FACT SHEET

State Superfund Program

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Site Name: Frontier Chemical - Royal Avenue
DEC Site #: 932110 Operable Units 01, 02 *
Address: 4626 Royal Avenue
Niagara Falls, NY 14303

Have questions? See "Who to Contact" Below

NYSDEC Announces Reclassification of Site on Superfund Registry; Certifies Cleanup Requirements Achieved at State Superfund Site

The New York State Department of Environmental Conservation (NYSDEC) has determined that the cleanup requirements to address contamination related to the Frontier Chemical - Royal Avenue site ("site") located at 4626 Royal Avenue, Niagara Falls, Niagara County under New York's State Superfund Program have been or will be met. Please see the map for the site location.

NYSDEC has approved a Final Engineering Report and issued a Certificate of Completion regarding the site. A copy of the report and Notice of the Certificate of Completion are available at the location(s) identified below under "Where to Find Information."

The cleanup activities were performed by NYS Department of Environmental Conservation.

Completion of Project
Following site cleanup, NYSDEC reclassified the site from Class 2 (significant threat to public health or environment - action required) to Class 4 (site properly closed – requires continued management) for the following reason(s):

Summary of the Remedy for OU 01:

1. Preparation of a Remedial Design based on the Record of Decision.
2. Removal of existing Site buildings, above grade structures, and demolition debris from the Site.
3. Excavation and on-site thermal treatment of contaminated source area soil (generally defined as soil with total VOC and monochlorotoluene < 100 ppm). The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible. Collection of appropriate soil confirmation samples to document removal of the source area.

*Operable Unit: An administrative term used to identify a portion of a site that can be addressed by a distinct investigation and/or cleanup approach. An operable unit can receive specific investigation, and a particular remedy may be proposed.

4. Performance of a radiological surface soil scan to identify potential radiological soil "hot spots" that may interfere with the performance of the on-site thermal treatment system along with a radiological scanning protocol intended to identify radiological active material prior to thermal treatment.
5. The backfill of soil removal areas with the soil originally removed from the excavation and the treated soil or other suitable material.
6. A site cover will be required to allow commercial/industrial use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required, it will be a minimum of one foot of soil for areas of commercial development meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d);
7. Site groundwater will be controlled/treated through the use of the existing municipal combined sewer infrastructure in agreement with the Niagara Falls Water Board.
8. Imposition of an institutional control in the form of an environmental easement for the property that:
    a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
    b. land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for commercial and industrial uses;
    c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH, County DOH, or City Authority;
    d. prohibits agricultural or vegetable gardens on the controlled property; and
    e. requires compliance with the Department approved Site Management Plan;
9. A Site Management Plan is required, which includes the following:
    a. an Institutional Control Plan that identifies all use restrictions for the site and details the steps and media-specific requirements necessary to assure the institutional controls remain in place and effective. This plan includes, but may not be limited to:
        i. an Excavation Plan for the western portion of the site which details the provisions for management of future excavations in areas of remaining contamination;
        ii. descriptions of the provisions of the environmental easement for the western portion of the site including any land use restrictions;
        iii. evaluate the potential for vapor intrusion for any buildings constructed on the site, including provisions for mitigation of any impacts;
        iv. maintaining site access controls and Department notification; and
        v. the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
    b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The

plan includes, but may not be limited to:

i. monitoring of groundwater to assess the performance and effectiveness of the remedy;
ii. a schedule of monitoring and frequency of submittals to the Department;
iii. monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required by the Institutional and Engineering Control Plan discussed in item (a) above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

i. compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
ii. maintaining site access controls and Department notification; and
iii. providing the Department access to the site and O&M records.

Summary of the Remedy for OU 02:

1. Development of a long-term plan to monitor the natural attenuation process, and determine its effectiveness at restoring deep bedrock groundwater quality.
2. Imposition of an institutional control in the form of an environmental easement for the controlled property that:
   a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional controls in accordance with Part 375-1.8 (h)(3).
   b. allows the use and development of the controlled property for industrial uses as defined by Part 375-1.8(g), though land use is subject to local zoning laws;
   c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
   d. prohibits agriculture or vegetable gardens on the controlled property;
   e. requires compliance with the Department approved Site Management Plan;
3. A Site Management Plan is required, which includes the following:
   a. An Institutional Control Plan that identifies all use restrictions for the site and details the steps and media-specific requirements necessary to assure the following institutional controls remain in place and effective. The Institutional Controls include the Environmental Easement discussed above. This plan includes, but may not be limited to:
      i. descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
      ii. maintaining site access controls and Department notification; and
      iii. the steps necessary for the periodic reviews and certification of the institutional controls;
   b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but not be limited to:
      i. monitoring of deep bedrock groundwater to assess the performance and effectiveness of the remedy;

ii. a schedule of monitoring and frequency of submittals to the Department;
iii. provision to evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified;
iv. provision to evaluate the potential for soil vapor intrusion for existing buildings if building use changes significantly or if a vacant building become occupied.

