



AMENDED PROPOSED PLAN OF REMEDIAL ACTION

SYNTECH SITE
OPERABLE UNIT 2 (OU-2)
Newark, Delaware
DNREC Project No. DE-0173



July 2014

Delaware Department of Natural Resources and Environmental Control
Division of Waste and Hazardous Substances
Site Investigation & Restoration Section
391 Lukens Drive
New Castle, Delaware 19720

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Approval:

This Proposed Plan meets the requirements of the Hazardous Substance Cleanup Act.

Approved by:
 TR
Timothy Ratsep, Environmental Program Administrator Site Investigation & Restoration Section
7/2/14
Date



What is the Amended Proposed Plan of Remedial Action for OU-2?

The Amended Proposed Plan of Remedial Action (Amended Proposed Plan) for Operable Unit 2 (OU-2) summarizes the clean-up (remedial) actions that are being proposed to address groundwater contamination found at the Syntech Site (“the Site”) for public comment. A legal notice is published in the newspaper for a 20-day comment period. DNREC considers and addresses all public comments received and publishes an Amended Final Plan of Remedial Action (Amended Final Plan) for the Site. The previous plan of remedial action is being amended to address a change in the technology for the remediation of the groundwater contamination in the surficial Columbia aquifer at the Site.

What is the Syntech Site OU-2?

The Syntech Site consists of one tax parcel (11-010.00-068) covering approximately 3.5 acres at 785 Dawson Drive, Newark, New Castle County, Delaware (Figure 1). The Site is located south of the intersection of Shea Way and Dawson Drive within the Delaware Industrial Park. The Site is zoned commercial and the surrounding land use is commercial and light industrial.

The Site is bordered to the north by Dawson Drive, to the south by Interstate 95, to the east by DuHadaway Tool and Die Company, and to the west by Maaco Automobile Painting Company and Murphy Steel, Inc. (Figure 2). Up until 2013, the Site consisted of a main plant area, a boiler room, a pilot plant, a drum storage area and an office when those structures were removed. Presently, there are no structures on the Site.

The Site is fenced, unoccupied, and covered with vegetation, broken asphalt, crushed concrete and concrete building footers. The Delaware Economic Development Office (DEDO) is the current owner of the Site.

This amended proposed plan addresses Operable Unit-2 (OU-2), which consists of the groundwater at the Site. Soil was evaluated independently under Operable Unit-1 (OU-1), for which no remedial action was required.

What happened at the Syntech Site?

Between 1981 and 1987, Helix Associates (Helix) operated a specialty chemicals manufacturing and processing facility on the Site which reportedly recovered iodine from waste sulfuric acid solutions. In 1986, an explosion in a 750-gallon reactor vessel destroyed a portion of the manufacturing building and eventually led to closure of the Helix facility.

In July 1989, Synthesis Technologies, Inc. (Syntech) began operations on the Site by manufacturing specialty batch diazo compounds, including dyes for cloth, color photography, and biological tissue staining until its closing in February 1991. In 1990, a reactor leaked vapors containing heptanes and nitric acid into the outside atmosphere.

What is the environmental problem at the Syntech Site?

As a result of releases of hazardous substances from historical operations at the Site, groundwater in the surficial Columbia and the semi-confined Potomac Aquifer has been contaminated.

The contaminants of concern (COCs) in the groundwater are 1,2-dichloroethane (DCA), chlorobenzene, benzene, carbon tetrachloride, 4-chloroaniline, chloroform, 1,4-dichlorobenzene, tetrachloroethene, and ethylbenzene (Figure 3). These COCs are present in the groundwater in the area beneath the footprint of the former main plant, and continue to source the dissolved groundwater contaminant plume that has migrated offsite from the Site to commercial properties to the southeast (Figure 4). These COCs pose a risk to human health.

Based on the results from the Johnson & Ettinger Model, there is a potential risk from vapor intrusion to indoor air from the COCs in groundwater if a new structure is constructed in the focused evaluation area.

What clean-up actions have been taken at the Syntech Site?

Helix conducted an investigation of the Site in August 1989. Volatile organic compounds (VOCs) were detected in groundwater at the Site in milligram per liter (mg/l) or parts per million (ppm) concentrations with the highest levels of VOCs occurring in the groundwater east/southeast of the building where the vessel had exploded.

