UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 0 8 2014

REPLY TO THE ATTENTION OF:

WC-15J

CERTIFIED MAIL 7011 1150 0000 2639 5421
RETURN RECEIPT REQUESTED

CT Corporation System
1300 East 9th Street
Cleveland, Ohio 44114-0000
Registered Agent for Service of Process for:

BASF Corporation
100 Campus Drive
Florham Park, NJ 07932

Subject: BASF Corporation, 1000 Harvard Avenue, Cleveland, Ohio
Administrative Order for Compliance Pursuant to
33 U.S.C. §§ 1318 and 1319(a).
Docket No. V-W- 15-309-01

Dear BASF Corporation:

Protecting water quality is a high priority of the U.S. Environmental Protection Agency. Pollutants such as heavy metals and radionuclides discharged from sites to waterways contribute to poor water quality and the impairment of the uses of those waterways.

EPA issues to BASF Corporation, 1000 Harvard Avenue, Cleveland, Ohio, (BASF or "the Site"), this Administrative Order for Compliance, pursuant to Sections 308 and 309(a) of the Clean Water Act (CWA), 33 U.S.C. §§ 1318 and 1319(a). The Order asserts that BASF violated Section 301 of the CWA, 33 U.S.C. § 1311, by discharging effluent containing nickel, lead, cadmium, chromium, copper, selenium, zinc, and uranium, as well as other radionuclides, from its Outfall No. 007, into the Cuyahoga River, without a National Pollutant Discharge Elimination System (NPDES) permit.

In October 2013, representatives of EPA conducted a water sampling inspection at the Site. All samples were shipped to the National Analytical Radiation Environmental Laboratory (NAREL) for analysis. The analytical results were completed in December 2013 and submitted to EPA in January 2014. A final report was completed in May 2014. The results demonstrated that BASF discharged untreated effluent from its Outfall No. 007 into the Cuyahoga River without a permit to discharge. The untreated effluent contained nickel,

lead, cadmium, copper, selenium, uranium and other radionuclides. A copy of the sampling report is appended to the Order as Attachment A. The copy does not include all of the attachments listed on the sampling report, but these attachments can be provided if you so request.

The Order requires BASF to immediately cease the discharge of pollutants from Outfall 007 into the Cuyahoga River without a permit, as alleged above, and to complete any and all necessary action to comply with the CWA. Please direct any questions to Jeffery M. Trevino of our Office of Regional Counsel at telephone number (312) 886-6729, or e-mail address trevino.jeffery@epa.gov. We find this to be a serious matter and request you comply immediately with this Order.

Sincerely,

Tinka G. Hyde
Director, Water Division

Enclosure

cc: Erm Gomes, Ohio EPA, Northeast District Office

Nancy L. Martin
Senior Counsel
BASF Corporation
100 Campus Drive
Florham Park, NJ 07932

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

In the Matter of:	)	**Docket No. V-W-15-309-01**
	)	
BASF Corporation	)	**Proceeding Under Section 308(a) and**
1000 Harvard Avenue,	)	**309(a) of the Clean Water Act,**
Cleveland, Ohio	)	**33 U.S.C. § 1319.**
	)	
Respondent.	)	

ORDER FOR COMPLIANCE

I. STATUTORY AUTHORITY

1. The Director of the Water Division, Region 5, U.S. Environmental Protection Agency, makes the following **FINDING OF VIOLATION** and issues to BASF Corporation the following **ADMINISTRATIVE ORDER FOR COMPLIANCE** pursuant to the authority of the Administrator of EPA under Sections 308 and 309(a) of the Clean Water Act (CWA), 33 U.S.C. §§ 1318 and 1319(a). The Administrator delegated this authority to the Regional Administrator, Region 5, EPA, who then redelegated the authority to the Director of the Water Division, Region 5, EPA.

2. Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants to the waters of the United States by any person except in compliance with a permit issued under the authority of the CWA.

3. Section 308(a) of the CWA, 33 U.S.C. § 1318(a), authorizes the Administrator to require the owner or operator of any point source to establish and maintain records, make reports, install, use, and maintain monitoring equipment, sample effluent and provide any other information she may reasonably require to carry out the objectives of the CWA.

4. Section 309(a)(3) of the CWA, 33 U.S.C. § 1319(a)(3), states that whenever the Administrator finds a person in violation of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), she may issue an order requiring that person to comply with the requirements of the CWA.

