



US EPA RECORDS CENTER REGION 5
437101

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 W. JACKSON BLVD
CHICAGO, IL 60604

09 AUG 2012

MEMORANDUM

SUBJECT: Request for approval and Funding for a Time-Critical Removal Action at the Ironwood Manufactured Gas Plant Site, Ironwood, Gogebic County, Michigan (Site ID #B5ZC)

FROM: Kathy Halbur, OSC
Emergency Response Section 1

Jacob Hassan
Emergency Response Section 3

THRU: Jason H. El-Zein, Chief
Emergency Response Branch 1

TO: Richard C. Karl, Director
Superfund Division

I. PURPOSE

The purpose of this memorandum is to request and document your approval to expend up to \$1,823,471 to conduct a time-critical removal action at the Ironwood Manufactured Gas Plant (MGP) Site (or the Site), located in Ironwood, Gogebic County, Michigan. The response actions proposed herein are necessary to mitigate threats to public health, welfare, and the environment posed by the presence of uncontrolled hazardous substances at the Site. The Site contains MGP waste material, such as coal tar and other process waste, that are the source of hazardous substances that have migrated and are migrating into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs) and inorganic contaminants.

This Action Memorandum would serve as approval for expenditures by EPA, as lead technical agency, to take actions described herein to abate the imminent and substantial endangerment posed by hazardous substances at the Site. The proposed removal of hazardous substances would be taken pursuant to Section 104(a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),

42 U.S.C. § 9604(a)(1), and 40 C.F.R. § 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The uncontrolled conditions of the hazardous substances present at the Site, and the potential threats they present require that this action be classified as a time-critical removal action. The response actions described in this Action Memorandum will require an estimated 90 on-site working days to complete.

There are no nationally significant or precedent setting issues associated with the Site. The Site is not on the National Priorities List (NPL).

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID:	MIN000510500
RCRA ID:	Not applicable (NA)
Category:	Time-Critical Removal Action

A. Site Description

The Ironwood MGP Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and operated using a carbureted water gas (CWG) process. A review of Sanborn maps indicates that the processes at the Site were consistent with typical CWG processes for the era. These processes generally included a first step in which coke or coal was heated in a closed vessel or retort into which steam was injected. A flammable gas mixture of methane and carbon monoxide was produced. In some cases petroleum products may have been applied to the heated mixture increasing the flammability of the resultant gas mixture. During these processes, a dense, oily liquid known as coal tar would condense out of the gas at various stages during its production, purification and distribution, and the coal tar would need to be either recycled in the process, sold or otherwise disposed of.

Identifiable Site features on the Sanborn Maps and historical photos (Attachment 4) include a retort room, coke and coal storage as well as crude oil storage, and gas storage. In addition to coal gas production, the Site also served as the center of the gas distribution system for the communities of Ironwood, MI, and Hurley, WI. The gas was piped to properties and used for heating and cooking. The operations at the plant were reportedly run 24 hours a day. By 1928, the plant had enough storage capacity for 160,000 cubic feet (ft³) of manufactured gas.

The plant continued operations and distribution of manufactured gas until the late 1950s when natural gas pipelines and service became more readily available in the area. By 1956 the plant was for sale and based on accounts of the Wisconsin Public Service Commission, by 1961 had discontinued service to Hurley, including the removal of meters following abandonment.

Interviews conducted by the Michigan Department of Environmental Quality (MDEQ) with local residents indicate that the buildings at the Site were removed prior to the

gasometers (gas storage tanks). Based on the historical accounts, the surface structures at the Site were demolished and removed during the 1970s and the 1980s. Following removal of the surface structures, the Site was reportedly used by the City of Ironwood for the storage of inoperable equipment and debris.

1. Removal site evaluation

Based on the discovery of observable contamination during bridge construction at West Norrie Street, approximately 700 feet downgradient of the Site, and the historical operations at the Site, MDEQ developed a Site Inspection Work Plan in 2010 to characterize conditions in the subsurface at the Site as well as in the surface water and sediment in the adjacent Montreal River. The Site Inspection activities performed by the MDEQ were implemented with the intent of evaluating groundwater, surface water, and soil exposure pathways. In general, the Site Inspection included the following tasks:

- Collection of shallow and deep soil samples to determine source area waste characteristics, contaminant migration, and soil exposure hazards.
- Collection of groundwater samples from temporary monitoring wells to determine whether a contaminant plume is emanating from the Site.
- Collection of surface water and sediment samples to determine whether and where a contaminant plume may be discharging to the Montreal River.

Soil, sediment, surface water, and groundwater were considered relevant sample media relating to the potential transport and migration of contaminants from the Site. Ambient air was not sampled although wastes typically associated with MGP sites often produce strong odors and it is possible that particulates in surface soils may be transported as airborne particulates.

The results of the MDEQ's Site Inspection indicated the presence of uncontrolled hazardous substances at the Site. Gross tar and MGP process waste contamination was discovered in the surface and subsurface soil primarily located in the historical operating area of the Site, which contained VOCs, SVOCs, and inorganic contaminant concentrations exceeding the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) and Groundwater Surface-water Interface (GSI) Criteria (Table 1).

Based on the results of its investigation, MDEQ requested assistance from EPA. On November 19, 2010, EPA conducted a reconnaissance visit at the Site. The goals of the reconnaissance visit were to obtain relevant information about the Site and potential human and environmental receptors, evaluate planning logistics, and evaluate Site conditions. During the reconnaissance visit, the Site was covered with approximately two inches of snow, impeding visual inspection. A considerable amount of fill (approximately 4 ft to 5 ft high) was observed in stockpiles in the northern portion of the Site. The temporary monitoring wells installed on Site during the MDEQ Site Inspection were checked with a bailer to ascertain the presence of free product. In TMW-4 (located in the center of the Site), the bailer was coated with tar and emitted a strong hydrocarbon odor. The bailer was inserted into the well several times with the same result. During the

Site visit, EPA also probed along the eastern bank of the Montreal River to identify product or sheen within the bank sediment and/or sediment within the river. A moderate to heavy sheen was observed along the river edge after agitation. Also, a suspected distribution pipe was observed below the water's surface in the river. Light sheen was also observed upgradient along the southern edge of the Site adjacent to the river. Additional observations during the Site reconnaissance were:

- The Site was unsecured;
- An ATV trail is accessed on the eastern boundary of the Site;
- The Site is bordered by a private excavating company and residential properties;
- Evidence of recreational use at the Site and the Montreal River adjacent to the Site; and
- A review of Sanborn Insurance maps and historical photos suggest that a substantial amount of tar and process waste may be present at the property.

EPA conducted a Supplemental Site Assessment during the week of April 9, 2012, to better understand the scope and extent of contamination at the Site. This assessment included the following activities: test pitting, off-site groundwater sampling, surface water and sediment sampling, residential well sampling, waste characterization sampling, and geotechnical sampling. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River). Toxicological testing conducted on aquatic biota indicate that the waste is significantly impacting the health of the Montreal River immediately adjacent to the Site (0% mean survival for the *C. tentans* survival test). Additional surface water and sediment sampling conducted by EPA and the Wisconsin Department of Natural Resources (WDNR) upgradient and downgradient of the Site demonstrate that contamination from the Site is migrating downstream, but that the mortality impacts are localized to the river area immediately adjacent to the Site. This supports removal of the source material as an effective remedy for this Site.

EPA's Site Assessment Reports and relevant studies of the Site and Montreal River conducted by MDEQ and WDNR are included in the Administrative Record.

2. Physical location

The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan (Figure 1), 49388. The Site coordinates are latitude 46.4517 North and longitude -90.1778 West, and lies in the southern portion of Section 21, Township 47 North, and Range 47 West. The Site's Gogebic County Property Tax Identification Numbers are 2752-21-477-010 (northern portion) and 2752-21-478-010 (southwestern portion).

The City of Ironwood owns the Site and historical records identify the City of Ironwood as the owner and operator of the former Ironwood Gas Works. The Site is accessible from Hemlock Street and is bounded to the west by the Montreal River; to the north by the former Chicago and Northwestern Railroad Right of Way (now an ATV trail); to the south by residential properties and Fahrner Excavating, which occupies a historical building associated with city operations; and to the east by residential properties.

The property encompasses approximately 2.1 acres and is vacant. The building on the adjacent property, owned by Fahrner Excavating, existed during plant operations, but was reportedly used as a storage and maintenance facility for electric trolley cars.

