3-2.** All laboratory reports for 2014 groundwater samples are presented in **Appendix D.** Historical natural attenuation field measurements and analytical laboratory data are presented in **Appendix E. Appendix E** also lists historical PCE and select PCE daughter product concentrations for ease of reference.

The strongest indications of natural attenuation at the Site include decreasing PCE concentration trends and the prevalence of PCE daughter products (see **Section 3.3**). In general, biological attenuation parameter results discussed in the following sections suggest that, although natural bioremediation of PCE is occurring to some extent, decreasing PCE concentration trends likely primarily result from active PCE mass reduction within the source area and physical attenuation processes, such diffusion and dispersion, within the dissolved plume that extends into saprolite, transition zone, and bedrock groundwater.

3.2.1 Source Area Saprolite Wells

Natural attenuation parameter investigations at the Site have focused on parameters indicative of PCE reductive dechlorination by anaerobic halorespiring bacteria. Significant degradation of source area PCE by anaerobic halorespiring bacteria is not anticipated due to the oxygenation generated by the air sparge system, which supports aerobic bacteria and hinders anaerobic bacteria. As expected, source area monitoring wells generally exhibit elevated DO and ORP values. It is possible that aerobic bacteria in the source area may remediate PCE daughter products such as cis-1,2-dichloroethylene (cDCE), but not the parent PCE. As such, the majority of source area PCE remediation is anticipated through the physical stripping and extraction action of the AS/SVE system.

3.2.2 North Area and South Area Saprolite and Transition Zone Wells

North area and south area saprolite and transition zone field parameter measurements generally suggest conditions incompatible with reductive dechlorination. Positive ORP values (>0) and DO concentrations greater than 1 mg/L indicate mostly aerobic geochemistry, possibly partially resulting from upgradient source area AS/SVE operations. In addition, several pH values in these areas fall below the optimal range for reductive dechlorination of 5 to 9. Monitoring wells located further downgradient (north) of W-40T exhibit similar elevated ORP and DO levels although pH values are generally increased within this area.

During 2014, natural attenuation parameter analytical samples were collected from five monitoring wells, W-20S, W-30T, W-40S, W-40T, and IW-06T, all screened within north area saprolite or transition zone soils. Detected concentrations of sulfate and nitrate were generally low, indicating that sulfate- and nitrate-reducing anaerobic microbes are not likely to degrade subsurface carbon sources otherwise available to halorespiring bacteria. As part of the proposed ANA remedy discussed in **Section 1.2**, an injection of extended hydrogen release compound (HRC-X®), a hydrogen and carbon source for halorespiring bacteria, was performed in 2007 along several rows transecting north area groundwater flow. Despite that injection, TOC concentrations were minimal during 2014 suggesting that halorespiring bacteria may not currently have a sufficient food source to effectively reduce PCE in the north area. Historical changes in alkalinity concentrations in the north area may reflect the effects of the 2007 injection, although alkalinity trends are generally inconsistent among the monitoring wells evaluated (**Appendix E**).

3.2.3 Bedrock Wells

North area and south area bedrock field parameter measurements suggest bedrock geochemistry is more compatible with reductive dechlorination than that observed in saprolite and transition zone wells. Several low ORP values (<0) and DO concentrations (<1 mg/L) indicate anaerobic geochemistry. In addition, pH values are generally higher in bedrock, although some measurements fall above the optimal range.

3.3 Groundwater VOC Analytical Results

Groundwater sample analytical results for VOCs are summarized in **Table 3-3.** All laboratory reports for 2014 groundwater samples are presented in **Appendix D. Appendix F** presents historical groundwater VOC results for the Site. **Figure 3-1** through **Figure 3-3** present summaries of PCE concentrations detected in 2014 in saprolite, transition zone, and bedrock monitoring wells, respectively. **Sections 3.3.1** through **3.3.4** provide a narrative description of historical trends and 2014 results for source area saprolite wells, north area saprolite and transition zone wells, south area saprolite and transition zone wells, and bedrock wells, respectively. The primary COC in groundwater is PCE. However, **Sections 3.3.1** through **3.3.4** each include a brief results summary for other VOCs detected during 2014.

Figure 3-4 presents a generalized cross-section of 2014 PCE concentrations along a north to south transect of OU-3. **Section 3.3.5** includes a discussion of this cross-section.

3.3.1 Source Area Saprolite Wells

For the purposes of this VOC results discussion, source area wells are defined by the former Burlington Industries Building footprint, as well as the loading dock and ancillary buildings north of the building (as represented by EW-12, EW-13, EW-15, and EW-18). This area is illustrated in the source area inset shown on **Figure 2-3**.

PCE was detected above the 0.7 µg/L limit prescribed by the North Carolina Administrative Code Title 15A (NCAC 15A) Subsection 02L.0200 (NC 2L standard) in 30 of the 30 source area saprolite wells sampled during 2014. The highest reported concentration of PCE was in well EW-8 (4,190 µg/L in April 2014 and 3,110 µg/L in October 2014). However, source area PCE concentrations have generally exhibited a significant downward trend since the AS/SVE system start-up in 2001. For example:

- EW-2, which historically contained PCE concentrations greater than 100,000 µg/L, exhibited PCE concentrations of 50.3 µg/L and 40.5J µg/L in April and October 2014, respectively.
- Eight source area monitoring wells have historically exhibited PCE concentrations above 10,000 µg/L (EW-5, EW-7, EW-10, EW-13, EW-15, EW-17, EW-20, and EW-21). During 2014, the highest PCE concentration detected in these wells was 1,340J µg/L in EW-21, while the PCE concentrations detected in the remaining seven wells averaged approximately 75 µg/L.

– Twenty-seven (27) of the source area monitoring wells sampled during 2014 have historically exhibited PCE concentrations greater than 1,000 µg/L. Wells EW-8, EW-4 (2,220 µg/L in April 2014 and 1,350J µg/L in October 2014), and EW-21 (1,350J µg/L in April 2014) were the only three of these monitoring wells to exhibit PCE concentrations above 1,000 µg/L during 2014.

Source area PCE concentration decreases can generally be attributed to the operation of the AS/SVE system. Recent PCE concentration decreases, such as decreases in groundwater samples collected from EW-13, EW-15, EW-17, and EW-21, are likely attributable to the 2009 AS pilot test and 2013 system expansion. Further discussion of the effects of the AS/SVE system on recent PCE concentration trends is presented **Appendix G**.

TCE and cDCE are recognized as common products of PCE degradation. Both constituents were also detected in the source area. Of the 30 source area saprolite monitoring wells sampled during 2014, 24 contained detectable concentrations of TCE. Of the wells containing detectable TCE, 12 wells contained TCE above the NC 2L standard of 3 µg/L. The cDCE concentration in EW-8 (414 µg/L) represents the only exceedance of the 70 µg/L NC 2L standard in source area saprolite wells during 2014. Vinyl chloride, the final chlorinated constituent in the most common PCE dechlorination pathway, was below the laboratory method detection limit (MDL) for all source area wells sampled in 2014 except for well MP-8 (2.2 µg/L in April 2014 and 2.6 µg/L in October 2014). In general, concentrations of PCE daughter products are much lower than the corresponding source area PCE concentrations. These data sets indicate that biodegradation is limited in the source zone, which is consistent with the data discussed in **Section 3.2**.

Carbon tetrachloride (CT) was detected at nine source area wells (EW-6, EW-7, EW-8, EW-18, EW-20, EW-21, MP-3, and MP-7) above the NC 2L standard. These wells are all generally located in the southeastern section of the source area. The primary degradation product of CT is chloroform, which was detected in many of the source area wells below the NC 2L standard. Other VOCs that were detected above the NC 2L standards in the source area include: 1,1,2,2 tetrachloroethane (EW-22), 1,2 dichloropropane (12DCP) (EW-3, EW-8, EW-20, EW-21, and EW-22), and bromodichloromethane (EW-12). Concentrations of CT, 12DCP, and chlorinated ethanes at the Site have historically been very low in comparison with PCE. In addition, maximum source area well concentrations for 1,4 dioxane, which was analyzed for the first time during 2014, were 219 µg/L and 11.8 µg/L in wells EW-16 and EW-13, respectively. As such, these compounds are considered to be secondary COCs.

3.3.2 North Area Saprolite and Transition Zone Wells

The boundary of NC 2L standard exceedances within the north area saprolite and transition zone wells is currently defined by W-18S to the east, W-11S to the west, and W-88S and W-88I to the north. Concentrations of PCE were below NC 2L standards in each of these wells during 2014. W-11S, W-88S, and W-88I PCE results have historically been below the laboratory MDL while W-18S PCE concentrations have historically fluctuated around the NC 2L standard and have been below the NC 2L standards during 7 of the 8 most recent sampling events.

The highest PCE concentrations outside of the source area have historically been detected in saprolite wells W-19S, MP-16, and MP-17 and transition zone wells W-30T, IW-4T, IW-5T, and IW-6T. These wells are located near the centerline of the dissolved phase plume directly downgradient (north) of the source area. W-19s and MP-16 were not sampled during 2014 but have exhibited elevated (above 1,000 µg/L) and stable PCE concentrations during the period of record. MP-17 PCE concentrations have historically fluctuated between approximately 1,000 and 2,000 µg/L but decreased from 1,990 µg/L in April 2013 to 74 µg/L in April 2014. Although further monitoring is warranted, the decrease may be partially attributable to upgradient AS/SVE system improvements during 2013. PCE concentrations in IW-4T, IW-5T, and IW-6T were elevated during 2014 (1,840 µg/L, 912 µg/L, and 4,550J µg/L, respectively) but have gradually decreased from historical maximums (8,230 µg/L, 1,270 µg/L, and 14,900 µg/L, respectively). PCE was detected at 2,490 J µg/L in the October 2014 W-30T sample, consistent with historical results.

Historical results in downgradient northern plume wells W-37S, W-37T, W-38S, W-38T, and W-39S demonstrate that as groundwater moves further north of the source area within the saprolite and the transition zone, PCE concentrations are reduced via physical and biological processes. PCE concentrations in these wells have historically ranged from approximately 100 to 500 µg/L and, despite apparent PCE mass removal within the source area, have been relatively stable during the period of record. One exception to this stability is a decreasing trend observed in saprolite well W-39S, which exhibited a PCE concentration of 1.2 µg/L during 2014, down from a historical maximum of 468 µg/L. Monitoring wells W-37S and W-37T were not sampled during 2014, and PCE concentrations were detected in W-38S and W-38T at 303 J µg/L to 165 µg/L, respectively.

2014 results for monitoring wells W-20S, W-40S, W-40T, W-89-25, W-90-29, W-92-50, W-93-20, and W-95-15 demonstrate that PCE concentrations remain within the 100 to 500 µg/L range as groundwater approaches the Northern Drainage Feature. Based on several lines of evidence, including porewater sample results presented in **Appendix H,** groundwater flow net analysis (URS, February 2013), and historical results for wells located north and south of the Northern Drainage Feature (**Appendix F**), it is suspected that the majority of PCE mass within the north area plume is intercepted by vertical groundwater flow into the Northern Drainage Feature. This conclusion is supported by a comparison of maximum 2014 PCE concentrations in adjacent saprolite and transition monitoring wells; PCE concentrations in W-20S, W-40S, W-40T, URS-MW-2, URS-MW-2D, W-89-25, W-90-29, W-92-50, W-93-40, and W-95-15 (located south of the Northern Drainage Feature) averaged approximately 200 µg/L during 2014 while PCE concentrations averaged only 2 µg/L in W-88S, W-88I, W-91-15, W-94-15, and W-94-15 (located north of the Northern Drainage Feature). As such, the northern boundary of the PCE plume, historically defined by monitoring wells W-31S, W-88s, and W-88I, is principally controlled by the hydraulic divide imposed on groundwater by the Northern Drainage Feature.

The presence and magnitude of other COCs in groundwater north of the source area has historically mimicked the pattern exhibited by source area wells; elevated concentrations of PCE with moderate concentrations of daughter products TCE, cDCE, and vinyl chloride and low intermittent detections of CT and 12DCP. During 2014, TCE, cDCE, vinyl chloride, CT, and 12DCP were detected above the NC 2L standard in one or more north area saprolite or transition zone monitoring wells. North area results for 1,4 dioxane were generally below MDLs or present at trace concentrations. Based on these findings for north area groundwater, 1,4 dioxane is not likely present above laboratory MDLs or the level set forth by NCAC 15A Subsection 02B.0200 (NC 2B Standards) in Northern Drainage Feature surface water.

3.3.3 South Area Saprolite and Transition Zone Wells

PCE concentrations within the south area are generally lower than concentrations observed in the north area, likely resulting from the relative location of the north-south hydraulic divide and the generally stronger northward hydraulic gradients. PCE has not been detected above 1,000 µg/L in any south area monitoring well during the period of record (see **Appendix F**).

The boundary of NC 2L standard exceedances within south area saprolite and transition zone wells is currently defined by W-4S and W-6S to the east and W-2S, MW-4, and MW-8 to the west. PCE concentrations in W-4S, W-2S, and MW-4 were below laboratory MDLs or NC 2L standards during 2014. Monitoring wells W-6s and MW-8 were not sampled during 2014 but have historically exhibited non-detect PCE concentrations.

The highest PCE concentrations within the south area plume have historically been detected in saprolite wells W-3S and W-5S and transition zone well W-41T. PCE concentrations in W-3S, W-5S, and W-41T have decreased over time from historical maximums of 880 µg/L, 380 µg/L, and 6.4 µg/L to April 2014 concentrations of 99.1 µg/L, 21.7 µg/L, and 0.56 J µg/L, respectively. Historical results for saprolite monitoring wells south of W-41T exhibit fragmented and generally low PCE concentrations at or below NC 2L standards. Although not sampled during 2014, PCE results for W-22S, W-23S, W-25S, W-27S, MW-1, MW-3, MW-7, MW-9, and MW-10 were below laboratory MDLs during the most recent sampling event for each well (see **Appendix F**). Similarly, historical non-detect PCE concentrations in MW-5S were further validated by a non-detect result in April 2014. Concentrations in W-24S and MW-2 have gradually decreased from historical maximums of 3.5 µg/L and 69 µg/L to April 2014 concentrations of 1.0 µg/L and 0.82J µg/L, respectively. Based on the fragmented and generally minimal PCE concentrations described above and historically low PCE results for W-24S, the southern boundary of NC 2L standard exceedances in saprolite and transition zone wells can be roughly defined by W-24S.

During 2014, TCE was detected above the NC 2L standard in samples collected from both W-3S and W-5S and cDCE and vinyl chloride were detected above their NC 2L standards in W-5S. Chlorinated ethanes 1,1,1 trichloroethane and 1,1 dichloroethane have historically been detected at higher concentrations in W-5S than in any other monitoring well on-site, including the source area saprolite wells discussed in **Section 3.3.1**. April 2014 concentrations of 1,1,1 trichloroethane and 1,1 dichloroethane in MW-5S have decreased significantly from historical maximums but remain above their respective NC 2L standards.

3.3.4 Bedrock Wells

As may be expected, the highest PCE concentrations in bedrock during 2014 were observed in monitoring wells relatively close to the source area, including IW-1 (118 µg/L), W-28I (99.5 µg/L), IW-3 (43.4 µg/L), and W-5I (44.2 µg/L). Concentrations in the remaining monitoring wells sampled during 2014 are generally lower by an order of magnitude or more, reflecting diffusion, dispersion, and chemical and biological degradation of PCE as groundwater in bedrock flows away from source area.

Exceedances of the NC 2L standard for PCE in bedrock are partially bounded by W-13I to the east (0.45 J µg/L), W-2I, W-9I, and W-26I to the west (0.43J µg/L, <0.26 µg/L, and 0.35J µg/L, respectively), and W-31I to the north (<0.26 µg/L). The outer lateral limit of NC 2L standard exceedances of PCE in bedrock can also be roughly estimated based on relatively low 2014 results for W-88D to the north (2.2 µg/L), W-10I to the east (6.4 µg/L), W-32I to the south (0.72 J µg/L), and W-12I to the west (0.71 J µg/L).

Historical PCE concentration data for bedrock monitoring well samples demonstrate a widespread decreasing trend on all sides of the building. Of the 21 bedrock monitoring wells sampled during 2014, 14 have exhibited an appreciable decrease in PCE concentration during the period of record. Of the seven remaining wells, four wells have consistently exhibited low or non-detect PCE concentrations including results at or below the NC 2L standard during 2014. In contrast, monitoring wells W-5I, W-10I, and IW-3 have exhibited generally stable PCE concentrations during the period of record and exhibited concentrations of 206 µg/L, 7.6 µg/L, and 84.3 µg/L, respectively, during 2014. The highest historical PCE concentrations in bedrock were observed in W-28I (4,300 µg/L) and W-30I (2,300 µg/L), which exhibited PCE concentrations of 99.5 µg/L and 10.7 µg/L, respectively, during 2014.

Other VOCs detected above the NC 2L standard in bedrock were limited to TCE in W-5I, W-20I, W-28I, W-42I, and IW-1; vinyl chloride in W-5I, W-20I, W-33I, and W-42I; 1,1 dichloroethane in W-5I and W-42I; 12DCP in W-20I, W-20D, W-30I, and W-33I; and 1,2, dichloroethane and 1,1,2 trichloroethane in well W-1I.

3.3.5 Cross-Section Profile

Figure 3-4 presents 2014 PCE concentrations along a north to south transect of OU-3. The cross-section depicts that the majority of the dissolved PCE mass is within the source area and in saprolite and transition zone wells north of the source area. As discussed above in **Section 3.2.2**, this PCE mass travels further north, where it is diluted and degraded through diffusion, dispersion, and chemical or biological degradation. These attenuation processes result in saprolite and transition zone PCE concentrations on the order of 100 µg/L to 500 µg/L, which ultimately discharge into the Northern Drainage Feature. A trace amount of PCE mass appears to pass under the Northern Drainage Feature as demonstrated by detectable PCE concentrations in W-88D.

As discussed above in **Section 3.3.3**, PCE mass also travels south from the source area as reflected by low and historically decreasing concentrations in W-5S, W-5I, W-24S, and W-29I. As the original source area mass diminishes, dissolved PCE concentrations to the south are expected to continue to decrease through various attenuation factors, including reductive dechlorination (as indicated by the dominant presence of daughter products in well W-5S), and dilution / dispersion (as indicated by the steady decrease in concentrations detected in W-3S).

