

**SIXTH FIVE-YEAR REVIEW REPORT FOR
REPUBLIC STEEL CORP. QUARRY SUPERFUND SITE
LORAIN COUNTY, OHIO**



Prepared by

**U.S. Environmental Protection Agency
Region 5
Chicago, Illinois**

3/20/2023

X

A handwritten signature in blue ink, which appears to read "Thomas Shroff", is written over a horizontal line.

for

Douglas Ballotti, Director
Superfund & Emergency Management Division
Signed by: Environmental Protection Agency

Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS	2
I. INTRODUCTION	3
FIVE-YEAR REVIEW SUMMARY FORM	4
II. RESPONSE ACTION SUMMARY	4
Basis for Taking Action	4
Response Actions	6
Status of Implementation	7
Institutional Controls	9
Systems Operations/Operation & Maintenance	11
III. PROGRESS SINCE THE LAST REVIEW	12
IV. FIVE-YEAR REVIEW PROCESS	14
Community Notification, Involvement & Site Interviews	14
Data Review	14
Site Inspection	15
V. TECHNICAL ASSESSMENT	16
QUESTION A: Is the remedy functioning as intended by the decision documents?	16
VI. ISSUES/RECOMMENDATIONS	17
OTHER FINDINGS	19
VII. PROTECTIVENESS STATEMENT	19
VIII. NEXT REVIEW	19
APPENDIX A – REFERENCE LIST	20
APPENDIX B – ADDITIONAL SITE INFORMATION	21
APPENDIX C – FIGURES AND SITE PHOTOS	22
APPENDIX D – FYR NOTIFICATION	25

LIST OF ABBREVIATIONS & ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
cPAH	Carcinogenic Polynuclear Aromatic Hydrocarbon
EC	Environmental Covenant
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
ICs	Institutional Controls
LTS	Long-Term Stewardship
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
Ohio EPA	Ohio Environmental Protection Agency
O&M	Operation and Maintenance
OMZM	Outside Mixing Zone Maximum
OU	Operable Unit
ppb	parts per billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objectives
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SVOC	Semi-Volatile Organic Compound
Site	Republic Steel Corp. Quarry Superfund Site
SWRAU	Site-wide Ready for Anticipated Use
UECA	Uniform Environmental Covenants Act
UPUS	Unrestricted Potable Use Standard
UU/UE	Unlimited Use and Unrestricted Exposure
VAP	Voluntary Action Program
VOC	Volatile Organic Compound

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 United States 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 (NCP) (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the sixth FYR for the Republic Steel Corp. Quarry Superfund Site (Site). The triggering action for this statutory review is the signature date of the fifth FYR, March 20, 2018. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one (1) Operable Unit (OU), which will be addressed in this FYR. The OU1 remedy addresses the soil, sediment, and groundwater.

The Site FYR was led by David Linneer, Remedial Project Manager (RPM) with EPA, in affiliation with the Ohio Environmental Protection Agency (Ohio EPA). Participants included Nicholas Roope (Ohio EPA) and Adrian Palomeque (EPA Community Involvement Coordinator). The City of Elyria, which is the potentially responsible party (PRP) was notified of the initiation of the FYR on April 18, 2022. The review began on April 18, 2022.

Site Background

The Site is located in Elyria, Ohio, east of West River Road and west of the West Branch of the Black River. Elyria is located southwest of Cleveland in Lorain County in northeastern Ohio. The Site consists of a 4.9-acre water-filled quarry which is surrounded by 7.4 acres of densely vegetated land. A fence surrounds the Site's perimeter. The water depth of the quarry is approximately 60 feet and the sides of the quarry rise to about 25 feet above the water surface. The quarry walls are formed by Berea Sandstone at and below the quarry water level. Above the Berea Sandstone, the walls consist of large vertically stacked sandstone blocks which were used as retaining walls during quarrying operations. Water discharges from the quarry directly into the Black River via an open tributary outlet.

There are two hydraulic outlets in the quarry. The first is a concrete outlet-works and is equipped with a gate valve located along the east quarry wall where the elevation dips to about 704 feet above mean sea level. Water is usually draining from the outlet and discharges into the river, but the gate valve can no longer be adjusted. The second is a four-inch diameter steel pipe located at the southeasternmost corner of the quarry extending down into the water and is no longer operational. These hydraulic outlets do not pose any impact to the Site or offsite receptors. This pipe is believed to have been used for withdrawing water from the quarry to the Republic Steel plant rather than being used to discharge the pickle liquor wastes.

The groundwater flows from southwest to northeast. The water table contours suggest the quarry area is a partial groundwater sink from which discharge is uniformly directed toward the river. The topography

of the area is flat to gently rolling, except for the valleys eroded by the Black River. The West Branch of the Black River is located along the eastern boundary of the Site and at one time was used as an overflow relief for the quarry during seasonal flooding periods. The river flows directly north from Elyria into the City of Lorain, where it discharges into Lake Erie. Currently, there are no plans to develop the Site and it is anticipated the Site will remain vacant for the foreseeable future. Appendix B contains additional background information about the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Republic Steel Corp. Quarry		
EPA ID: OHD980903447		
Region: 5	State: OH	City/County: Elyria / Lorain County
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): David Linnear		
Author affiliation: U.S. EPA		
Review period: 4/18/2022 - 12/13/2022		
Date of site inspection: 11/23/2021		
Type of review: Statutory		
Review number: 6		
Triggering action date: 3/20/2018		
Due date (five years after triggering action date): 3/20/2023		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The remedial investigation (RI) (U.S. EPA, 1988) results indicated all contamination caused by the Republic Steel disposal practices were limited to quarry sediments, the pickle liquor discharge ditch, and several soil locations around the quarry’s edge. Contaminated sediments were confined to the quarry bottom and were not readily accessible to humans, except via the fish consumption pathway.

The Site had unacceptable risk to human health and the environment due to potential exposure to volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), heavy metals, carcinogenic polynuclear aromatic hydrocarbons (cPAHs), and polynuclear aromatic hydrocarbons (PAHs). Site contaminants of concern (COCs) identified in the 1988 Record of Decision (ROD) (U.S. EPA, 1988) were SVOCs in the groundwater and surface water and VOCs, SVOCs, PAHs, and heavy metals in the surface soil and sediment in the quarry. The COCs identified for all media types for the Site is presented in Table 1 below.

