

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Fairchild Republic Co.
Facility Address: East Farmingdale, NY 11735
Facility EPA ID #: NYD079818555

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination? **(Note: This determination addresses contaminated media regulated under New York State's Inactive Hazardous Waste Disposal Site Remedial Program.)**

- If yes - check here and continue with #2 below.
- If no - re-evaluate existing data, or
- if data are not available, skip to #8 and check the "TN" status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be "**contaminated**"¹ above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

 X If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

 If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

 If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Background

The Fairchild Republic Main Plant Site is located in East Farmingdale, Suffolk County, New York (Fig. 1). The Main Plant Site was located on the east side of Route 110 bounded by the Long Island Railroad (LIRR) to the north; New Highway to the east; and Republic Airport to the south. Fairchild manufactured aircraft and related parts from 1931 to 1987.

Seversky Aircraft operated at the site from 1931 to 1939. Republic Aviation Corporation purchased Seversky Aircraft in 1939. Numerous manufacturing buildings were built or expanded in the 1940's. Fairchild Industries, Inc. took possession of the property in 1965 when it acquired the Republic Aviation Corporation.

The Fairchild Republic Main Plant closure plan was submitted to the NYSDEC in 1987 under the Resource Conservation and Recovery Act (RCRA) requirements. The approved plan was implemented from 1987 through 1988. The site closure included the removal of hazardous materials, residues, and all above and underground storage tanks, except four 15,000 gallon fuel oil tanks, which were removed in 1992.

Fairchild Republic Main Plant manufacturing operations did not change significantly from the mid-1940s to 1987. Building 17 (demolished in 1997) was the primary manufacturing area with processes including chemical milling, alodining, anodizing, vapor degreasing, titanium de-scaling, and cadmium plating. Process chemicals used in this area included nitric acid, chromic acid, sulfuric acid, sodium hydroxide, toluene, trichloroethene (TCE), tetrachlorethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), and nitric/hydrofluoric acid solutions. PCE, TCE, and 1,1,1-TCA were also used in other areas of the Main Plant.

PCE was substituted for toluene as a coatings vehicle to conform with air pollution regulations beginning in 1975. Years later, the piping from the PCE tank was found to be leaking, creating a source of PCE soil and groundwater contamination. The TCE soil and groundwater contamination came from the vapor degreaser operations, from TCE that occurs in non-reagent grade PCE and as a breakdown product of PCE when the PCE entered the groundwater.

Fairchild Republic constructed a wastewater treatment plant at the Main Plant in 1950 to reduce hexavalent chromium to trivalent chromium and to precipitate metal hydroxides in wastewater from the chemical milling, alodine process, anodizing, spot-weld wash, and paint shop operations. The plant was located adjacent to the south wall of

¹ "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

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Building 17. Wastewater was treated in batches from 1950 to 1963. The treatment plant was upgraded in 1963 to handle continuous waste streams and again in 1986 to meet publicly owned treatment works pretreatment standards. The treatment plant effluent was diverted to the New York State Department of Transportation (NYSDOT) sewage treatment plant located on the Republic Airport property in 1981. In 1986, the treatment plant was connected to the Suffolk County Publicly Owned Treatment Works. Shortly thereafter in 1987, Fairchild Republic ceased manufacturing operations at the Main Plant.

The Main Plant industrial water supply was always obtained from groundwater wells. The average pumping rate listed in the Remedial Investigation (RI) Report was estimated at 1.7 million gallons per day. Non-contact industrial and air conditioning cooling water, treated wastewater, and storm water were discharged through the storm sewer to the Old Recharge Basin located west of the site beginning in the early 1940s. The Old Recharge Basin was located west of Route 110 and south of Conklin Street. The Remedial Investigation for the Old Recharge Basin (ORB) showed that the ORB was not a source of groundwater contamination.

Fairchild connected several homes that had private wells to public water that were identified within an area between Route 110, the Southern State Parkway, Wellwood Avenue and Sunrise Highway. All private wells identified in this area of concern that are being used as a source of drinking water have been offered the opportunity to connect to the Suffolk County Water Authority (SCWA) public water supply at no cost to the homeowner as required by the 1998 Fairchild Republic Main Plant site Record of Decision. Two of these homeowners have refused to be connected and their cases referred to the Suffolk County Health Department.

