United States Steel Corporation
Gary Works
One North Broadway
Gary, IN 46402

Dan Killeen
Vice President

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Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

EPA Region V
Director, Air and Radiation Division
77 West Jackson Blvd.
Chicago, IL 60604-3507
Submitted via CEDRI

Re: United States Steel Corporation – Gary Works
One North Broadway, Gary, IN 46402
Source ID 089-00121
40 CFR 63 Subpart GGGGG Site Remediation
Notification of Compliance Status

Dear Director,

Pursuant to requirements under 40 CFR 63.7950, United States Steel Corporation - Gary Works ("USS") located at One North Broadway, Gary, IN 46402 is hereby submitting the Notification of Compliance Status (NOCS) for the Site Remediation regulation in 40 CFR 63 Part GGGGG.

Process Description

USS operates a steel manufacturing facility located at One North Broadway, Gary, IN 46402. The facility includes steel making and finishing facilities.

The North American Industry Classification System (NAICS) code for the facility is 331111 — Iron and Steel Mills. The Standard Industrial Classification (SIC) code is 3312 – Steel Works, Blast Furnaces (Including Coke Ovens), and Rolling Mills.

The facility contains affected remedial sources, as defined at 40 CFR 63.7882, which are grouped as Remediation Material Management Units (RMMUs). Each affected source at the site is considered an existing source as the site remediation commenced construction or reconstruction under the authority of the Comprehensive Environmental Response and Compensation Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA) or a State program authorized under RCRA as a remedial action on or before May 13, 2016. As such, compliance with the Subpart GGGGG regulations is required by June 24, 2024.

The facility does not have any process vents or pressure relief devices. A description of each of the RMMUs at the Gary Works facility follows.

East Side Groundwater Interim Stabilization Measure (ISM) – Extraction Well Transfer System
The East Side Groundwater ISM is a remedial action consisting of Source Area extraction wells, conveyance piping for extracted Source Area groundwater, Containment Area extraction wells (and conveyance piping for the extracted Containment Area groundwater. The Source Area and the Containment Area water are combined after the Source Area water is processed through the oil water separator (OWS) and prior to entering the wastewater treatment operations at the Environmental Treatment Facility (ETF). The Extraction Well Transfer System is the RMMU.

East Side Groundwater ISM - 1W Pit
The East Side Groundwater ISM 1W Pit is an open sump located in the ETF tank farm area where development and purge water from remedial activities is dumped.

East Side Groundwater ISM – Environmental Treatment Facility (ETF)
The East Side Groundwater ISM ETF consists of the OWS, two tanks with clarifiers used as active biological treatment units (T7400 and T7410 – identical units, typically only one is operating), and then a sludge belt and roll off dumpster to collect the sludge. All transfer piping between the various units are covered transfer systems.

Corrective Action Management Unit (CAMU)
The CAMU provides containment, passive dewatering, and disposal of dredged sediments as part of the Grand Calumet River (GCR) Sediment Remediation Project, as well as RCRA investigative and Corrective Action waste materials. The key elements of the CAMU design include Units 1 and 2 (surface impoundments), a perimeter berm, an interior berm separating Units 1 and 2, primary and secondary liner systems, and leachate collection and leak detection systems. In addition to CAMU Units 1 and 2, the CAMU has a wastewater treatment facility that pumps and treats surface water out of the CAMU units in order to maintain the water level. The wastewater treatment system consists of river screens (that pull surface water out of the units), bag filters, pumps, transfer piping, a holding tank, a neutralization tank, an equalization tank, sand pressure filters, strainer, and two carbon filter tanks. After treatment the water goes through NPDES outfall 001 to the Grand Calumet River.

Misc Containers
As a result of remedial activities, the facility generates remedial materials that are placed in various containers, primarily drums and small buckets.

Applicability and Compliance Mechanism

The USS Gary facility is an existing source of Table 1 HAP emissions, primarily benzene along with smaller concentrations of toluene, xylene and naphthalene. Therefore, the facility is subject to 40 CFR Subpart GGGGG and specific compliance mechanisms are outlined below.