As discussed above in **Section 3.3.4**, PCE also travels downward into bedrock below the source area, as indicated by concentrations in IW-1 (118 µg/L), W-28I (99.5 µg/L), IW-3 (43.4 µg/L), and W-5I (44.2 µg/L). PCE mass travels outward in bedrock, resulting in a plume with a slightly larger footprint than the saprolite and transition zone plume with generally lower PCE concentrations. Due to significant remediation of source area PCE mass, the overall plume footprint is expected to remain stable or shrink in saprolite, the transition zone, and bedrock groundwater.

4 AS/SVE Performance

4.1 Historical AS/SVE Operations Summary

The RI and Feasibility Study (FS) were completed for the Site in 1996. EPA Region IV executed the ROD for OU-3 on September 30, 1996. The AS/SVE and MNA remedy prescribed by the ROD and subsequent ANA ESD are described in **Section 1.2**.

The original construction for the AS/SVE system included the installation of several concentric design monitoring wells. The wells, designated EW-, MP-, or SW-, are shown on **Figure 2-3**. All MP wells and EW- wells 1 through 24 were constructed in a similar concentric fashion with a 2-inch sparge well installed within a 4-inch extraction well. The extraction well sections consist typically of 24 feet of screen between approximately 17 feet to 41 feet bgs. The sparge well portion was inserted within the extraction well, and consists of a 2.5-foot long well screen installed above auger refusal, which varies within the building between 46 feet bgs at EW-20 to 59 feet bgs at EW-11. All concentric design EW- wells (EW-1 through EW-24) have been utilized as SVE wells. Sparging has only been conducted through five of these wells: EW-1, EW-2, EW-4, EW-17, and EW-23 (also referred to as SW-1, SW-2, SW-4, SW-17, and SW-23). The lower 2.5-foot sparge screens have also been used for groundwater monitoring at all EW- and MP- well locations.

While approximately 6,250 kilograms (kg) (13,750 pounds) of PCE had been extracted via SVE by 2008, the rate of PCE mass removal had declined to less than 10 kg per year (URS, August 2009). While the data indicated effective vadose zone remediation, concentrations of PCE within the source area groundwater monitoring points remained elevated. In 2009, three new dedicated sparge wells designated AS-25, AS-26, and AS-27 were installed at the Site. Air Sparge (AS) well locations are illustrated on **Figure 2-3**. The objective of the project was to improve upon air sparging implementation by using dedicated sparge points rather than concentric design sparge points co-located with extraction wells. Operation of the new sparge wells resulted in an increase in PCE mass removal and an initial decrease in groundwater concentrations in monitoring wells adjacent to the new AS well locations. The pilot test was performed between September 15, 2009 and April 23, 2010 and was documented in the *Air Sparge Pilot Test* report (URS, November 2010). Wells AS-25, AS-26, and AS-27 were operated in place of the original AS wells throughout 2010 and 2011. However, air flow in the pilot test wells consistently decreased over time. In May of 2012, air injection was reinitiated at SW-17, SW-2, and SW-4 while air injection at AS-25, AS-26, and AS-27 continued.

An investigation work plan was developed and implemented in 2011 to assess whether shallow sources of PCE remained on the Site. The results of this work are summarized in the *Source Area Investigation Report* (URS, May 2012). Following completion of the source area investigation, a system expansion work plan was developed and submitted to the USEPA and NCDENR for approval (URS, March 2013). Source area remediation system expansion included the addition of four AS wells and four SVE wells in 2013. Three additional dedicated SVE wells were installed (EW-25, EW-27, and EW-28) and one existing concentric design monitoring point (MP-4) was converted to an SVE well (also referred to as EW-26). In addition, two AS wells (AS-25R and AS-27R) were installed to replace AS pilot test wells AS-25 and AS-27, which had clogged over time and did not provide sufficient air flow for treatment. Finally, two new dedicated AS wells (AS-28 and AS-29) were installed in areas of persistent elevated PCE concentrations in groundwater. All AS and SVE well locations except for EW-27 and EW-28 are illustrated on **Figure 2-3**. The locations of EW-27 and EW-28 are shown on **Figure 2-2**. Further discussion of the 2009 pilot test and 2013 expansion including evaluation of relevant source area groundwater sampling data is presented in **Appendix G**.

4.2 2014 AS/SVE Operations Summary

The AS/SVE progress report for 2014 is attached as **Appendix G**. Current remediation well locations are shown on **Figure 2-2** and **Figure 2-3** and available well construction information is presented in **Table 2-1**. All "EW" wells were operated during 2014 SVE operations. AS operations were limited to wells AS-26, AS-28, AS-29, AS-30 and AS-31 during 2014. AS-26 was taken offline in September 2014 after repeated flow measurements of zero standard cubic feet per minute (scfm).

Summary and conclusions from the AS/SVE performance data are as follows:

- Since AS/SVE operations began in 2001, the system has removed an estimated total PCE mass of 6,479 kg. An estimated 56 kg were removed during the 2014 reporting period.
- The SVE and AS equipment operated 94.6 percent during the target operating period. This percentage was primarily affected by temporary shut downs during O&M activities and groundwater sampling.
- 2014 SVE inlet vapor concentrations have decreased since 2013 but remain above pre-system expansion levels.
- Prior to the AS pilot test, SVE system PCE removal had followed a conventional logarithmic decay pattern and did not appear to be removing meaningful amounts of VOCs from the subsurface. Following reconfiguration of the AS/SVE system to utilize wells AS-25, AS-26, and AS-27, mass removal increased in late 2009, and subsequently remained relatively stable from 2010 to 2012. After the system expansion in 2013, a substantial increase in removal was observed. Throughout 2014, PCE removal decreased from the previous reporting period but remained elevated above levels prior to the system expansion.
- Site O&M activities performed during 2014 included monthly on-site O&M, as needed condensate management, and several miscellaneous maintenance activities including automatic tank drain valve replacement, replacement of the system HMI computer with a touchscreen, and completion of an arc flash survey for site electrical components.
- PCE effluent concentrations are such that granular activated carbon (GAC) treatment is not required for regulatory purposes and the generation of nuisance odors is implausible. GAC vessel replacement was not required during the reporting period and is not anticipated in the future at the Site.
- The volume of condensate removed from the drip traps and liquid separator during the reporting period was 921 gallons. Waste manifests for condensate transport and disposal in 2014 are included in **Appendix C**.

5 Other 2014 Activities

The purpose of this section is to identify and briefly discuss the purpose and results of additional work conducted in support of the overall OU-3 remedy in 2014. Reports summarizing these investigations either have been previously submitted to USEPA and NCDENR, will be generated and submitted separately, and/or are provided as appendices to this report.

5.1 Surface Water and Porewater Sampling

In 2014, several surface water sampling activities were conducted as described in the *Surface Water Work Plan* (URS, February 2009). These activities were conducted in accordance with the 2012 request from NCDENR Division of Water Quality (DWQ) to conduct surface water sampling on a quarterly schedule.

Surface water sampling activities have predominantly been performed within a small stream running along the northern boundary of the Site, referred to as the Northern Drainage Feature. Based on historical exceedances of the limit set forth by the NC 2B standard for PCE in Northern Drainage Feature surface water, EPNG has performed several additional investigations as well as a 2013 pilot test injection of BOS-100®. The pilot test injection and ongoing full-scale injection design activities are discussed in **Section 5.2.** Expanded surface water sampling, as well as sampling and analysis of Northern Drainage Feature porewater, was performed during 2014 to evaluate the injection pilot test and to support a full-scale injection design.

The 2014 surface water sampling activities are documented in quarterly surface water monitoring reports provided to NCDENR and USEPA. Northern Drainage Feature porewater sampling activities have been documented in the *Injection Pilot Test Summary Report* (URS, August 2014) and the *Injection Work Plan* (URS, March 2015). The results are summarized in the following sections.

5.1.1 Surface Water Sampling Activities

Surface water samples were collected from sixteen discrete locations (URS-SW-02, URS-SW-03, URS-SW-05, URS-SW-09, URS-SW-15, URS-SW-16, URS-SW-22, URS-SW-T4, URS-SW-A, URS-SW-B, URS-SW-C, URS-SW-D, URS-SW-D2, URS-SW-E, URS-SW-F, and URS-SW-G) during the first and second quarters in 2014. During the third and fourth quarter, only twelve of the locations listed above were sampled; samples were not collected at locations URS-SW-A, URS-SW-B, URS-SW-C, and URS-SW-G during the third and fourth quarters of 2014. All sample locations except for SW-URS-9 and URS-SW-15 are within the Northern Drainage Feature and are shown on Figure H-1 of **Appendix H**. Sample location URS-SW-09 is located in a separate drainage feature located south of the Site (Southern Drainage Feature). Sample location URS-SW-15 representing groundwater seepage prior to discharge into the Northern Drainage Feature.

Surface water samples were analyzed quarterly for total suspended solids (TSS) and the following VOCs: PCE, TCE, cDCE, and vinyl chloride. Samples were also analyzed for general water quality indicator parameters including: pH, temperature, specific conductance, ORP, and DO.

5.1.2 Surface Water Analytical Results

Surface water analytical results are presented in Table H-1 and Table H-2, both included in **Appendix H.** Table H-1 presents the December 2014 surface water sample data and Table H-2 summarizes historical surface water sample results through December 2014.

Analytical data for URS-SW-05, the downstream Northern Drainage Feature sample location, remained at or below laboratory method detection limits for PCE and its daughter compounds in 2014. These analytical results are consistent with the previous sampling events. However, as shown on Table H-1 of **Appendix H**, several surface water samples contained PCE concentrations which exceed the NC 2B standard of 3.3 µg/L. No VOCs other than PCE were detected above their respective NC 2B standard during 2014, consistent with historical results.

Surface water sampling results appear to indicate stable and decreasing PCE concentrations adjacent to and down-stream of the BOS-100® pilot test injection area (i.e. URS-SW-D, URS-SW-D2, and URS-SW-3) during 2014 (Table H-1 of **Appendix H**). While there may be many contributing factors to this result, it is reasonable that the pilot test injections are at least in part attributable for these reductions. However, PCE detections at these locations are within the historical range of pre-injection fluctuations and additional monitoring at these locations is required to assess the performance of the pilot test and the proposed full-scale injection.

5.1.3 Porewater Sampling Activities

Prior to and following the pilot test injection a total of 21 piezometers, including six co-located piezometer pairs, were installed within the Northern Drainage Feature streambed (Figure H-2 of **Appendix H**). The piezometers allow sampling and analysis of water within streambed sediment pores (porewater) approximately 2 to 4 feet below the streambed surface. Installation and sampling procedures and analytical results for the six co-located piezometer pairs were described in the *Injection Pilot Test Summary Report* (URS, August 2014). The remaining nine piezometers (PZ-99, PZ-100, and PZ-107 through PZ-113) were installed in early May 2014 using the same installation procedures.

Samples were collected from the six original piezometer pairs on five occasions beginning in October 2013, including sampling events in February 2014 and May 2014. All of the 21 piezometers were sampled during May 2014. All piezometer samples have been analyzed for site-specific VOCs specified in the QAPP. Several samples were also analyzed for chloride. Finally, piezometer samples were analyzed in the field for pH, ORP, specific conductivity, temperature, and DO.

5.1.4 Porewater Analytical Results

Porewater analytical results are presented in Table H-3 of **Appendix H**. Porewater data essentially represent the PCE concentrations in groundwater at the leading edge of the plume, just prior to entering the Northern Drainage Feature surface water. As such, the data are useful for designing and assessing the performance of remediation intended to mitigate Northern Drainage Feature surface water PCE impacts. Based on historical PCE concentration trends shown in Table H-3 of **Appendix H** for piezometers located adjacent the pilot test injection (PZ-101S/D through PZ-104S/D), the injection has formed a successful barrier and significantly reduces the PCE mass migrating into streambed porewater and eventually into surface water. Sampling results for May 2014 indicate remaining elevated PCE concentrations northeast of the injection area (PZ-105S/D and PZ-106S/D) as well as moderate PCE concentrations further northeast (PZ-111 through PZ-113) and southwest (PZ-99 and PZ-100) of the pilot test injection area. These data are useful for full-scale injection design purposes.

5.2 Full-Scale Injection Design

As described above, a pilot test injection of BOS-100® was performed adjacent to the Northern Drainage Feature during October and November of 2013. The pilot test included injections into 689 intervals across 43 injection points evenly spaced approximately 5 feet apart. Injections were performed at multiple intervals, generally spaced 1.5 feet apart, between approximately 6 and 34 feet bgs. Individual injection loading ranged from 1 to 35 pounds, with a total of 7,350 pounds of BOS-100® injected during the pilot test. All injections were performed through direct push technology (DPT) drilling rods pushed into the ground at an angle of approximately 65-degrees from level towards the Northern Drainage Feature. The intent of the angled injection was to form a PRB by placing BOS-100® perpendicular to groundwater flow, including vertical groundwater flow pathways beneath the streambed. The pilot test injection was documented in the *Injection Pilot Test Summary Report* (URS, August 2014) and was summarized in the *Annual Remediation Progress Report - 2013* (URS, June 2014).

URS subsequently submitted the *Injection Work Plan* (URS, March 2015), which described proposed Site preparation activities, two injection phases (Phase 1 and Phase 2), and proposed performance monitoring. Activities planned for 2015 are discussed further in **Section 5.6**.

5.3 Asbestos Abatement

URS, on behalf of EPNG, subcontracted NEO Corporation (NEO), a North Carolina accredited asbestos abatement contractor, to remove asbestos containing material (ACM) from several portions of the main building and boiler room building at the Site. ACM removal was proposed based on the results of an inspection performed by Hygeinetics Environmental Services, Inc. in 2004 and subsequent surveys conducted by URS in 2009 and 2011.

Prior to ACM abatement, NEO procured applicable approval and permits from the North Carolina Department of Health and Human Services (DHHS) Health Hazards Control Unit. On November 4, 2014, a North Carolina-accredited air monitor with

Matrix Health and Safety Consultants, L.L.C. (Matrix) collected six background air samples. ACM removal activities were performed between November 5, 2014 and November 20, 2014. NEO, with oversight by a North Carolina-accredited inspector employed by URS, removed 6,727 feet of pipe insulation, 5,384 square feet (SF) of asbestos cement panels, 4,809 SF of floor covering and mastics, and 50 SF of vessel insulation from the main building and boiler room buildings at the Site. A summary map of ACM abatement areas is included in **Appendix I** as Figure I-1. A summary of removed ACM is presented in **Appendix I** as Table I-1.

During ACM removal in Room C, the main pipe run area was contained within plastic sheeting and placed under negative pressure by operating air machines equipped with HEPA filters. All removed ACM was appropriately sealed within bags or plastic wrapping, labeled, and decontaminated with amended water before being removed from the abatement area through a designated load-out zone. In other abatement areas, critical barriers were constructed over large openings such as doors, windows, and vents prior to ACM removal by glovebags or utilizing wet methods. All removed ACM were transported to the Iredell County Landfill in Statesville, North Carolina for disposal. ACM removal permits and Asbestos Waste Shipment Records are included in **Appendix I**. Following ACM removal in each area, visual clearance was granted by URS to confirm complete abatement. Matrix collected confirmatory air samples following abatement activities on November 11, 2014 and November 21, 2014 at locations noted on Figure I-1 of **Appendix I**. Analytical results for asbestos fiber concentrations in the air samples were below the National Institute of Occupational Safety and Health (NIOSH) limit of 0.01 fiber per cubic centimeter (f/cc) in all analyzed samples.

Approximately 200,000 SF of asbestos-containing roofing materials and window glazing within the main building and approximately 500 linear feet of pipe insulation within an underground tunnel extending between the boiler room building and main building were left in place. The materials either could not be accessed safely or could not be removed without compromising building integrity. Should the main building or boiler room building be demolished, these materials should be removed and disposed of in an appropriate manner prior to building demolition activities

5.4 Planned Tasks for 2015

5.4.1 Groundwater Monitoring

Groundwater monitoring will continue semi-annually consistent with the 2007 ANA Work Plan (B & C, March 2007).

5.4.2 AS/SVE System Operation

The source area AS/SVE system will continue to be operated in a manner consistent with the 2014 operations described in **Section 4** and **Appendix G**.

5.4.3 Surface Water and Porewater Monitoring

In 2014, surface water sampling activities will continue in accordance with the *Surface Water Work Plan* (URS, February 2009). These activities will be conducted in accordance with the 2012 request from NCDENR DWQ to conduct surface water sampling on a quarterly schedule. Additional locations will be sampled, consistent with 2014 sampling, to assist with pilot test and full-scale injection performance monitoring. In addition, Northern Drainage Feature streambed piezometers will be sampled on up to three occasions as part of proposed full-scale injection monitoring. Surface water and porewater monitoring activities proposed for 2015 are summarized in the *Injection Work Plan* (URS, March 2015).

The 2015 surface water sampling activities will be documented in quarterly surface water monitoring reports provided to NCDENR and USEPA. Surface water and porewater monitoring results will be summarized in the Annual Remediation Progress Report for 2015.

5.4.4 Phase 1 BOS-100® Injection

As described in the *Injection Work Plan* (URS, March 2015), the proposed Phase 1 injection plan includes 1,972 injection intervals across 116 injection points evenly spaced approximately 5 feet apart. Injections are proposed at multiple intervals, generally spaced 1.5 feet apart, between approximately 6 and 34 feet bgs. Proposed BOS-100® loading ranges from 5 to 9 pounds per individual injection interval, with a proposed total of 15,120 pounds. Injection will be performed through DPT drilling rods pushed into the ground at an angle of approximately 65-degrees from level towards the Northern Drainage Feature. The injection is anticipated to be "permitted by rule" under NCDENR Division of Water Resources (DWR) Underground Injection Control (UIC) guidelines based on a total injection area less than 10,000 square feet. URS will submit an UIC injection notification form at least 14 days prior to the injection event, which is anticipated to occur during the 2nd half of 2015.

Phase 1 preparation activities will include clearing the proposed injection area of brush, fallen tree branches, and select small trees, installing drainage piping, adding a 4-inch layer of gravel within the injection area, and installing silt fencing and hay bales to contain daylighted injection materials. Site preparation will also include modifying several stick-up wells and abandoning monitoring wells W-93-15 and W-93-28 to improve injection drill rig access.

