

**THIRD FIVE-YEAR REVIEW REPORT FOR  
BYRON BARREL AND DRUM SUPERFUND SITE  
GENESEE COUNTY, NEW YORK**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 2  
New York, New York  
June 2017**

A handwritten signature in dark ink, appearing to read "John Prince", is written over a horizontal dashed line.

**John Prince, Acting Director  
Emergency and Remedial Response Division**

6/29/17  
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Date

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## LIST OF ABBREVIATIONS & ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
1,2-DCE	1,2-dichloroethene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
EVO	Emulsified Vegetable Oil
FS	Feasibility Study
FYR	Five-Year Review
gpm	gallon per minute
HI	Hazard Index
IC	Institutional Control
IRIS	Integrated Risk Information System
MCLs	Maximum Contaminant Levels
µg/l	micrograms per liter
mg/kg	milligrams per kilogram
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
OM&M	Operation, Maintenance & Monitoring
OU	Operable Unit
PCE	tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
TAGM	Technical and Administrative Guidance Memorandum
TCA	trichloroethane
TCE	trichloroethylene
UAO	Unilateral Administrative Order
VOCs	volatile organic compounds

## **I. INTRODUCTION**

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

Although the remedial action (RA) at this site will not leave hazardous substances, pollutants, or contaminants above levels that allow for unlimited use and unrestricted exposure, a policy FYR is required due to the fact that the RA requires five or more years to complete. This is the third FYR for the Byron Barrel & Drum Superfund site. The triggering action for a subsequent FYR is the signature date of the last review. The trigger for this FYR is September 11, 2012, the approval date of the last review.

The site is being addressed as a single operable unit (OU), which is the subject of this FYR.

The Byron Barrel & Drum Superfund site FYR was led by George Jacob, the EPA Remedial Project Manager (RPM). Participants included Robert Alvey (EPA hydrogeologist), Charles Nace (EPA human-health and ecological risk assessor), and Michael Basile (EPA CIC). The FYR began on December 20, 2016.

Appendix A summarizes the documents, data, and information reviewed in completing this FYR.

### **Site Background**

The Byron Barrel and Drum site is located on Transit Road in Byron Township, Genesee County, New York. The site is set back approximately 1,000 feet from the east side of Transit Road. The major roadways in this area include Route 98 and Route 24. The site occupies approximately 2 acres of an 8-acre parcel that was used as a salvage yard for heavy construction equipment. Heavily-wooded areas and farmland border the site.

A large, metal former maintenance building is located in the northern portion of the property, an abandoned house (the former property owner's residence) is located to the west, and a large metal building is located to the southwest. All three structures may not be structurally sound. The closest body of water is Oak Orchard Creek, which is located within one-half mile of the site. A small storm water drainage ditch, which flows to the creek, runs along the northern property boundary of the site. The access road entry area is fenced and gated.

The site is abutted by heavily wooded areas and is directly adjacent to an active vegetable farm.

This area has been classified as prime agricultural land by the State of New York. Groundwater is used as a potable water source by residents and as a source of irrigation water by farmers.

See Figure 1 for a site plan.

Appendix B, attached, summarizes the site's topography, geology/hydrogeology, and land and resource use

### *History of Contamination*

The site which, at the time, was being used as a salvage yard for heavy construction equipment, was discovered in early July 1982, when an unidentified individual reported the disposal of "approximately 400 55-gallon steel barrels that were filled with noxious-smelling chemicals" to the New York State Police Major Crimes Unit. As a result of this report, a police investigation was initiated. A helicopter flight over the area revealed the presence of a number of drums on the property. Further investigation revealed that Darrell Freeman, Jr., who owned the property, did not have a permit from either the New York State Department of Environmental Conservation (NYSDEC) or EPA for the storage or disposal of hazardous waste.

As a result of the investigation, a search warrant was issued. Two drum storage areas were located. The first area contained 121 drums and the second area contained 98 drums. NYSDEC representatives obtained 11 samples from the drums during the search.

Subsequently, various parties were interviewed regarding waste disposal activities at the site. A former employee of Mr. Freeman reported that he first noted approximately 80 drums on the Freeman property in spring 1978. These drums were located off the east side of the dirt road that runs through the property. The source further indicated that two more shipments of drums arrived at the site in summer 1979. These drums were unloaded and deposited off to the west side of the dirt road behind a small clump of trees. These drum storage locations correspond to those identified during the police search. The source further reported that a fourth load of drums arrived sometime that summer. He did not witness their arrival, but noted that they were placed in an area just south of the second disposal site. The source also indicated that sometime in fall 1980, Mr. Freeman instructed him to go to the site of the fourth load of drums to rip the drums open with a backhoe, mix them in with the dirt, and bury them.

### *Initial Response*

Wehran Engineering and Camp Dresser & McKee submitted a preliminary investigation report to NYSDEC in September 1983. In August 1984, in response to a request from NYSDEC, EPA removed 219 drums and approximately 40 cubic yards of contaminated soil and debris from the site for off-site disposal.

On June 10, 1986, the Byron Barrel and Drum site was placed on the National Priorities List (NPL).

In 1987, EPA's contractor, Ebasco Services, Inc., commenced a remedial investigation and feasibility study (RI/FS). The RI/FS identified three areas of concern at the site—Source Area 1,

a former drum storage and waste disposal area; Source Area 2, a solvent disposal area and maintenance building; and Source Area 3, a shallow ravine containing construction debris and fill material.