The topography of the Site is relatively flat. A steep-sloping grade is present along the north Site boundary rising up to the former railroad grade. Similarly, along the western boundary of the Site, the grade slopes gradually down to the Montreal River. The elevation of the Montreal River is approximately 10 feet lower than the ground surface in the northern portion of the Site. The Montreal River flows north towards Lake Superior.

Groundwater flow in the Site area is generally to the west/northwest toward the Montreal River. The depth to groundwater beneath the Site ranges from several feet along the eastern Site boundary to more than 5 ft along the western portion of the Site.

The area surrounding the Ironwood MGP Site was screened for Environmental Justice (EJ) concerns using Region 5's EJ Assist Tool (which applies the interim version of the national EJ Strategic Enforcement Assessment Tool [EJSEAT]). Census tracts with a score of 1, 2, or 3 are considered to be high-priority potential EJ areas of concern according to EPA Region 5. The Ironwood MGP Site is in a census tract with an average score of 7 (see Attachment 1). Therefore, Region 5 does not consider this Site to be a high-priority potential EJ area of concern. Please refer to the attached analysis for additional information.

3. Site characteristics

EPA's Superfund Technical Assessment and Response Team (START) contractor prepared a Site Assessment (SA) Report based on the results of the MDEQ's Site Inspection that is part of the Administrative Record. A Supplemental Site Assessment Report detailing the results of the April 2012 investigation is also included in the Administrative Record. Analytical results are summarized in data tables within the SA and SSA Reports, providing documentation of the presence of hazardous substances at the surface and subsurface of the Site.

The Site is unsecured and evidence of recreational use is present at the Site and along the Montreal River. Visitors to the Site and Montreal River users are exposed to contamination from the Site.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

The Supplemental Report identifies an area of coal tar and MGP process waste in subsurface soils on the MGP property and bank of the Montreal River that are probable sources of the release or threatened release of hazardous substances and contaminants, including VOCs, SVOCs, and metals into the groundwater and nearby surface water pathways. A map indicating the extent of known subsurface source contamination is included as Figure 3.

The surface water pathway is not only impacted by the erosion of soils at the Site, but is also impacted by groundwater discharge into the Montreal River. The study completed by the MDEQ confirms that groundwater at the Site is discharging to the Montreal River. Samples collected from the groundwater contain contaminants, including VOCs, SVOCs, and metals consistent with the wastes observed at the Site. Further, the concentrations of contaminants in groundwater exceed Part 201 Groundwater/Surface Water Interface Criteria and are negatively impacting the Montreal River.

Surface water and sediment samples collected from the Montreal River show that contaminants from the Site are migrating downriver. In addition, gross contamination, including process waste, has been observed along the river bank (Attachment 4, photo log). Toxicological testing conducted on aquatic biota indicate that the waste is significantly impacting the health of the Montreal River immediately adjacent to the Site (0% mean survival for the *C. tentans* survival test). Hazardous discharges from the Site's subsurface will continue to impact the Montreal River as long as the source material remains at the Site.

5. NPL status

The Site is not listed on the National Priorities List.

6. Maps, pictures and other graphic representations

Figure 1: Site Location Map

Figure 2: Floodplain Map

Figure 3: Area of Extent of Contamination Map

Table 1: MDEQ Soil Sample Analytical Results – October, 2010

Attachment 1: Environmental Justice (EJ) Analysis,

Attachment 4: Photo Log Photographs

B. Other Actions to Date

1. Previous actions

EPA has conducted the assessment activities discussed above.

2. Current actions

The City of Ironwood is currently removing nonhazardous trash and rubble from the Site. Fahrner Excavating is also removing nonhazardous materials related to its activities from the Site.

C. State and Local Authorities' Roles

MDEQ and WDNR have conducted assessment activities at the Site. Both agencies were also active participants in the Supplemental Site Assessment conducted in April 2012. Both agencies have requested EPA assistance removing the source material at the Site. Both agencies have also pledged to continue to monitor the Site after the proposed removal action.

The Michigan Department of Community Health (MDCH) and the Wisconsin Department of Health Services have also both assisted with the assessment of this Site. In a letter dated July 3, 2012, MDCH concluded that the coal tar material and the physical hazards at the Site could cause people harm. MDCH recommends removal of the visibly contaminated material at the Site to prevent exposure. MDCH's letter is included in the Administrative Record for the Site.

EPA issued a General Notice Letter to the City of Ironwood on July 6, 2012. The City of Ironwood is not able to conduct the removal action, but is assisting by providing in-kind services, such as surveying the Site, removing surface debris piles, and providing backfill.

III. **THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

The conditions at the Ironwood MGP Site present an imminent and substantial threat to the public health or welfare, and the environment, and meet the criteria for a time-critical removal action provided for in 40 C.F.R. § 300.415 (b)(2) of the NCP. These factors include, but are not limited to, the following:

Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;

The State of Michigan performed multiple inspections at the property and documented the presence of tar and waste materials on the ground surface and in the shallow subsurface. Further soil samples collected from surface and subsurface soils contain contaminant concentrations that exceed residential direct contact criteria for SVOCs typically associated with MGP wastes. Polyaromatic hydrocarbons such as benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene exceeded RDCC in multiple soil samples collected at the property (Table 1).

Inorganic COCs (including lead, arsenic, and cyanide) at the Site pose immediate threats to human health and the environment based on factors that should be considered when evaluating potential future actions at the Site. Human and biological receptors are present at the Site based on the observation of footpaths, ATV tracks, and animals in the vicinity of the Site. Further, potential receptors outside of the Site (e.g., Montreal River users) could be exposed to Site-related contaminants.

In a letter dated July 3, 2012, MDCH concluded that the coal tar material and the physical hazards at the Site could cause people harm. MDCH recommends removal of the visibly contaminated material at the Site to prevent exposure. MDCH's letter is included in the Administrative Record for the Site.

Actual or potential contamination of drinking water supplies or sensitive ecosystems;

The properties surrounding the Site are serviced by municipal water supply. Municipal water wells are located several miles from the Site and are currently not believed to be threatened by contaminant migration from the Site.

The Montreal River borders the Site to the west and appears to be connected to groundwater. Analytical results from water and sediment samples collected from the river indicate that volatile and semi-volatile organic compounds as well as inorganic compounds are present. Sheen and coal tar have been observed emanating from the river bank and the sediment adjacent to the property. Sediment samples taken from the Montreal River immediately adjacent to the site show that Acenaphthene, Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[ghi]perylene, Dibenzofuran, Fluoranthene, Fluorene, and Indeno (1,2,3-cd) pyrene are present in levels above EPA's Ecological Screening Levels (ESLs). These substances are identified as hazardous substances in 40 C.F.R. § 302.4 of the NCP. Furthermore, toxicological testing conducted on aquatic biota indicate that the waste is significantly impacting the health of the Montreal River immediately adjacent to the Site (0% mean survival for the *C. tentans* survival test).

Soil at the Site is contaminated with inorganic, volatile, and semi-volatile contaminants. Runoff from the Site is unmanaged. During rain events and spring snowmelt, contaminated soil and debris from the Site may be transported to both the Montreal River and surrounding properties. Further, an exposed open pipe along the west boundary of the property was observed to contain tar and sheen. This pipe presents another possible contaminant migration pathway that could impact surface waters of the state and sensitive ecosystems.

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

Bulk storage containers were not observed at the property. Historical operations at the property, however, utilized containers that were stored both above and below grade. It is unclear at this time whether subsurface containers remain at the property. Test pitting conducted during the April 2012 assessment revealed portions of the former gasometers

buried at the Site. The extent and remaining content of the gasometers is not known. However, since the gasometers are where condensed tar was collected, they possibly are acting as sources of extensive contaminant migration.

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate;

Inorganic, volatile, and semi-volatile contaminants in surface and subsurface soils at the Site pose immediate threats to human health and the environment. The Site Assessments demonstrate that contaminated soil is in direct contact with the waters of the Montreal River. As mentioned previously, human and biological receptors are present at the Site. Further, potential receptors outside of the Site could be exposed to Site-related contaminants through the erosion of surface soil by both weather and animal and human traffic in the area. These mechanisms could transport soil from the Site and increase the potential for exposure beyond the property boundaries.

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

Gogebic County has an average annual snowfall of approximately 156 inches. Seasonal snowmelt results in the erosion and transport of surface soil. The average annual rainfall for the county is 35 inches. Also, the Site is partially located within a 100 year flood plan and entirely located within a 500 year flood plan (Figure 2).

The proximity of the property to the Montreal River increases the potential for hazardous substances to be released to the waters of the state. Weather conditions, especially the erosive forces of wind and water, will contribute to the potential migration of contaminated surface soil at the Site.