Final Engineering Report Approved

The NYSDEC has approved the Final Engineering Report, which:

1) Describes the cleanup activities completed.

2) Certifies that cleanup requirements have been or will be achieved for the site.

3) Describes any institutional/engineering controls to be used.

4) Certifies that a site management plan for any engineering controls used at the site has been approved by NYSDEC.

Institutional and Engineering Controls

Institutional controls and engineering controls generally are designed to reduce or eliminate exposure to contaminants of concern. An institutional control is a non-physical restriction on use of the site, such as a deed restriction, when contamination left over after the cleanup action makes the site suitable for some, but not all uses. An engineering control is a physical barrier or method to manage contamination such as a cap or vapor barrier.

The following institutional controls have been or will be put in place on the site:

-Soil Management Plan
-Site Management Plan
-Monitoring Plan
-Groundwater Use Restriction
-Land Use Restriction
-Environmental Easement

The following institutional controls have been or will be put in place on the site:

-Site Cover System

Next Steps

With its receipt of a Certificate of Completion, the remedial party is eligible to redevelop the site. In addition, the remedial party has no liability to the State for contamination at or coming from the site, subject to certain conditions.

A Certificate of Completion may be modified or revoked if, for example, there is a failure to comply with the terms of the order or agreement with NYSDEC.

Site Background

Location: The Frontier Chemical Royal Avenue site is approximately 9.8 acres in size and is located at the northwestern corner of Royal Avenue and 47th Street in the City of Niagara Falls.

Site Features: The buildings on the site have been demolished. The site is completely fenced and the surface of the site is covered by either crushed concrete, stone or blacktop. A residential neighborhood is present approximately 1/2 mile west of the site. The Frontier Chemical site is in a heavily industrialized area of Niagara Falls. Numerous other inactive hazardous waste sites are within 1 mile of the site. These include several Occidental Chemical waste and plant sites, as well as DuPont Chemical, Olin Chemical, and the Solvent Chemical sites. The Niagara River is located approximately 3/4 mile south of the site.

Current Zoning/Use(s): The site is currently zoned for industrial use. The nearest residential area is 0.5 miles to the west.

Past Use: The Frontier Chemical Waste Process Corporation operated a permitted waste treatment, storage, and disposal (TSD) facility at the Royal Avenue Site from 1974 to December 1992. While operating, this facility treated or stored approximately 25,000 tons of chemical wastes per year. Several major spills were documented during the facility operations, and in December 1992, following documented releases of hazardous waste from numerous drums, the Site was ordered closed by the NYSDEC.

Several investigations of the Site were performed between 1981 1990. These investigations were primarily focused on identifying areas of groundwater contamination, and were required under terms of the facility's operating permit. In 1992, the bankruptcy of the company's management firm ended the company's preliminary plans to implement corrective actions to address the identified groundwater contamination.

The facility closed in December 1992, and an emergency removal action was initiated by the US Environment Protection Agency (EPA) to remove the stored hazardous wastes from the Site. During 1993 1994, under a voluntary agreement with the EPA, a group of PRPs removed over 4,000 drums of waste from the Site. In a subsequent agreement with the EPA, a second removal was conducted by the PRPs during 1994 1995 which resulted in the removal of wastes from the 45 storage tanks on the property.

In 1995, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or environment and action is required. In January 2001 the Site was referred to NYSDEC for action using the State Superfund. Operable Units: The site was divided into two operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, thereat of release or exposure pathway resulting from the site contamination.

Operable Unit (OU) No. 1 consists of the overburden soil, as well as overburden and upper (defined as the A zone and B zone) bedrock groundwater. Operable Unit No. 2 is the deep (defined as the C zone and deeper) bedrock groundwater. A Record of Decision (ROD) for Operable Unit No. 1 was issued in March 2006. The remedy called for removal of above grade structures and debris, excavation and off-site disposal of soils containing VOCs greater than 100

ppm, soil or asphalt cover system, groundwater control/treatment, a Site Management Plan, an Environmental Easement, Long-term Operation, Monitoring, and Maintenance, and periodic certification of the controls. A ROD Amendment was issued in March 2012 which revised the remedy from off-site disposal to on-site thermal treatment. A ROD for Operable Unit No. 2 was issued in March 2011. The ROD called for development of a long-term plan to monitor the natural attenuation process.