### **Five-Year Review Summary Form**

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> Byron Barrel & Drum Superfund Site		
<b>EPA ID:</b> NYD980780670		
<b>Region:</b> 2	<b>State:</b> NY	<b>City/County:</b> Byron Township/Genesee County
<b>SITE STATUS</b>		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> No	<b>Has the site achieved construction completion?</b> Yes	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> EPA <i>[If "Other Federal Agency", enter Agency name]:</i> N/A		
<b>Author name (Federal or State Project Manager):</b> George Jacob		
<b>Author affiliation:</b> EPA		
<b>Review period:</b> 9/11/2012 - 6/11/2017		
<b>Date of site inspection:</b> 4/6/2017		
<b>Type of review:</b> Policy		
<b>Review number:</b> 3		
<b>Triggering action date:</b> 9/11/2012		
<b>Due date (five years after triggering action date):</b> 9/11/2017		

## **II. RESPONSE ACTION SUMMARY**

### **Basis for Taking Action**

The RI detected volatile organic compounds (VOCs) in the soils in Source Areas 1 and 2. Chromium and lead were detected in a few surface soil samples from Source Area 3 (organic contamination was not detected in this area) and no groundwater impacts were observed. Groundwater underlying Source Areas 1 and 2 was contaminated with VOCs. Hydrogeologic and groundwater quality investigations determined that VOC-impacted groundwater had not migrated

to or impacted area drinking water supply wells. The risk assessment concluded that surficial soils contamination posed a minimal risk to human receptors. Also, groundwater, based on residential use, posed an unacceptable risk if developed for potable use.

Oak Orchard Creek was also evaluated during the RI. It was noted that the aquatic ecosystem appeared healthy (based on visual observations), no stressed flora or fauna were noted. It was concluded that no unacceptable ecological risks were present at the site.

### **Response Actions**

Following the completion of the RI/FS, a Record of Decision (ROD) for the site was issued in 1989. The following remedial action objectives (RAOs) were established for the site:

- Ensure protection of groundwater and surface water from the continued release of contaminants from soils.
- Restore groundwater to levels consistent with state and federal standards.

The major components of the selected remedy as described in the ROD include:

- In-situ soil flushing (*i.e.*, extraction and treatment of the contaminated groundwater, followed by the discharge of the treated groundwater to the soil to flush the contaminants to the aquifer) in Area 1 and Area 2;
- Dismantling, and decontamination, if necessary, of the maintenance building, with disposal of the debris off-site;
- Extraction and treatment of groundwater, via precipitation, sedimentation, and filtration to remove the heavy metals, and air stripping and carbon adsorption to remove volatile organics underlying the site;
- Reinjection of treated groundwater to the aquifer and, if necessary, discharge of excess treated water to the closest surface water body;
- Further evaluation of elevated surface soil inorganic concentration in Source Area 3, where organic contamination is not present, to determine its ultimate disposition (*i.e.*, off-site disposal or placement on the soil to be flushed);
- Disposal of the groundwater treatment residuals at an off-site Resource Conservation and Recovery Act Subtitle C disposal facility; and
- Appropriate environmental monitoring, including monitoring of residential wells, to ensure the effectiveness of the remedy.

The soil cleanup objectives were established pursuant to New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 objectives (Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, Division of Hazardous Waste Remediation, January 24, 1994) (TAGM). These levels were the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater.

The groundwater cleanup goals were the more stringent of the state or federal promulgated standards. EPA and New York State Department of Health promulgated health-based protective Maximum Contaminant Levels (MCLs) are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose either a short- or long-term health risk.

### **Status of Implementation**

In 1990, EPA issued a Unilateral Administrative Order (UAO) to a group of potentially responsible parties (PRPs) for the performance of the design and construction of the selected remedy (the UAO was superseded by a Consent Decree in 1996).

The Source Area 3 investigation called for in the ROD consisted of the collection and analysis of 64 soil samples. The results of this investigation showed that the mean chromium and lead concentrations in this area (1.39 milligram per kilogram [mg/kg] and 15.71 mg/kg, respectively) were below the lesser of the ROD cleanup objectives or the TAGM objectives for these constituents (50 mg/kg and 400 mg/kg) and that there was no significant difference between total chromium and lead concentrations in Source Area 3 soils and background soils.

In addition, post-RI/FS groundwater quality data conducted from (year) to (year) indicated a downward trend of VOC concentrations in Source Area 1. Specifically, trichloroethylene (TCE) decreased from 3,300 micrograms per liter (µg/l) to 7 µg/l and trichloroethane (TCA) decreased from 860 µg/l to 57 µg/l (the cleanup levels specified in the ROD for TCE and TCA are 5 µg/l and 50 µg/l, respectively). It is believed that the levels of contamination diminished in the groundwater as a result of the removal of the source of the groundwater contamination (*i.e.*, the drums and contaminated soil and debris) in combination with natural attenuation (dilution, dispersion, and degradation) of the VOC contamination in the groundwater.

Because the results of the above investigations indicated that the contaminant concentrations in the groundwater in Source Area 1 were only marginally above the cleanup levels specified in the ROD and that the levels of inorganic contaminants in the surface soil in Source Area 3 were consistent with background concentrations, it was concluded that further action for soils and groundwater in these two areas was not warranted. The contamination in Source Area 2, however, still required remediation.

Therefore, it was decided to proceed with the groundwater and Source Area 2 remedy, namely groundwater extraction and treatment, reinjection to flush subsurface soils, and long term monitoring. Based upon a pre-design investigation which evaluated the characteristics of the contaminated soil, it was determined that the treated water would not be able to properly percolate through the surface soil. Therefore, to enhance the ability of the treated groundwater to infiltrate and flush the contaminated soil, the remedial design (RD) called for the excavation of several feet of contaminated soil and the construction of an infiltration gallery, consisting of perforated pipe and gravel.