Remediation Area	Affected Equipment	Applicability Discussion
East Side Groundwater ISM – Extraction Wells and Piping	Source Area and Containment Area Transfer Systems	The transfer systems are RMMUs. In certain piping runs, the incoming remedial material has a VOHAP concentration greater than 500 ppmw; therefore, the facility must install and operate controls according to the requirements in 40 CFR 63.962.
East Side Groundwater ISM - 1W Pit	1W Sump Pit, T7100 Backup Storage Tank, T7110 Backup Storage Tank, T7120 Backup Storage Tank	All 1W Pit remedial units are RMMUs. The facility elected to address this remedial stream using the 1 MG/year RMMU exemption under 40 CFR 63.7886(d).
East Side Groundwater ISM – ETF	Source Area Oil-Water Separator (OWS), T7400 Treatment Tank, T7410 Treatment Tank, sludge belt, and transfer systems	OWS: The incoming remedial material has a VOHAP concentration greater than 500 ppmw; the OWS is closed and vented to a control device (carbon canister) per 40 CFR 63.7910(b)(2). T7400 & T7410 and Sludgebelt: The incoming remedial material has a VOHAP concentration less than 500 ppmw; therefore, the RMMUs are compliant based on 40 CFR 63.7886(b)(2).
CAMU	CAMU Units 1 and 2 (surface impoundments), Conveyance Piping, T002 Holding Tank, T003 Neutralization Tank, T004 Sand Pressure Filters, CF006A and CF006B Carbon Cannisters	All of the CAMU affected units are RMMUs. The incoming remedial material has a VOHAP concentration less than 500 ppmw; therefore, the RMMUs are compliant based on 40 CFR 63.7886(b)(2).
Misc Containers	Buckets, Drums, Totes	The containers at the facility follow the MACT requirements for containers at 40 CFR 63.7900.
Equipment Leak Sources	Equipment Components	None of the equipment components associated with the various RMMUs manage remediation materials with a total HAP concentration of 10% by weight or more. As per 63.7882(3), the piping and equipment are not affected equipment leak sources under Subpart GGGGG.

Performance Tests

The facility does not conduct any operations that are subject to performance testing, opacity or visible emission observations, or continuous monitoring system (CMS) performance evaluations under 40 CFR 63 Subpart GGGGG. Pursuant to 40 CFR 63.693(d)(2)(ii), the facility conducted a design analysis to

document the 95% removal and to establish regular intervals for carbon drum replacement. A copy of the calculations and the specifications on the carbon are included as Attachment A to this document.

Type and Quantity of HAPs Emitted

The Subpart GGGGG MACT affected units at the facility are insignificant emission sources of volatile organics. Primary VOHAPs contained in the remediation material include benzene, toluene, xylene and naphthalene which consistently account for the vast majority (>98%) of all Table 1 volatile organic HAPs in the extracted groundwater. The facility used historical sampling data to demonstrate existing knowledge pursuant to 40 CFR 63.7943. The table below shows the primary HAPs that have been historically detected in the groundwater at each RMMU.

Remediation Area	HAP
East Side Groundwater ISM – Extraction Well Transfer System	Benzene, Toluene, Xylene and Naphthalene
East Side Groundwater ISM - 1W Pit	Benzene, Toluene, Xylene and Naphthalene
East Side Groundwater ISM – ETF	Benzene, Toluene, Xylene and Naphthalene
CAMU	Benzene, Toluene, Xylene and Naphthalene
Misc Containers	Benzene, Toluene, Xylene and Naphthalene

Description of Air Pollution Control Equipment

<u>East Side Groundwater ISM – Extraction Well Transfer System</u>
Pursuant to 40 CFR 63.7915(b), for each affected transfer system that is an individual drain system, the facility must install and operate controls according to the requirements in 40 CFR 63.962. The facility utilizes hard-piping pursuant to 63.692 to meet the control requirements in 63.7916(b).

<u>East Side Groundwater ISM – Environmental Treatment Facility (ETF)</u>
The incoming water to the OWS is above the 500 ppmw threshold; therefore, the OWS is closed and vented to a control device, a carbon canister pursuant to 3.7910(b)(2). The requirements for venting the OWS through a control device are specified at 40 CFR 63.1044 along with the emissions limitations and work practice standards at 40 CFR 63.7925.