The availability of other appropriate federal or state response mechanisms to respond to the release;

The MDEQ and WDNR have requested EPA conduct a time critical removal action at the Site. MDEQ, WDNR, and the City of Ironwood do not have the resources to remove the source material at the Site.

Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

The Site is unsecured and an ATV and snowmobiling trail runs adjacent to the property. There is evidence of recreational activity and graffiti at and adjacent to the Site, including in the areas of visual contamination. Exposure is documented and ongoing.

IV. ENDANGERMENT DETERMINATION

Given the Site conditions, the nature of the hazardous substances on Site, and the potential exposure pathways described in Sections II and III above, actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the

response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Proposed Actions

1. Proposed action description

The OSC proposes to undertake the following response actions to mitigate threats posed by the presence of uncontrolled hazardous substances, including coal tar, manufactured gas plant process waste and free product (which contain high levels of PAHs, VOCs and SVOCs and/or inorganic compounds) in surface and subsurface soils at the Ironwood MGP Site:

1. Develop and implement a Site-specific Health and Safety Plan, an Air Monitoring Plan, an Emergency Contingency Plan, and a Site Security Plan;
2. Identify, characterize, excavate, remove, and properly dispose of MGP process waste, coal tar, free product, and visibly contaminated soils;
3. Collect and dispose of contaminated groundwater generated during excavation activities;
4. Develop and implement a post excavation sampling plan to verify cleanup;
5. Backfill excavated areas with clean material;
6. Provide final cover on Site;
7. Restore excavated areas to pre-removal conditions;
8. Establish institutional controls such as environmental covenant to limit future use of the property necessary to prohibit interference with remedy components (such as the Site cover) and to prevent exposure to hazardous substances remaining at the Site; and
9. Address any release or threatened release of a hazardous substance, pollutant, or contaminant that the EPA determines may pose an imminent and substantial endangerment to the public health or the environment.

The removal action will be conducted in a manner not inconsistent with the NCP. The OSC has initiated planning for the provision of post-removal Site control consistent with the provisions of 40 C.F.R. § 300.415(l) of the NCP.

All hazardous substances, pollutants, or contaminants removed off-site pursuant to this removal action for treatment, storage, and disposal shall be treated, stored, or disposed of

at a facility in compliance, as determined by EPA, with the EPA Off-Site Rule, 40 C.F.R. § 300.440.

2. Contribution to remedial performance:

The proposed action will not impede future actions based on available information. No long-term remedial actions are anticipated for the Site.

3. Engineering Evaluation/Cost Analysis (EE/CA)

Not Applicable

4. Applicable or relevant and appropriate requirements (ARARs)

All potential applicable, relevant, and appropriate requirements (ARARs) of Federal and state law will be reviewed by EPA and complied with to the extent practicable considering the exigencies of the circumstances. On July 16, 2012, EPA sent a letter to Steve Harrington of MDEQ asking for any potential State of Michigan ARARs which may apply.

5. Project Schedule

The removal activities are expected to take an estimated 90 on-site working days to complete.

B. Removal Project Ceiling Estimate

EXTRAMURAL COSTS:

Regional Removal Allowance Costs: \$1,444,559
Total Cleanup Contractor Costs
(This cost category includes estimates for: ERRS and subcontractors, Includes 15% contingency)

Other Extramural Costs Not Funded from the Regional Allowances:

Total START, including multiplier costs \$ 75,000

Subtotal, Extramural Costs \$1,519,559

Extramural Costs Contingency \$ 303,912
(20% of Subtotal, Extramural Costs)

TOTAL REMOVAL ACTION PROJECT CEILING \$1,823,471

The response actions described in this memorandum directly address the actual or threatened release of hazardous substances, pollutants, or contaminants at the Site which may pose an imminent and substantial endangerment to public health or welfare or to the

environment. These response actions do not impose a burden on affected property disproportionate to the extent to which that property contributes to the conditions being addressed.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Given the Site conditions, the nature of the hazardous substances and pollutants or contaminants documented on Site, and the potential exposure pathways to nearby populations described in Section II, III, and IV above, actual or threatened releases of hazardous substances and pollutants or contaminants from this Site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, or the environment, increasing the potential that hazardous substances will be released, thereby threatening the adjacent population and the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

For administrative purposes, information concerning the enforcement strategy for this Site is contained in the Enforcement Confidential Addendum.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be \$3,089,951.¹

$$(\$1,823,471 + \$75,000) + (62.76\% \times \$1,898,471) = \$3,089,951$$

IX. RECOMMENDATION

This decision document represents the selected removal action for the Ironwood MGP Site in Ironwood, Gogebic County, Michigan, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based upon the Administrative Record for the Site. Conditions at the Site meet the NCP Section 300.415(b) criteria for a removal, and I recommend your approval of the proposed removal action.

¹Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of the removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

The total project ceiling if approved will be \$1,823,471. Of this, an estimated \$1,748,471 comes from the Regional removal allowance.

APPROVE _____


Richard C. Karl, Director
Superfund Division

DATE: _____

8/9/2012

DISAPPROVE _____

Richard C. Karl, Director
Superfund Division

DATE: _____

Enforcement Addendum

Figures:

1. Site Location Map
2. Floodplain Map
3. Source Area Extent of Contamination Map

Tables:

1. MDEQ Soil Sample Analytical Results (SB1-SB7) – October, 2010

Attachments

1. Environmental Justice Analysis
2. Cleanup Contractor Cost Estimate
3. Independent Government Cost Estimate
4. Photo Log
5. Administrative Record Index

cc: S. Fielding, U.S. EPA 5202G
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ENFORCEMENT ADDENDUM

IRONWOOD MANUFACTURED GAS PLANT SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN

AUGUST 2012

ENFORCEMENT CONFIDENTIAL
NOT SUBJECT TO DISCOVERY

FOIA EXEMPT

(REDACTED 3 PAGES)