The findings related to Source Areas 1 and 3 and the modification to the remedy for Source Area 2 were documented in an August 2000 Explanation of Significant Differences (ESD). The RD, prepared by Blasland, Bouck, & Lee, Inc. on behalf of the PRPs was completed in June 2000. In



August 2000, a contract was awarded by the PRP Group to ERM C & O Services (presently, ECOR Solutions, Inc.) for the implementation of the remedy.

### Soil Excavation

In June 2001, equipment and personnel were mobilized to the site. Following the clearing of vegetation and the construction of an access road, approximately 500 cubic yards of contaminated soil (an area of approximately 2,555 square feet to a depth of 5 feet) was excavated for the construction of the infiltration gallery. The excavated soil was stockpiled for testing; the analysis of this soil indicated that it met the TAGM objectives. Therefore, the soil was used as fill above the infiltration gallery.

Because it was believed that contaminated soil extended beneath the on-site maintenance building in Source Area 2, the ROD called for the dismantling and decontamination, if necessary, of the building, with the disposal of the debris off-site. Because post-excavation side wall sampling in the vicinity of the maintenance building indicated that the soil contamination did not extend beneath the building, the building was not dismantled. Instead, the building was decontaminated and this remedy change was documented in a 2015 ESD.

### Building Decontamination

The maintenance building was decontaminated in November 2001 by ECOR Solutions, Inc. The decontamination activities included the removal and off-site disposal of approximately 200 individual containers of paint, thinners, solvents, and other paint-related material followed by the spray washing of the building. In total, 5 cubic yard boxes of paint waste, 3 drums of rinse water, and 5 drums of hazardous waste were transported by Hazmat Environmental Group, Inc. to Ensco, an approved treatment, storage, and disposal facility located in Arizona.

### Infiltration Gallery

Approximately 200 linear feet of 2-inch slotted PVC pipes were installed at the bottom of the excavation described in the “Remedy Implementation” section, above. The pipes were wrapped in a geomembrane covering (to filter out soil particles) and placed in a 1-foot thick gravel bed. The excavation was then backfilled with the previously-excavated soils.

### Groundwater Extraction Well Installation

During the performance of design investigation work in 1999, one groundwater recovery well was installed for a pump test. This well was converted to an extraction well and two additional extraction wells were installed.

### Groundwater Treatment System

The groundwater treatment system includes a bag filter which removes solids greater than 50 microns. After the bag filter, the groundwater is routed through a low-profile air stripping unit (150 standard cubic feet per minute), which removes the VOCs from the groundwater. Following air stripping, the groundwater can be directed either to surface water or to a combination of surface water and the infiltration gallery for in-situ flushing of the unsaturated soils. Discharges to Oak Orchard Creek and the infiltration gallery must meet New York State Pollutant Discharge Elimination System requirements.

The construction of the groundwater treatment system was completed in July 2001. An interim RA report for the groundwater remedy was approved in September 2002.

From 2001 to 2007, the groundwater extraction system pumped approximately 21 million gallons of contaminated groundwater and the treatment system removed approximately 38 pounds of dissolved-phase VOCs from Source Area 2. In 2007, after groundwater concentrations reached asymptotic levels, the extraction and treatment system operations were “temporarily” suspended to allow the performance of a treatability study to assess the viability of using bioremediation to enhance the removal of the contaminants in the groundwater. Specifically, emulsified vegetable oil (EVO) was injected into the impacted groundwater starting in 2007 to evaluate means to facilitate the bioremediation of the contaminants in the groundwater. EVO was injected again at selected locations in 2009. Please add a sentence or two regarding the sampling results from this time period (e.g., VOCs in “x” out of “y” monitoring wells showed decreases in concentrations/evidence of bioremediation . . .

### Soil Flushing

During its soil flushing operations (2001-2002), approximately 1 gallon per minute (gpm) of treated groundwater was discharged through the infiltration gallery to flush the contaminants from the unsaturated zone soils. The remainder of the treated groundwater (approximately 19 gpm) was discharged to Oak Orchard Creek.

In August 2002, soil samples were collected from the area undergoing soil flushing. The analytical results from the soil sampling indicated that the soil had achieved the ROD's cleanup objectives and achieved soil concentrations that allow for unrestricted use of site subsurface soils. At that time, soil flushing through the infiltration gallery ceased and all of the treated groundwater was discharged to surface water. In September 2002, an RA report for the soil was approved.

### Institutional Controls

The concentration of VOCs in the shallow groundwater in Area 2 remains elevated above drinking water standards. In addition, there is a potential for the VOCs in the groundwater to migrate through the soil and into buildings (*i.e.*, vapor intrusion). In order to restrict the use of groundwater as a source of potable or process water (unless appropriately treated) until groundwater standards are achieved, and to prevent the potential for human exposure through vapor intrusion into any of the existing, on-property structures or any new construction that occurs on the site, EPA

determined that ICs were required to ensure the protectiveness of the remedy. Specifically, an environmental easement and declaration of restrictive covenant is required that would restrict the use of groundwater as a source of potable or process water without prior approval by the New York State Department of Health, or the Genesee County Department of Health, until groundwater standards are achieved, and require an evaluation of the vapor intrusion pathway and mitigation, if necessary, for any of the existing, on-property structures intended for human occupancy or habitation or any new construction that occurs on the property. The 2015 ESD documented EPA's decision to require ICs to prevent exposure to contaminated groundwater and potential exposure through vapor intrusion.