Table 1: COCs for the Site by Media Type

<p>Soil: 2-Butanone Chromium Copper Manganese Mercury Methylene Chloride Acetone Bis(2-ethylhexyl)phthalate Di-n-butylphthalate Di-n-octylphthalate Calcium Iron Nickel Cadmium <i>Non-carcinogenic PAHs:</i> Fluoranthene Pyrene Phenanthrene Anthracene Benzo(g,h,i)perylene <i>Carcinogenic PAHs:</i> Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd) pyrene Dibenzo(a,h)anthracene</p> <p>Sediment: Acetone 2-Butanone Copper Ethylbenzene Mercury Methylene Chloride Pentachlorophenol Bis(2-ethylhexyl)phthalate Butylbenzylphthalate Diethylphthalate Di-n-butylphthalate</p>	<p>Surface Water (metals): Barium Calcium Iron Manganese Nickel Vanadium Cadmium</p> <p>Groundwater: Aluminum Barium Benzoic Acid Beryllium Calcium Chromium Cobalt Copper Iron Lead Nickel Pentachlorophenol Phenol Potassium Silver Vanadium Zinc Manganese Sodium Cadmium Bis(2-ethylhexyl)phthalate Di-n-butylphthalate</p>
---	--

Di-n-octylphthalate Tin Tetrachloroethene Toluene <i>Non-carcinogenic PAHs:</i> Fluoranthene Pyrene Phenanthrene Anthracene Benzo(g,h,i)perylene <i>Carcinogenic PAHs:</i> Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(a)anthracene	
--	--

Primary risk pathways that formed the basis for taking action for future or current users at the Site were ingestion and dermal contact with Site soils and sediments, dermal contact and ingestion of groundwater and surface water, and ingestion of fish from the quarry. Cumulative carcinogenic risk posed by ingestion or contact with surface soil and sediment and fish consumption were determined to be scenarios of concern.

Response Actions

EPA issued a ROD on September 30, 1988, that included the following selected remedy components:

- Excavation of approximately 100 cubic yards of contaminated soil exceeding an Action Level of 300 ppb for total cPAHs that are located (1) in the ditch previously used to discharge pickle liquor to the quarry and (2) along the southern end of the quarry; and
- Disposing excavated soil according to RCRA regulations.

Because low levels of hazardous substances will remain on Site, the five-year review will apply to this action. Specific tasks recommended as part of this monitoring process are:

- Conducting a fish species survey and fish tissue bioassay to assure the absence of contaminants. The survey will identify fish species present in the quarry. Fish tissue samples will be collected from each species.
- Resampling groundwater to assure the concentrations of any contaminants are at acceptable risk levels.

The ROD also specified that a fish species survey, fish tissue bioassays, and groundwater sampling be conducted during a supplemental investigation to recalculate the risks using actual fish tissue data instead of modeled fish tissue values and more recent groundwater data. The Supplemental Investigation was completed in 1990 and discussed in *Status of Implementation* below.

Since groundwater was not used as a potable water supply, the ROD did not select a groundwater remedy component. The contaminated quarry sediments below the mixing zone were to be left in place inside the quarry because fish were not likely to come in contact with them.

While the ROD did not explicitly state the remedial action objectives (RAOs) to be attained by the remedy, the inferred objectives of the remedy are as follows:

- The selected action provides adequate protection of human health and the environment by preventing exposure and accidental ingestion of contaminated surface soils.
- Additionally, further U.S. EPA-conducted monitoring will assure that fish in the quarry and the downgradient groundwater do not pose a human health threat.

EPA issued an Explanation of Significant Differences (ESD) on September 28, 2001 (U.S. EPA, 2001), for institutional controls (ICs), a deed restriction, and access controls to prevent any Site and groundwater usage as discussed further in *Status of Implementation* below. Specifically, the ESD states:

The U.S. EPA has determined as per this ESD Document, that the following provisions should be incorporated into the institutional controls and deed restrictions for the Republic Steel Quarry Site:

1. Any future use of the Site must be restricted to heavy industrial use. This indicates that residential use of the property, as well as public access or recreational use of the quarry, its sediments and soil must be prohibited.
2. The use of groundwater as a source of drinking water must be prohibited and the use of the City of Elyria municipal water supply as the potable water source for any industrial or commercial development or public use must be required.
3. The City of Elyria must continue to post and maintain Site security and warning signs, as well as maintain the repair of the quarry perimeter fence. Further, the City must conduct sufficient inspections to ensure that any land use and access controls they may adopt in the future are complied with.

Status of Implementation

The Remedial Action (RA) was implemented by EPA's Removal Program in two phases between September 21, 1989, and September 25, 1990. The first phase focused on resolving the risk issues concerning groundwater and fish tissue that were raised during the RI baseline risk assessment. This involved determining the requirements for the upcoming fish/biota species survey and fish tissue bioassays, and additional groundwater monitoring for the Supplemental Investigation. The second phase involved addressing the contaminated soil and sediments.

Due to time constraints, the collection and analysis of actual fish tissue samples during the RI was not possible. Instead, the fish tissue concentrations were estimated using a conservative sediment to fish tissue model that incorporated quarry sediment data collected during the RI. According to the modeled exposure conditions in the baseline risk assessment, fish consumed on a regular basis from the quarry posed an unacceptable noncarcinogenic risk to humans due to cPAHs and mercury. Further, the Ambient Water Quality Criteria (AWQC), which are used to define risk-based acceptable surface water concentrations for the protection of aquatic organisms, were exceeded for mercury, manganese and copper in the quarry water.

On February 17, 1989, two PRPs, LTV Steel and the City of Elyria, were sent special notice letters to pay for the removal of the contaminated soils. EPA performed the second phase of the RA addressing contaminated soil and sediments after the PRPs declined to perform the cleanup. In August 1989, the EPA Technical Assistance Team (TAT) delineated the extent of soil contamination. The projected excavation volume was 100 cubic yards. However, in February 1990, 150 cubic yards of soil were

removed from the boat launch area and pickle liquor discharge ditch. The excavated volume was greater than anticipated due to the fact that the topsoil was slightly thicker than expected; the weather was wet during the removal; and some contamination had been tracked onto the access roads and had to be removed.

Confirmatory sampling indicated that the cleanup objective, i.e. the total concentration for the four cPAHs present: (benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene and benzo(a)anthracene), did not exceed 300 parts per billion (ppb) and that cleanup objectives had been achieved for the boat launch. However, the pickle liquor ditch was still contaminated above acceptable levels. An additional 40 cubic yards of soil were removed from the ditch in June 1990 to achieve the cleanup criterion.