ENFORCEMENT CONFIDENTIAL
NOT SUBJECT TO DISCOVERY

FIGURE 1
SITE LOCATION MAP
IRONWOOD MGP SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN
AUGUST 2012

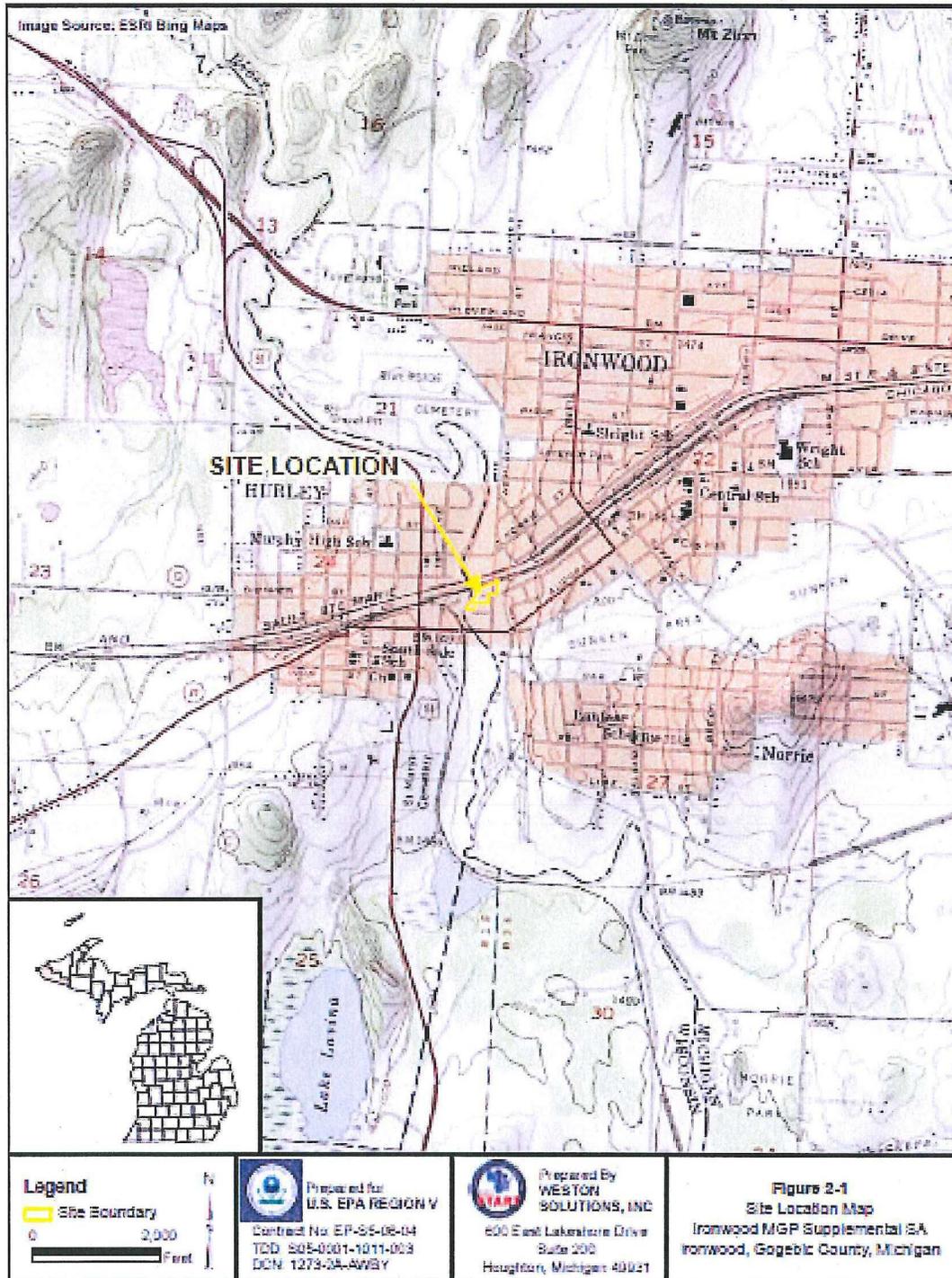
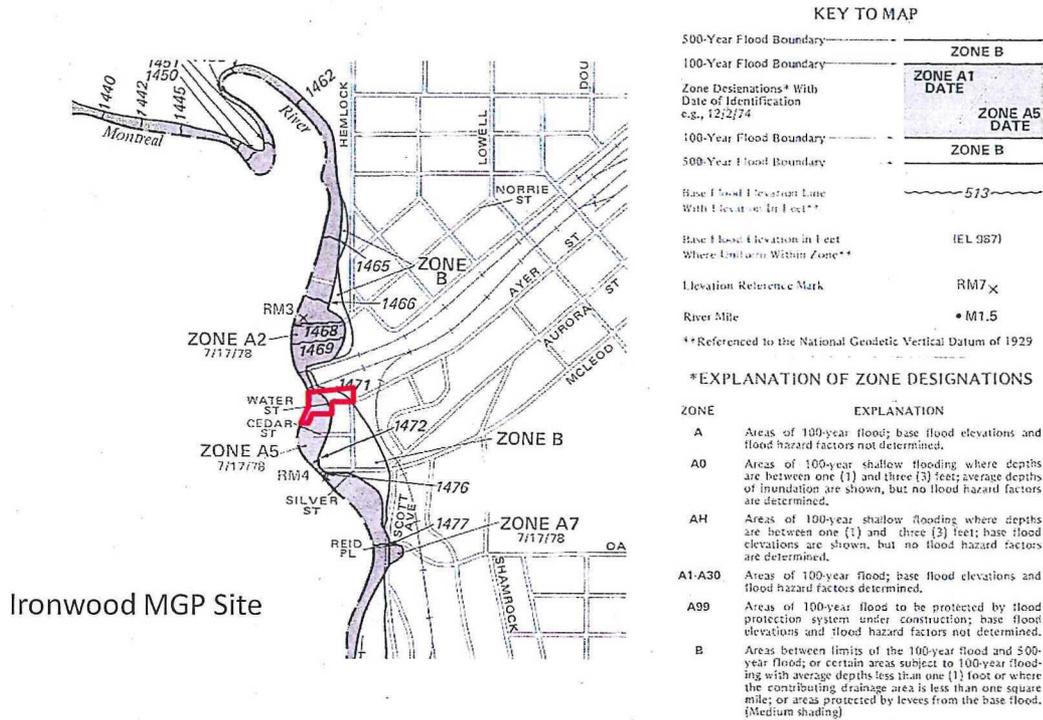


FIGURE 2

FLOODPLAIN MAP IRONWOOD MGP SITE IRONWOOD, GOGEBIC COUNTY, MICHIGAN AUGUST 2012



KEY TO MAP

500-Year Flood Boundary	-----	ZONE B
100-Year Flood Boundary	-----	ZONE A1 DATE
Zone Designations* With Date of Identification e.g., 12/2/74		ZONE A5 DATE
100-Year Flood Boundary	-----	ZONE B
500-Year Flood Boundary	-----	ZONE B
Base Flood Elevation Line With Elevation in Feet**	~~~~~	513
Base Flood Elevation in Feet Where Uniform Within Zone**		(E1 987)
Elevation Reference Mark		RM7x
River Mile		• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)

Source: FEMA Floodplains Maps

http://map1.msc.fema.gov/idms/IntraView.cgi?ROT=0&O_X=4056&O_Y=5127&O_ZM=0.035836&O_SX=290&O_SY=367&O_DPI=400&O_TH=33036031&O_EN=33219690&O_PG=1&O_MP=1&CT=0&DI=0&WD=8112&HT=10255&JX=1255&JY=795&MPT=0&MPS=0&ACT=1&KEY=32581246&ITEM=1&PICK_VIEW_CENTER.x=270&PICK_VIEW_CENTER.y=32&R1=VIN

FIGURE 3

**SOURCE AREA EXTENT OF CONTAMINATION MAP
IRONWOOD MGP SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN
AUGUST 2012**

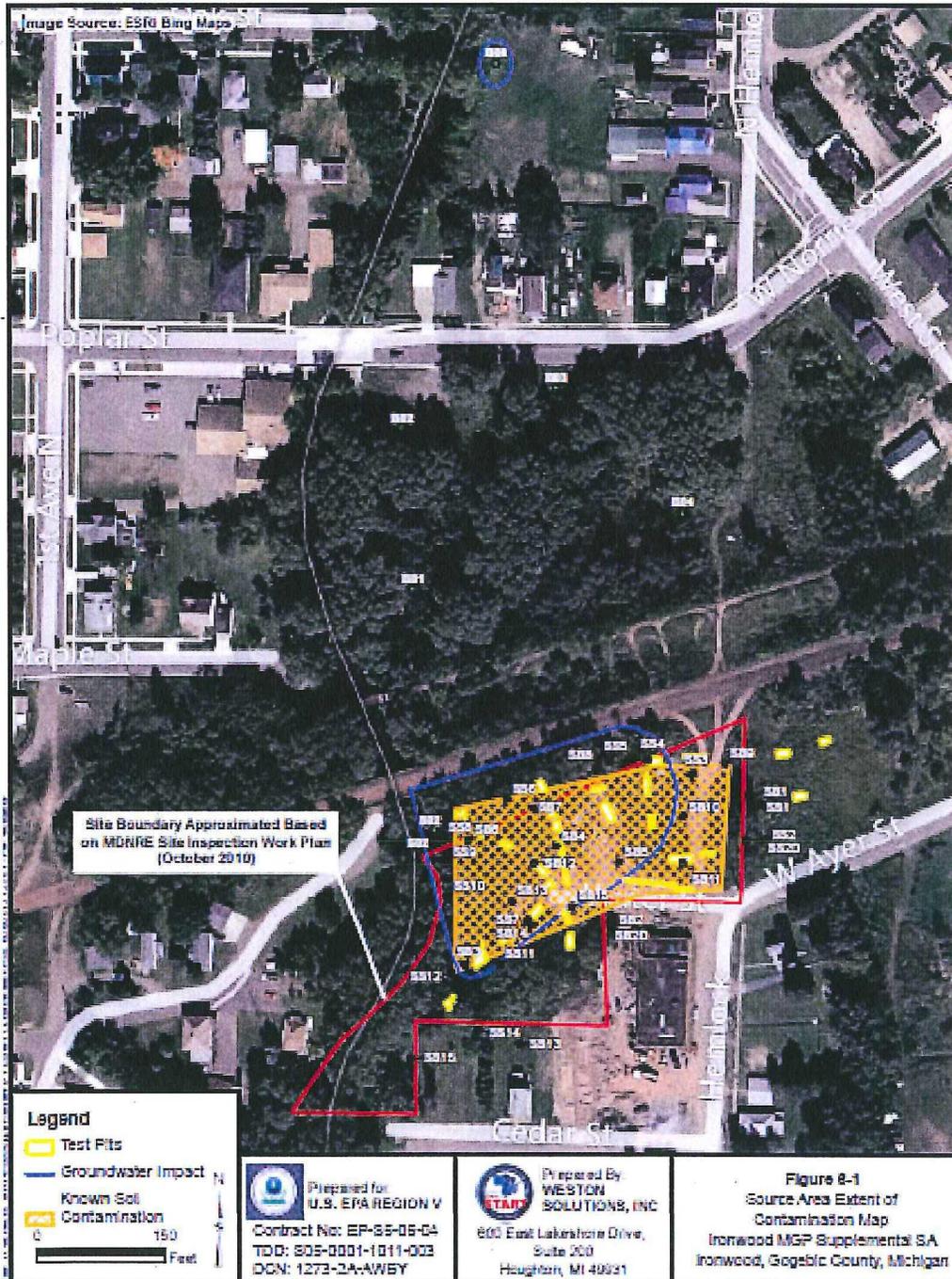


Table 1
MDEQ Soil Sample Analytical Results (SB1 - SB7) - October 2010
Ironwood MGP Site
Ironwood, Gogebic County, Michigan