Attempts to effect deed restrictions to prohibit the residential use of this property and the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved have not been successful. In 2001, ECOR Solutions, Inc. contacted the Town of Byron tax assessor's office to determine the ownership of the property so as to effect the necessary deed restrictions. The property's last known owner resided in Florida and had not paid taxes on the property for years. Because it was not feasible to expect that the site owner would be located or, if located, that he would cooperate in imposing ICs against the property, ICs were never implemented. In November 2013, Curt Randall acquired the site property in a quit-claim-deed transaction in his personal name and a portion of the property in a business name, Natalies Future Corporation. The new owner appears to be receptive to executing a Declaration of Covenants, Restrictions and an Environmental Easement. EPA has drafted a Declaration of Covenants, Restrictions and an Environmental Easement for purposes of implementing, facilitating and monitoring the response action and to impose on the property restrictions that will run with the land for the purpose of protecting human health and the environment. EPA and NYSDEC are in discussions with the PRP Group, as well as the new property owner, regarding the implementation of this IC.

Table 1, below, summarizes the implemented and planned ICs.

**Table 1: Summary of Implemented and Planned Institutional Controls**

<b>Media, engineered controls, and areas that do not support UU/UE based on current conditions</b>	<b>ICs needed?</b>	<b>ICs called for in the decision documents?</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Title of IC Instrument Implemented and Date (or planned)</b>
Groundwater	yes	Yes	Site-wide	Protect integrity of remedy and prevent use of contaminated groundwater for drinking or irrigation until cleanup levels have been met.	Anticipate Declaration of Covenants, Restrictions and an Environmental Easement by 12/31/17.
Groundwater	yes	Yes	Site-wide	Prohibit residential use of property and installation of groundwater wells for drinking or irrigation and evaluating the vapor intrusion pathway for new	Anticipate Declaration of Covenants, Restrictions and an Environmental Easement by 12/31/17.

				construction overlying the groundwater contaminant plume until groundwater standards are achieved.	
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### **Systems Operation/Operation & Maintenance**

The Operation and Maintenance (O&M) Manual for the site contains the procedures for operating, inspecting, and evaluating the groundwater extraction and treatment system, along with the long-term monitoring of groundwater. The groundwater extraction and treatment system has been off since 2007 for EVO pilot studies.

Groundwater levels are measured on a quarterly basis at four on-site monitoring wells (MW- 10B, PW-1, PW-2, and PW-3), three off-site monitoring wells (MW-1, MW-4 and MW-21), and at a water supply well associated with the abandoned residence on the property to determine the direction of groundwater flow. The wells are sampled quarterly except for the side-gradient monitoring well MW-21 and the well located on the abandoned residence which are sampled on a yearly basis.

During the 2015 sampling event and subsequent meetings at the site, it was discovered that several of the monitoring wells at the site had been inadvertently damaged by the new property owner as a result of clearing and salvage operations that the owner was conducting. Samples were collected using direct push temporary wells.

Potential impacts on the site from climate change were assessed. The performance of the remedy is currently not at risk due to the expected effects of climate change in the region near the site.

### **III. PROGRESS SINCE THE LAST REVIEW**

This section provides the protectiveness determinations and statements from the last FYR, as well as any recommendations from the last FYR and the current status of those recommendations.

Table 2, below, provides the OU1 and site-wide protectiveness determinations and statements from the 2012 FYR:

**Table 2: Protectiveness Determinations/Statements from 2012 Five-Year Review**

<b>OU</b>	<b>Protectiveness Determination</b>	<b>Protectiveness Statement</b>
01	Protectiveness Deferred	A protectiveness determination for this site cannot be made until additional information is obtained. It is expected that a report addendum containing a protectiveness statement will be issued within eighteen months of the date of this report.
Sitewide	Protectiveness Deferred	A protectiveness determination for this site cannot be made until additional information is obtained. It is expected that a

		report addendum containing a protectiveness statement will be issued within eighteen months of the date of this report.
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Table 3, below, provides the status of recommendations from the 2012 FYR:

**Table 3: Status of Recommendations from the 2012 Five-Year Review**

<b>OU</b>	<b>Issue</b>	<b>Recommendations</b>	<b>Current Status</b>	<b>Current Implementation Status Description</b>	<b>Completion Date<sup>3</sup></b>
1	A full capture analysis cannot be performed due to insufficient data.	Additional monitoring wells downgradient and east of the drainage ditch (east of MW-1 and MW-4) need to be installed and sampled.	Completed	Because pumping has ceased and concentrations are declining, a capture analysis is no longer necessary. These findings were presented in the 7/2/14 addendum.	7/2/2014
1	Institutional controls related to prohibiting the residential use of this property, the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved, and evaluating the vapor intrusion pathway for new construction overlying the groundwater contaminant plume are needed.	Since it does not appear likely that a deed restriction with the property owner can be effected, EPA has determined that a notice to successors-in-title to be filed with the County Clerk would be adequate protection. The wording for this notice needs to be prepared by the PRPs, approved by EPA, and filed with the County Clerk.	Ongoing	Attempts to effect deed restrictions to prohibit the residential use of this property and the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved have not been successful. In 2001, ECOR Solutions, Inc. contacted the Town of Byron tax assessor's office to determine the ownership of the property so as to effect the necessary deed restrictions. The property's last known owner resided in Florida and had not paid taxes on the property for years. Because it was not feasible to expect that the site owner would be located or, if located, that he would cooperate in imposing ICs against the property, ICs were never implemented. In November 2013, Curt Randall acquired the site property in a quit-claim-deed transaction in his personal name and a portion of the property in a business name, Natalies Future Corporation. The new owner appears to be receptive to executing a Declaration of Covenants, Restrictions and an Environmental Easement. EPA has drafted a Declaration	9/30/2013

<sup>3</sup> Planned completion dates for uncompleted actions and actual completion dates for completed actions.