5. Section 402 of the CWA, 33 U.S.C. § 1342, establishes the National Pollutant Discharge Elimination System (NPDES) by which the Administrator may issue permits for the discharge of pollutants to the waters of the United States subject to certain conditions. On March 11, 1974, EPA granted the Ohio Environmental Protection Agency (OEPA) approval to issue NPDES permits pursuant to Section 402(b) of the CWA.

II. FINDINGS

6. In 1898, the Harshaw, Fuller & Goodwin Company began ownership and operation of a 40-acre site located at 1000 Harvard Avenue, Cleveland, Ohio (the Site).

7. In 1929, the Harshaw, Fuller & Goodwin Company changed its name to the Harshaw Chemical Company. It completed chemical processing and manufacturing, including the processing and manufacturing of catalysts, inorganic fluorides, and metal finishing compounds.

8. From 1944 to 1959, the U.S. Government contracted with the Harshaw Chemical Company to refine uranium..

9. In 1966, the Kewanee Oil Company of Bryn Mawr, Pennsylvania, (Kewanee Oil) purchased the Harshaw Chemical Company, and it merged into Kewanee Oil.

10. In 1977, the Gulf Oil Corporation (Gulf) purchased Kewanee Oil.

11. In 1983, Gulf organized a joint venture with the Kaiser Aluminum & Chemical Corporation (Kaiser), and combined their two chemical units into the Harshaw/Filtrol Partnership to produce specialty chemicals. The Harshaw/Filtrol Partnership was the owner of the Site, and the Gulf and Kaiser Partnership was the operator of the Site.

12. In 1984, Standard Oil of California merged into Gulf and the company became the Chevron Corporation (Chevron). The Gulf and Kaiser Partnership was the operator of the Site.

13. From 1976 through 1978, the OEPA allowed the Harshaw Chemical Corporation, Division of Kewanee Oil, and then the Harshaw/Filtrol Partnership, and then the Harshaw Chemical Company again, to discharge pollutants from point sources into the waters of Big Creek and the Cuyahoga River: OEPA Permit No. E 306 *AD, entered March 3, 1976; OEPA Permit No. E306*BD, effective April 27, 1978; OEPA Permit No. 3IE00006*CD, effective September 30, 1987; OEPA Permit No. 3IE00006*DD, effective January 29, 1993; OEPA Permit No. 3IE00006*FD, effective October 1, 1993 (the Permits).

14. The Permits permitted Harshaw Chemical Corporation, Division of Kewanee Oil, and then the Harshaw/Filtrol Partnership, and then the Harshaw Chemical Company again, to discharge non-contact cooling water, boiler blow water, storm water, and ground water free from any process wastewater containing total suspended solids, nickel, fluoride, lead, ammonia, temperature, phosphorous, residue, acute toxicity, cadmium, copper, and zinc, from Site Outfall 007 (Latitude 41 ° 26 ' 54 "; Longitude 81 ° 41 ' 06 ") into the Cuyahoga River.

15. In 1988, the Engelhard Corporation (Engelhard), a specialty chemical and metallurgical maker, purchased the Harshaw/Filtrol Partnership, including its ownership of the Site, except for Building G-1. The Chevron and Kaiser Partnership became the owner and operator of Building G-1.

16. In June 1994, Engelhard installed and began operation of a Groundwater Extraction and Treatment System on the Site to control the infiltration of nickel-impacted groundwater into an interceptor beltline sewer that passes through the Site adjacent to the former nickel chloride and nickel sulfate production areas. The system captured groundwater, removed nickel, adjusted the groundwater for pH, then discharged the treated groundwater into the sanitary sewer pursuant to a permit issued by the Northeast Ohio Regional Sewer District (NEORSD). The system and permit continue to date.

17. In 2006, BASF Catalyst purchased Engelhard including the Site, except for Building G-1. The Chevron and Kaiser Partnership remained the owner and operator of Building G-1.

18. In 2010, BASF Catalyst changed its name to BASF Corporation (BASF or Respondent).

19. BASF remains the owner and operator of the Site, except for Building G-1. The Chevron and Kaiser Partnership remain the owner and operator of Building G-1.

20. On October 25 and 29, 2013, the EPA conducted a water sampling inspection at the Site and found BASF discharged effluent from Outfall 007 into the Cuyahoga River.

21. The National Analytical Radiation Environmental Laboratory (NAREL) found these water samples from Outfall 007 on the Site to contain nickel, lead, cadmium, copper, and selenium. It also found the water samples contained uranium and other radionuclides.