The subsequent 1990 Supplemental Investigation risk recalculation found that the previous assumptions made during the modeling of mercury and cPAHs concentrations in fish tissue, in lieu of actual data, were too conservative and unreliable. The recalculated maximum carcinogenic and noncarcinogenic risks to humans from consumption of fish tissue, based on fish tissue data obtained during the Supplemental Investigation, were found to fall within the acceptable risk range. Because the risk recalculations confirmed that no unacceptable risks were posed to humans consuming fish from either the quarry or the Black River, the Ohio Department of Health did not issue a fish advisory and no additional cleanup action was deemed necessary at the Site.

Additional groundwater monitoring was performed because beryllium and bis(2-ethylhexyl) phthalate had been reassigned higher cancer potency factors by EPA after completion of the RI baseline risk assessment. During the 1990 Supplemental Investigation, the risks from groundwater were recalculated for the semivolatile and inorganic contaminants previously identified in the RI. The carcinogenic and noncarcinogenic groundwater risks respectively increased and exceeded acceptable thresholds. There are currently no users of groundwater at the Site or within at least one-half mile of the Site, therefore there was no imminent risk presented to humans at the time from groundwater. Further, the groundwater was not expected to be used as a potable water source in the future.

The Supplemental Investigation Report, issued in September 1990 as a requirement of the ROD, concluded that the remedy components of the ROD had been accomplished (U.S. EPA, 1990) as follows:

- Groundwater – VOCs were not detected in any groundwater samples;
- Surface water – Samples were collected for VOCs, SVOCs and inorganic contaminants. No site-related organic contaminants were identified, but several inorganic contaminants were identified above upgradient concentrations with the greatest concentrations near the quarry bottom. A comparison of quarry and site-related samples indicated that the site was not adversely impacting Black River water quality.
- Fish Tissue – Mercury and manganese were detected not beyond the expected range from modeling;
- Surface soil – SVOCs and inorganic compounds were found below cleanup criterion; and
- Sediment – VOCs were detected only in deep samples (greater than 35 feet), while other contaminants were detected in both shallow and deep sediments. It was determined deeper sediments pose no immediate threat because the sediments do not mix into the quarry waters.

The City of Elyria passed an Emergency Resolution of Intent on November 1, 1999, to prohibit certain uses of the Site. On September 28, 2001, EPA issued an ESD requiring ICs to be placed on the Site. The ICs would enhance the protection of the remedy by decreasing the frequency of trespassing incidents or

the recreational use of the quarry, reducing the incidence of soil ingestion and fish consumption. In addition, residential use of the property, which assumes exposure to contaminated groundwater and soils, may present unacceptable risks. The ESD required ICs to prevent human and environmental contact with the Site and to enhance the remedy's protectiveness of human health and the environment. The City of Elyria owns the property and maintains the fence surrounding the quarry. Since ICs or deed restrictions were not part of the original remedy, EPA worked with the City to codify an ordinance to prevent current and future exposures to Site-related contaminants.

EPA deleted the Site from the National Priorities List (NPL) on November 12, 2002 (U.S. EPA, 2002). Under an EPA Management Assistance Grant, Ohio EPA has been conducting annual compliance inspections on the Site since 2003.

In January 2008, EPA issued a Site-Wide Ready for Anticipated Use (SWRAU) determination. The determination concluded that all cleanup goals in the ROD have been achieved for any media that may affect current and reasonably anticipated future land uses, so that there are no unacceptable risks, and that under current conditions, all ICs required by the ESD and ROD are in place and effective.

Institutional Controls

ICs are required to ensure the protectiveness of the remedy. ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for UU/UE. The 2001 ESD required ICs to be placed on the Site to enhance the protectiveness of the remedy by prohibiting trespassing, recreational use and residential use of the Site.

A Declaration of Restrictions on the property was recorded by the City of Elyria on June 21, 2002. The restrictions contained therein are as follow:

1. Restrict property use to H-1 (Heavy Industrial) uses only.
2. Prohibit the use of groundwater as a source of drinking water.
3. Require the use of the Elyria municipal water supply as the source of potable water for any industrial or commercial development or public use.
4. Require the posting of warning signs to keep out of the quarry Site.
5. Require maintenance of the perimeter fence.
6. Prohibit fishing, swimming, and boating in the quarry.
7. Prohibit public access or use of the quarry, its sediment, and soil.

The City of Elyria owns the property and is responsible for maintaining the Site including the fence surrounding the quarry.

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
---	------------	--	--------------------	--------------	--

Soil, Site Property surrounding quarry	Yes	Yes	The IC objective applies to and covers the physical area (12.24 acres). Elyria Township Lots 8, 115, 116, and 117 on Area A of Figure 4 in Appendix C	Prohibit residential and recreational use	City of Elyria Ordinance No. 2002-119; City of Elyria Declaration of Restrictions recorded June 21, 2002, with the Lorain County Recorder.
Quarry surface water, sediments and fish	Yes	Yes	The IC objective applies to and covers the physical area of the quarry (12.24 acres). Elyria Township Lots 8, 115, 116, and 117 on Area A of Figure 4 in Appendix C	Prohibit recreational use	City of Elyria Ordinance No. 2002-119; City of Elyria Declaration of Restrictions recorded June 21, 2002, with the Lorain County Recorder.
Groundwater	Yes	Yes	The IC objective applies to and covers the physical area (12.24 acres) Sitewide, Elyria Township Lots 8, 115, 116, and 117 on Area A and B of Figure 4 in Appendix C	Prohibit groundwater use on Site property; require the use of the Elyria municipal water supply for potable water	City of Elyria Ordinance No. 2002-119; City of Elyria Declaration of Restrictions recorded June 21, 2002, with the Lorain County Recorder.

Ohio Statewide Fish Advisory

The Ohio Department of Health currently advises that all persons limit consumption of sport fish caught from all water bodies in Ohio to one meal per week, unless there is a more or less restrictive advisory already in place. The advisory protects sensitive populations, including women of childbearing age and children under age 15. The statewide Advisory applies to the quarry at the Site because the quarry is considered to be an Ohio water body. In Lorain County, a specific fish advisory is also in effect for the West Branch of the Black River which includes the segment alongside the quarry property. The advisory limits consumption of White Sucker to once per month due to elevated mercury levels. The updated listing of water bodies having advisories is available to the public on the Ohio EPA website. <https://odh.ohio.gov/know-our-programs/ohio-sport-fish-consumption-advisory/publications/oh-fish-advisory>.