5.4.5 Well Abandonments

In addition to abandoning W-93-15 and W-93-28 as described above, abandonment of monitoring wells IW-2 and W-2S is proposed during 2015. Based on recent sampling results, PCE and PCE daughter product concentrations in these wells are below laboratory MDLs. As such, further sampling of these monitoring wells is not necessary for remedial progress evaluation. Well abandonment records signed by an NC-licensed driller will be submitted to NCDENR DWR for all wells abandoned during 2015.

5.4.6 Community Relations

During 2015, URS will develop a fact sheet in cooperation with the USEPA and NCDENR to summarize the proposed Phase 1 injection and applicable background information. Once finalized, it is assumed that the USEPA will mail the fact sheet to the mailing list consistent with past practices. Concurrently, the mailing list will be reviewed to identify adjoining neighbors and those who had specifically expressed interest in the project previously. URS will schedule individual meetings with home owners, tentatively projected to be between 3 and 5. At the meetings URS will explain the project details, observations and potential disruptions that they might expect, and contact information should they have questions or concerns regarding the project. Concurrently, URS will schedule a meeting with the Statesville Councilman who represents the Wendover Hills neighborhood.

6 References

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Tables

Table 2-1
OU-3 Monitoring and Remediation Well Construction Summary
FCX-Statesville Superfund Site OU-3

Wells[a]	Total Depth (ft below TOC)	Total Depth - 2007[b] (ft below TOC)	Screen Interval (ft bgs)	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)
North Area					
Saprolite or Transition Zone Wells					
W-1s	47.74	--	38 - 48	964.33	963.80
W-6s	37.72	37.62	22 - 37	947.17	947.07
W-7s	30	--	15 - 30	948.04	947.96
W-8s	35	34.56	20 - 35	942.60	943.18
W-9s	51.50	--	34 - 49	964.47	965.99
W-10s	35.08	35.18	20 - 35	947.00	946.73
W-10t	55.43	55.45	46 - 56	947.48	947.16
W-11s	42.70	--	25 - 40	958.50	961.14
W-12s	33	--	18 - 33	954.10	956.73
W-14s	41.52	--	37 - 52	957.74	957.59
W-16s	49.07	--	35 - 50	965.57	965.13
W-17s	44.47	--	29.5 - 44.5	965.60	965.31
W-18s	37.90	37.94	22.5 - 37.5	949.95	949.27
W-19s	29.97	30.06	17 - 27	934.37	937.05
W-20s	14.40	14.18	4 - 14	896.84	895.42
W-21s	20.20	19.91	10 - 20	928.48	927.21
W-21t	80.57	80.52	66 - 81	927.57	927.23
W-30t	34.81	34.81	25 - 35	913.74	913.38
W-31s	15.69	15.50	5 - 15	896.99	896.58
W-34t	63.51	61.38	47 - 62	947.98	947.57
W-35s	35.74	35.74	26 - 36	944.52	944.16
W-35t	50.93	50.98	41-51	942.95	942.65
W-36s	21.02	21.02	12 - 22	930.77	930.34
W-36t	35.51	35.51	26 - 36	929.20	928.86
W-37s	14.60	17.56	4 - 14	908.59	911.41
W-37t	81	--	66.0 - 81.1	908.81	911.32
W-38s	42.76	42.76	30 - 40	908.83	911.72
W-38t	118.49	115.56	100 - 115	909.63	912.65
W-39s	43.17	43.17	30 - 40	907.99	911.01
W-40s	18.31	21.34	8 - 18	899.01	902.11
W-40t	95.88	95.61	78 - 95	899.63	902.75
W-88s	25	--	15 - 25	903.50	905.66
W-88i	84	--	69 - 84	904.93	907.08
URS-MW-1	15	--	9.11 - 14.38	902.01	905.09
URS-MW-2	10	--	2.87 - 8.14	897.09	899.80
URS-MW-2d	26	--	20.72 - 25.99	897.67	899.75
URS-MW-3	9	--	3.28 - 8.66	894.86	894.61
MP-16	55.10	56.00	46 - 56	947.83	947.53
MP-17	50.50	50.42	41 - 51	948.46	948.04
IW-4t	59.95	59.81	57.5 - 60	947.65	947.34
IW-5t	65.15	65.03	62.0 - 65.5	949.01	948.66
IW-6t	41.61	41.69	27.5 - 42.0	927.14	926.88

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Wells[a]	Total Depth (ft below TOC)	Total Depth - 2007[b] (ft below TOC)	Screen Interval (ft bgs)	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)
North Area (continued)					
Intermediate or Deep Bedrock Wells					
W-1i	72.38	--	62.5 - 72.5	964.77	964.65
W-8i	93	--	83 - 93	943.05	943.80
W-9i	93.20	93.13	81 - 91	964.52	967.21
W-10i	68.69	--	59 - 69	947.30	946.50
W-12i	83	--	73 - 83	954.60	957.59
W-14i	95.60	--	105 - 115	956.78	956.60
W-16i	86.50	--	77 - 87	965.58	965.07
W-20i	94.36	94.20	84 - 94	897.70	897.50
W-20d	161.75	150.43	152 - 162	897.44	897.19
W-26i	117.90	117.64	103 - 118	925.04	924.86
W-28i	98.46	--	73 - 88	963.04	962.79
W-28d	249	--	234 - 249	962.90	962.69
W-30i	57	--	47.5 - 57.5	915.35	915.30
W-31i	44.68	44.43	34 - 44	896.66	896.28
W-33i	107.62	--	98 - 108	960.58	960.14
W-33d	202.61	--	188 - 203	960.62	960.24
W-88d	134	--	114 - 134	911.00	913.11
IW-1	130.10	127.52	76 - 136	948.81	948.41
IW-2	131	130.85	72 - 132	947.17	946.63
IW-3	130	--	71 - 131.5	949.17	949.00
South Area					
Saprolite or Transition Zone Wells					
W-2s	44.10	44.20	33.5 - 43.5	963.67	963.36
W-3s	43.84	43.93	34 - 44	961.37	960.90
W-4s	44	43.72	34 - 44	964.92	964.42
W-5s	43.42	43.44	32 - 42	961.94	961.72
W-13s	30	29.70	15 - 30	964.80	964.57
W-15s	51.63	41.40	30 - 45	972.61	972.32
W-22s (ABN[c])	35	--	20 - 35	--	--
W-23s	20.15	20.15	25 - 40	934.89	934.23
W-24s	20.09	20.17	5 - 20	920.17	919.62
W-25s	25.13	--	10 - 25	930.24	930.01
W-27s	40.95	--	25 - 40	947.85	947.48
W-41t	62	--	47 - 62	959.70	960.01
MW-1	43.09	43.10	41.56 - 51.56	947.44	949.50
MW-2	50.23	50.22	42.52 - 52.52	952.01	954.22
MW-3	53.01	--	43.01 - 53.01	952.47	954.51
MW-4	53.94	--	51.43 - 61.43	963.21	965.87
MW-5s	42.75	42.78	48.03 - 58.03	949.12	952.02
MW-6s	53.85	--	45.36 - 55.36	956.52	960.52
MW-7	52.51	--	37 - 47	947.87	950.69
MW-8	53.43	--	45.88 - 55.88	961.20	964.20
MW-9	45.28	45.22	53.50 - 63.50	955.53	959.42
MW-10	47.70	47.72	50.56 - 60.56	955.34	959.08

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FCX-Statesville Superfund Site OU-3

Wells[a]	Total Depth (ft below TOC)	Total Depth - 2007[b] (ft below TOC)	Screen Interval (ft bgs)	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)
South Area (continued)					
Intermediate or Deep Bedrock Wells					
W-2i	92.50	--	83 - 93	963.44	963.31
W-5i	67.66	--	56 - 66	961.94	961.92
W-13i	79.85	79.80	70 - 80	964.67	964.05
W-15i	130	--	71 - 81	972.43	972.35
W-22i (ABN[c])	67	--	57 - 67	--	--
W-29i	98	--	88 - 98	913.42	913.18
W-32i	131.45	--	112 - 132	890.89	890.55
W-42i	88	--	78 - 88	946.72	946.22
MW-5d (ABN Aug. 2007)	130	--	--	948.11	949.45
MW-6d (ABN Aug. 2007)	130	--	--	956.27	957.51
MW-11 (ABN Aug. 2007)	75.20	75.04	--	920.75	920.50
Northern Drainage Pre-Design Investigation Monitoring Wells					
W-89-10	10	--	5 - 10	901.27	903.83
W-89-25	10	--	20 - 25	901.37	903.61
W-90-15	10	--	10 - 15	900.38	903.22
W-90-29	10	--	24 - 29	900.42	903.43
W-91-15	10	--	10 - 15	--	--
W-92-15	10	--	10 - 15	902.06	904.70
W-92-33	10	--	28 - 33	902.69	905.53
W-92-50	10	--	45 - 50	903.43	905.77
W-92-65	10	--	60 - 65	902.62	905.10
W-93-15	10	--	10 - 15	898.80	901.40
W-93-28	10	--	23 - 28	898.78	901.06
W-93-40	10	--	35 - 40	899.10	901.55
W-93-52	10	--	47 - 52	898.57	900.59
W-93-65	10	--	60 - 65	898.83	900.82
W-94-15	10	--	10 - 15	897.26	900.36
W-94-28	10	--	23 - 28	897.93	900.96
W-94-40	10	--	35 - 40	897.61	900.41
W-94-52	10	--	47 - 52	897.84	900.62
W-94-65	10	--	60 - 65	898.03	900.51
W-95-15	10	--	10 - 15	897.14	899.66
W-95-25	10	--	20 - 25	896.72	899.57
W-PRB7-PZ	10	--	7 - 8	901.17	903.82

Table 2-1
OU-3 Monitoring and Remediation Well Construction Summary
FCX-Statesville Superfund Site OU-3

Wells[a]	Total Depth (ft below TOC)	Total Depth - 2007[b] (ft below TOC)	Screen Interval (ft bgs)	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)
Inactive Liquid Injection Wells					
W-41	73.92	--	24 - 74	947.44	946.87
W-42	70.45	--	27 - 72	947.20	946.59
W-43	69.65	--	25 - 70	947.59	947.32
W-44	66.45	--	26 - 67	947.72	947.32
W-45	65.70	--	26 - 66	948.37	947.94
W-46	62.65	--	29 - 63	949.09	948.61
W-47	66.58	--	27 - 67	948.59	948.93
W-48	67.70	--	28 - 68	948.75	948.29
W-49	68.39	--	24 - 69	948.56	948.12
W-50	66.70	--	27 - 67	948.42	947.96
W-51	65.20	--	25 - 65	948.37	947.89
W-54	66.05	--	26 - 66	947.75	947.37
W-55	64.97	--	25 - 65	947.58	947.97
W-56	61.52	--	27 - 62	947.40	946.87
W-57	60.60	--	26 - 61	947.47	946.92
W-58	59.80	--	25 - 60	947.36	946.94
W-59	57.10	--	27 - 57	947.28	946.99
W-60	58.62	--	24 - 59	947.27	946.85
W-61	58.25	--	24 - 59	947.44	947.04
W-62	56.55	--	27 - 57	947.07	947.42
W-63	56.80	--	27 - 57	947.53	947.20
W-64	56.60	--	27 - 57	947.61	947.12
W-65	57.15	--	23 - 58	947.89	947.53
W-66	58	--	24 - 59	948.13	947.74
W-67	59.86	--	25 - 60	948.28	947.88
W-68	59.51	--	24 - 59	948.09	947.71
W-69	59.65	--	25 - 60	948.02	947.59
W-70	59.64	--	25 - 60	947.88	947.54
W-71	60.08	--	25 - 60	948.37	947.99
W-72	60.56	--	26 - 61	948.33	947.95
W-73	59.64	--	25 - 60	948.80	948.46
W-74	59.85	--	25 - 60	949.21	948.77
W-75	59.39	--	25 - 60	949.53	948.99
W-76	56.23	--	25 - 56	949.82	949.50
W-77	65.92	--	27 - 67	949.90	949.46
W-78	58.95	--	25 - 60	950.00	949.63
W-79	59	--	25 - 60	950.24	949.76
W-80	58.65	--	30 - 60	950.51	949.91
W-81	59.20	--	30 - 60	950.37	950.76
W-82	51.69	--	30 - 55	950.86	950.37
W-83	51.53	--	27 - 52	951.15	950.75
W-84	44.65	--	25 - 45	951.19	950.87
W-85	48.69	--	24 - 49	951.24	950.64
W-86	44.22	--	25 - 45	951.27	950.73
W-87	49.05	--	25 - 50	951.38	951.07

Table 2-1
OU-3 Monitoring and Remediation Well Construction Summary
FCX-Statesville Superfund Site OU-3

Wells[a]	Total Depth (ft below TOC)	Total Depth - 2007[b] (ft below TOC)	Screen Interval (ft bgs)	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)
Source Area Concentric Design Wells					
EW-1 (SW-1)	55.96	56.08	51.9 - 54.4	965.64	968.77
EW-2 (SW-2)	56.15	56.18	52.9 - 55.4	965.60	968.77
EW-3	63.20	62.46	58.2 - 60.7	965.51	968.06
EW-4 (SW-4)	61.90	62.19	57.6 - 60.1	965.60	968.75
EW-5	55.71	55.53	50.7 - 53.2	965.60	968.09
EW-6	60.66	59.72	54.7 - 57.2	965.60	968.08
EW-7	61.82	62.91	56.9 - 59.4	965.60	968.13
EW-8	57.86	57.98	53.2 - 55.7	965.61	967.93
EW-9	55.56	55.75	53.6 - 56.1	965.56	965.24
EW-10	56.66	53.80	52.8 - 55.3	964.42	964.08
EW-11	64.35	64.57	58.9 - 61.4	965.52	967.81
EW-12	67.90	67.78	66.4 - 68.9	960.53	960.22
EW-13	50.50	50.38	48.5 - 51.0	961.44	960.98
EW-14	53.20	53.20	48.2 - 50.7	965.56	967.86
EW-15	54.19	54.00	52.1 - 54.6	962.42	962.12
EW-16	58.01	58.02	53.3 - 55.8	965.56	967.83
EW-17 (SW-17)	59.71	59.90	56.4 - 58.9	965.55	968.47
EW-18	62.97	62.93	53.5 - 63.5	963.07	962.32
EW-19	63.13	53.28	51.0 - 61.0	965.54	967.66
EW-20	50.59	50.46	46.1 - 48.6	965.63	967.94
EW-21	55.91	55.98	51.2 - 53.7	965.60	967.73
EW-22	62.78	63.17	57.8 - 60.3	965.62	967.99
EW-23 (SW-23)	61.26	61.34	57.7 - 60.2	965.63	968.59
EW-24	57.67	57.80	53.1 - 55.6	965.67	968.03
MP-1	55.74	55.52	58.0 - 60.5	965.58	965.26
MP-3	53.98	53.76	51.7 - 54.2	965.69	965.61
MP-4 (EW-26)	54.12	54.18	51.9 - 54.4	965.61	964.97
MP-7	54.54	54.78	52.3 - 54.8	965.59	965.19
MP-8	54.43	54.45	52.3 - 54.8	965.57	965.35
MP-15	51.70	54.60	49.3 - 51.8	965.58	965.30
Source Area Dedicated Soil Vapor Extraction Wells					
EW-25	41	--	16 - 41	--	--
EW-27	31	--	6 - 31	--	--
EW-28	31	--	6 - 31	--	--
Source Area Dedicated Air Sparging Wells					
AS-25R	59	--	57 - 59	--	--
AS-26	48	--	46 - 48	--	--
AS-27R	63	--	61 - 63	--	--
AS-28	65	--	63 - 65	--	--
AS-29	65	--	63 - 65	--	--
AS-30	65	--	63 - 65	--	--
AS-31	65	--	63 - 65	--	--

Table 2-1
OU-3 Monitoring and Remediation Well Construction Summary
FCX-Statesville Superfund Site OU-3

Abbreviations:

TOC = Top of Casing	ft = feet
MSL = mean sea level	bgs = below ground surface
ABN = abandoned	-- = not applicable or available

Notes:

[a]Monitoring Well ID. Alternate well IDS, where applicable, are shown in parenthesis.

[b]Total Depth taken during the 2007 Baseline Groundwater Monitoring Event.

[c]W-22s and W-22i were presumably abandoned circa 2000 during OU2 construction activities.

-AS-25 and AS-27 were abandoned in March 2013 and replaced with AS-25R and AS-27R.

-Northern Drainage pre-design investigation wells, inactive injection wells, and source area monitoring and remediation wells are screened within saprolite or the transition zone.

-Source Area Concentric Design Wells are screened in saprolite in both the vadose and saturated zones. The screen intervals shown represent the saturated zone (monitoring or air sparge) screen intervals.