22. On August 28, September 3, 4, 8, 9, 15, 16, 25, and October 1, 2014, BASF continued to discharge effluent from Outfall 007 into the Cuyahoga River.

23. BASF was and remains a corporation.

24. Therefore, BASF was and remains a "person" pursuant to Section 502(5) of the CWA, 33 U.S.C. § 1362(5).

25. BASF added pollutants including, but not limited to, nickel, lead, cadmium, chromium, copper, selenium, zinc, and uranium from Outfall 007 into the Cuyahoga River.

26. The Cuyahoga River is both a "navigable water" as defined by Section 502(7) of the CWA, 33 U.S.C. § 1362(7), and a "water of the United States" as defined by EPA regulations in 40 C.F.R. § 122.2.

27. Therefore, BASF "discharged" "pollutants" from a "point source" into "navigable waters," pursuant to Sections 502(16), (12), (19), (14), and (7), of the CWA 33 U.S.C. §§ 1362(16), (12), (19), (14), and (7).

28. BASF does not have a CWA NPDES Permit to discharge pollutants from a point source at the Site into navigable waters.

29. Therefore, BASF discharged pollutants from a point source into navigable waters without a permit in violation of Section 301 of the CWA, 33 U.S.C. § 1301.

III. ORDER FOR COMPLIANCE AND REQUEST FOR INFORMATION

BASED ON THE FOREGOING FINDINGS IT IS HEREBY ORDERED in accordance with Section 309(a)(3) of the CWA, 33 U.S.C. § 1319(a)(3), that Respondent complete the actions detailed in the following paragraphs.

30. BASF will immediately cease and desist from any and all discharges of pollutants from any and all point sources on the Site, including Outfall 007, into navigable waters, including the Cuyahoga River, without an NPDES Permit.

31. BASF will immediately provide to EPA for its review and approval a written proposal, with specific work milestones and dates certain, to cease and desist from any and all discharges of pollutants from any and all point sources at the Site, including Outfall 007, into navigable waters, including the Cuyahoga River, without an NPDES Permit.

32. Upon completion of each milestone in the approved Plan, BASF will document and report to EPA its completion using the certification statement in paragraph 34.

IV. SUBMITTALS

33. Any documents or notifications required by this Order to be submitted to EPA shall be mailed to the following address:

Noel Vargas
Water Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency
77 West Jackson Boulevard (WC-15J)
Chicago, Illinois 60604-3590

34. All submittals made pursuant to this Order shall be returned under an authorized signature containing the following certification.

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information, including the possibility of fines and imprisonment for knowing violations.

35. If the signatory finds at any time after submittal of information that any portion of the submittal is false or incorrect, the signatory shall notify EPA immediately. Knowing submittal of false information to EPA in response to this Order may subject Respondent to criminal prosecution under Section 309(c) of the CWA, 33 U.S.C. § 1319(c), and 18 U.S.C. §§ 1001 and 1341.

36. You may not withhold information because you claim it is confidential. However, pursuant to 40 C.F.R. Part 2, Subpart B, you may assert a claim of business confidentiality regarding any portion of the information submitted in response to this Order, as provided in 40 C.F.R. § 2.302(a)(2). The regulations provide that a person may assert a business confidentiality claim covering part or all of the information furnished to EPA when that person submits the information. The manner of asserting such claims is specified in 40 C.F.R. § 2.203(b). Effluent data (as defined in 40 C.F.R. § 2.302(A)(2)) and information in NPDES permit applications are not entitled to confidential treatment. 40 C.F.R. § 122.7. Information subject to a business confidentiality claim is available to the public only to the extent, and by means of the procedures, set forth in 40 C.F.R. Part 2, Subpart B.

37. If you do not assert a claim of business confidentiality when you submit the information, EPA may make the information available to the public without further notice.

38. EPA may use any information submitted in response to this Order in support of an administrative, civil or criminal action against Respondent.

V. EFFECTIVE DATE AND OPPORTUNITY TO CONFER

39. Respondent has the opportunity to confer with and submit information to EPA concerning the validity of this Order.

40. Such information may include evidence (*i.e.*, documentation), arguments and comments regarding the legal and factual determinations on which the Order is

based, its applicability to Respondent, the appropriateness of its terms or any other relevant and material issue.