A map (Figure 4) showing the area in which the ICs apply is included in Appendix C.

Current Compliance:

The ICs and required land use restrictions are generally effective in preventing residential and commercial uses but ongoing trespassing, vandalism, and recreational uses have been observed. The 11/23/2021 Site inspection conducted by Ohio EPA provided evidence which supported violations of the restrictions contained in the Declaration of Restrictions. Additional detail of the Site Inspection is included in Section IV below.

Restrictions on groundwater use are effective. Per the Ohio EPA 11/21/2021 inspection no drinking water supply wells were installed within the impacted groundwater area and ICs ensure that any new potable water needs must be supplied by the Elyria municipal supply. The Elyria Water Works provides the potable water supply to the area using Lake Erie as its water source. According to past residential well inventories, there are no known residential wells operating within a one-half mile radius of the Site and, there are no known existing downgradient wells that were previously used to provide potable water.

Long Term Stewardship: Long-term protectiveness requires continued compliance with the ICs on land use and groundwater use restrictions to ensure that the remedy continues to function as intended. Long-term stewardship (LTS) helps ensure that the ICs are maintained, monitored, and enforced. The City of Elyria needs to develop LTS procedures and incorporate them into an Operation and Maintenance (O&M) plan. A draft O&M plan containing LTS procedures needs to be provided to EPA and Ohio EPA for review. An example of an LTS Plan was provided to the City of Elyria in October 2021 to keep them informed and engaged in the development process.

IC Follow up Actions Needed: The City of Elyria needs to submit an O&M plan containing LTS procedures; replacement of missing warning signs; reparations to the Site fence; and plans to address the ongoing trespassing and vandalism at the Site by implementing improved Site security.

Systems Operations/Operation & Maintenance

The Site has been in the O&M phase since December 31, 1992, when the Final Closeout Report (U.S. EPA, December 1992) was completed. The RA involved only soil removal. There are no on-Site operating structures, and there was no formal O&M Plan. The RI monitoring wells remain in place but have not been sampled since the Site was deleted from the NPL in 2002. Use of the groundwater is prohibited by the ICs at the Site.

The City of Elyria, as the local authority and landowner, continues to assume responsibility for the observance of the ICs. Should a violation of the ordinance occur, the City will be able to take the appropriate enforcement action. A State Superfund Contract (SSC), signed in September 1989 with Ohio EPA, indicates that Ohio EPA will assure all future O&M of the RA for the expected life of the actions. To date, it has not been necessary for Ohio EPA to directly undertake O&M activity at the Site because the City of Elyria has assumed this responsibility. Cost reconciliation and termination of the SSC occurred in October 1998. Ohio EPA has continued to consult with EPA on all actions since the termination of the SSC.

Ohio EPA has been conducting annual compliance inspections since 2003. However, no formal documentation existed prior to July 2006. A compliance inspection report and guidance used by the Ohio EPA is available to the city. The city does not perform its own regular compliance inspections but

does accompany Ohio EPA on its annual inspections and receives copies of the final compliance reports prepared by Ohio EPA.

At the request of EPA and Ohio EPA, surface water and sediment sampling was performed by a contractor to the City of Elyria in September 2018 due to a sheen that was observed on the surface water of the quarry during the fifth FYR Site Inspection (City of Elyria Report, January 2020). The report concluded that there was no evidence of chemical impacts to surface water from the sheen observed on the quarry surface during the assessment. Sediment sample results were also consistent with historic analytical results. The results of this sampling are discussed in the *Data Review* section below.

III. PROGRESS SINCE THE LAST REVIEW

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

Table 2: Protectiveness Determinations/Statements from the 2018 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1/Sitewide	Short-term Protective	The remedy is currently protective of human health and the environment because exposure pathways that could result in unacceptable risks are being controlled. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: sample sheen and quarry water and determine source; develop and implement a monitoring program; develop and implement an O&M Plan; develop long-term stewardship activities as part of the O&M Plan; and address Site access controls and security.

Table 3: Status of Recommendations from the 2018 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
01/Sitewide	Oil sheen observed on quarry pond water.	Sample and analyze sheen and quarry water to determine source.	Completed	The City of Elyria conducted an evaluation of the sediment and surface water in 2020 and determined no potential risks to the quarry. The City's conclusion is that no further action is required at this time. EPA agrees with this conclusion but also believes that it is necessary to implement an O&M Plan. Surface water and sediment sampling were analyzed for	1/13/2020

				historically detected parameters within the quarry. Results concluded that parameters were not detected above their maximum historic concentrations and no additional source area was detected. <i>See</i> Data Review for a summary of the sampling results.	
01/Sitewide	Lack of fish tissue survey, fish tissue sampling, fish tissue bioassays, and groundwater monitoring with each FYR as required by the ROD.	Develop and implement the required monitoring program.	Completed	EPA reported in the last FYR that additional fish tissue and groundwater sampling would be required. However, since that time it was determined that all required fish tissue and groundwater sampling was completed during the September 1990 Supplemental Investigation.	9/26/1990
01/Sitewide	Lack of O&M program.	Develop and implement an O&M Plan.	Addressed in Next FYR	The City of Elyria will prepare an O&M Plan that will incorporate long-term stewardship activities of ICs and Site inspections	NA
01/Sitewide	Lack of long-term stewardship of ICs.	Develop long-term stewardship procedures as part of O&M Plan and implement.	Addressed in Next FYR	The City of Elyria will prepare an O&M Plan that will incorporate long-term stewardship activities of ICs and Site inspections.	NA
01/Sitewide	Inadequate Site access controls and Site security.	Maintain the Site access controls and security. This includes controlling vegetative growth along the fence line, repairing breaches and holes within the perimeter fence and gaps beneath the fence, and maintaining posted warning signs. The City of Elyria should also actively pursue enforcement of the Declaration of Restrictions under the city ordinance as needed.	Ongoing	The City of Elyria is working to address additional Site security measures to ensure safety and long-term protectiveness of the remedy. The City of Elyria has explored other options to increase security measures at the Site, including obtaining a quote for a camera security system to be monitored by the City police department and sending letters to nearby residents notifying them to contact the police department with Site trespassing concerns.	NA

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available on 12/20/22, stating that there was a FYR planned for the Site and inviting the public to submit any comments to EPA (Appendix D). In February 2023, a resident contacted EPA and expressed concerns about people trespassing on the Site property and swimming in the quarry. EPA responded to the resident that EPA would incorporate these public concerns into the current FYR report. Since that time, the resident has contacted the local newspaper and Senator Sherrod Brown's office seeking support. On March 2, 2023, EPA sent a response to an inquiry from the Senator's office indicating EPA's willingness to maintain open lines of communication and provide an update to the community on the current status.