Table 2-2A
April 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
North Area					
Saprolite or Transition Zone Wells					
W-1s	964.33	963.80	38 - 48	37.94	925.86
W-6s	947.17	947.07	22 - 37	27.32	919.75
W-7s	948.04	947.96	15 - 30	28.72	919.24
W-8s	942.60	943.18	20 - 35	24.01	919.17
W-9s	964.47	965.99	34 - 49	40.04	925.95
W-10s	947.00	946.73	20 - 35	24.91	921.82
W-10t	947.48	947.16	46 - 56	26.02	921.14
W-11s	958.50	961.14	25 - 40	32.13	929.01
W-12s	954.10	956.73	18 - 33	29.58	NC
W-14s	957.74	957.59	37 - 52	27.48	930.11
W-16s	965.57	965.13	35 - 50	41.12	924.01
W-17s	965.60	965.31	29.5 - 44.5	40.25	925.06
W-18s	949.95	949.27	22.5 - 37.5	24.31	924.96
W-19s	934.37	937.05	17 - 27	19.54	917.51
W-20s	896.84	895.42	4 - 14	0.68	894.74
W-21s	928.48	927.21	10 - 20	11.64	915.57
W-21t	927.57	927.23	66 - 81	12.42	914.81
W-30t	913.74	913.38	25 - 35	AW	NC
W-31s	896.99	896.58	5 - 15	6.22	890.36
W-34t	947.98	947.57	47 - 62	28.00	919.57
W-35s	944.52	944.16	26 - 36	25.58	918.58
W-35t	942.95	942.65	41-51	23.63	919.02
W-36s	930.77	930.34	12 - 22	14.01	916.33
W-36t	929.20	928.86	26 - 36	12.71	916.15
W-37s	908.59	911.41	4 - 14	0.74	910.67
W-37t	908.81	911.32	66.0 - 81.1	AW	NC
W-38s	908.83	911.72	30 - 40	5.13	906.59
W-38t	909.63	912.65	100 - 115	2.95	909.70
W-39s	907.99	911.01	30 - 40	6.47	904.54
W-40s	899.01	902.11	8 - 18	5.85	896.26
W-40t	899.63	902.75	78 - 95	6.35	896.40
W-88s	903.50	905.66	69 - 84	12.26	893.40
W-88i	904.93	907.08	15 - 25	14.82	892.26
URS-MW-1	902.01	905.09	9.11 - 14.38	7.58	897.51
URS-MW-2	897.09	899.80	2.87 - 8.14	4.23	895.57
URS-MW-2d	897.67	899.75	20.72 - 25.99	5.95	893.80
URS-MW-3	894.86	894.61	3.28 - 8.66	2.64	891.97
MP-16	947.83	947.53	46 - 56	28.15	919.38
MP-17	948.46	948.04	41 - 51	28.19	919.85
IW-4t	947.65	947.34	57.5 - 60	28.35	918.99
IW-5t	949.01	948.66	62.0 - 65.5	28.61	920.05
IW-6t	927.14	926.88	27.5 - 42.0	11.94	914.94

Table 2-2A
April 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
North Area (continued)					
Intermediate or Deep Bedrock Wells					
W-1i	964.77	964.65	62.5 - 72.5	38.83	925.82
W-8i	943.05	943.80	83 - 93	28.33	915.47
W-9i	964.52	967.21	81 - 91	40.90	926.31
W-10i	947.30	946.50	59 - 69	26.65	919.85
W-12i	954.60	957.59	73 - 83	31.50	926.09
W-14i	956.78	956.60	105 - 115	32.09	924.51
W-16i	965.58	965.07	77 - 87	42.71	922.36
W-20i	897.70	897.50	84 - 94	2.21	895.29
W-20d	897.44	897.19	152 - 162	0.02	897.17
W-26i	925.04	924.86	103 - 118	11.00	913.86
W-28i	963.04	962.79	73 - 88	42.06	920.73
W-28d	962.90	962.69	234 - 249	44.16	918.53
W-30i	915.35	915.30	47.5 - 57.5	3.90	911.40
W-31i	896.66	896.28	34 - 44	5.99	890.29
W-33i	960.58	960.14	98 - 108	41.74	918.40
W-33d	960.62	960.24	188 - 203	42.23	918.01
W-88d	911.00	913.11	114 - 134	15.02	898.09
IW-1	948.81	948.41	76 - 136	1.39	947.02
IW-2	947.17	946.63	72 - 132	0.23	946.40
IW-3	949.17	949.00	71 - 131.5	30.55	918.45
South Area					
Saprolite or Transition Zone Wells					
W-2s	963.67	963.36	33.5 - 43.5	34.91	928.45
W-3s	961.37	960.90	34 - 44	33.14	927.76
W-4s	964.92	964.42	34 - 44	36.54	927.88
W-5s	961.94	961.72	32 - 42	33.66	928.06
W-13s	964.80	964.57	15 - 30	29.49	935.08
W-15s	972.61	972.32	30 - 45	44.35	927.97
W-23s	934.89	934.23	25 - 40	10.09	924.14
W-24s	920.17	919.62	5 - 20	2.25	917.37
W-25s	930.24	930.01	10 - 25	NA	NC
W-27s	947.85	947.48	25 - 40	21.10	926.38
W-41t	959.70	960.01	47 - 62	32.51	927.50
MW-1	947.44	949.50	41.56 - 51.56	23.83	925.67
MW-2	952.01	954.22	42.52 - 52.52	29.11	925.11
MW-3	952.47	954.51	43.01 - 53.01	27.34	927.17
MW-4	963.21	965.87	51.43 - 61.43	37.33	928.54
MW-5s	949.12	952.02	48.03 - 58.03	25.47	926.55
MW-6s	956.52	960.52	45.36 - 55.36	35.09	925.43
MW-7	947.87	950.69	37 - 47	28.18	922.51
MW-8	961.20	964.20	45.88 - 55.88	35.20	929.00
MW-9	955.53	959.42	53.50 - 63.50	32.05	927.37
MW-10	955.34	959.08	50.56 - 60.56	32.65	926.43

Table 2-2A
April 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
South Area (continued)					
Intermediate or Deep Bedrock Wells					
W-2i	963.44	963.31	83 - 93	35.43	927.88
W-5i	961.94	961.92	56 - 66	35.25	926.67
W-13i	964.67	964.05	70 - 80	36.18	927.87
W-15i	972.43	972.35	71 - 81	46.48	925.87
W-29i	913.42	913.18	88 - 98	AW	NC
W-32i	890.89	890.55	112 - 132	6.94	883.61
W-42i	946.72	946.22	78 - 88	31.05	915.17
Northern Drainage Pre-Design Investigation Monitoring Wells					
W-89-10	901.27	903.83	5 - 10	3.16	900.67
W-89-25	901.37	903.61	20 - 25	2.87	900.74
W-90-15	900.38	903.22	10 - 15	6.33	896.89
W-90-29	900.42	903.43	24 - 29	6.52	896.91
W-91-15	NA	NA	10 - 15	6.55	NC
W-92-15	902.06	904.70	10 - 15	7.67	897.03
W-92-33	902.69	905.53	28 - 33	9.67	895.86
W-92-50	903.43	905.77	45 - 50	9.61	896.16
W-92-65	902.62	905.10	60 - 65	8.80	896.30
W-93-15	898.80	901.40	10 - 15	6.46	894.94
W-93-28	898.78	901.06	23 - 28	6.00	895.06
W-93-40	899.10	901.55	35 - 40	6.01	895.54
W-93-52	898.57	900.59	47 - 52	5.01	895.58
W-93-65	898.83	900.82	60 - 65	5.23	895.59
W-94-15	897.26	900.36	10 - 15	5.89	894.47
W-94-28	897.93	900.96	23 - 28	5.52	895.44
W-94-40	897.61	900.41	35 - 40	5.02	895.39
W-94-52	897.84	900.62	47 - 52	5.21	895.41
W-94-65	898.03	900.51	60 - 65	5.02	895.49
W-95-15	897.14	899.66	10 - 15	4.87	894.79
W-95-25	896.72	899.57	20 - 25	4.14	895.43
W-PRB-7-PZ	901.17	903.82	7 - 8	2.81	901.01

Table 2-2A
April 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
Source Area Concentric Design Wells					
EW-1 (SW-1)	965.64	968.77	51.9-54.4	43.95	924.82
EW-2 (SW-2)	965.60	968.77	52.9-55.4	43.80	924.97
EW-3	965.51	968.06	58.2-60.7	44.82	923.24
EW-4 (SW-4)	965.60	968.75	57.6-60.1	44.69	924.06
EW-5	965.60	968.09	50.7-53.2	44.32	923.77
EW-6	965.60	968.08	54.7-57.2	43.05	925.03
EW-7	965.60	968.13	56.9-59.4	42.07	926.06
EW-8	965.61	967.93	53.2-55.7	41.84	926.09
EW-9	965.56	965.24	53.6-56.1	39.29	925.95
EW-10	964.42	964.08	52.8-55.3	36.35	927.73
EW-11	965.52	967.81	58.9-61.4	44.29	923.52
EW-12	960.53	960.22	66.4-68.9	39.14	921.08
EW-13	961.44	960.98	48.5-51.0	38.74	922.24
EW-14	965.56	967.86	48.2-50.7	42.02	925.84
EW-15	962.42	962.12	52.1-54.6	40.96	921.16
EW-16	965.56	967.83	53.3-55.8	43.94	923.89
EW-17 (SW-17)	965.55	968.47	56.4-58.9	45.12	923.35
EW-18	963.07	962.32	53.5-63.5	40.35	921.97
EW-19	965.54	967.66	51.0-61.0	44.30	923.36
EW-20	965.63	967.94	46.1-48.6	43.61	924.33
EW-21	965.60	967.73	51.2-53.7	42.30	925.43
EW-22	965.62	967.99	57.8-60.3	42.24	925.75
EW-23 (SW-23)	965.63	968.59	57.7-60.2	43.39	925.20
EW-24	965.67	968.03	53.1-55.6	42.63	925.40
MP-1	965.58	965.26	58.0-60.5	40.97	924.29
MP-3	965.69	965.61	51.7-54.2	38.95	926.66
MP-4 (EW-26)	965.61	964.97	51.9-54.4	42.90	922.07
MP-7	965.59	965.19	52.3-54.8	38.24	926.95
MP-8	965.57	965.35	52.3-54.8	38.15	927.20
MP-15	965.58	965.30	49.3-51.8	40.18	925.12

Abbreviations:
AW=Artesian Well
NA=Not accessible
NC=Not Calculated
ft = feet
bgs = below ground surface
TOC = Top of Casing
MSL = mean sea level

Notes:
[1] Monitoring Well ID. Alternate well IDS, where applicable, are shown in parenthesis.

Table 2-2B
October 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
North Area					
Saprolite or Transition Zone Wells					
W-1s	964.33	963.80	38 - 48	37.85	925.95
W-6s	947.17	947.07	22 - 37	30.11	916.96
W-7s	948.04	947.96	15 - 30	29.71	918.25
W-8s	942.60	943.18	20 - 35	26.93	916.25
W-9s	964.47	965.99	34 - 49	40.54	925.45
W-10s	947.00	946.73	20 - 35	27.10	919.63
W-10t	947.48	947.16	46 - 56	28.24	918.92
W-11s	958.50	961.14	25 - 40	33.39	927.75
W-12s	954.10	956.73	18 - 33	30.42	926.31
W-14s	957.74	957.59	37 - 52	NA	NC
W-16s	965.57	965.13	35 - 50	41.45	923.68
W-17s	965.60	965.31	29.5 - 44.5	40.24	925.07
W-18s	949.95	949.27	22.5 - 37.5	27.00	922.27
W-19s	934.37	937.05	17 - 27	22.19	914.86
W-20s	896.84	895.42	4 - 14	2.09	893.33
W-21s	928.48	927.21	10 - 20	17.95	909.26
W-21t	927.57	927.23	66 - 81	16.08	911.15
W-30t	913.74	913.38	25 - 35	1.44	911.94
W-31s	896.99	896.58	5 - 15	6.96	889.62
W-34t	947.98	947.57	47 - 62	30.11	917.46
W-35s	944.52	944.16	26 - 36	25.99	918.17
W-35t	942.95	942.65	41-51	26.21	916.44
W-36s	930.77	930.34	12 - 22	16.93	913.41
W-36t	929.20	928.86	26 - 36	15.63	913.23
W-37s	908.59	911.41	4 - 14	2.02	909.39
W-37t	908.81	911.32	66.0 - 81.1	AW	NC
W-38s	908.83	911.72	30 - 40	8.74	902.98
W-38t	909.63	912.65	100 - 115	6.87	905.78
W-39s	907.99	911.01	30 - 40	11.34	899.67
W-40s	899.01	902.11	8 - 18	8.45	893.66
W-40t	899.63	902.75	78 - 95	8.57	894.18
W-88s	903.50	905.66	69 - 84	13.83	891.83
W-88i	904.93	907.08	15 - 25	16.25	890.83
URS-MW-1	902.01	905.09	9.11 - 14.38	11.38	893.71
URS-MW-2	897.09	899.80	2.87 - 8.14	4.18	895.62
URS-MW-2d	897.67	899.75	20.72 - 25.99	6.93	892.82
URS-MW-3	894.86	894.61	3.28 - 8.66	3.89	890.72
MP-16	947.83	947.53	46 - 56	30.66	916.87
MP-17	948.46	948.04	41 - 51	30.50	917.54
IW-4t	947.65	947.34	57.5 - 60	30.66	916.68
IW-5t	949.01	948.66	62.0 - 65.5	30.54	918.12
IW-6t	927.14	926.88	27.5 - 42.0	13.83	913.05

Table 2-2B
October 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
North Area (continued)					
Intermediate or Deep Bedrock Wells					
W-1i	964.77	964.65	62.5 - 72.5	38.96	925.69
W-8i	943.05	943.80	83 - 93	27.66	916.14
W-9i	964.52	967.21	81 - 91	41.76	925.45
W-10i	947.30	946.50	59 - 69	29.20	917.30
W-12i	954.60	957.59	73 - 83	32.90	924.69
W-14i	956.78	956.60	105 - 115	NA	NC
W-16i	965.58	965.07	77 - 87	44.00	921.07
W-20i	897.70	897.50	84 - 94	3.93	893.57
W-20d	897.44	897.19	152 - 162	4.49	892.70
W-26i	925.04	924.86	103 - 118	13.42	911.44
W-28i	963.04	962.79	73 - 88	43.07	919.72
W-28d	962.90	962.69	234 - 249	46.45	916.24
W-30i	915.35	915.30	47.5 - 57.5	2.21	913.09
W-31i	896.66	896.28	34 - 44	6.95	889.33
W-33i	960.58	960.14	98 - 108	43.30	916.84
W-33d	960.62	960.24	188 - 203	43.35	916.89
W-88d	911.00	913.11	114 - 134	16.73	896.38
IW-1	948.81	948.41	76 - 136	7.60	940.81
IW-2	947.17	946.63	72 - 132	17.21	929.42
IW-3	949.17	949.00	71 - 131.5	33.12	915.88
South Area					
Saprolite or Transition Zone Wells					
W-2s	963.67	963.36	33.5 - 43.5	35.30	928.06
W-3s	961.37	960.90	34 - 44	33.35	927.55
W-4s	964.92	964.42	34 - 44	37.57	926.85
W-5s	961.94	961.72	32 - 42	34.40	927.32
W-13s	964.80	964.57	15 - 30	29.48	935.09
W-15s	972.61	972.32	30 - 45	NA	NC
W-23s	934.89	934.23	25 - 40	15.20	919.03
W-24s	920.17	919.62	5 - 20	4.63	914.99
W-25s	930.24	930.01	10 - 25	NA	NC
W-27s	947.85	947.48	25 - 40	23.35	924.13
W-41t	959.70	960.01	47 - 62	33.39	926.62
MW-1	947.44	949.50	41.56 - 51.56	25.60	923.90
MW-2	952.01	954.22	42.52 - 52.52	31.03	923.19
MW-3	952.47	954.51	43.01 - 53.01	29.24	925.27
MW-4	963.21	965.87	51.43 - 61.43	38.13	927.74
MW-5s	949.12	952.02	48.03 - 58.03	27.49	924.53
MW-6s	956.52	960.52	45.36 - 55.36	36.71	923.81
MW-7	947.87	950.69	37 - 47	30.59	920.10
MW-8	961.20	964.20	45.88 - 55.88	35.46	928.74
MW-9	955.53	959.42	53.50 - 63.50	32.84	926.58
MW-10	955.34	959.08	50.56 - 60.56	34.01	925.07

Table 2-2B
October 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
South Area (continued)					
Intermediate or Deep Bedrock Wells					
W-2i	963.44	963.31	83 - 93	35.93	927.38
W-5i	961.94	961.92	56 - 66	36.02	925.90
W-13i	964.67	964.05	70 - 80	36.55	927.50
W-15i	972.43	972.35	71 - 81	47.23	925.12
W-29i	913.42	913.18	88 - 98	AW	NC
W-32i	890.89	890.55	112 - 132	10.23	880.32
W-42i	946.72	946.22	78 - 88	29.91	916.31
Northern Drainage Pre-Design Investigation Monitoring Wells					
W-89-10	901.27	903.83	5 - 10	4.35	899.48
W-89-25	901.37	903.61	20 - 25	4.98	898.63
W-90-15	900.38	903.22	10 - 15	8.06	895.16
W-90-29	900.42	903.43	24 - 29	8.06	895.37
W-91-15	NA	NA	10 - 15	7.23	NC
W-92-15	902.06	904.70	10 - 15	10.87	893.83
W-92-33	902.69	905.53	28 - 33	11.46	894.07
W-92-50	903.43	905.77	45 - 50	11.64	894.13
W-92-65	902.62	905.10	60 - 65	10.98	894.12
W-93-15	898.80	901.40	10 - 15	7.48	893.92
W-93-28	898.78	901.06	23 - 28	7.09	893.97
W-93-40	899.10	901.55	35 - 40	7.36	894.19
W-93-52	898.57	900.59	47 - 52	6.40	894.19
W-93-65	898.83	900.82	60 - 65	6.65	894.17
W-94-15	897.26	900.36	10 - 15	6.77	893.59
W-94-28	897.93	900.96	23 - 28	6.79	894.17
W-94-40	897.61	900.41	35 - 40	6.30	894.11
W-94-52	897.84	900.62	47 - 52	6.50	894.12
W-94-65	898.03	900.51	60 - 65	6.34	894.17
W-95-15	897.14	899.66	10 - 15	6.09	893.57
W-95-25	896.72	899.57	20 - 25	5.66	893.91
W-PRB-7-PZ	901.17	903.82	7 - 8	3.51	900.31

Table 2-2B
October 2014 Groundwater Elevation Data
FCX-Statesville Superfund Site OU3

Wells[1]	Ground Surface Elevation (ft above MSL)	Top of Casing Elevation (ft above MSL)	Screen Interval (ft bgs)	Depth to Water (ft below TOC)	Water Level Elevation (ft above MSL)
Source Area Concentric Design Wells					
EW-1 (SW-1)	965.64	968.77	51.9-54.4	43.73	925.04
EW-2 (SW-2)	965.60	968.77	52.9-55.4	43.73	925.04
EW-3	965.51	968.06	58.2-60.7	45.55	922.51
EW-4 (SW-4)	965.60	968.75	57.6-60.1	44.79	923.96
EW-5	965.60	968.09	50.7-53.2	44.25	923.84
EW-6	965.60	968.08	54.7-57.2	42.87	925.21
EW-7	965.60	968.13	56.9-59.4	42.02	926.11
EW-8	965.61	967.93	53.2-55.7	41.77	926.16
EW-9	965.56	965.24	53.6-56.1	39.16	926.08
EW-10	964.42	964.08	52.8-55.3	36.65	927.43
EW-11	965.52	967.81	58.9-61.4	44.79	923.02
EW-12	960.53	960.22	66.4-68.9	41.00	919.22
EW-13	961.44	960.98	48.5-51.0	39.98	921.00
EW-14	965.56	967.86	48.2-50.7	41.85	926.01
EW-15	962.42	962.12	52.1-54.6	42.51	919.61
EW-16	965.56	967.83	53.3-55.8	44.07	923.76
EW-17 (SW-17)	965.55	968.47	56.4-58.9	45.85	922.62
EW-18	963.07	962.32	53.5-63.5	41.61	920.71
EW-19	965.54	967.66	51.0-61.0	44.80	922.86
EW-20	965.63	967.94	46.1-48.6	43.40	924.54
EW-21	965.60	967.73	51.2-53.7	42.25	925.48
EW-22	965.62	967.99	57.8-60.3	42.31	925.68
EW-23 (SW-23)	965.63	968.59	57.7-60.2	43.48	925.11
EW-24	965.67	968.03	53.1-55.6	42.47	925.56
MP-1	965.58	965.26	58.0-60.5	40.98	924.28
MP-3	965.69	965.61	51.7-54.2	38.89	926.72
MP-4 (EW-26)	965.61	964.97	51.9-54.4	42.78	922.19
MP-7	965.59	965.19	52.3-54.8	38.44	926.75
MP-8	965.57	965.35	52.3-54.8	38.33	927.02
MP-15	965.58	965.30	49.3-51.8	40.00	925.30

Abbreviations:
AW=Artesian Well
NA=Not accessible
NC=Not Calculated
ft = feet
bgs = below ground surface
TOC = Top of Casing
MSL = mean sea level

Notes:
[1] Monitoring Well ID. Alternate well IDS, where applicable, are shown in parenthesis.