41. If Respondent chooses to confer orally with EPA, it shall request an informal conference within 10 calendar days of its receipt of this Order. To request a conference, contact Noel Vargas at telephone number (312) 353-3575, or Respondent's attorney may contact Jeffery M. Trevino, Associate Regional Counsel, at telephone number (312) 886-6729.

    a. Any conference held pursuant to this Paragraph shall take place within 10 calendar days from the date of the request, unless the time period is extended by agreement of the parties. Respondent may appear in person, participate by telephone or be represented by an attorney or other representative.

    b. Respondent is responsible for reducing all oral information it presents at the conference, including comments and arguments, to writing and submitting that document to EPA within five calendar days following the conference, unless the time period is extended by agreement of the parties.

    c. Such a conference is not a formal evidentiary hearing and does not constitute a proceeding to challenge this Order. EPA will not make a formal transcript of the conference.

42. Regardless of whether Respondent requests a conference, Respondent may submit written information to EPA, as provided in Paragraphs 39 and 40, above, within 10 calendar days of the date of signature of this Order by the Water Division Director, unless the time period is extended by agreement of the parties. Respondent shall submit any written information according to the instructions in Section IV of this Order.

43. EPA shall deem a failure to either request a conference or submit written information within 10 calendar days of the date of signature of this Order by the Water Division Director as a waiver of the opportunity to confer.

44. If Respondent does not request a conference or submit written information pursuant to this Section, this Order shall become final and effective 15 calendar days after its date of signature by the Water Division Director.

45. EPA shall consider all relevant and material written information submitted by Respondent pursuant to this Section and determine that: (1) this Order should become final as originally issued; (2) this Order should be modified; or (3) this Order should be withdrawn.

46. If EPA determines that this Order should become final as originally issued or should be modified, then EPA shall address the material and relevant information submitted by Respondent in a responsiveness summary.

a. All written information submitted by Respondent and EPA's responsiveness summary shall be included in the administrative record supporting this Order.

b. The administrative record shall be available for public review under the Freedom of Information Act. If EPA determines that this Order should become final as originally issued, EPA will notify Respondent of that decision in writing and shall provide Respondent with a copy of the responsiveness summary.

47. If EPA determines that this Order should be modified, EPA will modify the Order and issue a modified order to Respondent and shall provide Respondent with a copy of the responsiveness summary.

48. If EPA determines that this Order should be withdrawn, EPA will provide Respondent with written notice of the withdrawal of this Order.

49. No modification or withdrawal of this Order shall be effective unless and until it is issued in writing by EPA.

50. If EPA determines this Order should become final as originally issued, this Order shall become final and effective seven calendar days after the date of EPA's signature of the written notification to Respondent of that determination.

51. If EPA modifies this Order, the modified order shall become final and effective 7 calendar days after the date of EPA's signature of the modified order.

VI. GENERAL PROVISIONS

52. Respondent may seek immediate federal judicial review of a final Order pursuant to Chapter 7 of the Administrative Procedure Act, 5 U.S.C. §§ 701-706. Section 706, which is set forth at http://uscode.house.gov/download/pls/05C7.txt, states the scope of such review.

53. Neither the issuance of this Order by EPA nor compliance with this Order by the Respondent shall be deemed to relieve the Respondent of liability for or limit EPA's authority to seek any relief, penalty, fine, remedy or sanction authorized to be imposed pursuant to Section 309(b), (c), (d), and/or (g) of the CWA, 33 U.S.C. §§ 1319(b), (c), (d), and/or (g) for the violations cited in the Findings, and for any violation of any other applicable requirement of the CWA. EPA specifically reserves the right to seek any or all of the remedies specified in Section 309 for any such violations, including the violations cited in the Findings.

54. This Order does not affect Respondent's responsibility to comply with the CWA, its Permit, and other local, state, and federal laws and regulations.

55. This Order does not restrict EPA's authority to enforce the Permit or any section of the CWA.

56. Failure to comply fully and truthfully with this Order, within the specified timeframes, may subject Respondent to enforcement action under Section 309 of the CWA, 33 U.S.C. § 1319.

57. The terms of this Order are binding on Respondent, its assignees and successors. Respondent must give notice of this Order to any successors in interest prior to transferring ownership, and must simultaneously verify to EPA, at the above address, that Respondent has given the notice.