Beginning in March 2013 a remedial action was implemented by the PRP group in accordance with the March 2012 ROD amendment. This work was completed in December of that year. Reports documenting the results of the remedial work were drafted, reviewed and approved in 2014 with a Certificate of Completion issued August 15, 2014. The CoC requires compliance with the Site Management Plan and restrictions for industrial use only.
Long term monitoring is currently on-going.

Site Geology and Hydrogeology:
The surface of the site is mostly covered by either asphalt or concrete. Up to 2 feet of fill material (generally gravel with some cinder, glass, wood, slag, bricks, etc.) over lies an overburden mostly comprised of a silty-clay, with some discontinuous seams of silty sand and clay. The total depth of the overburden is 14 to 17 feet. The bedrock immediately beneath the overburden is Lockport Dolomite. There are two man-made structures which exert a significant influence on the flow of bedrock groundwater in the region: the New York Power Authority (NYPA) conduits and the Falls Street Tunnel.

Depth to groundwater within the overburden ranges from about 2 to 10 feet below ground surface. There is a horizontal overburden groundwater gradient to the southeast, with a localized overburden sink (inwardly directed groundwater depression) in the south-central portion of the site. A downward vertical groundwater gradient exists between the overburden and the top of the bedrock. Within the upper 35 feet of bedrock, 3 distinct horizontal fracture zones have been identified. The A-zone consists of the highly weathered upper 3 to 5 feet of bedrock. The B-zone is a fracture system which is up to 2 feet thick and is located approximately 8 to 10 feet below the A-zone. A downward vertical groundwater gradient exists from the A-zone to the B-zone. The C-zone is a fracture system approximately 20 feet below the B-zone. Although the C-zone has not been fully characterized, a slight upward vertical groundwater gradient has been calculated from the C-zone to the B-zone. The bedrock between the three defined horizontal fracture zones contains some vertical fractures which provide some groundwater communication between the zones.

The FST and the New Road Tunnel run along the south and east sides of the site, respectively. As both of these tunnels intersect the bedrock B-zone fracture system, site bedrock groundwater from the B-zone directly infiltrates into these tunnels. This infiltration in turn promotes a downward groundwater gradient from the site overburden and upper weathered bedrock into the B-zone. The effect of the Falls Street tunnel as an upper bedrock groundwater interceptor has been well documented in numerous hydrogeologic studies of the area. The location, depth, and hydraulic influence of the tunnels has effectively intercepted site overburden and upper bedrock groundwater and prevented it from migrating beyond the Royal Avenue and 47th street tunnel alignments. At the Frontier Chemical site, groundwater within the bedrock C-zone and some of

the lower bedrock fracture systems are also likely influenced by the NYPA conduit drain system. Site groundwater flow within some of these lower bedrock fracture zones is most likely toward the NYPA conduits. Since significant amounts of conduit water discharges into the Falls Street Tunnel, it appears likely that at least some of the C-zone and lower site bedrock groundwater is discharged to the FST.

Additional site details, including environmental and health assessment summaries, are available on NYSDEC's website at:
http://www.dec.ny.gov/cfmx/extapps/derexternal/haz/details.cfm?pageid=3&progno=932110

State Superfund Program: New York's State Superfund Program (SSF) identifies and characterizes suspected inactive hazardous waste disposal sites. Sites that pose a significant threat to public health and/or the environment go through a process of investigation, evaluation, cleanup and monitoring.

NYSDEC attempts to identify parties responsible for site contamination and require cleanup before committing State funds.

For more information about the SSF, visit: http://www.dec.ny.gov/chemical/8439.html

FOR MORE INFORMATION

Where to Find Information

Project documents are available at the following location(s) to help the public stay informed.

Niagara Falls Library Earl W. Brydges Building
Attn: Ms. Betty Babanoury
1425 Main Street
Niagara Falls, NY 14305
phone: 716-286-4881

Project documents are also available on the NYSDEC website at:
http://www.dec.ny.gov/chemical/37554.html

Who to Contact
Comments and questions are always welcome and should be directed as follows:

Project Related Questions
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Site-Related Health Questions
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We encourage you to share this fact sheet with neighbors and tenants, and/or post this fact sheet in a prominent area of your building for others to see.

Receive Site Fact Sheets by Email

Have site information such as this fact sheet sent right to your email inbox. NYSDEC invites you to sign up with one or more contaminated sites county email listservs available at the following web page: http://www.dec.ny.gov/chemical/61092.html. It's quick, it's free, and it will help keep you *better informed*.

As a listserv member, you will periodically receive site-related information/announcements for all contaminated sites in the county(ies) you select.

Note: Please disregard if you already have signed up and received this fact sheet electronically.

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