The results of the review and the report will be made available at the Site information repository located at the Elyria Central Public Library 320 Washington Ave. Elyria, Ohio 44035, and at: www.epa.gov/superfund/republic-steel-quarry. Due to Covid-19 travel restrictions, interviews were not conducted. Historically, interviews with the public have been limited because there is little public interest at the Site.

Data Review

Following the 2018 FYR, EPA and the Ohio EPA requested a data assessment of the quarry water with surface water and sediment sampling at the Site due to a sheen observed on the surface of the quarry water during the fifth FYR Site Inspection. Sampling was performed in September 2018 by a contractor to the City of Elyria (City of Elyria Report, January 2020). The sheen had been observed within the quarry near the boat launch area on the south side of the quarry. Sheen had also been observed on the surface water on the eastern side of the quarry. The collected data would provide the chemical makeup of the sheen, provide the current water conditions, and current properties of the sediment.

Surface water samples were collected with one (1) surface water sample with no sheen and one (1) surface water sample of the sheen for comparison. Each surface water sample was analyzed for the following parameters: free cyanide, alkalinity as calcium carbonate (CaCO₃), hexavalent chromium, fluoride, nitrate nitrogen, Chemical Oxygen Demand (COD), metals, water quality parameters, polychlorinated biphenyls (PCBs), VOCs, and total phosphorus (orthophosphate).

No evidence of chemical impacts to surface water were found from the sheen observed on the surface water of the quarry based on this 2018 sampling event. VOCs, SVOCs, pesticides, water quality parameters, PCBs, and metals were not detected above the Ohio EPA Lake Erie Basin aquatic life and human health screening values for outside mixing zone maximum (OMZM) or the Ohio Voluntary Action Program (VAP) Unrestricted Potable Use Standard (UPUS) in surface water samples. There were no significant variations in data between the samples collected with and without a sheen observed.

Sediment samples were analyzed for historically detected parameters including SVOCs and metals. One SVOC, benzo(a)pyrene, was detected in all of the sediment samples above the regional screening levels for residential soil. Several metals including arsenic, chromium, and iron were detected at levels above the regional screening levels for residential soil. In addition, several metals including antimony, arsenic,

cadmium, copper, nickel, and selenium were detected at levels above the Ohio VAP Statewide and Regional Sediment Reference Values. However, these parameters were not detected above their maximum historic concentration within the Site sediment. Sediment sample results were consistent with historic analytical results.

Based on the results, the City of Elyria does not recommend additional investigation concerning the sheen observed on the surface of the quarry water. At this time Ohio EPA and EPA accept this recommendation. However, the Agencies recommend that the City of Elyria prepare an O&M Plan to incorporate long-term stewardship activities of ICs and Site inspections.

Site Inspection

Ohio EPA conducted their annual Site Inspection on November 17, 2021 (*see* Appendix C for inspection report). Photos were taken and included in Appendix C. Due to Covid-19 work travel restrictions, the EPA FYR Site inspection could not be completed. The FYR inspection of the Site will be conducted by EPA once it is feasible to do so, and the written inspection results and Site photos taken during the inspection will be included in the Site's files for documentation.

The inspection noted that, while warning signs on the north and south sides of the fence were intact, those on the east and west sides were removed/vandalized. The inspection noted some portions of the fence had been cut/damaged. Per the inspection report:

Despite the repairs made to the fence and additional signs being posted to alert potential trespassers of the hazards within the fence, trespassing was still occurring. Evidence of swimming and fishing was noted during the inspection. The city representative stated that the city would like to consider additional alternatives, if possible, to fill the quarry with Lake Erie dredged sediments (under the beneficial reuse program) to help minimize the appeal for trespassing in the quarry area and prevent future exposure.

During the inspection, the city was asked to complete repairs by March 2022 and provide documentation to EPA and Ohio EPA. It is also noted that these issues have been ongoing and identified in FYRs since 1998 and this FYR recommends that additional steps be taken to improve Site security, including finding ways to enforce trespassing.

The City of Elyria installed new signs around the perimeter to replace the ones that were missing (per an email received by the state and EPA). The City of Elyria contracted with the Cuyahoga Fence Company to repair all the fencing sections that were in disrepair in February/March 2022. Repairs were completed on August 23, 2022. The City of Elyria also requested and received a quote for a camera security system to be monitored by the Elyria Police Department.

During the inspection on November 17, 2021, Ohio EPA asked if the City of Elyria maintained its interest in using sediment dredged from the Black River for beneficial re-use as fill to support wetland creation and/or recreational uses if possible. Based on discussions with EPA's Surface Water Division, it appears that this process is costly and may take a significant amount of time to appropriately plan and implement.

The City of Elyria is continuing to communicate that individuals with trespassing complaints should contact the City of Elyria Police Department and report trespassing concerns either in lieu of or in

addition to notifying the Agencies. In addition, the City of Elyria sent letters to nearby residents in August 2022 to contact the police department to report trespassing.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

No. The review of the available information indicates that some components of the remedy are functioning as it was intended by the ROD and ESD, and other components are not. Site access restrictions are not functioning as effectively as intended as recreational use of the quarry still occurs on a regular basis.

EPA issued a ROD on September 30, 1988, which called for excavation of contaminated soils in the ditch previously used to discharge pickle liquor to the quarry and along the southern end of the quarry. The 300-ppb total cPAHs soil cleanup goals were met via excavation from the designated areas. The ROD also called for a supplemental investigation during which further studies of fish tissue and groundwater were to be performed. The risk calculations performed during the supplemental investigation, which was completed in 1990, confirmed that no unacceptable risks were posed to humans consuming fish from either the quarry or the adjacent Black River. The quarry sediments, though contaminated, were left in place since they lay below the mixing zone and fish were not likely to come in contact with them. It was also determined that there were no users of groundwater at the Site or within at least one-half mile of the Site, and no imminent risk was presented by groundwater to humans.

Following the 2018 FYR, EPA and the Ohio EPA requested a data assessment of the quarry water with surface water sampling and sediment sampling at the Site due to observation of a sheen on surface water of the quarry during the fifth FYR Site Inspection. Evidence of chemical impacts to surface water from the sheen observed on the surface water of the quarry were not observed during the September 2018 assessment. Sediment sample results were consistent with historic analytical results.