- The OWS has a fixed roof and closure devices that meet the requirements in 63.1042(b).
- With exceptions for maintenance or removing accumulated sludge, whenever a regulated material is in the separator, the fixed roof shall be installed with each closure device secured in the closed position.
- The closed-vent system is designed to operate with no detectable organic emissions determined by Method 21.
- Pursuant to 40 CFR 63.693(d)(2)(ii), the facility conducted a design analysis to document the 95% removal and to establish regular intervals for carbon drum replacement.
- Spent carbon will be disposed in accordance with 40 CFR 63.693(d)(4)(ii).

Methods Used to Determine Continuous Compliance

The following table illustrates the continuous compliance monitoring method employed by USS for each remediation area:

Remediation Area	Continuous Compliance Monitoring Method
East Side Groundwater ISM – Extraction Well Transfer System	Hard piping will be used at all locations to comply with the transfer system requirements. Inspections will be conducted annually.
East Side Groundwater ISM - 1W Pit	A log of the remedial material dumped into the stream will be maintained to ensure RMMU is below the 1 MG/yr threshold and remains exempt.
East Side Groundwater ISM – Environmental Treatment Facility (ETF)	OWS: When the OWS is in use, the closures will be documented, and annual monitoring will occur for detectable emissions. Carbon canister replacements and disposal will also be documented per 40 CFR 63.693(d)(4)(ii). Tank T7400/T7410: Routine groundwater monitoring is conducted to ensure the unit operates below the 500 ppmw incoming threshold.
CAMU	Evaluations will be conducted prior to adding additional materials to prevent addition of materials in excess of the 500 ppmw threshold.
Misc Containers	The containers used meet the MACT container requirements at 40 CFR 63.7900. Containers are maintained closed except when adding or removing materials.

Certification

I certify that my facility has complied with all the relevant standards and other requirements of 40 CFR part 63, subpart GGGGG.

I certify that, based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate and complete.

Name: Dan Killeen, Vice President – Gary Works

_____ Date: 7-2-2024

Signature

If any additional information is needed or if there are any questions, please contact Jacob Blahut at (219) 888-3432 or via email at JNBlahut@uss.com.

Attachment A – Carbon Calculations

OWS Carbon Usage Calculations, Gary Works

Step 1: Calculate amount of contaminants in groundwater

Concentration of the Source Area Groundwater (from 7248_Analytical Results II_20240228212135_2022_2023_Es GW ISM.xls Pivot2)

Extraction Well	Corresponding Monitoring Well	Backup MW	2023 Avg Flow Rate	2020 Avg Flow Rate	Worst Case (ppbw) Benzene	Toluene	Xylene	Total (ppb)	Average Case (ppbw) Benzene	Toluene	Xylene	Total (ppb)	Low Case (ppbw) Benzene	Toluene	Xylene	Total (ppb)
CP-EW-04	CP-MW-39	ES-NWTF-MW006D	8.0	8.0	1,000,000	22,000	-	1,022,000	780,000	22,000	-	802,000	560,000	0	-	560,000
CP-EW-05	ES-NWTF-MW005D	ES-NWTF-MW006D	4.4	7.1	1,000,000	22,000	-	1,022,000	780,000	22,000	-	802,000	560,000	0	-	560,000
CP-EW-06	ES-NWTF-MW005D	ES-NWTF-MW006D	3.8	6.3	1,000,000	22,000	-	1,022,000	780,000	22,000	-	802,000	560,000	0	-	560,000
CP-EW-07	ES-NWTF-MW007D		3.4	5.3	630,000	13,000	-	643,000	540,000	13,000	-	553,000	450,000	0	-	450,000
CP-EW-08	ES-NWTF-MW008D		3.2	6.0	660,000	38,000	3,000	701,000	506,667	37,000	3,000	546,667	230,000	0	-	230,000
			22.8	32.7												
		Flow Weighted Conc '23			897,105	22,904	421	920,430	705,848	22,763	421	729,032	497,281	-	-	497,281
		Flow Weighted Conc '20			877,645	23,477	550	901,673	690,948	23,294	550	714,792	481,621	-	-	481,621
		WT% in GW			0.090%	0.002%	0.000%	0.092%	0.071%	0.002%	0.000%	0.073%	0.050%	0.000%	0.000%	0.050%
		% Benzene			97%				97%				100%			

Range (wght %)				Wght % Use
Benzene	0.048%	to	0.090%	0.100
Toluene	0.0000%	to	0.002%	0.003
Xylene	0.0000%	to	0.0001%	not significant

No other VOCs or SVOCs of significant concentration.