During an inspection on February 8, 1991, the DNREC Emergency Response Branch (ERB) discovered over 500 drums of unknown waste chemicals throughout the Site; many of the drums had visible leaks. Syntech began to classify, over pack and dispose of the chemicals off-site at a RCRA facility under an Imminent Hazard Order from DNREC. The company ceased operations and dissolved its corporation prior to completing the cleanup, and DNREC contracted with a private consultant to complete the work.

In 1994, DNREC performed a facility evaluation (FE) of the Site. Monitoring wells were installed at the Site and additional on-site soil and groundwater samples were collected. Two domestic wells located south of the Site, along with six water supply wells from the City of Newark's South Well Field were also sampled.

In the fall of 1995, WIK Associates, Inc. conducted a FE of the former Process Industries Site (DE-1032) located immediately to the east of Syntech at 801 Dawson Drive, which is now owned by DuHadaway Tool and Dye Company. Two monitoring wells were installed to evaluate groundwater quality on the property. Contaminants associated with the Syntech were present in the sample from the well located on the property boundary with the Site.

Between 1998 and 1999, DNREC's contractor, Camp Dresser and McKee (CDM), completed a remedial investigation (RI), a human risk assessment (HRA), and feasibility study (FS) of the Site. Additional monitoring wells were installed in the surficial water-bearing sands of the Columbia Formation and also in the uppermost confined sand aquifer of the Potomac Formation. 1,2-DCA was reported from the 2 background monitoring wells that were installed on the Lilly Fasteners property located 700 feet to the east of the Site.

In November 1999, DNREC completed a Site Inspection (SI) at the Lilly Fasteners Site (DE-0295) located at 855 Dawson Drive to determine if the Site was the source of the 1,2 DCA in the groundwater. The SI reported that the soil samples did not contain VOCs and the groundwater was impacted with high concentrations of 1,2-DCA, and low concentrations of trichloroethylene (TCE), carbon tetrachloride (CT), benzene, and chloroform.

In the fall of 2000, DNREC's contractor, Tetra Tech, Inc. (Tetra Tech), conducted a direct push sampling event in the former plant area. Carbon tetrachloride (CT) was detected in groundwater at a concentration of 47 mg/l suggesting that CT might be present in the groundwater as a dense non-aqueous phase liquid (DNAPL).

In July 2001, Tetra Tech performed additional groundwater sampling activities at the Syntech Site in order to obtain current data on groundwater quality. The concentrations of chlorobenzene reported from groundwater samples taken during this sampling event ranged from 3.5 mg/l to 5 mg/l suggesting that chlorobenzene might also be present in the groundwater as a DNAPL.

Between February 19 and 21, 2002, Tetra Tech's subcontractor, Columbia Technologies, completed a Membrane Interface Probing (MIP) program at Syntech, which identified a "hot spot" between 10 to 12 feet below ground surface located outside of the door at the rear of the main plant near the boiler room. Tetra Tech used this additional data to revise the FS, originally prepared by CDM in August 1999, and submitted a focused feasibility study update (FFSU) to DNREC on April 15, 2002.

In July 2003, DNREC SIRS issued a Final Plan of Remedial Action (FPRA) for the Site based on the revised FFS by Tetra Tech which called for the application of hydrogen reducing compound (HRC) and oxygen reducing compound (ORC) to treat the groundwater across the Site.

In April 2004, a Groundwater Management Zone (GMZ) was implemented to restrict the use of groundwater at the Site and within the extent of the contaminant plume.

In November 2005, Tier DE removed an 8,000 gallon underground heating oil tank from the Site. The tank was intact and contained approximately 300-400 gallons of heating oil.

In accordance with the FPRA, Tier DE also applied approximately 1,500 pounds of HRC and ORC in a series of test pits to treat the groundwater across the Site. The remedial action was completed in December 2005.

Between 2005 and 2008, Tetra Tech performed groundwater monitoring at the Site to determine the effectiveness of the remedial action.

In September 2008, Tetra Tech performed an additional subsurface investigation both on and off-site. Groundwater samples collected from within a portion of the main building indicated that there was significant VOC groundwater contamination remaining under the building that had not been remediated.

In February 2010, the GMZ was revised to incorporate a larger offsite area.