Table 3-1
Summary of Chemical Analyses and Analytical Method References for Groundwater Sampling
FCX-Statesville Superfund Site OU3

Sample Evaluation	Chemical Test/Analyte Parameter	Analytical Reference Method[a]	DQO Level[b]	Laboratory Data Package[c]
Field Measurements:	Conductivity	ASTM Method D1125	II	NA[e]
	Dissolved oxygen (DO)	ASTM Methods D888/ Chemetrics Kit, Cat. Nos. K-7501 (0-1 ppm) and K-7512 (1-12 ppm)[d]	II	NA
	Oxidation-reduction potential (ORP)	SM 2580B/ASTM Method D1498	II	NA
	pH	SM 4500H / ASTM Method D1293	II	NA
	Temperature	SM 2550B	II	NA
Laboratory Analyses:	Alkalinity (carbonate/bicarbonate)[f]	SM 2320B (2011)	IV	I
	Alkalinity, Total as $CaCO_3$	SM 2320B (2011)	IV	I
	Chloride	EPA Method 300	IV	I
	Total Organic Carbon (TOC)	SM 5310B (2011)	IV	I
	Nitrate	EPA Method 300	IV	I
	Sulfate	EPA Method 300	IV	I
	Target Compound List (TCL) VOC[g]	EPA Method 5030B/8260B[h]	IV	III
	1,4-Dioxane	EPA Method 5030B/8260B-SIM[h, i]	IV	III

Table 3-1
Summary of Chemical Analyses and Analytical Method References for Groundwater Sampling
FCX-Statesville Superfund Site OU3

Notes:

[a] Sample preservatives, when required by the method, will be added to sample containers at the analytical laboratory prior to sampling.

[b] DQOs (Data Quality Objectives) and QA/QC frequencies per Region 4 SESD Field Branches Quality System and Technical Procedures, which are available at http://www.epa.gov/region4/sesd/fbqstp/. Level I = Field Screening; Level II = Field Analyses; Level III = Screening Data with Definitive Confirmation; Level IV = Definitive Data.

[c] Laboratory data package formats are per the legacy EPNG laboratory program.

[d] Method will be per manufacturer's procedures.

[e] NA = Not Applicable.

[f] Samples to be collected in zero headspace containers to prevent exchange of carbon dioxide between the samples and the atmosphere

[g] VOC list will be the Target Compound List unless otherwise specified.

[h] VOA must have a relative response factor of $\geq$0.05 for all target compounds, except ketones, which must have an RRF $\geq$0.01, regardless of the analyses method. Analytical method will be most current method (low concentration purge and trap followed by capillary column GC/MS), unless otherwise specified.

[i] Select groundwater samples were analyzed for 1,4-Dioxane by EPA Method 5030B/8260B with Selected Ion Monitoring (SIM) during the April and October 2014 groundwater sampling events.

Table 3-2
Natural Attenuation Parameter Field Measurements and Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Location	Sample Date	Alkalinity (as $CaCO_3$) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	TOC (mg/L)	Dissolved Oxygen (mg/L)	ORP (mV)	pH (S.U.)	Specific Conductivity (µS/cm)	Temperature (Deg C)
North Area Saprolite or Transition Zone Wells													
W-01S	4/22/2014	--	--	--	--	--	--	--	5.36	24.7	4.58	64	18.60
W-06S	4/22/2014	--	--	--	--	--	--	--	2.81	16.2	3.80	157	17.77
W-09S	4/25/2014	--	--	--	--	--	--	--	6.59	250.6	4.28	30	16.92
W-10S	4/22/2014	--	--	--	--	--	--	--	5.57	240.7	3.56	34	16.38
W-10T	4/22/2014	--	--	--	--	--	--	--	5.19	210.5	5.26	34	16.44
W-11S	4/23/2014	--	--	--	--	--	--	--	7.44	90.9	6.02	31	15.99
W-18S	4/22/2014	--	--	--	--	--	--	--	5.76	207.1	5.29	20	16.63
W-19S	10/15/2014	--	--	--	--	--	--	--	4.66	240.7	5.49	112	16.00
W-20S	4/24/2014	62.3	62.3	<5	8.9	<0.05	3.3	11.1 J	0.18	134.5	6.09	145	14.62
	10/16/2014 [1]	65.7	65.7	<5	9.7	<0.05	4.8	<0.23	--	--	--	--	--
	10/16/2014	64.4	64.4	<5	8.8 J	<0.25 UJ	3.8 J	<0.23	0.08	44.4	6.82	149	16.10
W-21S	4/22/2014	--	--	--	--	--	--	--	4.36	252.6	3.77	34	14.48
W-21T	4/22/2014	--	--	--	--	--	--	--	5.82	195.7	6.15	68	15.60
W-30T	10/16/2014	26.9	26.9	<5	13.5	1.1	18.3	0.23 J	1.62	41	5.97	139	13.37
W-31S	4/22/2014	--	--	--	--	--	--	--	2.23	181.4	4.73	72	12.84
	10/14/2014	--	--	--	--	--	--	--	2.97	242.4	6.28	90	15.81
W-35T	10/15/2014	--	--	--	--	--	--	--	7.56	291.2	5.29	46	14.33
W-36S	10/15/2014	--	--	--	--	--	--	--	1.5	230.4	5.69	86	15.30
W-38S	10/16/2014	--	--	--	--	--	--	--	1.61	176.5	6.44	189	14.90
W-38T	10/14/2014	--	--	--	--	--	--	--	1.92	209.4	6.41	151	13.56
W-39S	10/14/2014	--	--	--	--	--	--	--	0.11	-100.3	6.58	393	14.80
W-40S	4/24/2014	52.9	52.9	<5	17.7	0.54	12.4	10.1	1.54	174.7	5.61	158	13.35
	4/24/2014 [1]	56.4	56.4	<5	17.9	0.54	12.5	11.2	--	--	--	--	--
	10/16/2014	58.7	58.7	<5	16.3	0.54	11.2	<0.23	1.26	166.2	6.47	176	16.10
W-40T	10/16/2014	83.8	83.8	<5	14.6	0.53	18.1 J	<0.23	0.59	222.4	6.46	203	13.24
W-88S	10/14/2014	--	--	--	--	--	--	--	3.05	207.5	6.15	95	14.80
W-88I	10/14/2014	--	--	--	--	--	--	--	3.25	169.8	7.27	93	15.10
URS-MW-01	4/22/2014	--	--	--	--	--	--	--	0.37	264.8	3.87	57	11.27
URS-MW-02	4/22/2014	--	--	--	--	--	--	--	0.21	24.1	5.91	139	10.16
URS-MW-02D	4/22/2014	--	--	--	--	--	--	--	0.14	-65.7	11.66	870	14.48
URS-MW-03	4/22/2014	--	--	--	--	--	--	--	0.75	193.2	4.60	37	11.70
MP-17	4/22/2014	--	--	--	--	--	--	--	5.69	54.2	4.62	53	16.82
IW-04T	4/22/2014	--	--	--	--	--	--	--	3.52	21.9	5.25	165	17.65
IW-05T	4/22/2014	--	--	--	--	--	--	--	2.99	30.5	7.00	154	17.33
IW-06T	10/16/2014	34	34	<5	12.5	1.1	18.2	5.1	0.36	201	5.59	380	16.30

Table 3-2
Natural Attenuation Parameter Field Measurements and Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Location	Sample Date	Alkalinity (as $CaCO_3$) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	TOC (mg/L)	Dissolved Oxygen (mg/L)	ORP (mV)	pH (S.U.)	Specific Conductivity (µS/cm)	Temperature (Deg C)
North Area Intermediate or Deep Bedrock Wells													
W-01I	4/22/2014	--	--	--	--	--	--	--	0.71	-22.4	7.29	77	18.45
W-09I	4/25/2014	--	--	--	--	--	--	--	0.31	-64.1	7.13	137	17.08
W-10I	4/22/2014	--	--	--	--	--	--	--	1.15	-129.1	10.24	114	16.41
W-20D	4/22/2014	--	--	--	--	--	--	--	0.32	-249.7	9.64	196	15.64
W-20I	4/22/2014	--	--	--	--	--	--	--	0.72	-129.6	7.73	246	15.29
	10/14/2014	--	--	--	--	--	--	--	0.24	53.6	7.56	226	15.30
W-26I	4/23/2014	--	--	--	--	--	--	--	0.32	-522.3	11.58	325	16.69
W-28I	4/22/2014	--	--	--	--	--	--	--	4.29	-63.2	11.91	694	17.80
W-30I	10/15/2014	--	--	--	--	--	--	--	0.03	224.7	8.06	496	15.70
W-31I	4/22/2014	--	--	--	--	--	--	--	0.29	-33.9	10.46	253	15.94
W-33I	4/22/2014	--	--	--	--	--	--	--	2.11	54.6	6.59	77	18.14
W-88D	10/14/2014	--	--	--	--	--	--	--	0.16	59.7	7.87	219	13.55
IW-01	4/22/2014	--	--	--	--	--	--	--	-0.02	-175.5	11.42	147	17.13
IW-02	4/25/2014	--	--	--	--	--	--	--	0.03	-306.7	8.70	178	17.61
IW-03	4/22/2014	--	--	--	--	--	--	--	0.05	-94.7	10.65	66	17.94
South Area Saprolite or Transition Zone Wells													
W-02S	4/25/2014	--	--	--	--	--	--	--	5.59	269.3	4.23	78	17.77
W-03S	4/23/2014	--	--	--	--	--	--	--	4.92	208.2	3.70	71	19.61
	10/15/2014	--	--	--	--	--	--	--	4.84	254.5	5.12	71	19.00
W-04S	4/25/2014	--	--	--	--	--	--	--	5.52	266.4	4.67	35	17.56
W-05S	4/23/2014	--	--	--	--	--	--	--	3.69	197.4	4.45	113	18.17
W-24S	4/23/2014	--	--	--	--	--	--	--	0.34	127.3	4.97	71	15.08
W-41T	4/23/2014	--	--	--	--	--	--	--	7.38	65.2	5.18	50	17.32
MW-02	4/23/2014	--	--	--	--	--	--	--	6.47	51.9	5.24	45	18.03
MW-04	4/23/2014	--	--	--	--	--	--	--	5.8	55.5	4.92	99	17.07
MW-05S	4/23/2014	--	--	--	--	--	--	--	4.48	78.6	4.81	65	19.16
South Area Intermediate or Deep Bedrock Wells													
W-02I	4/23/2014	--	--	--	--	--	--	--	9.13	-20.9	10.80	116	17.39
W-05I	4/23/2014	--	--	--	--	--	--	--	1.19	83	6.63	154	18.04
W-13I	4/23/2014	--	--	--	--	--	--	--	-0.51	-372.5	11.46	346	17.52
W-29I	4/23/2014	--	--	--	--	--	--	--	0.24	-179.5	5.57	120	17.09
W-32I	4/23/2014	--	--	--	--	--	--	--	0.56	-160.4	8.79	206	15.72
W-42I	4/23/2014	--	--	--	--	--	--	--	0.48	-154.2	7.69	367	17.67
Northern Drainage Pre-Design Investigation Monitoring Wells													
W-89-25	10/14/2014	--	--	--	--	--	--	--	0.68	50.4	8.01	312	12.78
W-90-29	10/14/2014	--	--	--	--	--	--	--	0.36	139.2	6.43	294	14.60
W-91-15	10/14/2014	--	--	--	--	--	--	--	3.68	201.5	6.34	124	14.45
W-92-50	10/14/2014	--	--	--	--	--	--	--	1.53	186.4	6.22	212	12.97
W-93-40	10/14/2014	--	--	--	--	--	--	--	1.49	196.6	6.03	213	13.09
W-94-15	4/22/2014	--	--	--	--	--	--	--	1.74	135.8	6.16	111	13.70
W-94-52	4/22/2014	--	--	--	--	--	--	--	4.81	137.3	6.61	105	15.24
W-95-15	10/14/2014	--	--	--	--	--	--	--	0.24	180	6.78	215	17.10

Table 3-2
Natural Attenuation Parameter Field Measurements and Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Location	Sample Date	Alkalinity (as $CaCO_3$) (mg/L)	Alkalinity, Bicarbonate (as $CaCO_3$) (mg/L)	Alkalinity, Carbonate (as $CaCO_3$) (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	TOC (mg/L)	Dissolved Oxygen (mg/L)	ORP (mV)	pH (S.U.)	Specific Conductivity (µS/cm)	Temperature (Deg C)
Source Area Concentric Design Wells													
EW-01	4/24/2014	--	--	--	--	--	--	--	4.38	188.8	6.04	140	18.90
EW-02	4/24/2014	--	--	--	--	--	--	--	6.77	170.7	5.84	24	18.95
	10/16/2014	--	--	--	--	--	--	--	8.72	281.9	5.66	32	17.24
EW-03	4/24/2014	--	--	--	--	--	--	--	5.17	190.4	5.24	66	18.29
EW-04	4/24/2014	--	--	--	--	--	--	--	7.56	266.2	5.98	170	18.67
	10/16/2014	--	--	--	--	--	--	--	11.24	267.1	5.88	176	16.78
EW-05	4/24/2014	--	--	--	--	--	--	--	8.22	305.9	4.14	15	18.50
EW-06	4/24/2014	--	--	--	--	--	--	--	5.19	189.2	5.33	43	18.98
EW-07	4/24/2014	--	--	--	--	--	--	--	7	218.8	4.73	19	19.20
EW-08	4/24/2014	--	--	--	--	--	--	--	7.65	248.8	4.42	83	19.11
	10/16/2014	--	--	--	--	--	--	--	4.09	347.2	5.43	92	17.22
EW-09	4/24/2014	--	--	--	--	--	--	--	6.31	280.8	5.00	72	18.47
EW-10	4/24/2014	--	--	--	--	--	--	--	5.94	265.5	4.88	60	17.70
EW-11	4/24/2014	--	--	--	--	--	--	--	5.76	320.7	4.78	499	18.47
EW-12	4/25/2014	--	--	--	--	--	--	--	4.72	285.2	5.13	364	17.61
EW-13	4/25/2014	--	--	--	--	--	--	--	8.49	261.2	5.79	353	17.95
	10/16/2014	--	--	--	--	--	--	--	9.08	210.7	6.28	349	18.00
EW-14	4/24/2014	--	--	--	--	--	--	--	5.47	229.1	4.70	115	18.86
EW-15	4/25/2014	--	--	--	--	--	--	--	9.19	273.2	5.63	468	17.43
	10/16/2014	--	--	--	--	--	--	--	7.19	220.1	6.14	367	17.20
EW-16	4/24/2014	--	--	--	--	--	--	--	5.75	294.8	4.99	431	18.70
	10/16/2014	--	--	--	--	--	--	--	5.69	254.1	5.35	473	18.70
EW-17	4/24/2014	--	--	--	--	--	--	--	5.71	279.5	5.12	33	18.18
EW-18	4/25/2014	--	--	--	--	--	--	--	6.34	297.2	4.80	188	17.75
EW-19	4/24/2014	--	--	--	--	--	--	--	6.3	291.3	4.59	43	18.21
EW-20	4/24/2014	--	--	--	--	--	--	--	8.23	274	4.52	66	18.69
	10/16/2014	--	--	--	--	--	--	--	8.45	264.6	5.30	68	18.80
EW-21	4/24/2014	--	--	--	--	--	--	--	7.08	190.7	5.53	24	18.89
EW-22	4/24/2014	--	--	--	--	--	--	--	9.41	251.9	4.63	15	19.13
EW-23	4/24/2014	--	--	--	--	--	--	--	19.28	246.2	7.44	42	19.40
	10/16/2014	--	--	--	--	--	--	--	7.63	184.6	6.73	35	19.00
EW-24	4/24/2014	--	--	--	--	--	--	--	10.27	197.8	6.79	108	19.10
MP-01	4/24/2014	--	--	--	--	--	--	--	3.71	138.7	5.85	96	18.54
MP-03	4/24/2014	--	--	--	--	--	--	--	7.24	230.5	4.43	20	19.10
MP-04	4/24/2014	--	--	--	--	--	--	--	4.29	198.5	6.42	125	19.16
MP-07	4/24/2014	--	--	--	--	--	--	--	7.49	270.1	3.84	28	18.93
MP-08	4/24/2014	--	--	--	--	--	--	--	5.33	256.9	4.01	33	18.96
	10/16/2014	--	--	--	--	--	--	--	4.47	339.6	4.51	44	17.05
MP-15	4/24/2014	--	--	--	--	--	--	--	6.59	195.4	5.57	91	18.93

Table 3-2
Natural Attenuation Parameter Field Measurements and Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Notes:
(1) Field Duplicate
"--" = Not analyzed for this constituent
< # = Not detected at specified detection limit
µS/cm = Microsiemens per centimeter
$CaCO_3$ = Calcium carbonate
Deg C = Degrees Celsius
J = Estimated concentration
mg/L = Milligrams per liter
MNA = Monitored Natural Attenuation
mV = Millivolts
ORP = Oxidation Reduction Potential
S.U. = Standard units
TOC = Total organic carbon
UJ = Not detected and the limit is estimated

This table presents all 2014 groundwater MNA results. Sample results have been qualified in accordance with the *Quality Assurance Project Plan for FCX (Statesville) Superfund Site (OU3)* (URS, April 2009). The data review process was modeled after the *Data Validation Standard Operating Procedures (SOP) for Organic Analysis* (EPA Region 4, August 2008, Revision 3.1) and *Data Validation SOP for Contract Laboratory Program Inorganic Data by ICP-AES & ICP-MS* (EPA Region 4, September 2, 2011, Version 2.0).