Previous Investigations

Numerous site wide investigations have been performed prior to and in conjunction with the Remedial Investigation/Feasibility Study (RI/FS) consent order. The following is a partial list of reports on file that detail the findings of those investigations:

Report Title	Date
Phase 2 Hydro-geological Investigation and Report	1987
Supplemental Phase 2 Report	1990
Summary of Environmental Investigations Report	1992
Old Recharge Basin Remedial Investigation Report	1995
Main Plant Site Remedial Investigation Report	1997
Main Plant Site Additional Sampling Report	1997

The purpose of the Main Plant Site (MPS) Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted in two phases. The first phase was conducted between August 1992 and January 1993 and the second phase between September 1993 and February 1994. A report entitled "Fairchild Industries, Inc. Main Plant Site Remedial Investigation Report" (May 1997) describes the field activities and findings of the RI in detail. The RI included the installation of monitoring wells and soil borings, chemical analysis of soil and groundwater samples, soil gas surveys for volatile organic compounds, characterization of groundwater hydrogeologic conditions and physical properties of site soils, and additional site sampling for soils to be used in filling the Old Recharge Basin.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, drinking water, and surface water SCGs identified for the Main Plant Site were based on NYS Department of Environmental Conservation (NYSDEC) Ambient Water Quality Standards and Guidance Values and 10 NYCRR Part 5 of NYS Sanitary Code. NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Soil

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Cleanup Guidelines for the Protection of Groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soils.

As described in the RI Report, many soil, groundwater and soil gas samples were collected at the Site to characterize the nature and extent of contamination. These samples were analyzed for volatile and semi-volatile organic compounds, pesticides, polychlorinated biphenyls (PCBs) and inorganics (metals). Overall, chlorinated volatile organic compounds (VOCs), mainly trichloroethylene (TCE) and perchloroethylene (PCE) are the contaminants of concern for this site. Discrete areas of site soils also contained chromium above NYSDEC TAGM 4046 guidelines but below hazardous levels of concern as substantiated by the Toxicity Characteristic Leaching Procedure (TCLP).

Soil and Soil Gas

The most significant manufacturing and process areas were located in Building 17. The alodine and chemical milling tanks, vapor degreaser, and PCE and TCA tanks were located along the southern wall. The soils beneath the slab and adjacent to Building 17 were found to be contaminated with VOCs; mainly TCE and PCE. The alodine and chemical milling areas under Building 17 and sulfuric anodizing area under Building 42 also contained levels of chromium above NYSDEC TAGM 4046 soil values.

A soil gas survey, along with soil sampling, was used to identify areas near the former PCE tank and near the vapor degreaser area beneath Building 17 that required remediation. This remediation included two soil vapor extraction (SVE) systems. Post-remediation soil sampling results (MPS Additional Sampling Report, October 1997) and monthly SVE monitoring data submitted by Fairchild indicated that the source areas have been completely remediated. The chromium contaminated soils did not fail TCLP and have been excavated and removed from the Site. During the same event, all onsite structures, including building slabs were completely torn down and removed.

Groundwater

The direction of groundwater for both the shallow and deep zone is to the south-southeast. The RI determined that Building 17 was a source area for VOC groundwater contamination. There is a PCE plume that is well defined emanating from the area of the former PCE tank there. There is also a trichlorethene (TCE) plume emanating from the former MPS site. This plume is moving south-southeast beneath the runways of Republic Airport. In the area of the Site, the glacial aquifer flow in the horizontal direction is about 1.5 feet/day.

Supplemental groundwater sampling of existing monitoring wells was conducted in 1997. The data revealed that the shallow and deep VOC groundwater contamination beneath the Site had dropped significantly and moved down-gradient. Some benzene, toluene, ethyl-benzene and xylene (BTEX) was found in up-gradient well MW-3 from an offsite spill that has since been remediated. The February 1997 sampling round that included MW-3, found BTEX reductions to just above SCGs. The groundwater analytical data was also reviewed for inorganic SCG exceedences; including chromium. The groundwater analytical results indicate that the Site is not a source of inorganic contamination to groundwater.