Location ID	SB1	SB2	SB2	SB3	SB4	SB5	SB6	SB7	1	2	3	
Field Sample ID	SB1	SB2	SB2D	SB3	SB4	SB5	SB6	SB7	Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Direct Contact Criteria	
Sample Date	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/20/2010	10/19/2010	10/20/2010	10/20/2010				
Chemical Name	Unit											
Inorganics												
Aluminum	mg/kg	11,400 J [1]	8,950 J [1]	8,660 J [1]	11,300 J [1]	8,400 J [1]	8,940 [1]	10,000 [1]	8,170 J [1]	1	NA	50,000 (DD)
Antimony	mg/kg	0.74 J	1.1 J	0.8 J	0.39 J	0.68 J	0.81 J	0.33 J	0.34 J	4.3	84 (X)	150
Arsenic	mg/kg	8.3 J [1,2,3]	2.2 J	2.4 J	5.9 J [1,2]	5.3 J [1,2]	8.4 [1,2,3]	1.4 J	2.2	4.6	4.6	7.6
Barium	mg/kg	77.1 J	49.2 J	45.3 J	80.3 J	57.2 J	61.7	23.4	31.7	1,300	150 (G)	37,000
Beryllium	mg/kg	0.076 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	21	1.3 (G)	410
Cadmium	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	6	1.7 (G, X)	500
Calcium	mg/kg	5,890 J	4,110 J	3,840 J	3,120 J	3,540 J	3,760	7,320	4,320	Not Listed	Not Listed	Not Listed
Chromium	mg/kg	34.2 J	33 J	21.8 J	33.4 J	25.2 J	28.1	24.5	21.1	1,600,000 (D)	1,300,000	790,000
Cobalt	mg/kg	15.3 J [1,2]	10.9 J [1,2]	10.6 J [1,2]	9.3 J [1,2]	9.9 J [1,2]	9.6 J [1,2]	11.5 J [1,2]	9.6 J [1,2]	0.50	2	2,600
Copper	mg/kg	49.3 [2]	22	18.7	22.2	28.4	46.5 J [2]	38 J [2]	28.5 J	3,500	31 (G)	20,000
Cyanide	mg/kg	2.2 [1]	0.5 U	0.84 [2]	1.7 [2]	7.8 [1,2]	31.5 [1,2,3]	0.5 U	0.5 U	4	0.10	12
Iron	mg/kg	35,100 [1]	11,800 [1]	20,500 [1]	20,700 [1]	18,100 [1]	48,000 [1]	17,700 [1]	20,400 [1]	6	NA	160,000
Lead	mg/kg	26.7 J	78 J	30.2 J	76.3 J	31.1 J	23.8 J	2.3 J	5.3 J	700	820 (G, X)	400
Magnesium	mg/kg	53.4 J	2,350 J	2,050 J	2,650 J	5,150 J	3,760	5,350	5,250	8,000	NA	1,000,000 (D)
Manganese	mg/kg	353 J [1,2]	353 J [1,2]	413 J [1,2]	261 J [1,2]	257 J [1,2]	353 [1,2]	337 [1,2]	333 [1]	1	2.2 (G, X)	75,000
Mercury	mg/kg	0.034 J	0.018 J	0.012 J	0.3 J	0.07	0.023 J	0.029 J	0.017 J	1,700	50 (G), 12	163,000
Nickel	mg/kg	27.5 J	16.2 J	14.8 J	17.3	21.1 J	21.3	24.5	19.1	100	32 (G)	40,000
Phosphorus	mg/kg	594	461 J	511 J	332 J	478 J	500 U	626 J	610 J	Not Listed	Not Listed	Not Listed
Selenium	mg/kg	1.8 J [2]	0.96 J [2]	1.3 J [2]	1.2 J [2]	1.5 J [2]	1.5 J [2]	0.6 J [2]	0.57 J [2]	4	0.40	2,600
Silver	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4.3	0.10 (G), 27	2,500
Sodium	mg/kg	432 J	287 J	268 J	277 J	317 J	374 J	423 J	347 J	2,500	NA	1,000,000 (D)
Thallium	mg/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.3	4.2 (X)	35
Zinc	mg/kg	71.1 J [1]	60.5 J	61.3 J	48.3 J	49.6 J	59.5	63.4	53.4	72	180	750 (DD)
None	mg/kg	50	35	37.4	50.3	59.8	59.8	31.6	32.3	2,400	69 (G)	170,000
VOCs												
1,1-Dichloroethene	ug/kg	170 U	170 U	170 U	170 U	11,000 J	8,100 J	170 U	2,400 J	Not Listed	Not Listed	Not Listed
1,2-Dichloroethane	ug/kg	170 U	170 U	170 U	170 U	2,500 J	170 U	170 U	7,400	7,600	1,10E-07	
1,2,3-Trichloroethane	ug/kg	170 U	170 U	170 U	170 U	300,000 J [1,2]	180,000 J [1,2]	170 U	49,000 J [2]	57,000	4,200	8.10E-06
1,2,4-Trichloroethane	ug/kg	170 U	170 U	170 U	170 U	3,800 J	1,200 J	170 U	170 U	Not Listed	Not Listed	Not Listed
1,1,1-Trichloroethene	ug/kg	170 U	170 U	170 U	170 U	6,200 J	3,000 J	170 U	170 U	Not Listed	Not Listed	Not Listed
Acetylene	ug/kg	170 U	170 U	170 U	170 U	9,100 J [2]	9,000 J [2]	170 U	300,000	NA	4.10E-07	
Acrylonitrile	ug/kg	2,400	170 U	170 U	170 U	27,000 J [1]	41,000 J [1]	170 U	8,500 [1]	2,500	ID	1,60E-06
Amblypene	ug/kg	170 U	170 U	170 U	170 U	23,000 J	26,000 J	170 U	3,600 J	41,000	ID	2.30E-05
Benzene	ug/kg	3,500	170 U	170 U	170 U	17,000 J	110,000 J [3]	170 U	2,600 J	NLL	NLL	20,000
Benzofuran	ug/kg	6,000 [3]	160 J	100 J	150 J	48,000 J [3]	28,000 J [3]	170 U	3,300 J [3]	NLL	NLL	2,000
Benzofuran	ug/kg	4,300	110 J	170 U	170 U	14,000 J	8,400 J	170 U	170 U	NLL	NLL	20,000
Benzofuran	ug/kg	3,100	120 J	170 U	170 U	14,000 J	8,000 J	170 U	170 U	NLL	NLL	2,50E-06
Benzofuran	ug/kg	3,500	140 J	170 U	140 J	15,000 J	7,200 J	170 U	2,100 J	NLL	NLL	2,60E-03
Bis(2-chloroethyl)ether	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	NLL	NLL	2,60E-06
Carbon tetrachloride	ug/kg	170 U	170 U	170 U	170 U	170 U	2,900 [2]	170 U	9,400	1,100	5.30E-03	
Chloroethene	ug/kg	6,000	100 J	170 U	170 U	20,000 J	84,000 J	170 U	2,300 J	NLL	NLL	3.60E-06
Dibenzofuran	ug/kg	1,300 J	170 U	170 U	170 U	8,200 J [3]	3,500 J [3]	170 U	170 U	NLL	NLL	2,600
Dibenzofuran	ug/kg	170 U	170 U	170 U	170 U	12,000 J [2]	6,000 J [2]	170 U	170 U	ID	ID	170 U
Fluorobenzene	ug/kg	4,600	170 U	170 U	170 U	47,000 J [2]	41,000 J [2]	170 U	2,600 J	7,30E-03	5,500	4.60E-07
Fluorene	ug/kg	170 U	170 U	170 U	170 U	43,000 J [2]	30,000 J [2]	170 U	4,500	3,80E-03	5,300	2.70E-07
Indane(1,2,3-d)styrene	ug/kg	3,900	170 U	170 U	170 U	15,000 J	6,400 J	170 U	170 U	NLL	NLL	20,000
Naphthalene	ug/kg	170 U	170 U	170 U	190 J	250,000 J [1,2]	210,000 J [1,2]	120 J	64,000 [1,2]	35,000	730	1.60E-07
Phenanthrene	ug/kg	1,400 J	170 U	170 U	170 U	56,000 J [2]	35,000 J [2]	170 U	11,000 [2]	56,000	2,100	1.80E-06
Phenol	ug/kg	170 U	170 U	170 U	170 U	1,500 J	170 U	170 U	170 U	88,000	9,000	12,000,000 (DD)
Pyrene	ug/kg	13,000 J	170 U	100 J	170 U	12,300 J	42,000 J	170 U	7,700 J	4,80E-03	ID	2.90E-07