Step 2: Calculate liquid mole fractions & then Partial Pressure above liquid

calculate liquid concentrations/mole fractions using top end of wght% range

Component	Volatile	HAP	MW	VP (mmHg) @ 20C	Liquid Fraction Wt%	moles	Xi
Benzene	y	y	78	75.2	0.100	1.282E-05	0.02%
Toluene	y	y	92	21.8	0.003	3.261E-07	0.00%
Water	y	n	18		99.897	0.0554983	99.98%
					100	0.0555115	100.00%

Component	Volatile	HAP	MW	VP (mmHg) @ 15C	Liquid Fraction Wt%	moles	Xi
Benzene	y	y	78	58.8	0.1	1.282E-05	0.02%
Toluene	y	y	92	16.6	0.003	3.261E-07	0.00%
Water	y	n	18	0.0	99.897	0.0554983	99.98%
					100	0.0555115	100.00%

a) if Raoult's Law

Part Pres (mmHg)	Part Pres (atm)
0.0174	2.29E-05
0.0001	
0.0000	

Part Pres (mmHg)	Part Pres (atm)
0.0136	1.79E-05
0.0001	
0.0000	

b) if Henry's Law (Yi = H*Xi)

H	Yi	PP (mmHg)= Yi*Pi	Part Pres (atm)
0.228	0.0053%	0.0040	5.21E-06
0.265	0.0002%	0.0000	

H	Yi	PP = Yi*Pi	Part Pres (atm)
0.228	0.0053%	0.0051	4.08E-06
0.265	0.0002%	0.0000	

Note: Evaluated both Raoult's Law and Henry's law to calcualte partial pressure.
Used Raoult's law as produced higher partial pressure of VOCs.

Calculate Vapor Pressure using Antoine's Equation Constants

pp = log-1(A-B/(T+C))

	A	B	C		T (C) gives VP (mmHg) 10	15	20	25	30
Benzene	6.90565	1211.033	220.79		45.5	58.8	75.2	95.2	119.3
Toluene	6.95334	1343.943	219.377	pp = log-1(A-I	12.4	16.6	21.8	28.4	36.7
Water							17.5		31.82

Step 3: Calculate mass passing into carbon unit and removal efficiency

focus only on Benzene, as Toluene is two orders of magnitude less

Constituent	Temp (c)	Temp (R)	Part Pres (atm)	M = P/RT (lbmoles/ft3)	Mass Conc (lbs/ft3)	Conc (mg/m3)	ppmv	Assumed Flow (CFM)	CE/day	Mass/Day (lb/day)	Assumed Relative Humidity	Capacity (lb/drum)	Days	Days assuming Safety Factor of (50%)	Drums/ year
Benzene	20	527.67	2.29E-05	5.93E-08	4.63E-06	74	23	0.5	720	0.003	100%	1.37	411	206	1.8
Benzene	15	518.67	1.79E-05	4.72E-08	3.68E-06	59	18	0.5	720	0.003	100%	1.7	641	321	1.1

Notes

1) Assume a worst case relative humidity of 100%

1) Average Temperature per year assumed to be ~15C (max). Per IDNR document Natural Features of Indiana Ground Water by Charles Bechert and John Heckard, average groundwater temperature in Indiana in the north is 52F (11C), with highs generally exceeding by

2) Assume a nominal flow of 0.5 cfm or roughly 30 cf/hr. Normally system is operated with inlet to carbon closed and only opened periodically as needed. Based on monitoring system operates at atmospheric pressure even when closed.

4) Assume capacity is only 50% of calculated (safety factor of 2).

5) Utilize Calgon Control Efficiency taken from modeling conducted by Calgon for VentoSorb Carbon Drum dated 3/21/24.

Carbon Capacity from Calgon @ 95% control

Temperature (C)	Relative Humidity (%)	Carbon Capacity (lbs/1000 acfm)	Benzene Adsorbed per 180lb drum of VPR
30	100	1.516	0.84
	90	0.323	3.94
	70	0.079	16
	50	0.071	17.8
20	100	0.961	1.37
	90	0.228	5.77
	70	0.071	18.6
	50	0.065	20.3
15	100	0.784	1.7
	90	0.195	6.84
	70	0.067	20
	50	0.062	21.7