58. EPA may use any information submitted under this Order in an administrative, civil, or criminal action.

59. The CWA includes provisions for administrative penalties, for civil injunctive relief and penalties, and for criminal sanctions for violations of the CWA. Specifically, EPA may:

    a. assess civil administrative penalties under 33 U.S.C. § 1319(g) and 40 C.F.R. Part 19 of $16,000 per day for each violation up to a total of $177,500 that occurred after January 12, 2009, through December 6, 2013. An administrative penalty action may total up to $187,500 for violations that occurred after December 6, 2013;

    b. seek civil injunctive relief and penalties for violations of the CWA under 33 U.S.C. § 1319(b) and 40 C.F.R. Part 19. EPA may seek civil judicial penalties of $37,500 per day for each violation that occurs after January 12, 2009, through December 6, 2013; and

    c. seek criminal sanctions, including fines and imprisonment, for negligent or knowing violations of the CWA under 33 U.S.C. § 1319(c).

60. The information required to be submitted pursuant to this Order is not subject to the approval requirements of the Paperwork Reduction Act of 1995, 44 U.S.C. § 3501 *et seq*.

VII. CERTIFICATION OF COMPLETION

61. Within 30 days after Respondent concludes that it has complied with all requirements of this Order, Respondent shall submit to EPA a written certification of completion describing all actions taken to comply with all requirements of this Order.

62. This Order shall be terminated when EPA notifies Respondent that Respondent has complied with all requirements of this Order.

Tinka G. Hyde
Director, Water Division

10/8/14
Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

In the Matter of:	)	**Docket No. V-W-15-309-01**
	)	
BASF Corporation	)	**Proceeding Under Section 308(a) and**
1000 Harvard Avenue,	)	**309(a) of the Clean Water Act,**
Cleveland, Ohio	)	**33 U.S.C. § 1319.**
	)	
Respondent.	)	

CERTIFICATE OF SERVICE

I, Mark Conti, Lead Environmental Engineer, Office of Enforcement and Compliance Assurance, Cleveland Office, Region 5, U.S. EPA, 25063 Center Ridge Road, Westlake, Ohio, hereby certify I personally served to CT Corporation System, the Registered Agent for Service of Process for BASF Corporation, Ohio, at the following address, the original Order for this matter pursuant to Section 309(a)(5)(A) of the Act, 33 U.S.C. § 1319(a)(5)(A).

CT Corporation System
Registered Agent for Service of Process for BASF Corporation
1300 East 9th Street
Cleveland, OH 44114-0000

I further certify that one copy of the Order for this matter was sent to Nancy Martin, Senior Environmental and Safety Counsel, BASF Corporation, via U.S. Mail, to the following address:

Nancy L. Martin
BASF Corporation
100 Park Avenue
Florham Park, NJ 07932

_____ _____
Mark Conti Date

Attachment A

*****ENFORCEMENT CONFIDENTIAL*****

CLEAN WATER ACT INSPECTION SAMPLING REPORT

BASF Corporation
1000 Harvard Avenue
Cleveland, Ohio

By:

Mark Conti, USEPA Region 5, OECA – Cleveland Office
Mark Moloney, USEPA Region 5, OECA – Cleveland Office

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 5
OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE – CLEVELAND OFFICE

1. SUMMARY OF FIELD ACTIVITIES AND OBSERVATIONS
   1.1 Objective of Sampling Effort
   1.2 Facility Description
   1.3 Sampling Description
   1.4 Sample Shipping Information

2. SAMPLING RESULTS

Tables

Table 1 USEPA Sample Collection Information
Table 2 Sample Bottle and Preservative Information
Table 3 Summary of USEPA Field Measurement for BASF Cleveland, Ohio Site
Table 4 Summary of USEPA Metals Results for BASF Cleveland, Ohio Site
Table 5 Summary of USEPA Radionuclide Results for BASF Cleveland, Ohio Site

Figures

Figure 1 Former Harshaw Chemical Site Diagram
Figure 2 Map of October 25 and 29, 2013 Sample Locations

APPENDIX A Photographs

APPENDIX B Chain of Custody Records

APPENDIX C U.S. EPA National Air and Radiation Environmental Laboratory Analyses Reports

APPENDIX D Graphical Presentation of Radionuclide Data

APPENDIX E Quality Assurance Project Plan (QAPP)

1.1 Objective of Sampling Effort

The objective is to confirm whether metals and/or radionuclides are being discharged into the Cuyahoga River from BASF property and whether the same pollutants are present in the Cuyahoga River at the point of discharge. Sampling results will also be used to learn whether radionuclides are being drawn into BASF's recovery wells and subsequently being discharged from the nickel treatment system into the Northeast Ohio Regional Sewer District sewage system.