Location ID	SB1	SB2	SB2	SB3	SB4	SB5	SB6	SB7	1	2	3	
Field Sample ID	SB1	SB2	SB2D	SB3	SB4	SB5	SB6	SB7	Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Direct Contact Criteria	
Sample Date	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/20/2010	10/19/2010	10/20/2010	10/20/2010				
Chemical Name	Unit											
VOCs												
1,2,3-Trichlorobenzene	ug/kg	0 U	0 U	0 U	0 U	68,000	74,000	0 U	8,500	Not Listed	Not Listed	Not Listed
1,2,4-Trichlorobenzene	ug/kg	100	0 U	0 U	0 U	210,000 [1,2,3]	230,000 [1,2,3]	150	23,000 [1,2]	2,100	570	1.10E-05 (C)
1,3,5-Trichlorobenzene	ug/kg	0 U	0 U	0 U	0 U	71,000 [1,2]	82,000 [1,2]	0 U	7,100 [1,2]	1,800	1,100	54,000 (C)
1,2,3,4-Tetrachlorobenzene	ug/kg	0 U	0 U	0 U	0 U	3,500,000 [1,2]	3,500,000 [1,2]	330	180,000 [1,2]	57,000	4,500	8.10E-06
Benzene	ug/kg	38	0 U	0 U	0 U	110,000 [1,2]	370,000 [1,2]	140 [1]	100	100	4,000 (C)	1,80E-05
Hexachlorobenzene	ug/kg	0 U	0 U	0 U	0 U	54,000 [1,2]	110,000 [1,2]	480 [2]	13,000 [1,2]	1,300	360	1.40E-03 (C)
Heptachlorobenzene	ug/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	91,000	5,200	3,90E-05 (C)	
Naphthalene	ug/kg	600	0 U	0 U	0 U	7,400,000 [1,2]	6,800,000 [1,2]	2,600 [2]	270,000 [1,2]	35,000	730	1.60E-07
n-Propylbenzene	ug/kg	0 U	0 U	0 U	0 U	11,000 [1]	16,000 [1]	0 U	1,600	ID	ID	2.50E-06
Total N-Volates	ug/kg	250	0 U	0 U	0 U	590,000 [1,2,3]	830,000 [1,2,3]	600	58,000 [1,2]	3,800	820	150,000 (C)
n-Propyltoluene	ug/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	Not Listed	Not Listed	Not Listed
o-Propylbenzene	ug/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	1,600	ID	ID	2.50E-06
Styrene	ug/kg	0 U	0 U	0 U	0 U	600,000 [1,2,3]	820,000 [1,2,3]	0 U	20,000 [1,2]	2,700	2,100	4.00E-05
Toluene	ug/kg	250	34	50	100	410,000 [1,2,3]	840,000 [1,2,3]	170	14,000 [2]	18,000	5,400	2.70E-07

Notes:
 ug/kg = Microgram per kilogram
 71,000 [1,2] = Analytical results in bold represent a criteria exceedance referenced by [1,2,3]
 (C) Value presented in a warning level based on the chemical-specific generic soil saturation concentration (Cst) since the calculated risk-based criterion is greater than Cst. Concentrations greater than Cst are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.
 (D) Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+09 ppm per billion (ppb).
 (DD) Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective of groundwater (GS) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water.
 ID = Insufficient data to develop criterion.
 J = This result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 U = This result is an estimated quantity, but the result may be biased low.
 U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 ug/kg = milligram per kilogram
 NLL = Hazardous substance is not likely to leach under most soil conditions.
 (1) Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards.
 UJ = The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 (X) The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharge in close proximity to a water supply intake in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1964 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provision of R209.5706a

Table 1
MDEQ Soil Sample Analytical Results (SB8 - SB15) - October 2010
Ironwood MGP Site
Ironwood, Gogebic County, Michigan

Location ID	SB8	SB9	SB10	SB11	SB12	SB13	SB14	SB15	1	2	3	
Field Sample ID	SB8	SB9	SB10	SB11	SB12	SB13	SB14	SB15				
Sample Date	10/19/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Direct Contact Criteria	
Chemical Name	Unit											
Inorganics												
Aluminum	mg/kg	7,650 [1]	11,500 [1]	14,000 [1]	3,430 [2]	12,000 [1]	14,200 [1]	10,800 [1]	11,100 [1]	1	NA	50,000 (DD)
Antimony	mg/kg	1.3 J	0.54 J	1.1 J	8 U	0.92 J	0.49 J	0.57 J	6 U	4.3	94 (C)	150
Arsenic	mg/kg	5.3 [1,2]	3.7	13.6 [1,2,3]	3.2	5.8 [1,2]	4	3	2.4	4.5	4.6	7.6
Barium	mg/kg	43.4	43.4	57.1	24.8	37.9	35.9	38.7	47.3	1,200	150 (G)	37,500
Beryllium	mg/kg	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	51	1.5 (G)	2
Cadmium	mg/kg	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6	1.7 (G, S)	550
Calcium	mg/kg	6,760	6,150	25,900	1,670	4,330	3,480	3,110	6,390	Not Listed	Not Listed	Not Listed
Chromium	mg/kg	24	19.9	24.9	8.5	30.6	27.2	17.4	25	1,600,000 (D)	1,300,000	790,000
Cobalt	mg/kg	84.3 [1,2]	15.9 J [1,2]	14.3 J [1,2]	3.1 [1,2]	10.5 J [1,2]	15.2 J [1,2]	11.8 J [1,2]	12.9 J [1,2]	0.50	2	2,600
Copper	mg/kg	45.1 J	54.1 J	72.7 J	20.2 J	57.9 J	57.6 J	48.3 J	51.2 J	5,600	31 (G)	20,000
Cyanide	mg/kg	10.9 [1,2]	0.5 U	6.1 [1,2]	4.7 [1,2]	2.9 [2]	0.5 U	0.5 U	0.5 U	4	0.10	12
Iron	mg/kg	27,000 [1]	30,400 [1]	50,300 [1]	14,200 [1]	32,300 [1]	28,700 [1]	22,000 [1]	19,000 [1]	6	NA	150,000
Lead	mg/kg	51.3 J	18.4 J	63.6 J	49.2 J	25.9 J	36.2 J	6.2 J	11 J	700	920 (G, S)	400
Magnesium	mg/kg	3,970	9,990 [1]	4,760	1,120	4,140	7,960	5,510	5,930	8,000	NA	1,000,000 (D)
Manganese	mg/kg	284 [1]	414 [1]	636 [1]	154 [1]	223 [1]	591 [1]	302 [1]	354 [1]	1	2.2 (G, S)	25,000
Mercury	mg/kg	0.024 J	0.041 J	0.11 J	0.066 J	0.057 J	0.063 J	0.013 J	0.027 J	1,700	30 (M); 1.2	160,000
Nickel	mg/kg	20.2	30.9	30.7	8.9	26.3	27	23.3	24.5	100	32 (G)	40,000
Positronium	mg/kg	500 U	500 U	915 J	500 U	594 J	626 J	500 U	753 J	Not Listed	Not Listed	Not Listed
Selenium	mg/kg	1.1 J [2]	1 J [2]	2.1 J [2]	3.5 U	1.2 J [2]	1.2 J [2]	0.62 J [2]	0.59 J [2]	4	0.49	2,600
Silver	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4.5	0.10 (M); 27	2,500
Sodium	mg/kg	490 J	338 J	312 J	256 J	449 J	323 J	394 J	601 J	2,500	NA	1,000,000 (D)
Thallium	mg/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.3	4.2 (C)	35
Vanadium	mg/kg	47.5	73.3 [1]	74.2 [1]	19.7	65.3	74.5 [1]	50.6	67.1	72	190	750 (DD)
Zinc	mg/kg	70.7	42	22.4	22.4	52.3	67.7	35.6	37.3	2,400	69 (G)	170,000
SVOCs												
1,1'-Dibiphenyl	ug/kg	170 U	170 U	170 U	170 U	5,200 J	170 U	170 U	170 U	Not Listed	Not Listed	Not Listed
2,4-Dimethylphenol	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	7,400	7,600	1,10E-07
2-Methylphenol	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	Not Listed	Not Listed	Not Listed
4-Methylphenol	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	Not Listed	Not Listed	Not Listed
Acenaphthene	ug/kg	170 U	170 U	3,400 J	170 U	170 U	170 U	170 U	170 U	300,000	8,700	4,10E-07
Acenaphthylene	ug/kg	1700 J	2,600	54,000 J [1]	1,100	27,000 [1]	320	140 J	370	3,500	ID	1,60E-06
Anthracene	ug/kg	170 U	2,100	8,200 J	460	15,000	250 J	170 U	59 J	41,000	ID	2,30E-05
Benzo[a]anthracene	ug/kg	6,500	9,600	7600 J	2,500	16,000	1,900	330	540	NLL	NLL	20,000
Benzo[a]pyrene	ug/kg	4,000 [3]	11,000 [3]	20,000 J [3]	1,500	12,000 [3]	740	330	590	NLL	NLL	2,600
Benzo[b]fluoranthene	ug/kg	3,200	6,900	15,000 J	1,300	7,000 J	440	330	400	NLL	NLL	20,000
Benzo[k]fluoranthene	ug/kg	5,700	9,900	15,000 J	1,400	8,500 J	420	340	540	NLL	NLL	2,30E-06
Benzo[k]perylene	ug/kg	4,800	8,900	10,000 J	2,300	9,400 J	720	300 J	540	NLL	NLL	2,00E-05
Benzofluoranthene	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	NLL	NLL	2,80E-06
Carbazole	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	8,400	1,100	5,30E-05
Chrysene	ug/kg	7,300	9,400	7,000 J	3,300	15,000	1,400	260	620	NLL	NLL	2,00E-06
Dibenz[a,h]anthracene	ug/kg	1,500 J	2,400 [3]	7,900 J [3]	470	170 U	150 J	170 U	110 J	NLL	NLL	2,800
Dibenzofuran	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	ID	1,700	ID
Fluorene	ug/kg	5,900 [2]	10,000 [2]	19,000 J [2]	3,000	24,000 [2]	1,600	190 J	420	7,30E+05	5,300	4,60E-07
Fluoranthene	ug/kg	170 U	170 U	7,100 J [2]	350	15,000 [2]	150 J	170 U	170 U	3,90E+05	5,300	2,70E-07
Indeno[1,2,3-cd]pyrene	ug/kg	4,400	6,800	13,000 J	1,100	6,500 J	330	210	270	NLL	NLL	20,000
Naphthalene	ug/kg	170 U	1,200 J [2]	1,400 J [2]	460	80,000 [1,2]	170 U	170 U	170 U	33,000	730	1,60E-07
Perfluoranthene	ug/kg	1,700 J	2,400 [2]	3,200 J [2]	1,400	57,000 [1,2]	590 J	120 J	120 J	36,000	2,100	1,60E-06
Phenol	ug/kg	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	88,000	9,000	12,000,000 (DD)
Pyrene	ug/kg	22,000	27,000 J	5,700 J	3,000	51,000	990	440 J	450	4,80E+05	ID	2,90E-07