O&M

Warning signs are missing and damage to the fence has been noted. Evidence of trespassing and use of the quarry for fishing and swimming have also been observed. This has been an ongoing issue noted in each one of the prior FYRs. The City of Elyria has pursued actions to address the damaged fence and other items noted during the 11/17/2021 Ohio EPA Site inspection. The quarry and surrounding land are also enclosed by a fence to prevent potential exposure to Site soils and fish from the quarry pond; however, Site access controls have not been completely effective in deterring trespassing and recreational use of the quarry.

Implementation of Institutional Controls and Other Measures

There is no potential exposure to groundwater because all potable water is supplied by the Elyria municipal water supply.

ICs are in place to limit the Site uses. IC effectiveness is questionable possibly due to lack of enforcement. IC restrictions prohibit interference with the remedy, prohibit use of the groundwater on

the Site, and prohibit residential and recreational uses of the Site including the quarry pond. Site uses (trespassing and recreational uses) which are inconsistent with the implemented ICs and the IC objectives were noted during the Site inspection and highlighted in follow-up discussions with Ohio EPA and City of Elyria. The City of Elyria, as the Site owner and PRP, is responsible for maintaining and enforcing the ICs at the Site. Compliance with ICs are necessary to assure the protectiveness of the remedy.

Implementation of LTS procedures is required to ensure that the ICs are maintained, monitored and enforced so that the remedy continues to function as intended. IC effectiveness needs to be improved through the implementation of an approved O&M Plan containing LTS procedures. The O&M plan that will be developed will include procedures for LTS of ICs, to ensure long-term protectiveness of the remedy.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Question B Summary:

Yes. The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selections are still valid. There have been no major changes in the physical conditions of the Site which would affect the protectiveness of the remedy. The Site is currently vacant. Although emerging contaminants could potentially be present that were not included as part of exposure assumptions at the time of remedy selection, the Site RAOs remain valid because residents and businesses in the area are connected to the municipal water supply and effective ICs are in place preventing use of the groundwater.

There has been no change to the standardized risk assessment methodology or contaminant characteristics that would affect the protectiveness of the remedy. There have been no changes in toxicity factors or cleanup levels. As per the ICs, the property is currently zoned for industrial use; however, there is currently no formal use of the property as it remains vacant except for trespassing and unauthorized seasonal recreation activities.

Question C: Has any other information become available that could call into question the protectiveness of the remedy?

Question C Summary:

No. There is no new information which has come to light which could affect the protectiveness of the remedy. No other events have affected the protectiveness of the remedy and there is no other information which calls into question the protectiveness of the remedy. There have been no natural disasters and/or climate change issues impacting the Site or the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

OU(s): 1/ Sitewide	Issue Category: Monitoring
	Issue: FYR Site inspection not conducted as part of this FYR due to work travel restrictions from COVID-19.

	Recommendation: Conduct a FYR Site Inspection now that COVID-19 travel restrictions have been lifted. Document the results of inspection in writing and include photographs for inclusion in the Site files.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA/State	12/31/2023

OU(s): 01/Sitewide	Issue Category: Operations and Maintenance			
	Issue: Lack of O&M Plan.			
	Recommendation: Develop and implement an O&M Plan that will incorporate LTS activities of ICs and Site inspections.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	12/31/2023

OU(s): 01/Sitewide	Issue Category: Institutional Controls			
	Issue: Lack of long-term stewardship of ICs.			
	Recommendation: Develop long-term stewardship procedures as part of O&M Plan ensuring that all ICs at the site are being monitored and maintained and ensure that LTS procedures as part of O&M continue to be implemented at the Site.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	12/31/2023

OU(s): 01/Sitewide	Issue Category: Site Access/Security			
	Issue: Inadequate Site access controls and Site security.			
	Recommendation: Maintain the Site access controls and security. This includes controlling vegetative growth along the fence line, repairing breaches and holes within the perimeter fence and gaps beneath the fence, and maintaining posted warning signs. The City of Elyria should also actively pursue enforcement of the Declaration of Restrictions under the City Ordinance as needed.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	12/31/2024

OTHER FINDINGS

During the 2018 FYR, EPA determined that eight on-site and off-site groundwater monitoring wells that were installed by EPA during the RI need to be properly abandoned. EPA, in consultation with Ohio EPA, will determine if this is an appropriate action given the recent trespassing concerns at the Site. Monitoring well abandonment will be necessary if the City pursues reuse and redevelopment of the Site.

VII. PROTECTIVENESS STATEMENT

OU1 and Sitewide Protectiveness Statement(s)
<p><i>Protectiveness Determination:</i> Short-term Protective</p>
<p><i>Protectiveness Statement:</i> The remedy currently protects of human health and the environment because soil cleanup goals were met, and ICs are in place. Also, the January 2020 Sediment and Surface Water Sampling Analysis Assessment indicates that no adverse impacts from sheen observed were occurring at the Site. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: Develop and implement an O&M Plan that will incorporate LTS activities of ICs and Site inspections; Develop long-term stewardship procedures as part of O&M Plan ensuring that all ICs at the site are being monitored and maintained and ensure that LTS procedures as part of O&M continue to be implemented at the Site; Maintain the Site access controls and security. This includes controlling vegetative growth along the fence line, repairing breaches and holes within the perimeter fence and gaps beneath the fence, and maintaining posted warning signs. The City of Elyria should also actively pursue enforcement of the Declaration of Restrictions under the City Ordinance as needed; and Conduct a FYR Site Inspection and document the results of the inspection in writing and include photographs for inclusion in the Site files.</p>

VIII. NEXT REVIEW

The next FYR report for the Republic Steel Corp. Quarry Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Environmental Design Group, January 13, 2020. Former Republic Steel Quarry City of Elyria Sediment and Surface Water Sampling Analysis Assessment, Republic Steel Quarry Site.

Ohio EPA, November 23, 2021. 2021 Annual Inspection Summary - Republic Steel Quarry, Elyria Site, Lorain County, Ohio, Republic Steel Quarry Site.

IC Report(s)

City of Elyria, June 2002. IC Investigation Study, Republic Steel Quarry Site.

Decision Document(s)

U.S. EPA, March 1988. Remedial Investigation Report

U.S. EPA, September 1988. Record of Decision, Republic Steel Quarry Site.

U.S. EPA, September 1990. Supplemental Investigation Report.