				of Covenants, Restrictions and an Environmental Easement for purposes of implementing, facilitating and monitoring the response action and to impose on the property restrictions that will run with the land for the purpose of protecting human health and the environment. EPA and NYSDEC are in discussions with the PRP Group, as well as the new property owner, regarding the implementation of this IC.	
1	Emulsified vegetable oil was injected into the groundwater as part of a treatability study to evaluate means to facilitate the bioremediation of the contaminants in the groundwater. While it is possible that the injections have resulted in the groundwater reaching standards, this cannot be confirmed. In the monitoring wells most affected by the amendment injections, many of the aqueous samples needed sample dilution before the analyses could be run. As a consequence of the dilution, the analytical detection reported limits for contaminants of concern were often higher than	Injections should be suspended and samples that are not impacted by the injection compound need to be collected over two consecutive quarters. If the injections have not resulted in the groundwater achieving water quality standards, an alternative technology needs to be selected.	Completed	<p>EVO injections were suspended and groundwater samples were collected from four on-property monitoring wells, three off-property monitoring wells, and at a water supply well associated with the abandoned residence on the property. In groundwater samples collected from monitoring well MW-1, which has consistently exhibited the highest historical 1,1,1-TCA concentrations of all of the monitoring wells, the 1,1,1-TCA concentrations decreased from 1,300 µg/l in 2001 to 23 µg/l in 2013. TCA daughter product 1,1-DCA was detected in monitoring wells MW-1 (28 µg/l), MW-4, (14 µg/l), MW-10B (28 µg/l) and PW-1 (6.1 µg/l). The MCLs for TCA and DCA are 5 µg/l. In addition, 1,1-dichloroethylene and TCE were detected in several monitoring wells below their MCLs.</p> <p>Mann-Kendall analyses indicates that the 1,1-DCA levels are in decline based on the results of the last ten sampling events. It is anticipated that the MCLs for the VOCs in the groundwater will be met within a few years.</p>	7/2/2014

	their respective required groundwater quality standards.			These findings were presented in the 7/2/14 addendum.	
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Based on the new information and actions taken following the second FYR's completion, an addendum FYR report was issued on July 2, 2014, revising the protectiveness determination and statements.

Table 4, below, provides the OU1 and site-wide protectiveness determinations and statements from the FYR addendum:

**Table 4: Protectiveness Determinations/Statements from 2014 Five-Year Review Addendum**

OU	Protectiveness Determination	Protectiveness Statement
01	Short-term Protective	The implemented OU1 remedy is protective of human health and the environment in the short-term. For the remedy to be protective in the long term, ICs prohibiting the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved and requiring the evaluation of the vapor intrusion pathway for new construction that could overlie the groundwater contaminant plume, are needed.
Sitewide	Short-term Protective	The implemented remedy is protective of human health and the environment in the short-term. For the remedy to be protective in the long term, ICs prohibiting the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved and requiring the evaluation of the vapor intrusion pathway for new construction that could overlie the groundwater contaminant plume, are needed.

The FYR addendum did not identify any new issues or recommendations.

#### **IV. FIVE-YEAR REVIEW PROCESS**

##### **Community Notification, Involvement & Site Interviews**

On January 13, 2017, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the Byron Barrel and Drum Superfund site. The announcement can be found at the following web address:

[https://www.epa.gov/sites/production/files/2016-11/documents/five\\_year\\_reviews\\_fy2017\\_final.pdf](https://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf).

In addition to this notification, a notice of the commencement of the FYR was posted on EPA's Region 2 website and sent to local public officials. The purpose of the public notice was to inform the community that EPA would be conducting a FYR to ensure that the remedy implemented at the site remains protective of public health and is functioning as designed. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the site. Once the FYR is completed, the results will be made available at the site information repositories. The information repositories are located at:

EPA  
290 Broadway, 18<sup>th</sup> Floor  
New York, New York 10007

Byron Town Hall  
7028 Byron Holley Road  
Byron, New York

Gilliam Grant Library  
6966 West Bergen Road  
Bergen, New York

In addition, efforts will be made to reach out to stakeholders and local public officials to inform them of the results.

### **Data Review**

The documents, data and information which were reviewed in completing this FYR are summarized in Table 5.

Groundwater samples were collected in December 2012, March 2013, June 2015, and November 2016 in general accordance with the recommendations of the second FYR. The samples were collected from on-site monitoring wells and, during the 2015 and 2016 monitoring events, from temporary direct push wells located in proximity to the site monitoring wells. The purpose of collecting samples from direct push wells was to compare the results with monitoring well results.

In summary, the comparison between monitoring well and direct push well data identified that constituents of concern concentrations reported in the temporary wells tend to be slightly greater than those reported in monitoring wells, with the exception of samples from temporary well MW-1-DP in 2016. In addition, 1,1,1-TCA and 1,1-DCA, a daughter product of 1,1,1-TCA degradation, continue to be the primary constituents in groundwater above New York State groundwater standards.

Historically, the highest concentrations of 1,1,1-TCA and 1,1-DCA have been collected at monitoring well MW-1. Because monitoring well MW-1 has consistently exhibited the highest detections of 1,1,1-TCA and 1,1-DCA concentrations, it was determined that the utilization of monitoring well MW-1 is appropriate to assess VOC trends at the site. Historically, during the



groundwater extraction and treatment operation, 1,1,1-TCA concentrations at monitoring well MW-1 decreased between 2002 and 2007 from approximately 1,700 µg/l (2002) to about 200 µg/l (2007) and 1,1-DCA decreased from 86 µg/l (2002) to about 10 µg/l (2007). After EVO injections in 2007 and 2009, 1,1-DCA concentrations at monitoring well MW-1 increased temporarily as the 1,1,1-TCA underwent reductive dechlorination. The concentrations at monitoring well MW-1 reported in the June 2015 sampling event were non-detect for 1,1,1-TCA and 32 µg/l for 1,1-DCA. The November 2016 sampling event results for monitoring well MW-1 were 25 µg/l for 1,1,1-TCA and 32 µg/l for 1,1-DCA. This variation indicates biodegradation is continuing at a slow pace. In general, monitoring well MW-1 sample results indicate that concentrations of contaminants of concern have decreased since the second FYR completed in 2012 (see Figure 3). The degradation appears to be related to the sustained effectiveness of the EVO injections completed in 2007 and 2009. Based on recent monitoring data, it appears that contaminant degradation may be slowing; however, oxidation-reduction-probe readings indicate that reducing groundwater conditions continue to exist at the site, and 2-butanone, a potential by-product of constituent biological degradation, was detected and is an available organic carbon source for further degradation. This information suggests that degradation reactions are still occurring at the site.