Location ID	SB8	SB9	SB10	SB11	SB12	SB13	SB14	SB15	1	2	3	
Field Sample ID	SB8	SB9	SB10	SB11	SB12	SB13	SB14	SB15				
Sample Date	10/19/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Direct Contact Criteria	
Chemical Name	Unit											
VOCs												
1,1,1-Trichloroethane	ug/kg	11000	0 U	0 U	0 U	21000	120	0 U	430	Not Listed	Not Listed	Not Listed
1,1,2-Trichloroethane	ug/kg	18,000 [1,2]	0 U	120	0 U	84,000 [1,2]	460	0 U	140	2,100	370	1,10E-05 (C)
1,1,2,2-Tetrachloroethane	ug/kg	4,500 [1,2]	0 U	0 U	0 U	18,000 [1,2]	350	0 U	32	1,800	1,100	84,000 (C)
1,2-Dichloroethane	ug/kg	220,000 [1,2]	0 U	0 U	0 U	470,000 [1,2]	0 U	0 U	0 U	37,000	4,200	8,10E-06
Benzene	ug/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	140 [1]	100	4,000 (C)	1,50E-03
Ethylbenzene	ug/kg	17,000 [1,2]	0 U	0 U	0 U	16,000 [1,2]	89	0 U	58	1,200	360	1,40E-05 (C)
Isopropylbenzene	ug/kg	0 U	0 U	0 U	0 U	0 U	100	0 U	360	91,000	3,200	3,90E-03 (C)
Naphthalene	ug/kg	700,000 [1,2]	450	850 [1]	0 U	740,000 [1,2]	0 U	0 U	860 [1]	35,000	730	1,60E-07
n-Propylbenzene	ug/kg	0 U	0 U	0 U	0 U	5,000 [1]	200	0 U	0 U	1,800	ID	3,50E-06
Total Xylenes	ug/kg	7,000 [1,2]	0 U	300	0 U	158,000 [1,2,3]	0 U	0 U	250	5,800	620	120,000 (C)
m-Dichlorobenzene	ug/kg	0 U	0 U	0 U	0 U	0 U	150	0 U	0 U	Not Listed	Not Listed	Not Listed
p-Dichlorobenzene	ug/kg	0 U	0 U	0 U	0 U	0 U	140	0 U	0 U	1,800	ID	2,50E-06
Styrene	ug/kg	0 U	0 U	0 U	0 U	48,000 [1,2]	0 U	0 U	0 U	2,700	2,100	4,00E-03
Toluene	ug/kg	4,900	150	210	0 U	26,000 [1,2]	110	0 U	0 U	18,000	3,400	3,50E-03

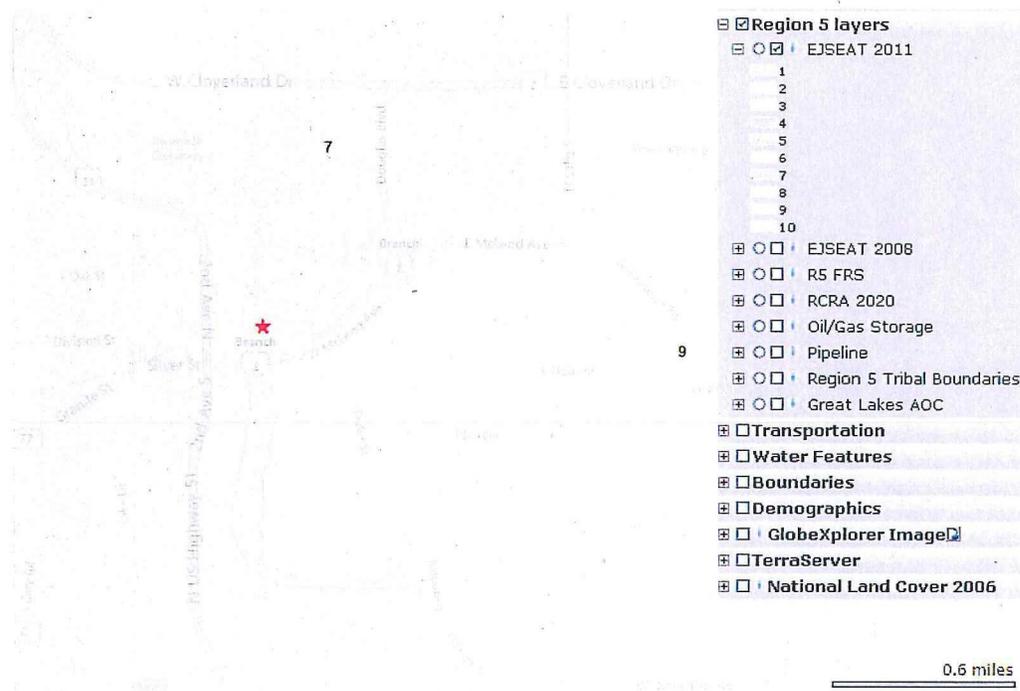
Notes:
 ug/kg = Microgram per kilogram
 71,000 [1,2] = Analytical results in bold represent a criteria exceedance referenced by [1,2,3]
 (C) Values presented in a screening level based on the chemical-specific generic soil saturation concentration (C_{sat}) since the calculated risk-based criterion is greater than C_{sat}. Concentrations greater than C_{sat} are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that the site-phase material containing a hazardous substance is not present.
 (D) Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E-9 parts per billion (ppb).
 (DD) Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective of a pregnant adult occupant.
 (G) Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water.
 ID = Insufficient data to develop criterion.
 J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 U = The result is an estimated quantity, but the result may be biased low.
 NA = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 mg/kg = milligram per kilogram
 NLL = Hazardous substance is not likely to leach under most soil conditions.
 (T) Refer to the Federal Toxic Substances Control Act (TSCA), 40 C.F.R. §751, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards.
 UJ = The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 (S) The GSI criterion shown in the generic cleanup criteria table is not protective for surface water that is used as a drinking water source. For groundwater discharges to the Great Lakes and their connecting waters or discharges in close proximity to a water supply intake in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value.
 Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 453, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R229.5706a.