Tetra Tech completed a FS for the Site and submitted the report in March 2011.

Between February 12, 2013 and March 15, 2013, BrightFields Inc. (BrightFields) completed the demolition of the buildings at the Site leaving only concrete slabs and retaining walls. All materials were recycled, composted, or disposed of in compliance with industry demolition practices.

BrightFields performed a Remedial Investigation of the Site in May 2013 to collect data from groundwater and soil within the former footprint of the buildings and submitted the report in February 2014.

BrightFields completed a Final Feasibility Study Addendum in May 2014.

What does the Department want to do at the Syntech Site OU-2?

The Department needs to achieve an effective, timely and cost effective remediation of the source groundwater contamination beneath the footprint of the buildings to restore the aquifer to potable use.

What additional clean-up actions are needed at the Syntech Site OU-2?

Based on the Final Feasibility Study Addendum, dated May 2014, prepared by BrightFields, Inc., DNREC proposes the following remedial actions for the Site, which need to be completed before a Certificate of Completion of Remedy (COCR) can be issued:

1. Remove all building footers.
2. Pump out, clean and remove all Site sumps and below ground holding tanks.
3. Implement Alternative 2: In-Situ Chemical Treatment which involves using in-situ chemical oxidation (ISCO) and in-situ chemical reduction (ISCR) technologies, and enhanced bioremediation.
4. Record an Environmental Covenant, consistent with Delaware's Uniform Environmental Covenants Act (Title 7, Del. Code Chapter 79, Subtitle II) (UECA), in the office of the Recorder of Deeds to include the following:

[a.] Use Restriction. Use of the Property shall be restricted solely to those non-residential type uses permitted within Commercial, Manufacturing, or Industrial Districts;

[b.] Interference with Remedy. There shall be no digging, drilling, excavating, grading, constructing, earth moving, or any other land disturbing activities on the Property without the prior written approval of DNREC-SIRS;

[c.] Limitation of Groundwater Withdrawal. No groundwater wells shall be installed, and no groundwater shall be withdrawn from any well, on the Property without the prior written approval of DNREC-SIRS and DNREC Division of Water;

[d.] Compliance with Long Term Stewardship Plan. Perform all work required by the Long Term Stewardship Plan (“LTS Plan”), as issued, approved, modified or amended by DNREC;

[e.] Compliance with Final Plan. Perform all work required by the Final Plan, the Amended Final Plan, etc. (“Final Plan”), as issued, approved, modified or amended by DNREC;

4. Develop a DNREC approved contaminated materials management plan (CMMP) to allow construction workers to safely handle any potential contaminated soil and groundwater at the Site.
5. Develop and implement a DNREC-approved Long-Term Stewardship (LTS) Plan. The LTS Plan will detail: 1) the groundwater monitoring network and schedule to be followed in order to monitor the attenuation of the groundwater COCs, and 2) the inspection schedule to be followed in order to ensure the long-term integrity of the remedy.
6. Perform a soil gas survey prior to redevelopment of the Site to evaluate remedial effectiveness and potential risk to future Site users.

What are the long term plans for the Syntech Site OU-2 after the cleanup?

The Site use will be restricted to non-residential (commercial/industrial) purposes by recording the environmental covenant. The CMMP will be completed and available for the Site.

How can I find additional information or comment on the Proposed Plan?

The complete file on the Site including the Feasibility Study and the various reports are available at the DNREC office, 391 Lukens Drive in New Castle, 19720. Most documents are also found on:

<http://www.nav.dnrec.delaware.gov/DEN3/>

The 20-day public comment period begins on July 6, 2014 and ends at close of business (4:30 pm) on July 28, 2014. Please send written comments to the DNREC office at 391 Lukens Drive, New Castle, DE 19720 to Robert C. Asreen, Jr., Project Officer or Robert Newsome, Public Information Officer.