Collectively, groundwater results from all of the monitoring wells show that 1,1,1-TCA and 1,1-DCA have only a few exceedances of state standards. The state standards of 5 ug/l for 1,1-DCA and 1,1,1-TCA were exceeded at monitoring well MW-1 where 1,1-DCA was detected at 32 ug/l and 1,1,1-TCA was detected at 25 ug/l. 2-butanone was detected at 970 ug/l at PW-1, which is above the 50 ug/l State standard. The concentration of toluene (16 ug/l) in monitoring well MW-10B was also detected above its state standard of 5 ug/l, however, since toluene has never been detected in this well, its presence is considered anomalous. The contaminant concentrations continued to decrease through the last FYR period and are expected to maintain a decreasing trend in the future.

### **Site Inspection**

A site inspection related to this FYR was conducted on April 6, 2017 by George Jacob of EPA. Also present for the inspection were John Grawthol of NYSDEC, Donald Sorbello of FMP Remediations Inc. (PRP consultant) and the new site property owner Mr. Curt Randall.

## **V. TECHNICAL ASSESSMENT**

***QUESTION A: Is the remedy functioning as intended by the decision documents?***

The remedy identified in the ROD consisted of on-site extraction and treatment of groundwater with on-site reinjection and soil washing. In 2002, soil samples were collected from the area undergoing soil flushing. The analytical results from the soil sampling indicated that the soil had achieved the ROD cleanup objectives. At that time, soil flushing through the infiltration gallery ceased and all of the treated groundwater was discharged to surface water.

In 2007, after groundwater concentrations reached asymptotic levels, the extraction and treatment system operations were suspended to allow the performance of an EVO treatability study to assess

the viability of using bioremediation to enhance the removal of the contaminants in the groundwater. The groundwater is being monitored during the pilot study to determine the effectiveness of the injections and it appears a reduction in groundwater contamination has resulted from EVO injections. The treatability study will continue.

The 2015 ESD required an environmental easement and declaration of restrictive covenant to restrict the use of groundwater as a source of potable or process water without prior approval by the New York State Department of Health, or the Genesee County Department of Health, until groundwater standards are achieved and require the evaluation of the vapor intrusion pathway and mitigation, if necessary, for any of the existing, on-property structures intended for human occupancy or habitation or any new construction that occurs on the property. EPA and NYSDEC continue to work with the PRPs and the new property owner to implement the institutional control. It is anticipated that this will be completed in December 2017.

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

*Human Health* – The previous FYR concluded that the exposure assumptions, toxicity data, cleanup levels and RAOs remained valid. These items were reviewed as part of this FYR and it was confirmed that the exposure assumptions, toxicity data, cleanup levels and RAOs remain valid at this time, as well.

Vapor intrusion was also evaluated during the previous FYRs with the conclusion that the vapor intrusion pathway was not complete due to buildings on the site being vacant. Since the previous FYR was completed, the property has changed ownership, with the new owner planning on residing in a building that may be in the vicinity of the groundwater plume. As detailed in the 2015 ESD, occupancy of the building is contingent upon conducting the vapor intrusion sampling in the building to determine if the vapor intrusion pathway is a potential problem, and appropriate mitigation if vapor intrusion is determined to be a problem. A copy of the ESD was given to the new property owner.

*Ecological* – There were no completed pathways identified for ecological receptors in previous documents. Based upon review of the past and current data, the previous conclusion that there are no completed exposure pathways for ecological receptors is still valid.

In summary, the groundwater is not currently being used as a drinking water source, there are no surface water discharges, and there are currently no completed exposure pathways at the site. Given that there is no exposure to site-related contaminants, the site is currently protective of human health and the environment.

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

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

## VI. ISSUES/RECOMMENDATIONS

**Table 4: Issues/Recommendations**

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 01	<b>Issue Category:</b> Institutional Controls			
	<b>Issue:</b> Institutional controls related to prohibiting the residential use of this property, the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved, and evaluating the vapor intrusion pathway for new construction overlying the groundwater contaminant plume are needed.			
	<b>Recommendation:</b> The new property owner appears to be receptive to executing a Declaration of Covenants, Restrictions and an Environmental Easement. EPA has drafted a Declaration of Covenants, Restrictions and an Environmental Easement for purposes of implementing, facilitating and monitoring the response action and to impose on the property restrictions that will run with the land for the purpose of protecting human health and the environment. The Declaration of Covenants, Restrictions and an Environmental Easement should be executed and filed.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	12/31/2017

### Other Findings

During the 2015 sampling event, it was discovered that several of the monitoring wells at the site had been damaged by the new property owner as a result of clearing and salvage operations that the owner was conducting. The damaged wells should be replaced and protective barriers should be installed around all of the monitoring wells

## VII. PROTECTIVENESS STATEMENT

**Table 5: Protectiveness Statements**

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU 1	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i>  EPA has determined that the OU1 remedy is protective of human health and the environment in the short-term. In order for the remedy to be protective in the long-term, ICs related to prohibiting the installation of groundwater wells for drinking or irrigation until groundwater	

standards are achieved, and evaluating the vapor intrusion pathway for new construction overlying the groundwater contaminant plume need to be implemented.