1.1 Facility Description

The BASF site ("Site") is located approximately 3.5 miles southwest of downtown Cleveland, Ohio. It is situated along the western bank of the Cuyahoga River, just north of its confluence with Big Creek. Harvard Avenue splits the facility into a north and south section. The BASF facility consists of approximately 24.46 acres and is comprised of four parcels (2, 3, 4 and 5) (Figure 1). Parcel 2 is approximately 4.37 acres in size and is currently a vacant lot. Parcel 3 is approximately 18.94 acres in size and includes seven remaining buildings. The current buildings within Parcel 3 include a warehouse (Building W-1), former foundry (Building F-1), former boiler house (Building B-1), groundwater recovery and treatment system building, garage, former hydrogen fluoride plant wastewater treatment system (Building H-10), and former scale house. Parcel 4 is approximately 0.87 acres in size, and Parcel 5 is approximately 0.28 acres in size; both are currently vacant lots. The BASF site also includes a structure referred to as Building G-1 and the property occupied by Building G-1, which are owned by BGD Company, which is an affiliate of Chevron USA, Inc. This building is located in the north-central portion of Parcel 3 and it is shown on Figure 1 as the area marked with cross hatch marks.

The BASF site is the subject of response action by the United States Army Corps of Engineers (USACE) under the federal government's Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Numerous other buildings that were once located at the facility for manufacturing have been demolished with oversight by the Nuclear Regulatory Commission (NRC), although most of the floor slabs remain. The locations of former and existing buildings are shown on Figure 1.

In 1901, the Harshaw Chemical Company (Harshaw) became the original owner and operator of a 40-acre site that included the current Site. Harshaw manufactured and processed chemicals including catalysts, inorganic fluorides, and metal finishing compounds. During the 1930s and 1940s, the U.S. government contracted with Harshaw to complete uranium research and enrichment at Building G-1 of the Site, in support of the government's Manhattan Project. Building G-1, the underlying soil, and groundwater became, and remain, heavily contaminated with uranium and other radioactive contaminants. In 1977, the Gulf Oil Corporation ("Gulf") purchased Harshaw and Gulf became parent company to subsidiary Harshaw. In 1983, Gulf and the Kaiser Aluminum and Chemical Corporation ("Kaiser") entered into a partnership, and Harshaw remained the owner of the Site and the Gulf/Kaiser Partnership became the operator of the Site. Shortly thereafter, Chevron purchased Gulf, and Chevron assumed Gulf's position in the Gulf/Kaiser Partnership. Historically, Harshaw was the permit holder of several Clean Water Act NPDES permits for the Site, including permits for process wastewater, storm water, groundwater, and about eight outfalls. In 1988, the Engelhard Corporation purchased the entire Site, except for Building G-1, which remained owned and operated by the Chevron/Kaiser Partnership. In the early 1990s, BASF purchased the Site, except for Building G-1, which remained owned and operated by the Chevron/Kaiser Partnership. BASF never conducted any operations at the Site, except for a pump and treat system to remediate nickel contamination on

the Site, pursuant to an order from the State of Ohio. On April 1, 1998, the remaining NPDES permits for the Site expired.