U.S. EPA, December 1992. Final Closeout Report.

U.S. EPA, September 2001. Explanation of Significant Difference, Republic Steel Quarry Site.

U.S. EPA, June 1997. Consent Decree, Republic Steel Quarry Site.

U.S. EPA, November 2002. National Priorities List deletion, Republic Steel Quarry Site.

U.S. EPA, March 20, 2018. 5th FYR, Republic Steel Quarry

APPENDIX B – ADDITIONAL SITE INFORMATION

The Republic Steel Quarry Site (the Site) is located in the City of Elyria, Ohio, and is situated east of West River Road and west of the West Branch of the Black River. The Site consists of a 4.9-acre water-filled quarry that is surrounded by seven acres of densely vegetated land. A fence now surrounds the Site perimeter. The water depth of the quarry is approximately 60 feet and the sandstone sides of the quarry rise to about 25 feet above the water surface. The walls consist of large vertically stacked sandstone blocks that were used as retaining walls during quarrying operations. Water from the quarry discharges directly into the West Branch of the Black River.

Historically, although the Site is fenced, it still was occasionally accessible through breaches in the fence. Trespassers were known to enter the Site for recreational use as evidenced by debris associated with drinking, fishing, and swimming. Well-worn foot paths led inward to the quarry pond from gaps in the fence. The City Elyria is maintaining the fencing and posting of warning signs, and occasionally is to conduct inspections to ensure no trespassing.

There are no residences or small businesses in the immediate area outside of the property fencing. The closest facility was the former LTV steel rolling facility located at 525 Mussey Avenue, which the quarry property adjoins. The facility location is currently up for industrial lease.

The Site was operated as a sandstone quarry during an unknown period of time prior to 1950. From 1950 to 1975, the Republic Steel Corporation discharged about 200,000 gallons per day of waste pickle liquor and rinse water from steel pickling operations to the quarry. The waste pickle liquor, consisting largely of sulfuric acid and dissolved metal oxides, was pumped through an aboveground pipe to a large ditch which flowed into the quarry. In 1976, the discharge ditch leading to the quarry was dammed. In 1977, the City of Elyria, using federal money, purchased the quarry, the ditch, and the seven surrounding acres of land from Republic Steel Corporation, with the intention of establishing a municipal park on the property.

In 1981, Republic Steel Corporation notified EPA of its past disposal activities in order to comply with Section 103(c) of CERCLA. In response to this information, a site investigation was performed in 1983 by EPA. The investigation indicated the presence of heavy metals, such as chromium, arsenic, lead and cadmium at greater concentrations in the downgradient wells than in the upgradient wells. The Site was subsequently proposed for the National Priorities List on October 15, 1984. Both the City of Elyria and LTV Steel Corporation, which later acquired Republic Steel Corporation, challenged the placement on the NPL. The site listing was finalized in 1986 and later upheld by the court in 1990.

In June 1997, EPA settled CERCLA response costs with the only two PRPs for the Site: LTV Steel/Republic Steel Corporation via the In re: Chateaugay Bankruptcy settlement approved by the U.S. Bankruptcy Court in the Southern District of New York, and the City of Elyria via a CERCLA Consent Agreement. Neither settlement obtained any injunctive relief on the part of a settling PRP.

The remedy at the Site was performed solely by EPA. No PRP is under obligation to perform any injunctive relief or remedial work.

APPENDIX C – FIGURES AND SITE PHOTOS

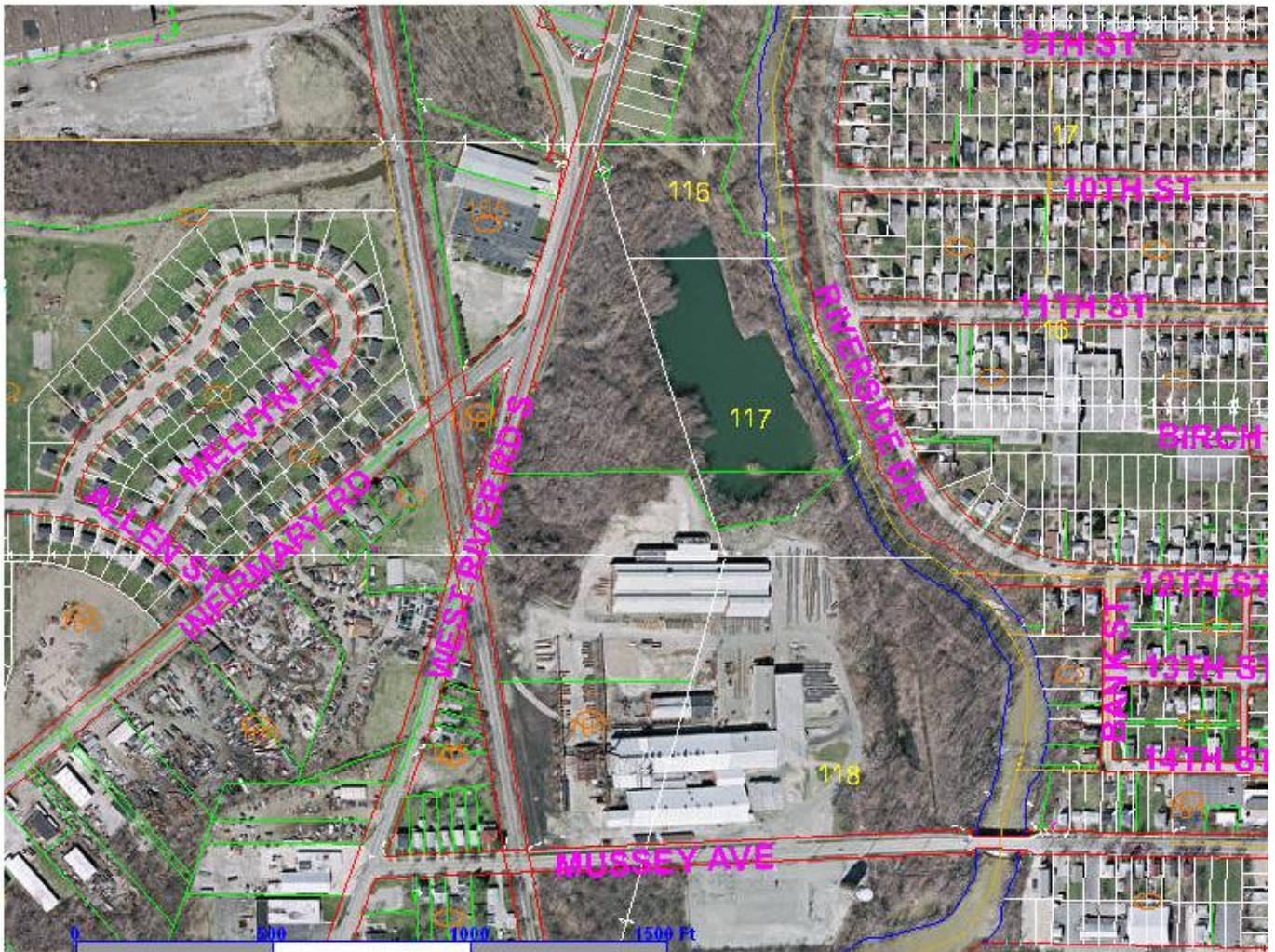
loraincountyauditor.com - Lorain County Internet Maps - Microsoft Internet Explorer