Table 3-3
Groundwater Volatile Organic Compound Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Location	Sample Date	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)	1,1,1-TCA (µg/L)	1,1,2,2-PCA (µg/L)	1,1,2-TCA (µg/L)	1,1-DCA (µg/L)	1,1-DCE (µg/L)	1,2-DCA (µg/L)	1,2-Dichloro propane (µg/L)	1,3-DCB (µg/L)	Carbon tetra chloride (µg/L)	Chloro benzene (µg/L)	Chloro ethane (µg/L)	Chloro form (µg/L)	Dibromo chloro methane (µg/L)	Bromo dichloro methane (µg/L)	Bromo form (µg/L)	Freon 113 (µg/L)	Freon 11 (µg/L)	Carbon disulfide (µg/L)	MIBK (µg/L)	Acetone (µg/L)	Benzene (µg/L)	Toluene (µg/L)
North Area Saprolite or Transition Zone Wells																												
W-01S	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-06S	4/22/2014		1.1	1.4	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-09S	4/25/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-10S	4/22/2014		0.79 J	0.53 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.62 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-10T	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-11S	4/23/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-18S	4/22/2014	0.64 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36 UJ	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-19S	10/15/2014			12.3 J	<6.9	<6.5 UJ	<6.7	<5.5	<6.3	<5.1	<5.1	<4.8	<7.1	<4	<7.9	<4.8	<10	<6.2	<7.2	<5.2	<7.7	<6.1	<10	<4	<20	<210	<4.9	<4
W-20S	4/24/2014			21.1	0.49 J		<0.34	<0.27	<0.32	<0.26	0.48 J	<0.24		<0.2	<0.4	<0.24	1.3 J	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2 UJ	<1	<11	<0.24	<0.2
	10/16/2014			18.3	<0.69		<0.67	<0.55	<0.63	<0.51	<0.51	<0.48		<0.4	<0.79	<0.48	<1	<0.62	<0.72	<0.52	<0.77	<0.61	<1	<0.4	<2	<21	<0.49	<0.4
	10/16/2014 [1]			15.9	<0.86		<0.84	<0.69	<0.79	<0.64	<0.63	<0.6		<0.5	<0.99	<0.6	<1.3	<0.78	<0.9	<0.65	<0.96	<0.77	<1.3	<0.5	<2.5	<26	<0.61	<0.5
W-21S	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-21T	4/22/2014		0.33 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-30T	10/16/2014			25.5 J	<17	<16	<17	<14	<16	<13	<13	<12	<18	<10	<20	<12	<25	<16	<18 UJ	<13 UJ	<19 UJ	<15	<25	<10	<50	<530	<12	<10
W-31S	4/22/2014	0.44 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/14/2014	<0.26	<0.3	<0.33	<0.34	<0.33 UJ	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-35T	10/15/2014		<3	<3.3	<3.4	<3.3 UJ	<3.4	<2.7	<3.2	<2.6	<2.5	<2.4	<3.6	<2	<4	<2.4	<5	<3.1	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
W-36S	10/15/2014			<0.82	<0.86	<0.81 UJ	<0.84	<0.69	<0.79	<0.64	<0.63	<0.6	<0.89	<0.5	<0.99	<0.6	<1.3	<0.78	<0.9	<0.65	<0.96	<0.77	<1.3	<0.5	<2.5	<26	<0.61	<0.5
W-38S	10/16/2014			25.9	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	2.1 J	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
W-38T	10/14/2014			4	<0.69	<0.65	<0.67	<0.55	<0.63	<0.51	<0.51	<0.48		<0.4	<0.79	<0.48	<1	<0.62	<0.72	<0.52	<0.77	<0.61	<1	<0.4	<2	<21	<0.49	<0.4
W-39S	10/14/2014				<0.86		<0.84	<0.69	<0.79	<0.64	<0.63	<0.6		0.74 J	<0.99	<0.6	<1.3	<0.78	<0.9 UJ	<0.65	<0.96	<0.77	<1.3	<0.5 UJ	<2.5	<26	<0.61	<0.5
W-40S	4/24/2014			34.3	<0.34	<0.33	<0.34	<0.27	<0.32	0.28 J	1.1	<0.24		<0.2		<0.24	<0.5	2.4	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	4/24/2014 [1]			33.9	0.36 J	<0.33	<0.34	<0.27	<0.32	0.27 J	1.2	<0.24		<0.2		<0.24	<0.5	2.5	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014			34.2	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	1.7 J	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
W-40T	10/16/2014			14	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	<1.6	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
W-88S	10/14/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-88I	10/14/2014	<0.26	<0.3	<0.33	<0.34	<0.33 UJ	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38 UJ	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
URS-MW-01	4/22/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
URS-MW-02	4/22/2014			27.7	0.7 J		<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	0.41 J	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
URS-MW-02D	4/22/2014			39.2	1		<0.34	<0.27	<0.32	<0.26	0.33 J	<0.24		<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.24 U	<1	12.1 J	<0.24	<0.2
URS-MW-03	4/22/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.27 U	<1	<11	<0.24	<0.2
MP-17	4/22/2014		0.32 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	0.6 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
IW-04T	4/22/2014			31.7	<3.4	<3.3	<3.4	<2.7	<3.2	<2.6	<2.5	<2.4	<3.6	<2	<4	<2.4	<5	8 J	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
IW-05T	4/22/2014			<3.3	<3.4	<3.3	<3.4	<2.7	<3.2	<2.6	9.9 J	<2.4	<3.6	<2	<4	<2.4	<5	<3.1	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
IW-06T	10/16/2014				<17	<16	<17	<14	<16	<13	<13	<12	<18	<10	<20	<12	<25	55.5	<18	<13	<19	<15	<25	<10	<50	<530	<12	<10

Table 3-3
Groundwater Volatile Organic Compound Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Location	Sample Date	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)	1,1,1-TCA (µg/L)	1,1,2,2-PCA (µg/L)	1,1,2-TCA (µg/L)	1,1-DCA (µg/L)	1,1-DCE (µg/L)	1,2-DCA (µg/L)	1,2-Dichloro propane (µg/L)	1,3-DCB (µg/L)	Carbon tetra chloride (µg/L)	Chloro benzene (µg/L)	Chloro ethane (µg/L)	Chloro form (µg/L)	Dibromo chloro methane (µg/L)	Bromo dichloro methane (µg/L)	Bromo form (µg/L)	Freon 113 (µg/L)	Freon 11 (µg/L)	Carbon disulfide (µg/L)	MIBK (µg/L)	Acetone (µg/L)	Benzene (µg/L)	Toluene (µg/L)
North Area Intermediate or Deep Bedrock Wells																												
W-01I	4/22/2014		2.3	4.8	<0.34	<0.33	<0.34	<0.27		0.95 J	19.9		<0.36	<0.2	<0.4	<0.24	<0.5	0.85 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.79 U	<1	<11	<0.24	<0.2
W-09I	4/25/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	30.1	<0.2	<1	<11	<0.24	<0.2
W-10I	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.25 U	<1	<11	<0.24	<0.2
W-12I	4/23/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<1.2 U	<1	12.6 J	<0.24	<0.2
W-20D	4/22/2014		1.7	2.3	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24		<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	11.6	<1	<11	<0.24	<0.2
W-20I	4/22/2014			35.9	<0.34		<0.34	<0.27	<0.32	<0.26	0.36 J	<0.24		<0.2	<0.4	<0.24	<0.5	0.39 J	<0.36	<0.26	<0.38	<0.31	<0.5	6.2	<1	<11	<0.24	<0.2
	10/14/2014			37.9	<0.34		<0.34	<0.27	<0.32	<0.26	0.53 J	<0.24		<0.2	<0.4	<0.24	<0.5	0.65 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-26I	4/23/2014	0.35 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.93 U	<1	<11	<0.24	<0.2
W-28I	4/22/2014			2.7	<0.69	<0.65	<0.67	<0.55	<0.63	<0.51	0.54 J	<0.48	<0.71	<0.4	<0.79	<0.48	<1	<0.62	<0.72	<0.52	<0.77	<0.61	<1	<0.4	<2	<21	<0.49	<0.4
W-30I	10/15/2014		2.4	2.8	<0.34	<0.33 UJ	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24		0.35 J	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	13.4	<1	<11	<0.24	<0.2
W-31I	4/22/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	12.6	<1	<11	<0.24	<0.2
W-33I	4/22/2014	<0.26	1.3	42.9	0.38 J		<0.34	<0.27	<0.32	<0.26	<0.25	<0.24		<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.52 U	<1	<11	<0.24	<0.2
W-88D	10/14/2014		0.79 J	0.42 J	<0.34	<0.33 UJ	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	0.58 J	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
IW-01	4/22/2014			0.96 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	1.6	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	0.56 J
IW-02	4/25/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
IW-03	4/22/2014		2.6	8.5	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	0.4 J	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
South Area Saprolite or Transition Zone Wells																												
W-02S	4/25/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-03S	4/23/2014			34.8	<0.34	<0.33	<0.34	<0.27	<0.32	1	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	2.5	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/15/2014			30.7	<0.34	<0.33 UJ	<0.34	<0.27	<0.32	0.77 J	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	2	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-04S	4/25/2014	0.29 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-05S	4/23/2014				<0.34		5.8	<0.27			0.82 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	1.1	<0.36	<0.26	<0.38	30.9	<0.5	<0.2	1.2 J	<11	<0.24	<0.2
W-24S	4/23/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-41T	4/23/2014	0.56 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	0.47 J	<0.5	<0.2	<1	<11	<0.24	<0.2
MW-02	4/23/2014		<0.3	1.5	<0.34	<0.33	<0.34	<0.27	<0.32	0.28 J	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	9.6	<0.5	<0.2	<1	<11	<0.24	<0.2
MW-04	4/23/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	1.6 J	<0.2	<1	<11	<0.24	<0.2
MW-05S	4/23/2014	<0.26	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
South Area Intermediate or Deep Bedrock Wells																												
W-02I	4/23/2014	0.43 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	11.2	<0.56 UJ	<1	<11	<0.24	<0.2
W-05I	4/23/2014			46	<0.34		<0.34	<0.27	<0.32		4.8 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.41 J	<0.36	<0.26	<0.38	2.6	<0.5	<0.2	<1	<11	<0.24	<0.2
	4/23/2014 [1]			60.1	0.5 J		<0.34	<0.27	<0.32		6.2 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	3.2	<0.5	<0.2	<1	<11	<0.24	<0.2
W-13I	4/23/2014	0.45 J	<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	0.67 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<1.9 U	<1	<11	<0.24	0.25 J
W-29I	4/23/2014		0.58 J	2	<0.34	<0.33	<0.34	<0.27	<0.32	0.77 J	0.99 J	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.5 J	<0.36	<0.26	<0.38	6.4	<0.5	<1.9 U	<1	<11	<0.24	<0.2
W-32I	4/23/2014		0.3 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	5.4	<1	<11	<0.24	<0.2
W-42I	4/23/2014			35.5	<0.34		<0.34	<0.27	<0.32		2.4	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.82 J	<0.36	<0.26	<0.38	0.38 J	<0.5	<0.2	<1	<11	0.31 J	<0.2
Northern Drainage Pre-Design Investigation Monitoring Wells																												
W-89-25	10/14/2014			32.3	<0.86	<0.81	<0.84	<0.69	<0.79	<0.64	<0.63	<0.6		<0.5	<0.99	<0.6	<1.3	<0.78	<0.9	<0.65	<0.96	<0.77	<1.3	<0.5	<2.5	<26	<0.61	<0.5
W-90-29	10/14/2014			7	<0.69	<0.65	<0.67	<0.55	<0.63	<0.51	<0.51	<0.48		<0.4	<0.79	<0.48	<1	<0.62	<0.72	<0.52	<0.77	<0.61	<1	<0.4	<2	<21	<0.49	<0.4
W-91-15	10/14/2014		0.58 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	0.3 J	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-92-50	10/14/2014			30.6	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	<1.6	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
W-93-40	10/14/2014			13.5	<0.69	<0.65	<0.67	<0.55	<0.63	<0.51	<0.51	<0.48		<0.4	<0.79	<0.48	<1	0.77 J	<0.72	<0.52	<0.77	<0.61	<1	<0.4	<2	<21	<0.49	<0.4
W-94-15	4/22/2014		0.41 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-94-52	4/22/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
W-95-15	10/14/2014			46.1	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	<1.6	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1

Table 3-3
Groundwater Volatile Organic Compound Analytical Results - 2014
FCX-Statesville Superfund Site OU3

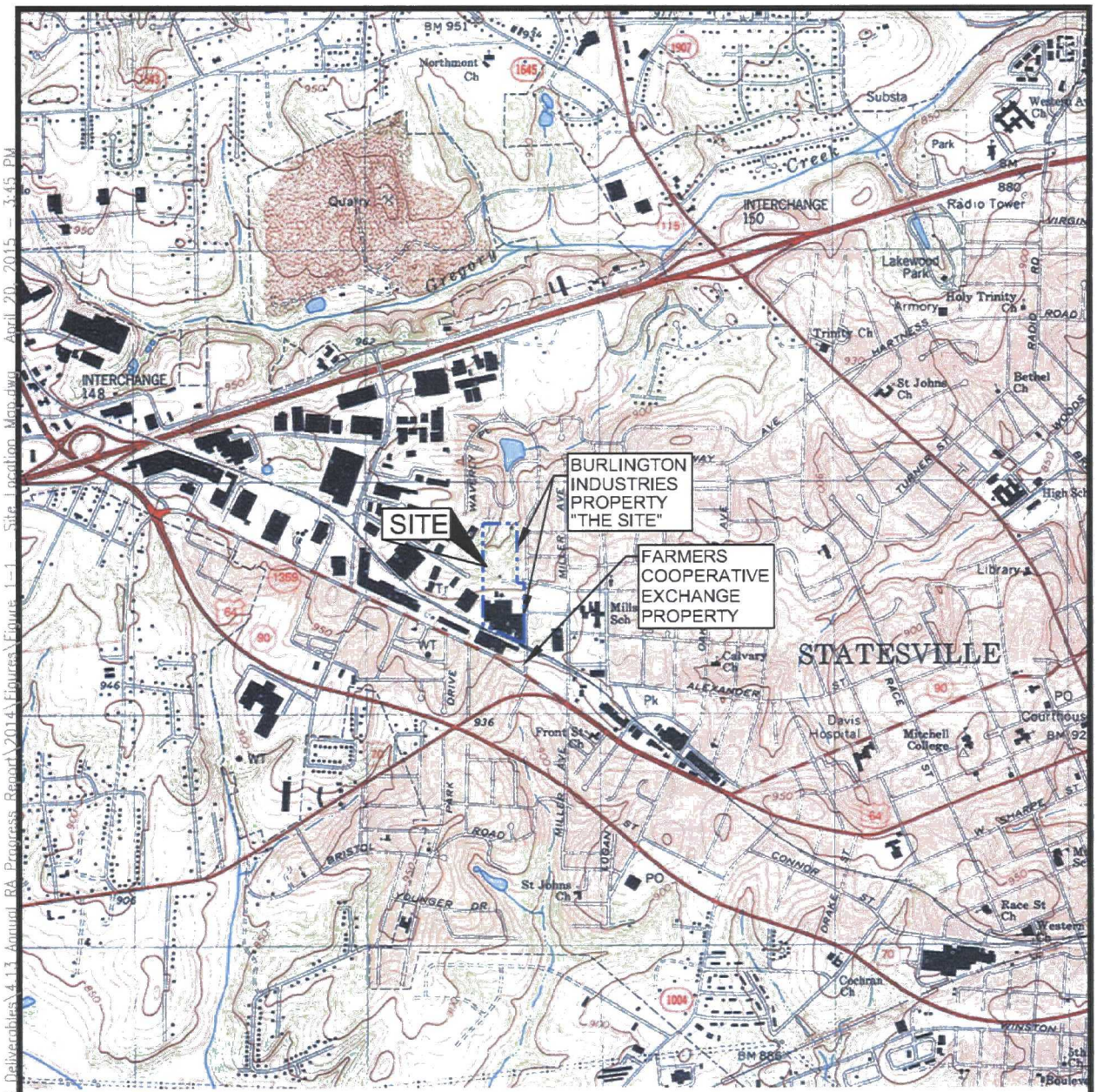
Location	Sample Date	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)	1,1,1-TCA (µg/L)	1,1,2,2-PCA (µg/L)	1,1,2-TCA (µg/L)	1,1-DCA (µg/L)	1,1-DCE (µg/L)	1,2-DCA (µg/L)	1,2-Dichloro propane (µg/L)	1,3-DCB (µg/L)	Carbon tetra chloride (µg/L)	Chloro benzene (µg/L)	Chloro ethane (µg/L)	Chloro form (µg/L)	Dibromo chloro methane (µg/L)	Bromo dichloro methane (µg/L)	Bromo form (µg/L)	Freon 113 (µg/L)	Freon 11 (µg/L)	Carbon disulfide (µg/L)	MIBK (µg/L)	Acetone (µg/L)	Benzene (µg/L)	Toluene (µg/L)
Source Area Concentric Design Wells																												
EW-01	4/24/2014			11.3 J	<6.9	<6.5	<6.7	<5.5	<6.3	<5.1	<5.1	<4.8	<7.1	<4	<7.9	<4.8	<10	11 J	<7.2	<5.2	<7.7	<6.1	<10	<4	<20	<210	<4.9	<4
EW-02	4/24/2014		0.33 J	0.37 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		0.54 J	0.46 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-03	4/24/2014			45.2	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24		<0.2	<0.4	0.55 J	<0.5	10.7	<0.36		<0.38	<0.31	1.8 J	<0.2	<1	<11	<0.24	<0.2
EW-04	4/24/2014			<3.3	<3.4	<3.3	<3.4	<2.7	<3.2	<2.6	<2.5	<2.4	<3.6	<2	<4	<2.4	<5	3.3 J	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
	10/16/2014		<7.6	<8.2	<8.6	<8.1	<8.4	<6.9	<7.9	<6.4	<6.3	<6	<8.9	<5	<9.9	<6	<13	<7.8	<9	<6.5	<9.6	<7.7	<13	<5	<25	<260	<6.1	<5
EW-05	4/24/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-06	4/24/2014		1.1	0.67 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	2.9	<0.24	<0.36	<0.2		<0.24	<0.5	0.98 J	<0.36	<0.26	<0.38	3.4	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-07	4/24/2014		1.3	0.77 J	<0.34	<0.33	<0.34	<0.27	<0.32	0.42 J	1.7	<0.24	<0.36	<0.2		<0.24	<0.5	1.5	<0.36	<0.26	<0.38	7.7	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-08	4/24/2014				<3.4	<3.3	<3.4	<2.7	<3.2	<2.6	<2.5	<2.4		<2		<2.4	<5	33.6	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
	10/16/2014			66	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	5.6	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
EW-09	4/24/2014		0.35 J	0.42 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	1.4	<0.36	<0.26	0.39 J	<0.31	1.5 J	<0.2	<1	<11	<0.24	<0.2
EW-10	4/24/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-11	4/24/2014		<0.3	0.57 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.96 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-12	4/25/2014		1	2.4	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31		<0.26	1.3	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-13	4/25/2014		0.71 J	1.3	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.49 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	4/25/2014 (1)		0.65 J	1.6	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.48 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		0.53 J	0.99 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.39 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-14	4/24/2014		1.9	6.9	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	1.2	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-15	4/25/2014		<0.3	0.99 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		<0.3	0.67 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-16	4/24/2014		1	3.8	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	0.87 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		<1.5	<1.6	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2	<1.8	<1	<2	<1.2	<2.5	3.8 J	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
	10/16/2014		2.6	2.9	<0.86	<0.81	<0.84	<0.69	<0.79	<0.64	<0.63	<0.6	<0.89	<0.5	<0.99	<0.6	<1.3	1 J	<0.9	<0.65	<0.96	<0.77	<1.3	<0.5	<2.5	<26	<0.61	<0.5
EW-17	4/24/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-18	4/25/2014		2.8	2.2	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	2	<0.24	0.48 J	<0.2		<0.24	<0.5	1.2	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-19	4/24/2014			<1.6	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	3.3 J	<1.2	<1.8	<1	<2	<1.2	<2.5	1.8 J	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
EW-20	4/24/2014		1.5	3	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25			<0.2		<0.24	<0.5	3.6	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		<1.5	3 J	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2		<1	<2	<1.2	<2.5	3.4 J	<1.8	<1.3	<1.9	<1.5	<2.5	<1	<5	<53	<1.2	<1
EW-21	4/24/2014			4.2	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	0.91 J	<0.24		<0.2		<0.24	<0.5	4.7	<0.36	<0.26	<0.38	0.65 J	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-22	4/24/2014			23.6	<0.34	<0.33	<0.34		<0.32	<0.26	<0.25	<0.24		<0.2		<0.24	<0.5	24.3	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-23	4/24/2014		<0.3	0.37 J	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014		<0.3	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
EW-24	4/24/2014			5.2	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	7.8	<0.36	0.28 J	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
MP-01	4/24/2014			8.3	<0.34	<0.33	<0.34	<0.27	0.56 J	<0.26	3.7	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	1.4	<0.36	<0.26	<0.38	0.44 J	<0.5	<0.2	<1	<11	<0.24	<0.2
MP-03	4/24/2014		0.51 J	<0.33	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	2	<0.24	<0.36	<0.2		<0.24	<0.5	0.96 J	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2
MP-04	4/24/2014			23.4	<3.4	<3.3	<3.4	<2.7	<3.2	<2.6	<2.5	<2.4	<3.6	<2	<4	<2.4	<5	10.8	<3.6	<2.6	<3.8	<3.1	<5	<2	<10	<110	<2.4	<2
MP-07	4/24/2014			14.8	<1.7	<1.6	<1.7	<1.4	<1.6	<1.3	<1.3	<1.2	<1.8	<1		<1.2	<2.5	14.6	<1.8	<1.3	<1.9	<1.5	8.1 J	<1	<5	<53	<1.2	<1
MP-08	4/24/2014			3.3	<0.34		3.7	<0.27	<0.32	2	1.7	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	70.6	<0.5	<0.2	<1	<11	<0.24	<0.2
	10/16/2014			4	<0.34		4.7	<0.27	<0.32	2.7	2.5	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	<0.31	<0.36	<0.26	<0.38	94.7	<0.5	<0.2	<1	<11	<0.24	<0.2
MP-15	4/24/2014		2.9	6.8	<0.34	<0.33	<0.34	<0.27	<0.32	<0.26	<0.25	<0.24	<0.36	<0.2	<0.4	<0.24	<0.5	4.3	<0.36	<0.26	<0.38	<0.31	<0.5	<0.2	<1	<11	<0.24	<0.2