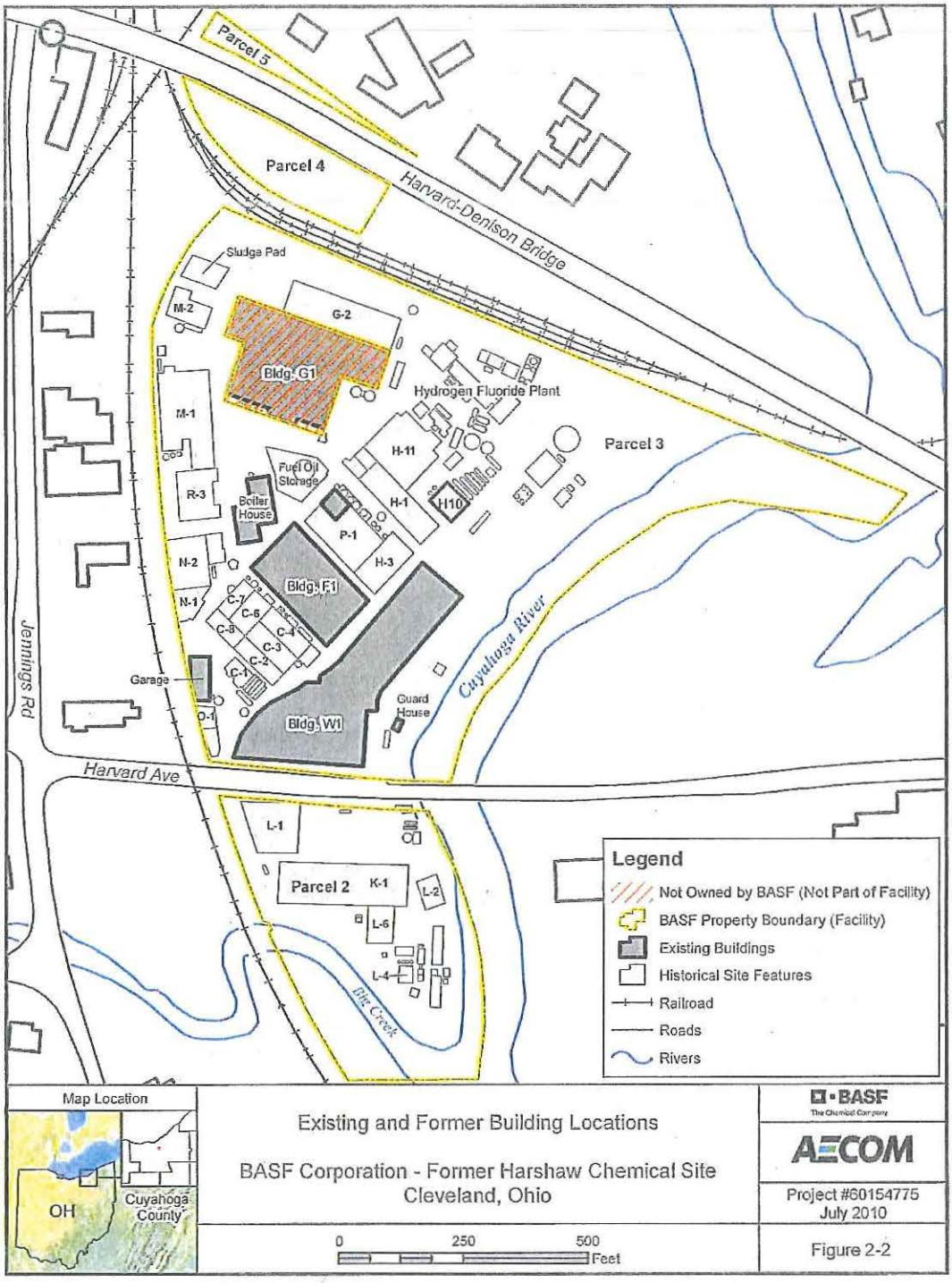

Figure 1 – Former Harshaw Chemical Site Diagram (drawing obtained from AECOM 6/17/2010 report *Draft Description of Current Conditions*)

In the early 2000s, the U.S. Congress delegated to the U.S. Army Corps of Engineers the remediation of the radioactive contamination at Building G-1 of the Site pursuant to the Formerly Utilized Sites Remedial Action Program (FUSRAP). USACE planned to begin such remediation in 5 to 15 years, but this remained subject to tight budgetary constraints.

On March 30, 2010, Region 5 of EPA issued to BASF a RCRA 3008(h) Administrative Corrective Action Order ("Order") to remediate heavy metals in the soil and groundwater at the Site. The Order excluded Building G-1 of the Site, since it was owned by Chevron/Kaiser. The Order also excluded Building G-1 since RCRA contaminants did not include radioactive contaminants, and since the U.S. Congress delegated to USACE the radioactive remediation of the Site. There was also no evidence that the radioactive contamination of Building G-1, or its underlying soil or groundwater, had migrated from those origins. (BASF provided EPA with its RCRA Facility Investigation workplan pursuant to EPA's Order, and EPA is completing its review.)

On or about April 2010, BASF notified EPA it found radioactive contamination in the pump and treat system it employed to remediate nickel contamination on the Site, pursuant to the State of Ohio order. BASF attempts to adjust its Pump and Treat System to reduce radioactive contamination in the system were unsuccessful.

In 2011, the Land and Chemicals Division (Christine McConaghy) discovered a pipe (Outfall 007) on the Site discharging water into the Cuyahoga River. BASF and USACE were surprised to learn of the discharge, and stated they knew absolutely nothing about it. In May of 2011, USACE sampled the water from the pipe (Outfall 007) and found the discharge to be approximately 25 – 30 gallons per minute, and "polished," meaning it appeared to have undergone some treatment process, and also found uranium at approximately 170 micrograms per liter. In July of 2012, USACE sampled water in the storm sewer from Building G-1 to the Cuyahoga River and found high levels of uranium in the storm sewer water near Building G-1 (2079 ug/L total, 1855 ug/L filtered), a decreased level of uranium in the storm sewer water at Outfall 007 (77.4 ug/L total, 75.3 ug/L filtered), and a further decreased level in the Cuyahoga River (41 ug/L total, 18 ug/L filtered).