ATTACHMENT I

ENVIRONMENTAL JUSTICE ANALYSIS IRONWOOD MGP SITE IRONWOOD, GOGEBIC COUNTY, MICHIGAN AUGUST 2012

The area surrounding the Ironwood Manufactured Gas Plant Site was screened for Environmental Justice (EJ) concerns using Region 5's EJ Assist Tool (which applies the interim version of the national EJ Strategic Enforcement Assessment Tool (EJSEAT)). Census tracts with a score of 1, 2, or 3 are considered to be high-priority potential EJ areas of concern according to EPA Region 5. The Ironwood Manufactured Gas Plant Site is in a census tract with a score of 7 (Figure 1). Therefore, Region 5 does not consider this Site to be a high-priority potential EJ area of concern.

(Figure 1) Ironwood Manufactured Gas Plant Site Map Showing EJ SEAT Values for Surrounding Area



ATTACHMENT 2

**DETAILED CLEANUP CONTRACTOR AND START ESTIMATE
IRONWOOD MGP SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN
AUGUST 2012**

The estimated cleanup contractor costs necessary to complete the removal action at the Ironwood MGP Site are as follows:

Regional Removal Allowance Costs

Total Cleanup Contractor Costs (This cost category includes estimates for ERRS, subcontractors, and Notice to Proceed. Includes a 15% contingency)	\$1,444,559
<u>Other Extramural Cost Not Funded from the Regional Allowance:</u>	
START Totals	\$75,000
Subtotal, Extramural Subtotal	\$1,519,559
20% Extramural Cost Contingency	\$303,912
TOTAL, Removal Action Project Ceiling	\$1,823,471

ATTACHMENT 3

INDEPENDENT GOVERNMENT COST ESTIMATE

**IRONWOOD MGP SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN**

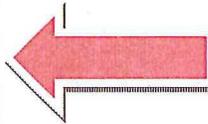
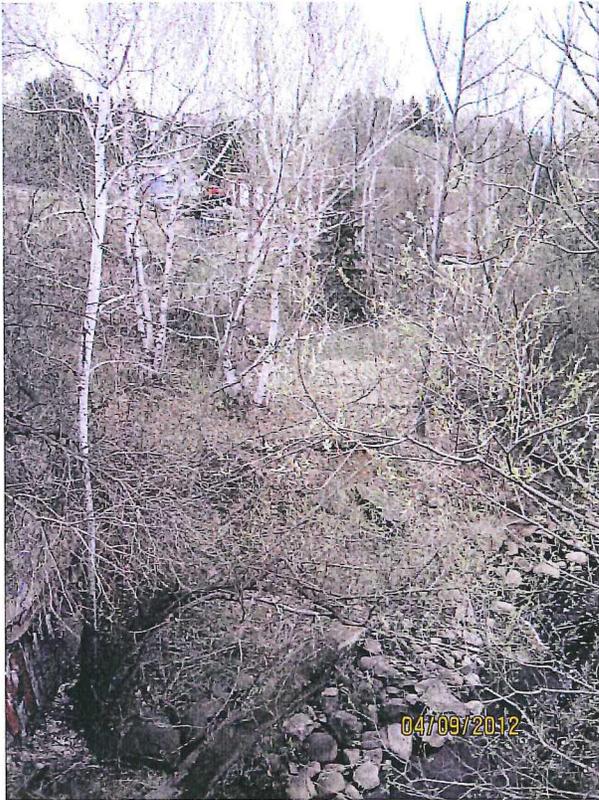
AUGUST 2012

(REDACTED 2 PAGES)

NOT RELEVANT TO THE SELECTION OF THE REMOVAL ACTION

ATTACHMENT 4

**PHOTO LOG
IRONWOOD MGP SITE
IRONWOOD, GOGEBIC COUNTY, MICHIGAN
AUGUST 2012**



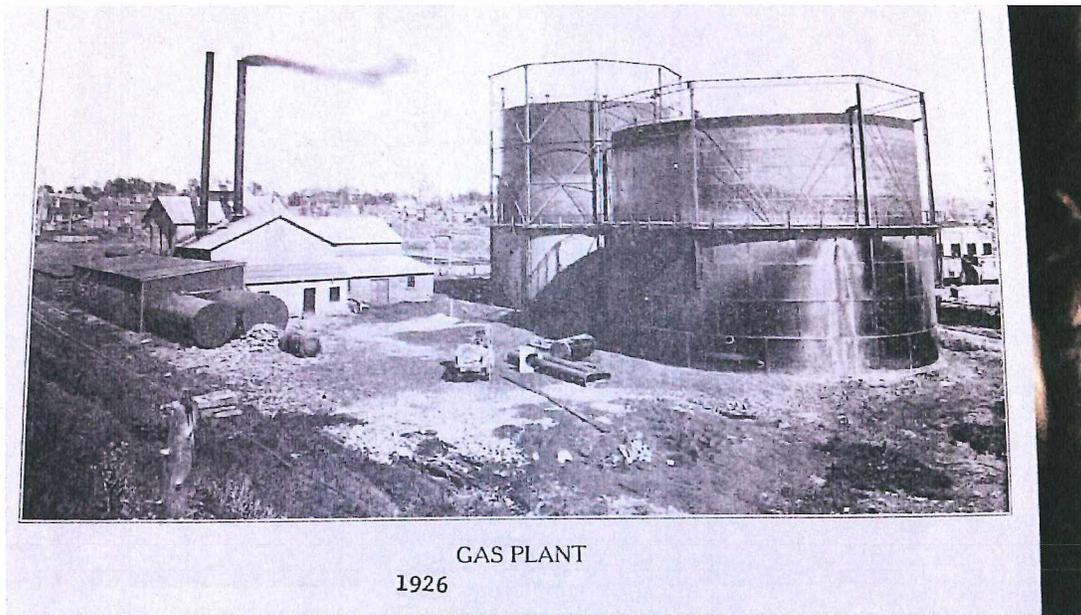
Contaminated material (coal tar)
at the surface along the Montreal
River bank (April 2012)



Graffiti on bridge supports adjacent to
photo above (June 2012)



Subsurface contaminated material (coal tar) in a test pit at the Ironwood MGP Site (April 2012)



Historic picture of Site (1926)

ATTACHMENT 5

U.S. ENVIRONMENTAL PROTECTION AGENCY REMOVAL ACTION

ADMINISTRATIVE RECORD FOR IRONWOOD MANUFACTURED GAS PLANT SITE IRONWOOD, GOGEBIC COUNTY, MICHIGAN

ORIGINAL
JULY 2012

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	01/00/11	WDNR	U.S. EPA	Appendix X: Areas in Wisconsin Associated with the Ironwood MGP Site	
2	04/26/11	Weston Solutions, Inc.	U.S. EPA	Draft Site Assessment Report for the Ironwood Manufactured Gas Plant Site	380
3	07/03/12	Gray, J., MDCH	Halbur, K., U.S. EPA	Letter re: Site Visit and Data Review for the Ironwood Manufactured Gas Plant Site	6
4	07/13/12	Weston Solutions, Inc.	U.S. EPA	Addendum 1 to the Site Assessment Report for the Ironwood Manufactured Gas Plant Site	334
5	07/16/12	Halbur, K., U.S. EPA	Harrington, S., MDEQ	Letter re: U.S. EPA Request that MDEQ Identify any State ARARs for the Ironwood Manufactured Gas Plant Site	2
6	00/00/00	Halbur, K., U.S. EPA	El-Zein, J., U.S. EPA	Action Memorandum: Request for Approval and Funding for a Time-Critical Removal Action at the Ironwood Manufactured Gas Plant Site (PENDING)	