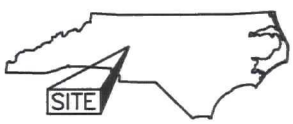
Table 3-3
Groundwater Volatile Organic Compound Analytical Results - 2014
FCX-Statesville Superfund Site OU3

Notes:
(1) - Field Duplicate
< # = Not detected at specified detection limit
< # U = Not present above the associated level; blank contamination exists
µg/L = Micrograms per liter
DCA = Dichloroethane
DCB = Dichlorobenzene
DCE = Dichloroethene
Freon 11 = Trichlorofluoromethane
Freon 113 = 1,1,2-Trichloro-1,2,2-trifluoroethane
I = Interim Maximum Allowable Concentration established under 15A NCAC 02L .0202
J = Estimated concentration
MIBK = 4-Methyl-2-pentanone
NC 2L = North Carolina Groundwater Quality Standard
PCA = Tetrachloroethane
PCE = Tetrachloroethene
TCA = Trichloroethane
TCE = Trichloroethene
UJ = Constituent not detected , estimated detection limit

This table presents the results of all analytes detected in groundwater samples collected in 2014 at the Site. Sample results have been qualified in accordance with the *Quality Assurance Project Plan for FCX (Statesville) Superfund Site (OU3)* (URS, April 2009). The data review process was modeled after the *Data Validation Standard Operating Procedures (SOP) for Organic Analysis* (EPA Region 4, August 2008, Revision 3.1) and *Data Validation SOP for Contract Laboratory Program Inorganic Data by ICP-AES & ICP-MS* (EPA Region 4, September 2, 2011, Version 2.0).

North Carolina groundwater quality standards for the protection of the groundwater are specified in 15A NCAC 2L .0200. A bold border with shading indicates the concentration is greater than the standard.





N

0 2000 4000

SCALE, FEET

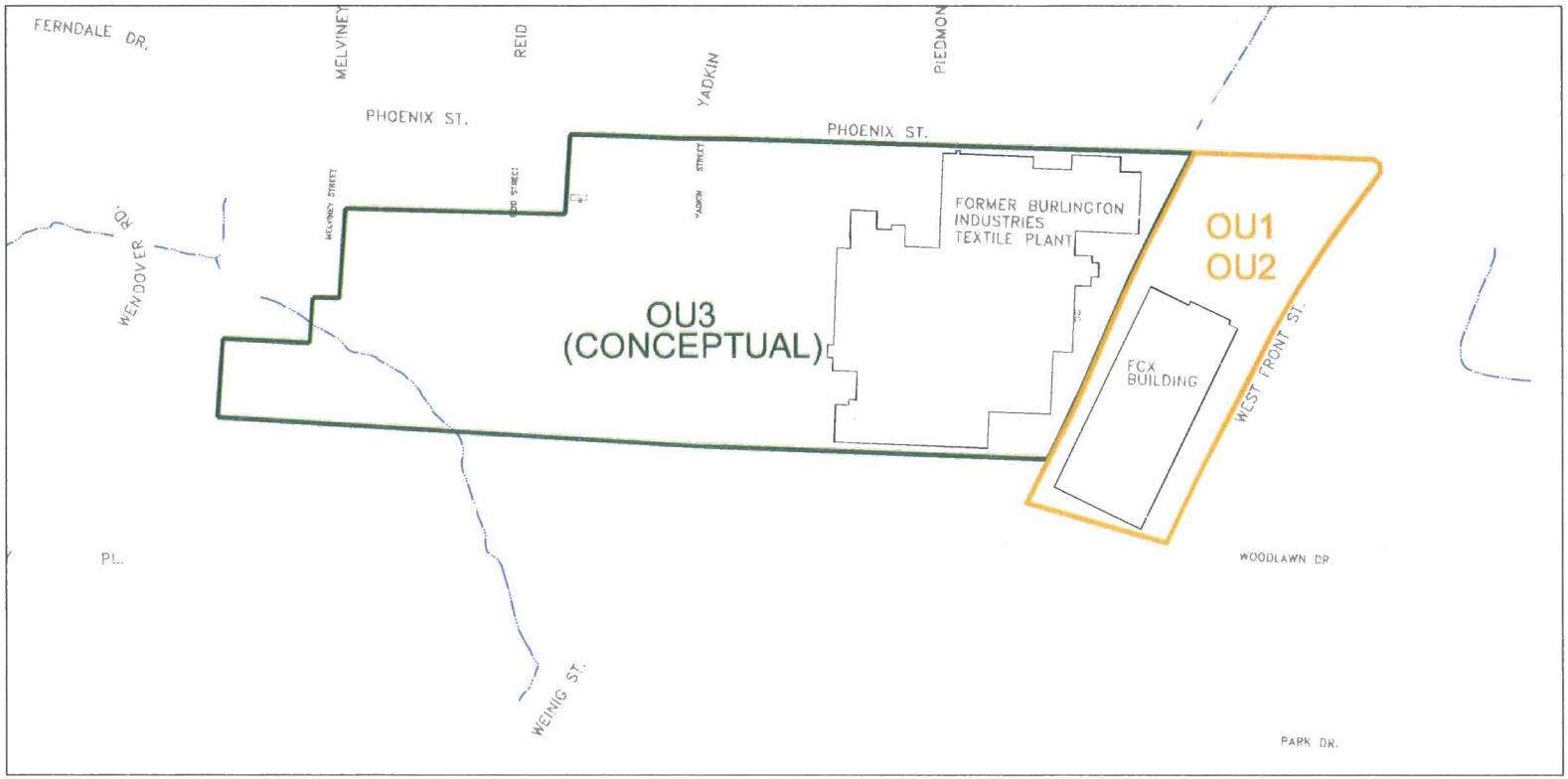
SOURCE:
USGS 7.5-MINUTE TOPOGRAPHIC MAP OF THE STATESVILLE WEST, NORTH CAROLINA QUADRANGLE DATED 2002.

URS
URS Corporation-North Carolina
1600 Perimeter Park Dr, Suite 400
Morrisville, NC 27560-8421
Tel: 919.461.1100
Fax: 919.461.1415
www.urscorp.com

PROJECT NO: 31829743.06140		CLIENT: EL PASO NATURAL GAS CO.	TITLE: SITE LOCATION MAP
DESIGN: JSH	SCALE: AS SHOWN	PROJECT: FCX SUPERFUND SITE STATESVILLE, NC	FIGURE NO: 1-1
APPROVED: ABB	DATE: 4/20/15		
DRAWN: TSH	FILE NO: STATESVILLE		

P:\Common_Projects\El Paso\Statesville\4.0 Deliverables\4.13 Annual RA Progress Report\2014\Figures\Figure 1-1 Site Location Monday, April 20, 2015 - 3:45 PM

Filename: P:\COMMON_PROJECTS\EL PASO\STATESVILLE\4.0 DELIVERABLES\4.13 ANNUAL RA PROGRESS REPORT\2014\FIGURES\FIGURE 1-2 - OPERABLE UNITS.DWG Project Management Initials: Designer: TSH Checked: SD Approved: CK



NOTE
OU-3 is defined as the extent of the chlorinated solvent plume which by definition is variable, and extends beyond the property boundary.

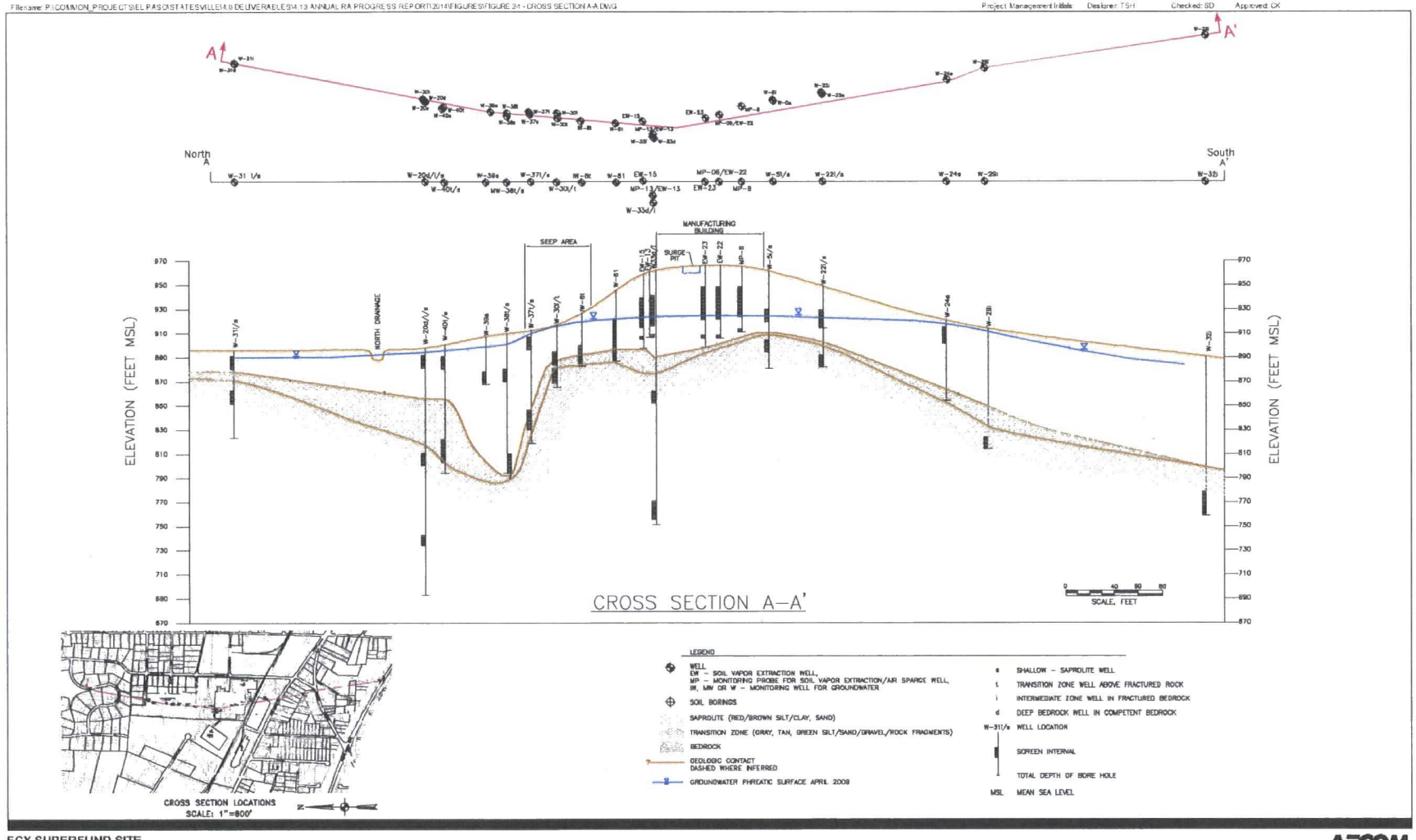
FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

FCX SUPERFUND SITE
OPERABLE UNITS
CONCEPTUAL SCALE

N

0 200 300 400
SCALE, FEET

AECOM
Figure: 1-2

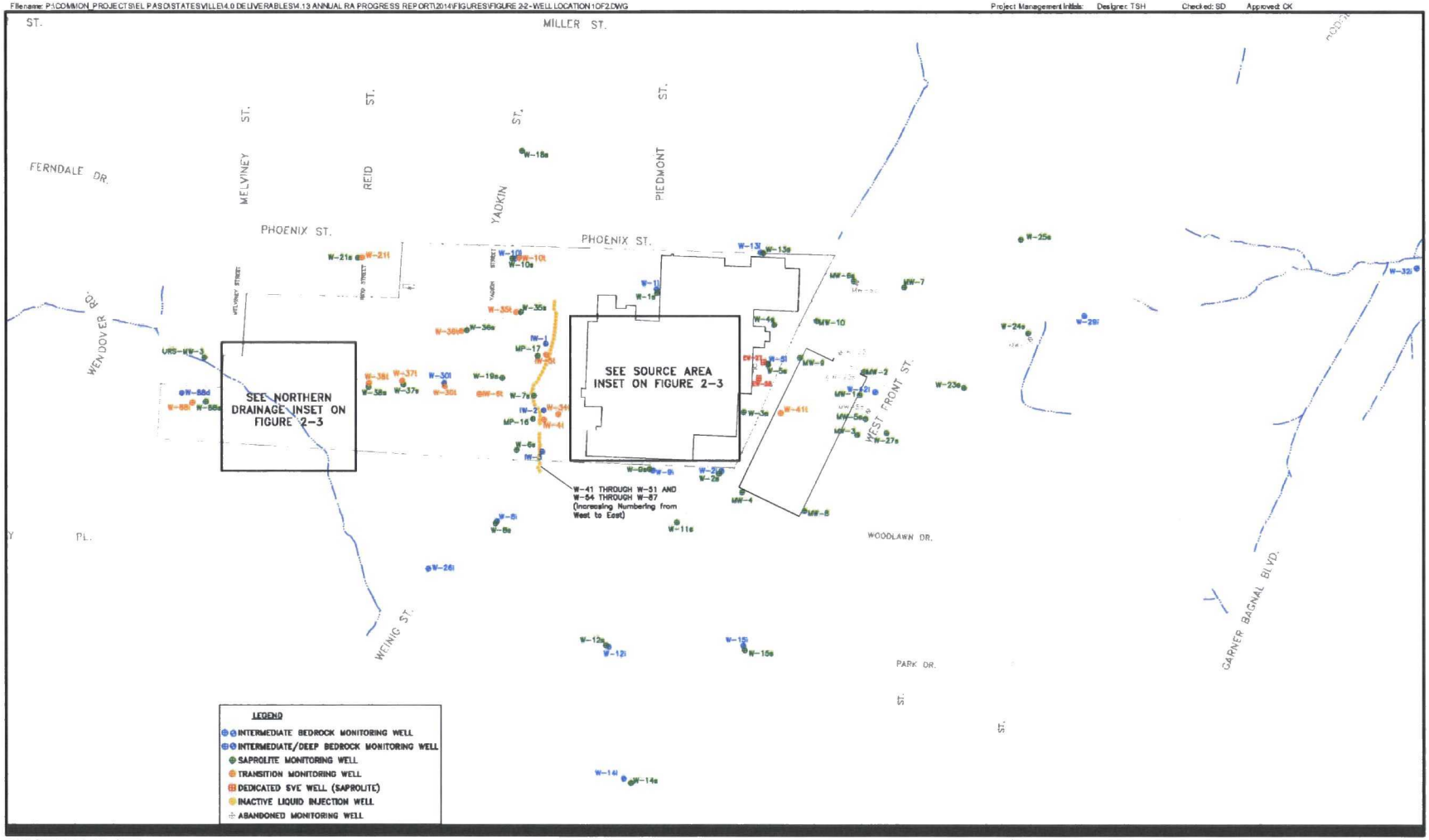


FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

CROSS SECTION A-A'