3. Has the migration of contaminated groundwater stabilized (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"² as defined by the monitoring locations designated at the time of this determination)?

² "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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- X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the horizontal or vertical dimensions of the "existing area of groundwater contamination").
- _____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination") - skip to #8 and enter "NO" status code, after providing an explanation.
- _____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

In March 1998, the NYSDEC issued a Record of Decision (ROD) for the Fairchild Republic Main Plant Site. The ROD acknowledged the completed IRMs for the soil vapor extraction systems and the removal of soils impacted with chromium, and to a much less extent, cadmium. The ROD also called for groundwater pump and treat system and a public supply well treatment contingency program that has an outpost, or sentry well component. This allows for time to design and construct a treatment system. The pump and treat system design was completed in October 2003 and is currently in full operation, maintenance and monitoring.

The primary elements of the selected remedy are as follows:

- a. A pre-design investigation determined the geology of and the optimum location for the groundwater extraction wells. The pre-design investigation and the long term monitoring program also included the development of a groundwater model of the aquifer, plume tracking, plume tracking updates and plume modeling periodic updates.
- b. Remedial design program to verify the components of the design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program.
- c. Groundwater extraction to address the majority of the mass of contamination of the total VOC plume to the south of the MPS.
- d. Long-term monitoring of the extraction well system.
- e. Installation and quarterly monitoring for VOCs of outpost monitoring wells installed for the East Farmingdale Water District and the Suffolk County Water Authority. If necessary, outpost monitoring will be added for the Suffolk County Water Authority North Fifth Street Well and/or the Lambert Avenue Well and/or the Great Neck Road Wells.
- f. A wellhead treatment contingency plan for the design, construction, operation and maintenance of wellhead treatment systems, if necessary. The East Farmingdale public supply well, has required the design and construction of a granular activated carbon unit as part of the wellhead treatment contingency program. The East Farmingdale public supply well lies within the capture zone of the groundwater extraction and treatment system.
- g. The East Farmingdale Route 109 and SCWA Tenety and Albany Avenue Wellfields will be sampled on a monthly basis for total volatile organic compounds.
- h. Connection of any private drinking water wells within and around an area between Route 110 and Great Neck Road, Wellwood Avenue and Sunrise Highway.

In March 1999, the NYSDEC executed a Remedial Design/Remedial Action (RD/RA) Consent Order for the

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design and construction of the remedial program at the Fairchild site. The design work plan was submitted for review in May 1999 and comments were forwarded to Fairchild. The revised design work plan was approved in September 1999. The conceptual model for the groundwater was submitted by Fairchild's consultant for review in January 2000.

As of May, 2005, the pre-design investigation, the remedial design and the remedial action is 100 percent complete. The groundwater pump and treat system is fully operational and has been on line since March 2005. Groundwater is about 35 feet below grade at this location. The outpost wells installed down gradient of the pump and treat system have been non-detect for the chemicals of concern and the remainder of the contaminated groundwater will be tracked as it naturally attenuates.

4. Does "contaminated" groundwater discharge into surface water bodies?
- _____ If yes - continue after identifying potentially affected surface water bodies.
- x If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.
- _____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Groundwater in this region is such that it does not become surface water down-gradient, but rather moves as groundwater towards the Atlantic Ocean.

5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?
- _____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.
- _____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): _____

6. Can the discharge of "contaminated" groundwater into surface water be shown to be "currently acceptable" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/ habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "currently acceptable") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s): _____

7. Will groundwater monitoring / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

 x If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

___ If no - enter "NO" status code in #8.

___ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): The selected remedy for the Fairchild Republic Main Plant Site includes groundwater extraction and treatment, long term monitoring and a wellhead treatment contingency plan (WHTCP). If the out post well system analytical data indicates that treatment is necessary then design and construction shall commence.