#### **Sitewide Protectiveness Statement**

*Protectiveness Determination:*

Short-term Protective

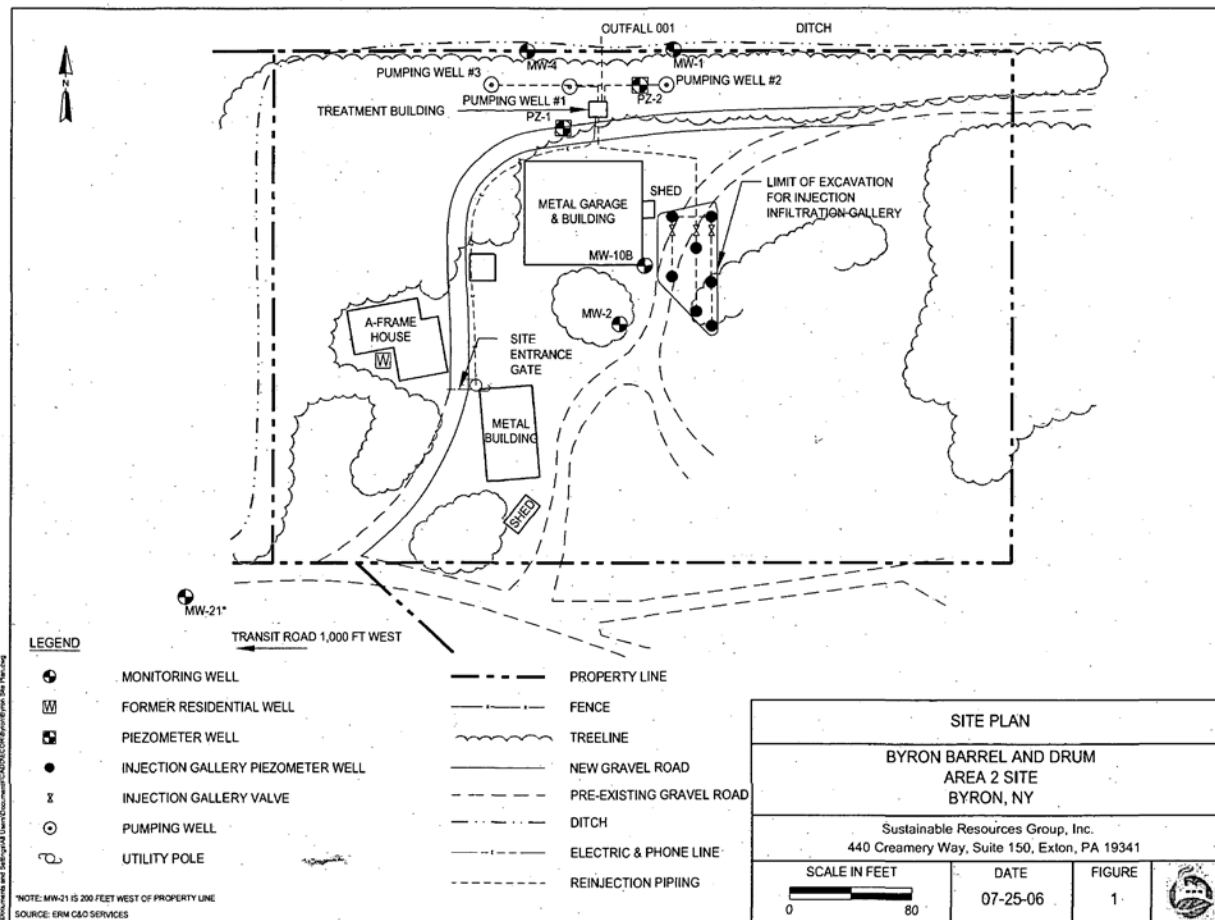
*Protectiveness Statement:*

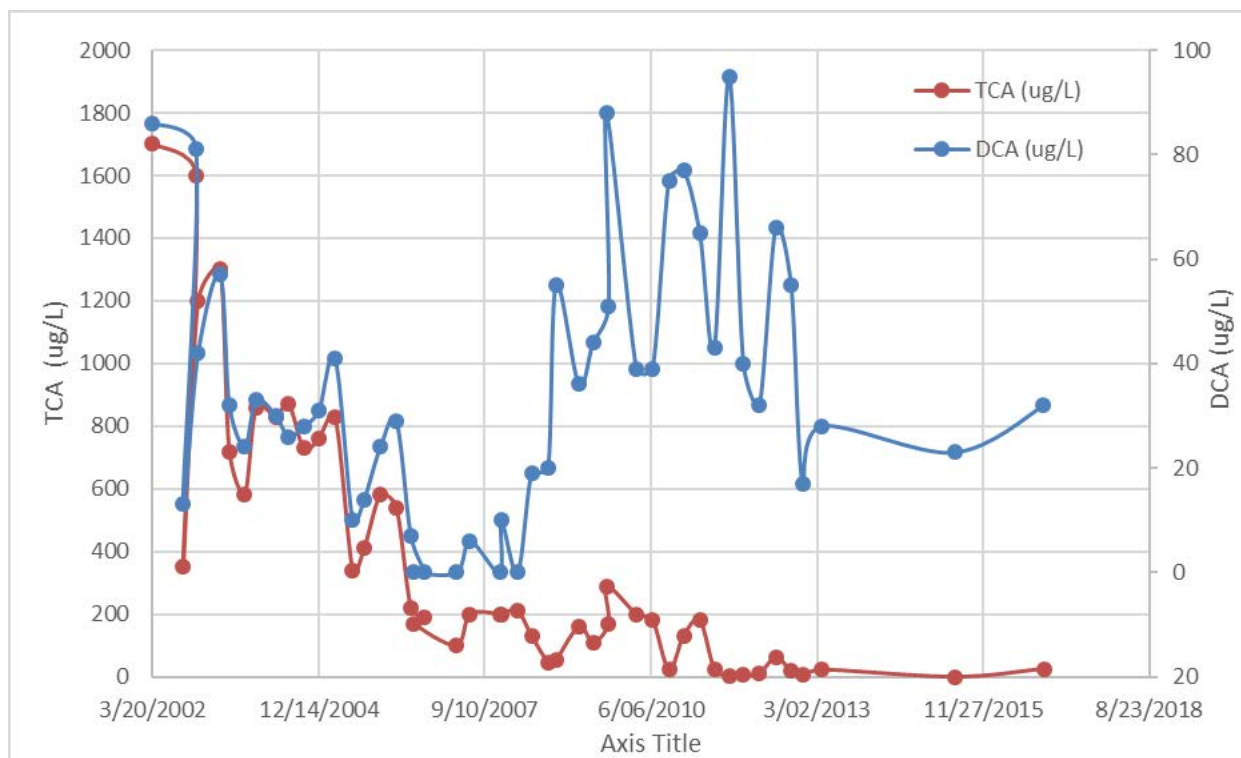
EPA has determined that the site-wide remedy is protective of human health and the environment in the short-term. In order for the remedy to be protective in the long-term, ICs related to prohibiting the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved, and evaluating the vapor intrusion pathway for new construction overlying the groundwater contaminant plume need to be implemented.

#### **VIII. NEXT REVIEW**

The next FYR report for the Byron Barrel & Drum Superfund site is required five years from the completion date of this review.

## FIGURES





## **APPENDIX A – REFERENCE LIST**



<b>Documents, Data, and Information Reviewed in Completing Five-Year Review</b>	
<i>Remedial Investigation/Feasibility Study</i> , Ebasco Services Inc.	1987
<i>Record of Decision</i> , EPA	1989
<i>Unilateral Administrative Order</i> , EPA	1990
<i>Consent Decree</i> , EPA	1996
<i>Final Design Report</i> , BB&L, Inc.	2000
<i>Explanation of Significant Differences</i> , EPA	2000
<i>OM&amp;M Manual</i> , ECOR Solutions, Inc.	2001
<i>Preliminary Close-Out Report</i> , EPA	2002
<i>First Five-Year Review Report</i> , EPA	2007
<i>Second Five-Year Review Report</i> , EPA	2012
<i>Second Five-Year Review Addendum Report</i> , EPA	2014
<i>Explanation of Significant Differences</i> , EPA	2015
<i>Annual Environmental Monitoring Reports</i> , ECOR, FPM Remediations Inc.	2012-2017
EPA guidance for conducting FYRs and other guidance and regulations to determine if any new Applicable or Relevant and Appropriate Requirements relating to the protectiveness of the remedy have been developed since EPA issued the Record of Decision.	

**APPENDIX B – TOPOGRAPHY, SITE GEOLOGY/HYDROGEOLOGY, AND LAND AND  
RESOURCE USE**

### *Topography*

The local topography surrounding the site consists of relatively flat terrain, with a large ravine on the right side. The site itself is flat with no discernible change in topography.

The site is abutted by heavily wooded areas and is directly adjacent to an active vegetable farm. The agricultural land originated from swamp deposits and is locally referred to a "muckland." This land has been classified as prime agricultural land by the State of New York. With respect to water use, groundwater is used as a potable water source by local residents and as a source of irrigation water by farmers.