AECOM
Figure: 2-1

Filename: P:\COMMON_PROJECTS\EL PASO\STATESVILLE\4.0 DELIVERABLES\4.13 ANNUAL RA PROGRESS REPORT\2014\FIGURES\FIGURE 2-2 - WELL LOCATION 1OF2.DWG Project Management Initials: Designed: TSH Checked: SD Approved: CK



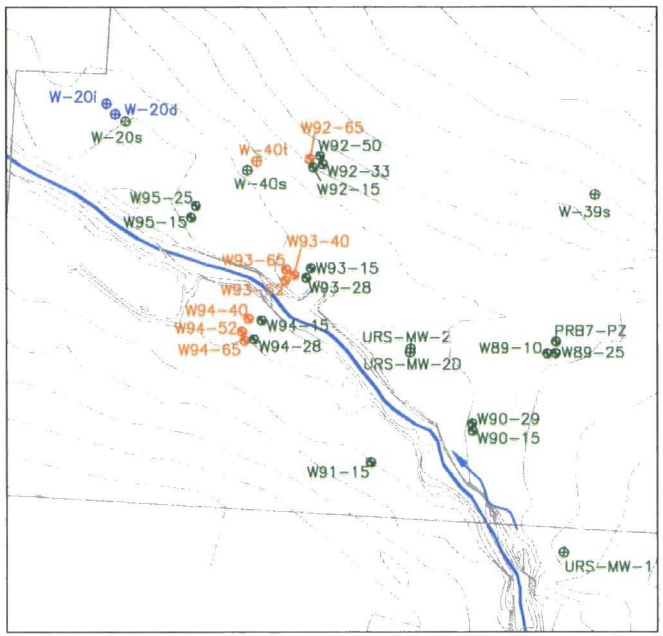
FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

MONITORING AND REMEDIATION WELL LOCATIONS (PART 1 of 2)

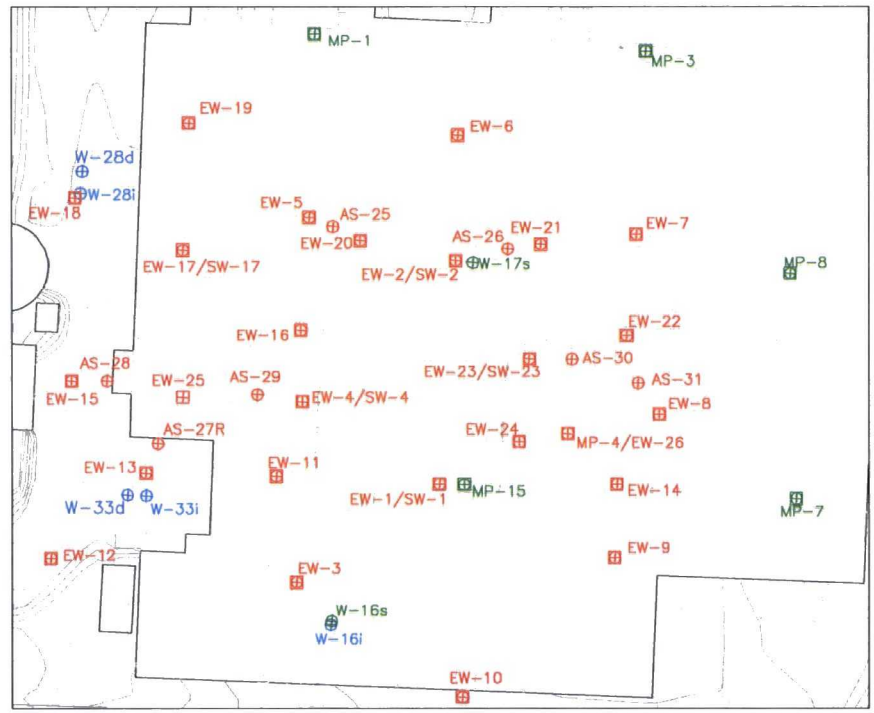
0 240 360 480
SCALE, FEET

AECOM
Figure: 2-2

Filename: P:\COMMON_PROJECTS\EL PASO\STATESVILLE\4.0 DELIVERABLES\4.13 ANNUAL RA PROGRESS REPORT\2014\FIGURES\FIGURE 2-3 - MW LOCATION 2OF2.DWG Project Management Initials: Designer: TSH Checked: SD Approved: CK



NORTHERN DRAINAGE INSET MAP



SOURCE AREA INSET MAP

LEGEND

- INTERMEDIATE BEDROCK MONITORING WELL
- INTERMEDIATE/DEEP BEDROCK MONITORING WELL
- SAPROLITE MONITORING WELL
- TRANSITION MONITORING WELL
- CONCENTRIC DESIGN SAPROLITE WELL USED FOR SVE AND/OR AIR SPARGING
- DEDICATED AIR SPARGE WELL (SAPROLITE/TRANSITION)
- DEDICATED SVE WELL (SAPROLITE)
- CONCENTRIC DESIGN SAPROLITE WELL USED FOR MONITORING

Notes:
1. Inset map locations are shown on Figure 2-2.
2. SVE = Soil Vapor Extraction

FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

MONITORING AND REMEDIATION WELL LOCATIONS (PART 2 of 2)

0 60 90 120
SCALE, FEET

AECOM

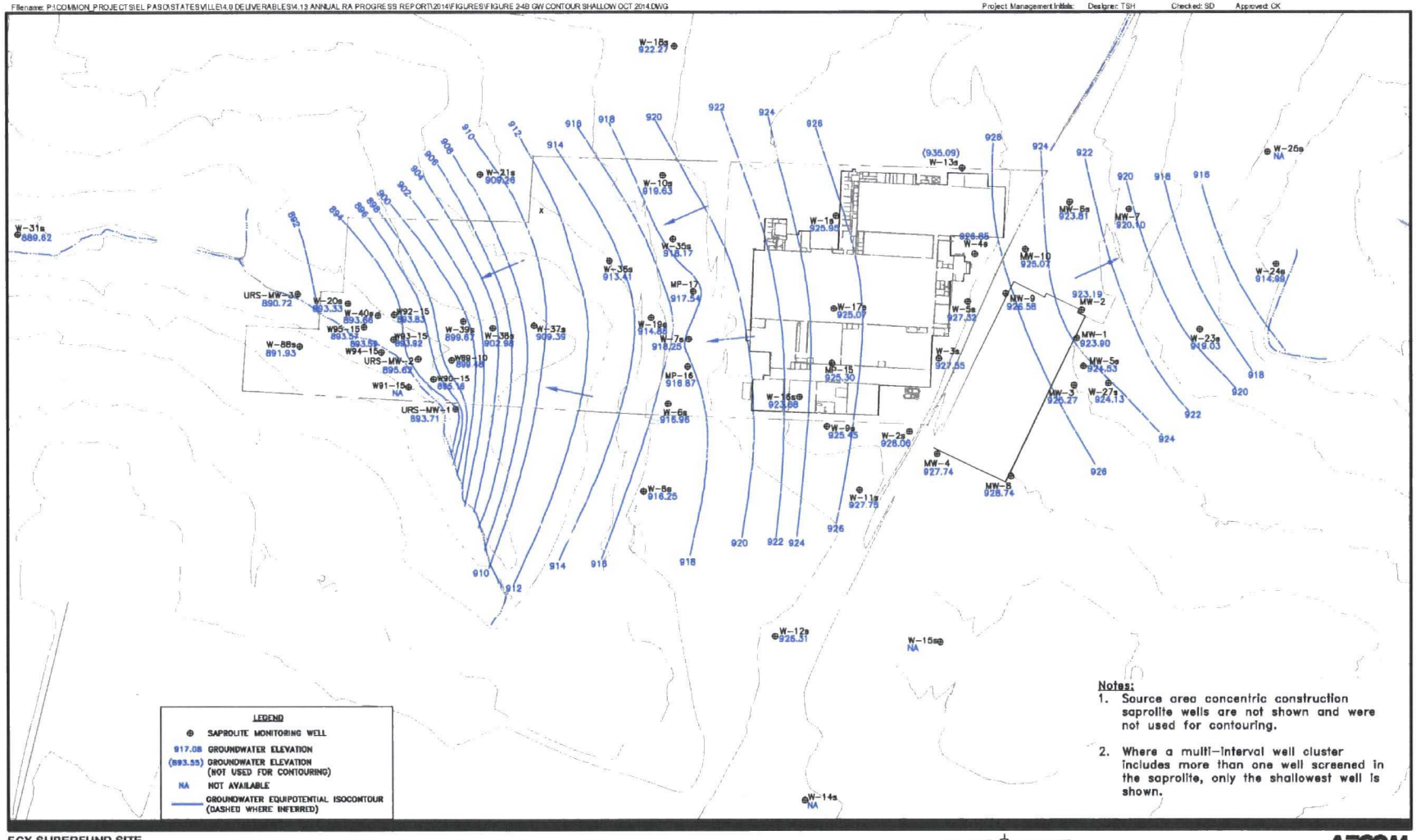
Figure: 2-3

FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

GROUNDWATER CONTOUR MAP
APRIL 2014
SAPROLITE ZONE

AECOM

Figure: 2-4a

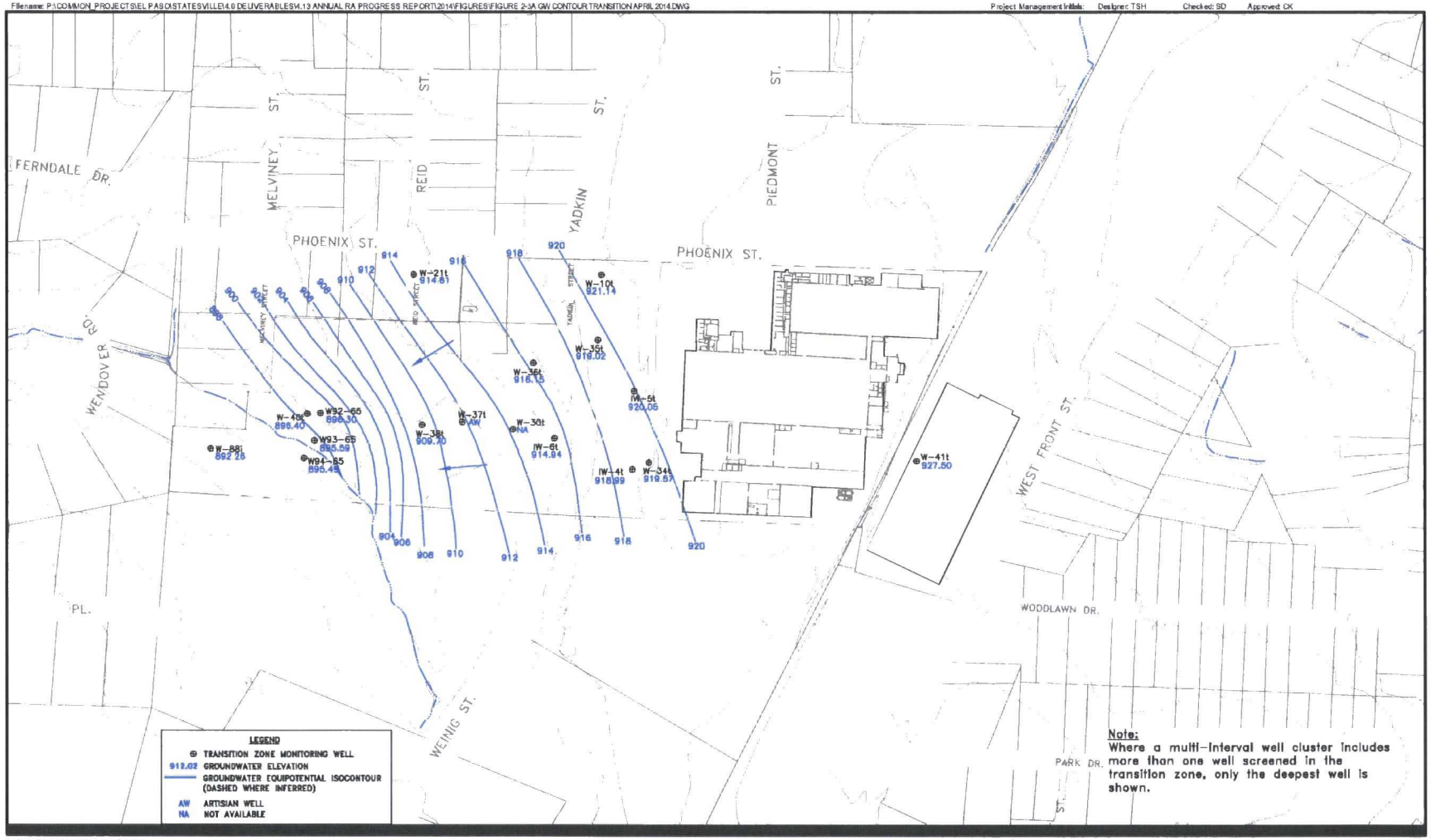


FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

GROUNDWATER CONTOUR MAP
OCTOBER 2014
SAPROLITE ZONE

AECOM

Figure: 2-4b

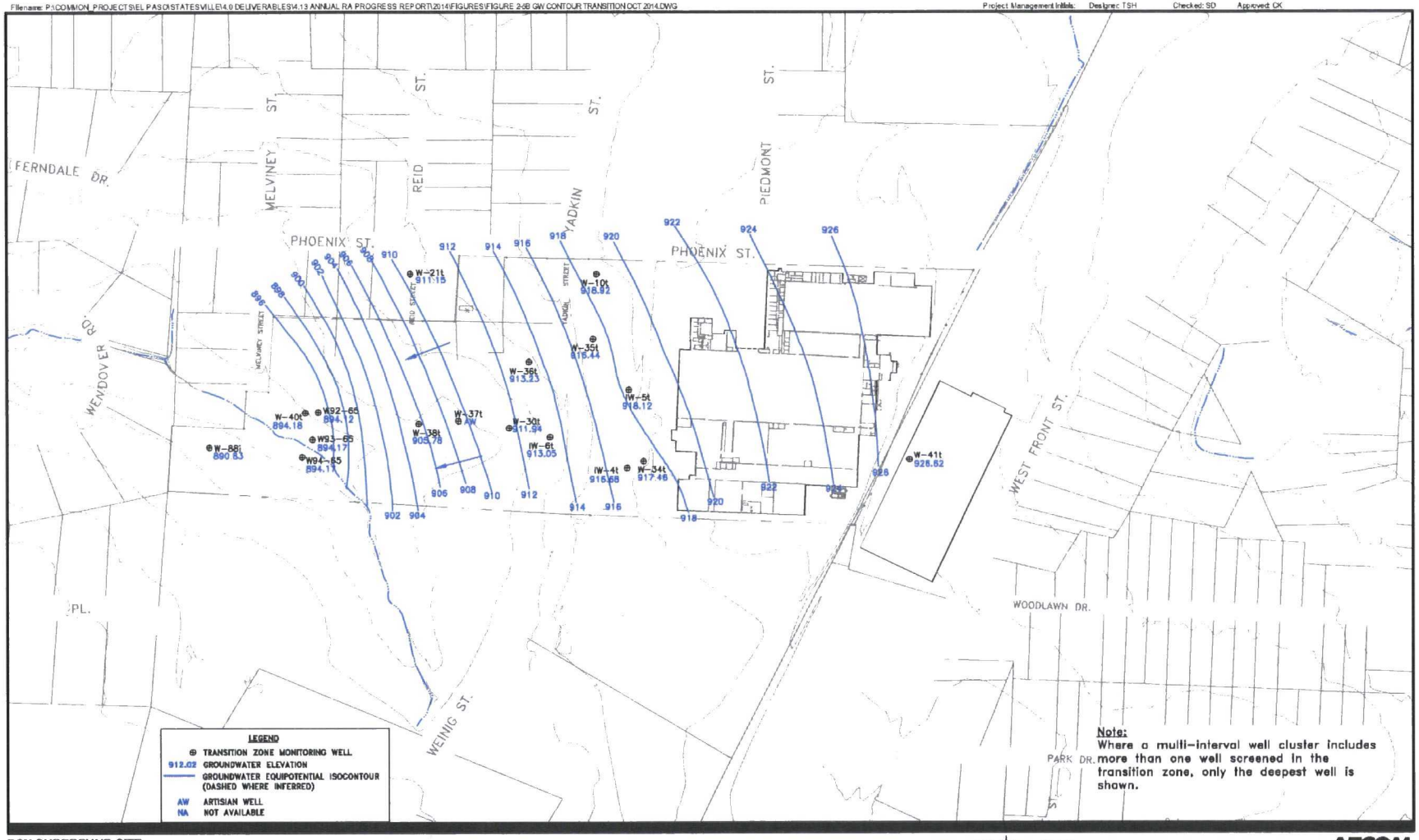


FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

GROUNDWATER CONTOUR MAP
APRIL 2014
TRANSITION ZONE

AECOM

Figure: 2-5a



FCX SUPERFUND SITE
EL PASO NATURAL GAS CORPORATION
STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

GROUNDWATER CONTOUR MAP
OCTOBER 2014
TRANSITION ZONE

AECOM

Figure: 2-5b

FCX SUPERFUND SITE
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STATESVILLE, NORTH CAROLINA
Project No.: 60395109 Date: 2015-05-26

GROUNDWATER CONTOUR MAP
APRIL 2014
BEDROCK ZONE

AECOM

Figure: 2-6a