Favorites Tools Help



Lorain County Internet Maps

Mark R. Stewart, Auditor

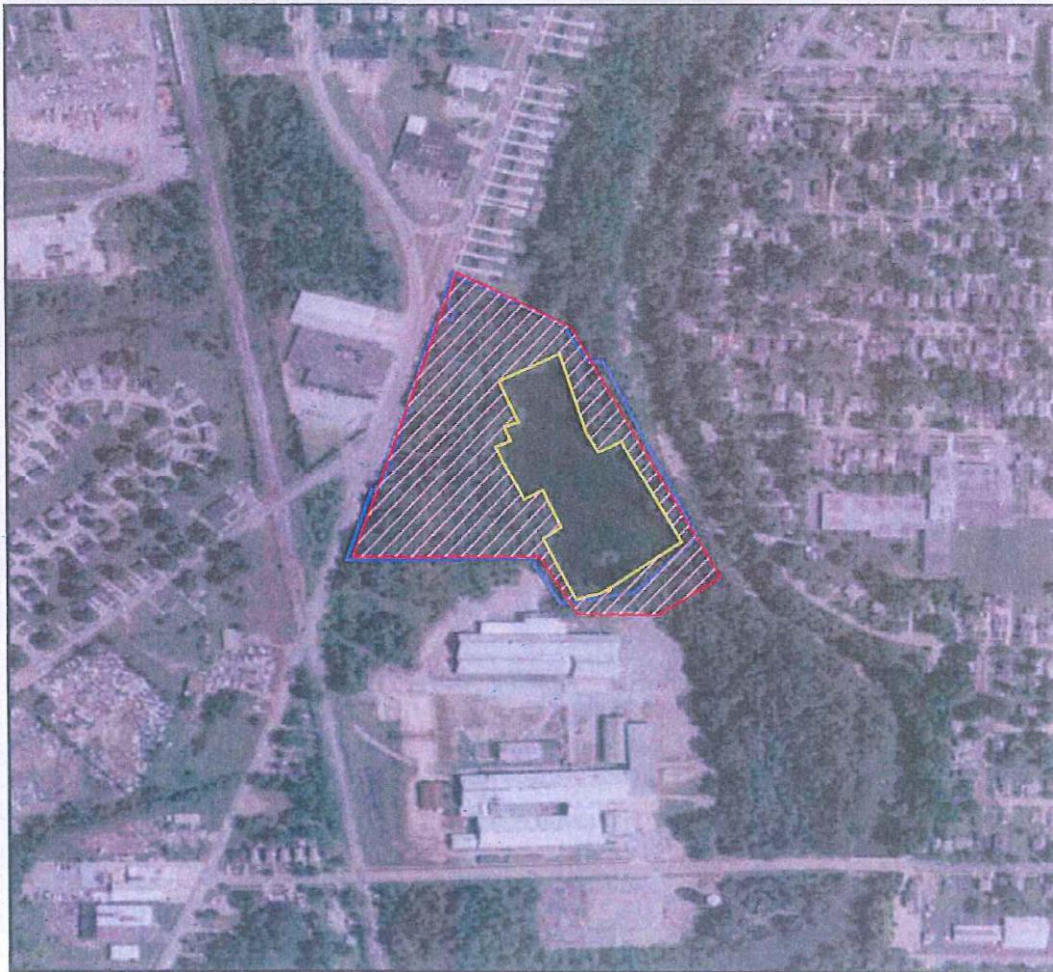


Map current as of 10/19/07. Aerial photo date: April 2005




Inbox - Microsoft Out... Lorain County Real E... Z:\Aerial 2005\Elyria0... http://www.loraincou... Aerial 2005

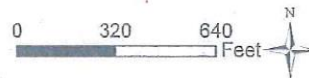


Implemented Institutional Controls



City of Elyria Declaration of Restrictions
for Areas A and B

-  Area A - Site Property
Surrounding Quarry
-  Area B - Quarry Proper
-  Site Fence



Created by Cesar Capaceta
U.S. EPA Region 5 on 03/01/2013

FIGURE 4

The City of Elyria has installed new signs around the perimeter to replace the ones that were missing.



APPENDIX D – FYR NOTIFICATION

PUBLIC NOTICE: Republic Steel Corp. Quarry Site – Five Year-Review in Process Publish Date

December 15, 2022

Summary

Sixth Five-Year Review in Process

U.S. Environmental Protection Agency is conducting a five-year review of the Republic Steel Corp. Quarry site at 525 15th St. in Elyria, Ohio. The Superfund law requires regular checkups of sites that have been cleaned up – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the sixth five-year review of this site.

EPA’s cleanup of the site’s drainage ditch and other pollution “hot spots” at the site consisted of removing contaminated soil and sediment (mud), conducting extensive groundwater sampling and performing a fish study to determine health risks. As a result of the first five-year review completed in 1998, the cleanup was expanded to include groundwater monitoring, fixing and inspecting the site fence, posting signs, and limiting the use of and access to the site.

More information is available at the Elyria Public Library, 320 Washington Ave., and at www.epa.gov/superfund/republic-steel-quarry. The review is expected to be completed by the end of March 2023.

The five-year review is an opportunity for you to tell EPA about site conditions and any concerns you have. Contact:

Adrian Palomeque

Community Involvement Coordinator
312-353-2035
palomeque.adrian@epa.gov

David Linnear

Remedial Project Manager
312-886-2014
linnear.david@epa.gov

You may also call EPA toll-free at 800-621-8431, 9 a.m. to 5:30 p.m., weekdays.