Figure 1: General Site Location Map

Figure 2: Former Syntech Site Features

Figure 3: 2013 Groundwater Contaminants of Concern

Figure 4: Groundwater Contaminants Exceeding Screening Levels March 2014

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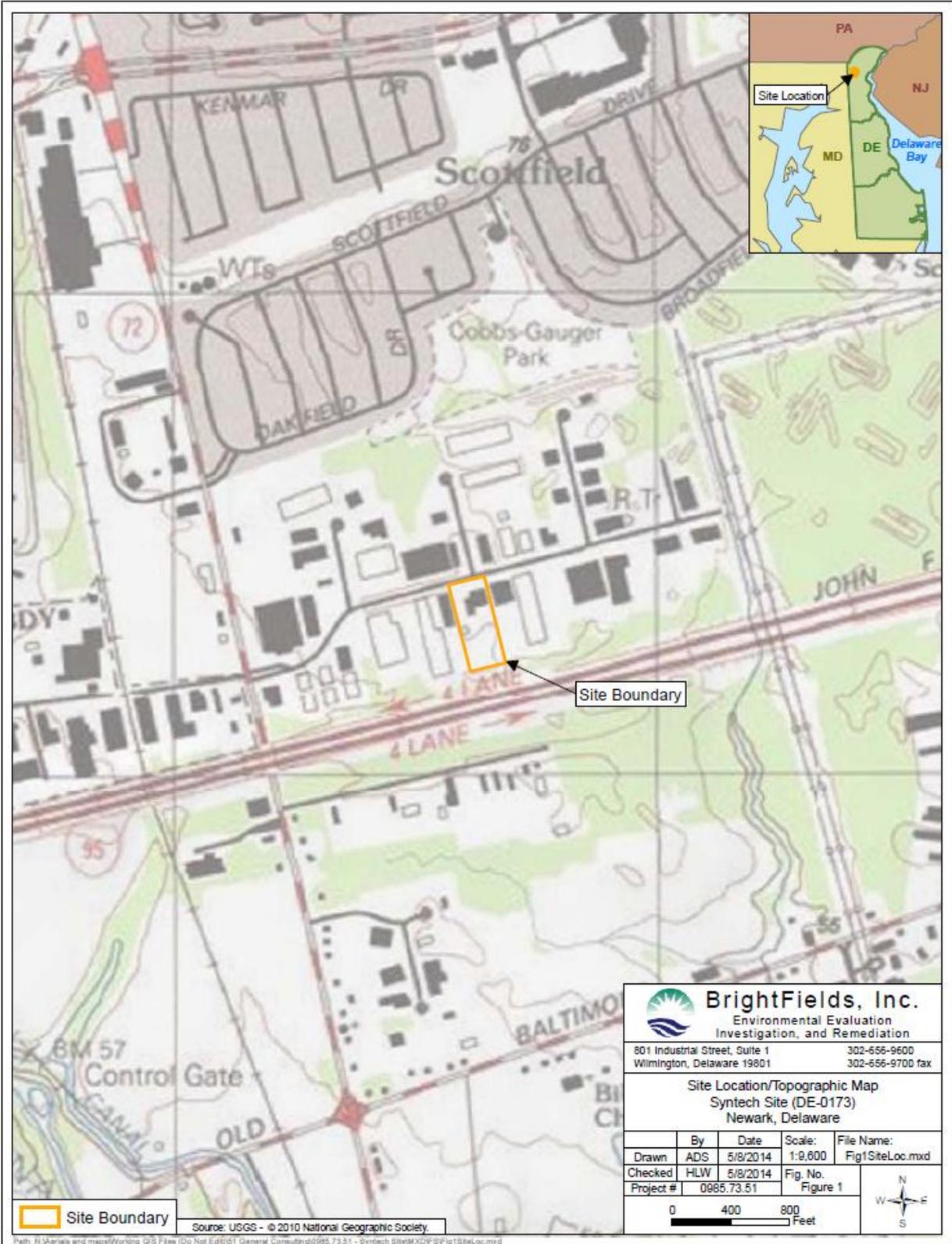