### *Site Geology/Hydrogeology*

The site's geology consists of a surface overburden of drained highly organic (muck) soil (now developed as onion fields) with incorporated sand and silt, which averages 20 feet in thickness. The soil was developed from a Pleistocene age former glacial lake bottom. A glacial esker occurs over the soil at the southern part of the site. The esker was formed by the filling of a meltwater channel at the bottom of the retreating glacier, by sand, gravel and boulders derived from the glacier. It is the site of the local gravel pit. The lake developed during glacial retreat on top of a compact, dense and impermeable glacial till, which averages 65 feet in thickness. The till, consisting of a poorly sorted sandy, silty clay, with some coarser debris, was deposited on bedrock. This highly impermeable till averages about 50 feet thick. The bedrock is an argillaceous (clayey) limestone, with some intermittent dolostone (high magnesium limestone) of Silurian age. The bedrock has an undulating surface, slight fracturing, and no visible porosity. The fractures are infilled with calcium carbonate.

Site monitoring wells have been drilled into the relatively impervious till and bedrock and screened within the shallower sand, gravel and silt deposits of the old glacial lake bottom. The water table, encountered at as shallow as 4 feet below ground surface, varies from 11 to 18 feet in thickness. The property around the site is artificially drained in order to support farming. Surface water at the site flows away from the esker and discharges into the Oak Orchard Creek via swales and ditches approximately 1,000 feet to the west of the site. The groundwater flow direction is north-northwest. There is no evidence of a perched water table. The groundwater velocity in the overburden ranges from 1.40 to 266 feet per year. The till and bedrock are both relatively impervious and, therefore, act as aquicludes (aquitards).

### *Land and Resource Use*

The site is abutted by heavily wooded areas and is directly adjacent to an active vegetable farm. The agricultural land originated from swamp deposits and is locally referred to a "muckland." This land has been classified as prime agricultural land by the State of New York.

With respect to water use, groundwater is used as a potable water source by local residents and as a source of irrigation water by farmers.