Monitoring of the groundwater, outpost wells and the groundwater treatment system will continue to confirm the effectiveness of the selected groundwater remedy. This is covered in the Long Term Operation, Maintenance and Monitoring Plan.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YES- "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Fairchild Republic Co. Site, located on Route 110 in East Farmingdale, NY 11735. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater". This determination will be re-evaluated when the State becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

___ IN - More information is needed to make a determination.

Completed by Steven M. Scharf Date 7/28/05
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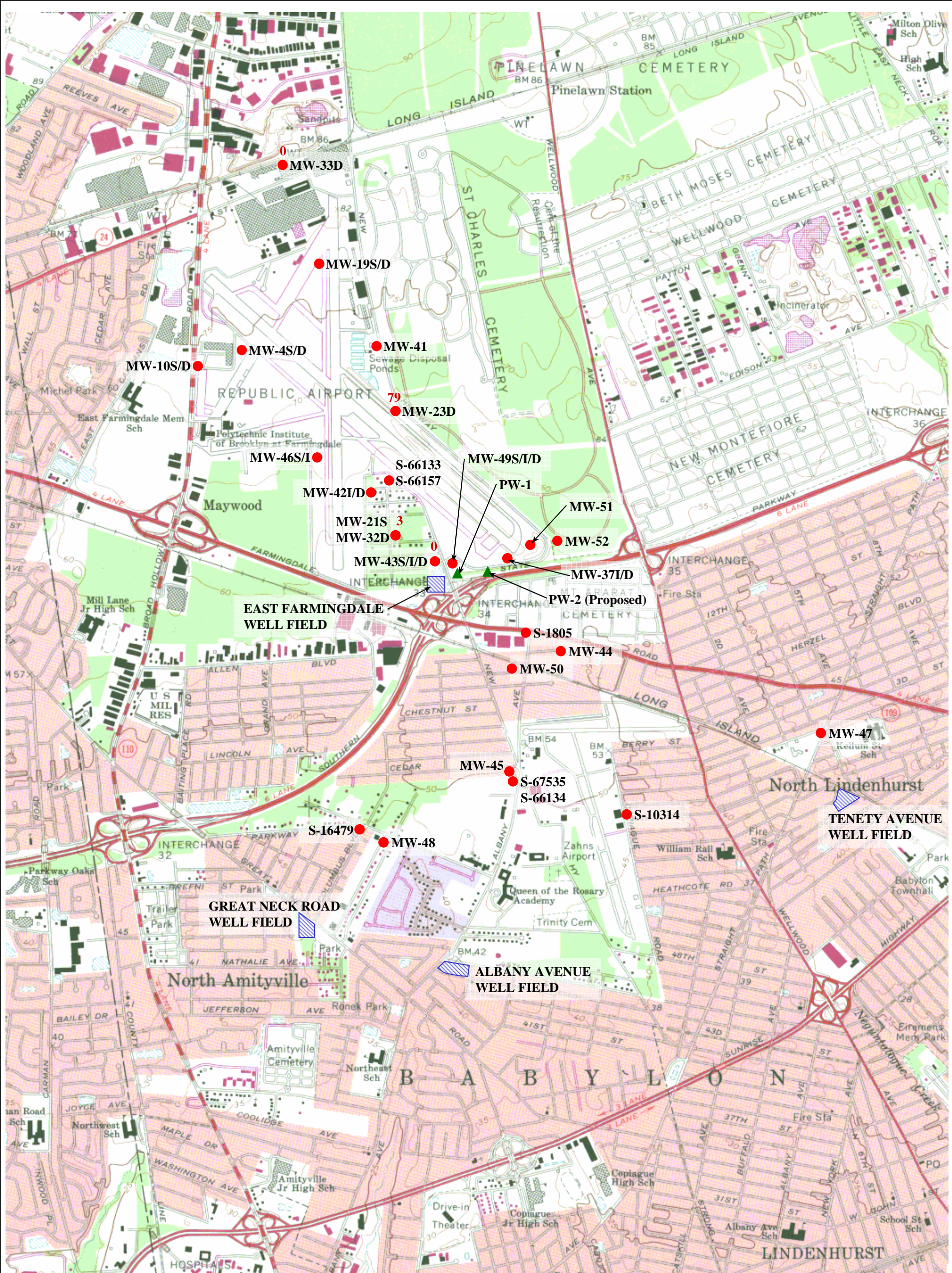
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Locations where References may be found:




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LEGEND

-  WELL FIELD
-  MONITORING WELL/FIRE WELL
-  RECOVERY WELL
- 79** TOTAL VOC'S (ug/L)