Figure 1: Syntech General Location Map

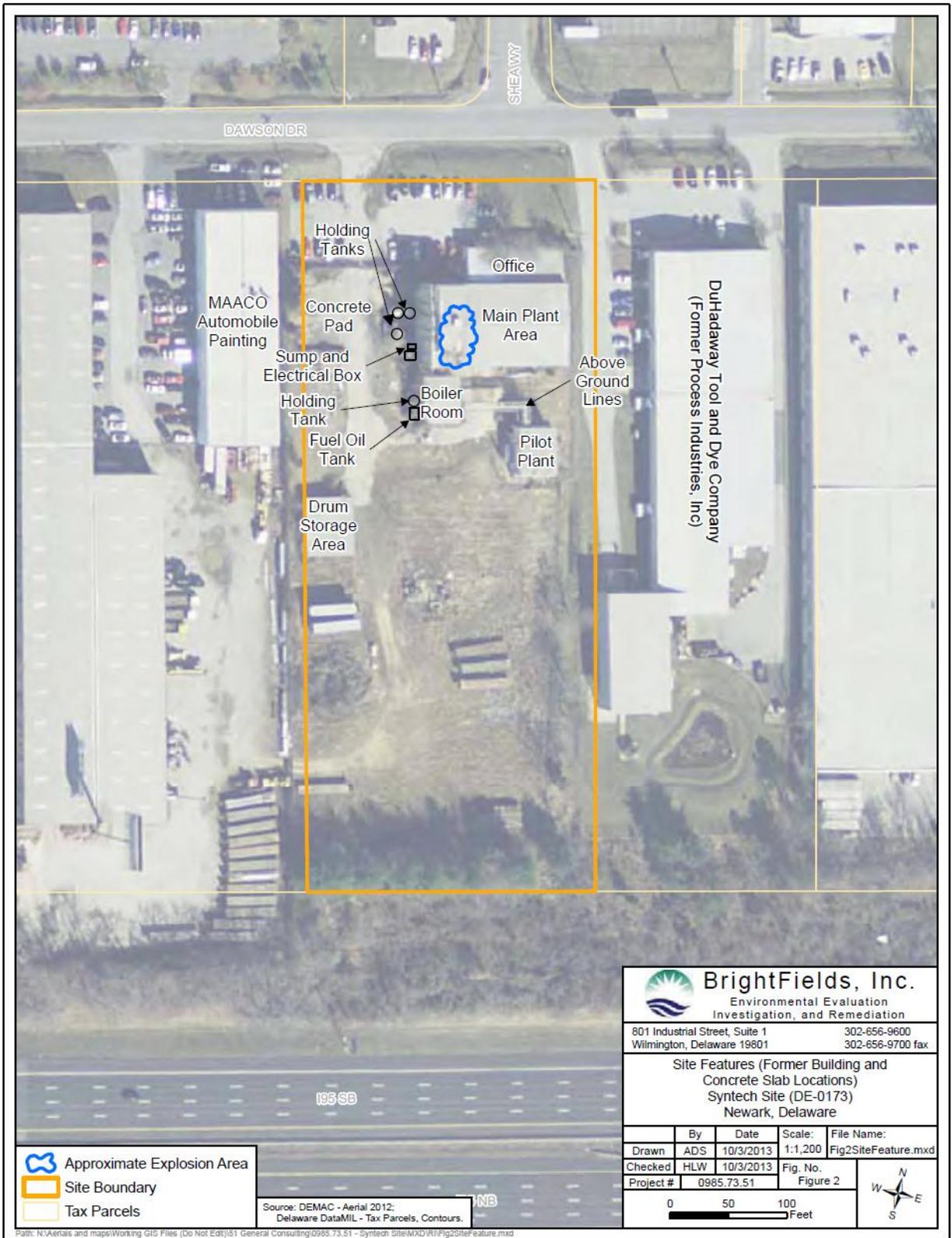


Figure 2: Former Syntech Site Features

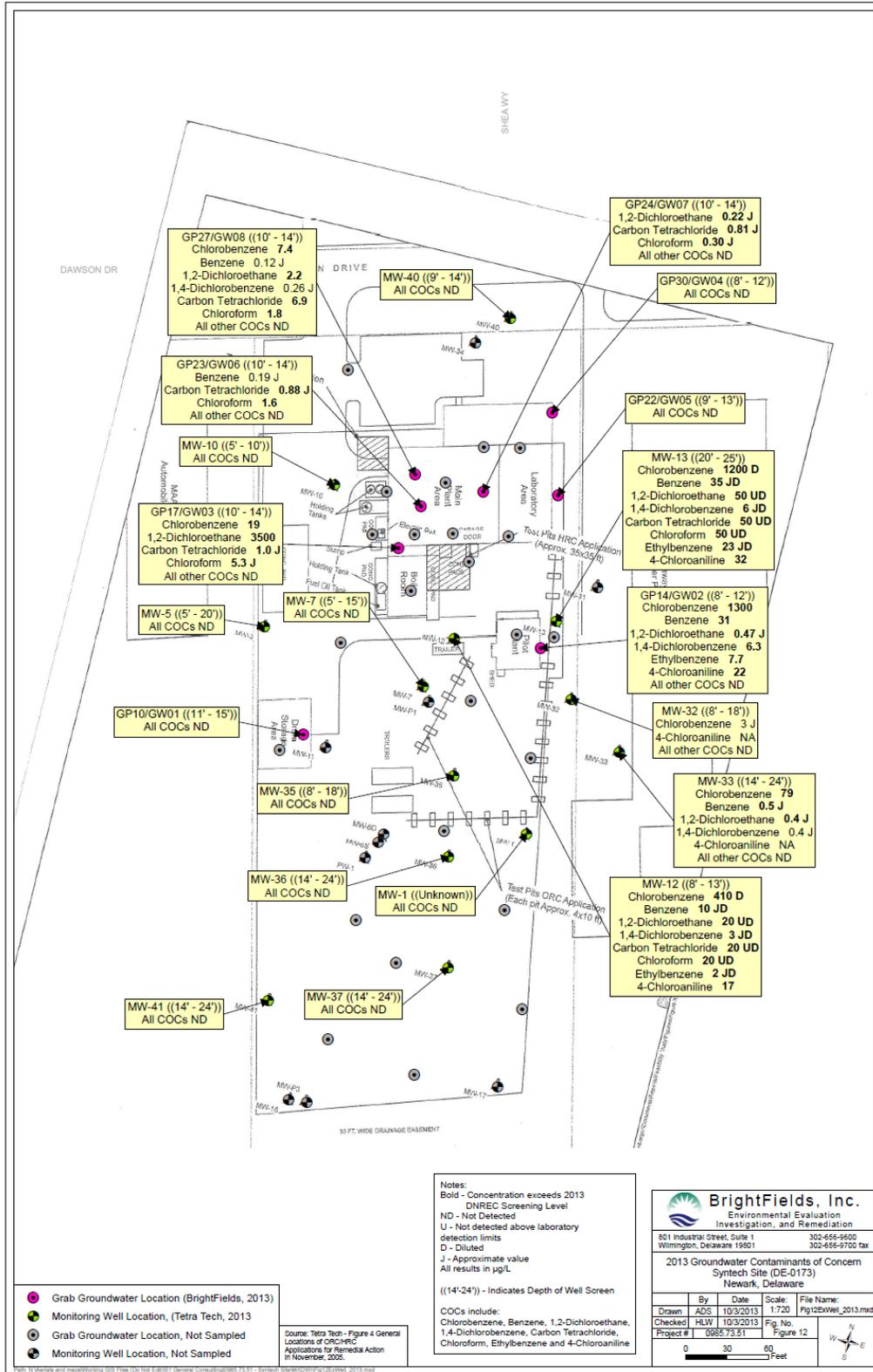


Figure 3: 2013 Groundwater Contaminants of Concern

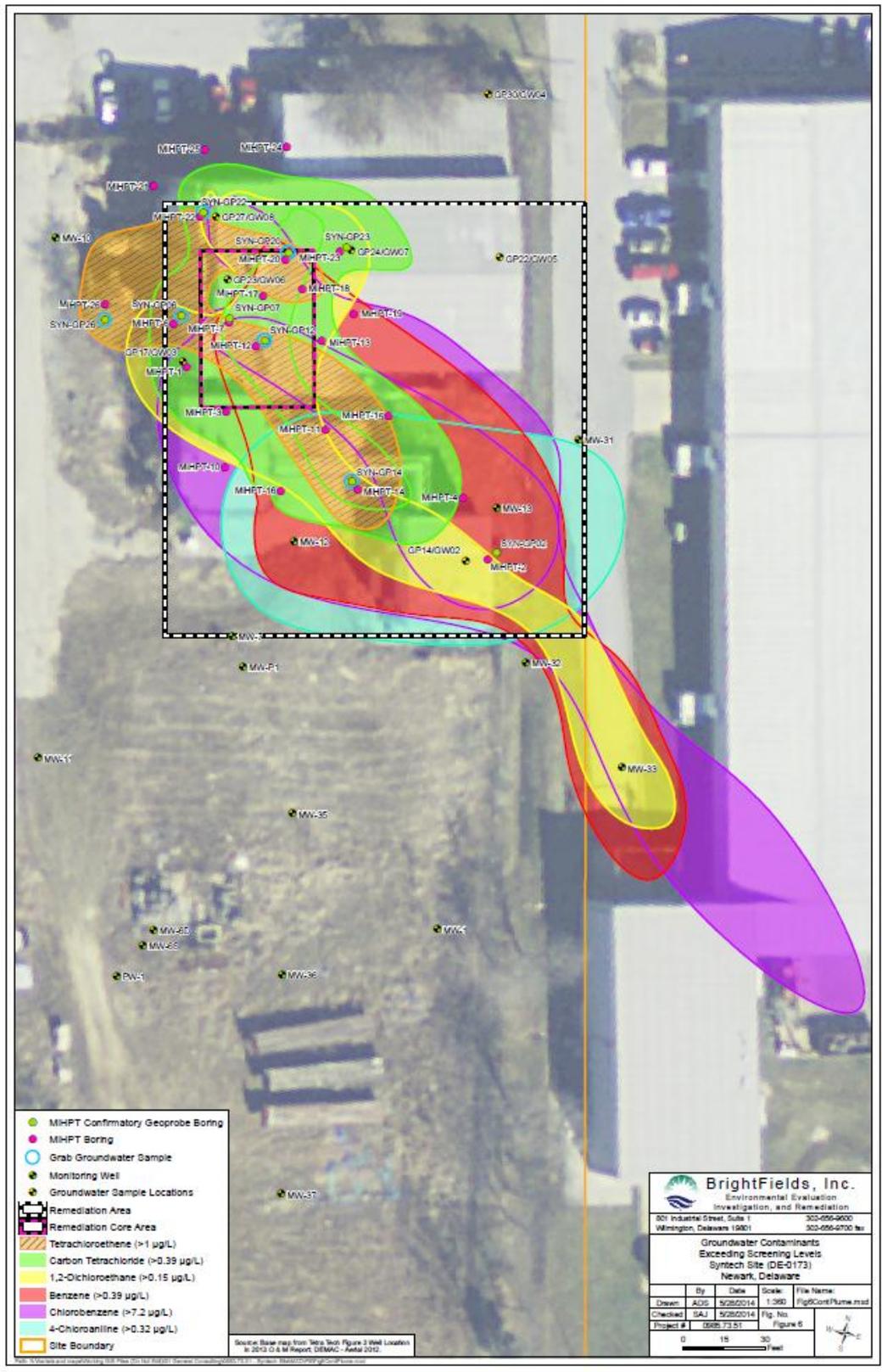


Figure 4: Syntech Site Groundwater Contaminants Exceeding Screening Levels March 2014

Glossary of Terms Used in this Proposed Plan

Certification of Completion of Remedy (COCR)	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
Contaminant of Concern (COC)	Potentially harmful substances at concentrations above acceptable levels.
Contaminated Materials Management Plan	A written plan specifying how potentially contaminated material at a Site will be sampled, evaluated, staged, transported and disposed of properly.
Final Plan of Remedial Action	DNREC's adopted plan for cleaning up a hazardous site.
Hazardous Substance Cleanup Act (HSCA)	Delaware Code Title 7, Chapter 91. The law that enables DNREC to identify parties responsible for hazardous substances releases and requires cleanup with oversight of the Department.
Human Health Risk Assessment (HHRA)	An assessment done to characterize the potential human health risk associated with exposure* to site related chemicals.
Preliminary Risk Assessment	A quantitative evaluation of only the most obvious and likely risks at a site
Risk	Likelihood or probability of injury, disease, or death.
Restricted Use	Commercial or Industrial setting
Site Inspection (SI)	Environmental study of a site which includes the sampling of soils, groundwater, surface water, sediment and/or wastes on the property, as appropriate. This evaluation is performed on behalf of the United States Environmental Protection Agency (U.S. EPA).
SIRS	Site Investigation Restoration Section of DNREC, which oversees cleanup of sites that were contaminated as a result of past use, from dry cleaners to chemical companies