USACE recently stated to EPA that it sampled the water from the pipe (Outfall 007) annually since at least 2008. However, USACE had not shared with EPA any details of any of its water samples or any of its underlying data, notwithstanding repeated requests, and notwithstanding USACE's oral agreements to do so. Therefore, to date, EPA has no separate and independent information to confirm USACE's findings or to provide factual or legal conclusions with necessary confidence.

1.3 Sampling Description

Wastewater grab samples were collected at five different locations at the BASF Cleveland, Ohio site on October 25, 2013 and at two locations on October 29, 2013. The sampling locations are shown in Figure 2. Beginning the morning of October 25, 2013, grab samples were collected by U. S. EPA personnel at the following locations: influent to BASF's groundwater pump and treat system, effluent discharge from BASF's groundwater pump and treat system, Outfall 007 (former) monitoring location, Outfall 007 discharge location and the Cuyahoga River at a point where it mixed with the Outfall 007 discharge. Samples were collected for metals and radionuclide analyses. Measurements for temperature, pH and conductivity were also performed at each sampling location by the U.S. EPA team, which consisted of Mark Conti and Mark Moloney. The weather during the sampling was overcast and raining.

Figure 2 – Map of October 25 and 29, 2013 Sample Locations

Table 5 – Summary of USEPA Radionuclide Results for BASF Cleveland, Ohio Site

Sample Location/ Description	Field Blank	BASF Pump and Treat Influent	BASF Pump and Treat Effluent	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.	Cuyahoga R. at Outfall 007	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.	Outfall 007 Discharge to Cuyahoga R (duplicate)
Sample No.	R01	S02	S03	S04	S05	S06	S07	S08	D09
Date	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/29/13	10/29/13	10/29/13
Time	0810	0926	1000	1028	1055	1120	0950	1020	1020
Radionuclides	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L	Activity pCi/L
Radium 226	0.0533	0.414	0.101	0.134	0.137	0.0796	0.153	0.151	0.077
Radium 228	-0.143	0.745	0.0182	0.318	-0.196	0.750	0.231	0.538	0.467
Uranium 234	0.0685	1.17	0.00364	34.4	27.7	3.27	36.8	38.8	36.8
Uranium 235	0.00966	0.102	-0.00436	1.70	1.69	0.173	1.87	1.81	1.64
Uranium 238	0.0685	0.883	0.00	33.7	29.0	3.20	37.7	40.5	36.2
Thorium 232	0.00418	0.0301	-0.00783	0.00923	0.00	0.0249	0.00865	0.00555	0.00
Thorium 230	0.00	-0.0151	-0.00784	-0.00308	0.00658	-0.0166	0.0144	0.00	0.00
Thorium 228	0.0294	0.101	0.106	0.0865	0.0858	0.00	0.113	0.0752	0.0738
Thorium 227	0.00	0.00	0.0243	0.00	-0.0136	-0.0344	0.00	0.00574	0.00585

Table 4 – Summary of USEPA Metals Results for BASF Cleveland, Ohio Site

Sample Location/ Description	Field Blank	BASF Pump and Treat Influent	BASF Pump and Treat Effluent	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.	Cuyahoga R. at Outfall 007	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.	Outfall 007 Discharge to Cuyahoga R (duplicate)
Sample No.	R01	S02	S03	S04	S05	S06	S07	S08	D09
Date	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/29/13	10/29/13	10/29/13
Time	0810	0926	1000	1028	1055	1120	0950	1020	1020
Total Metals	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**	**Conc., ug/L**
T. Aluminum	21.6	14.7	< 12.3	560	510	1130	306	331	335
T. Antimony	< 1.23	< 1.23	< 1.23	13.7	13.0	< 1.23	11.0	11.0	11.0
T. Arsenic	< 1.23	2.74	< 1.23	5.58	4.96	1.68	3.07	3.26	3.16
T. Barium	< 1.23	34.4	2.81	55.3	54.0	39.5	46.3	47.4	47.1
T. Beryllium	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.20	< 1.23
T. Cadmium	< 1.23	< 1.23	< 1.23	16.2	17.5	< 1.23	21.2	19.9	19.6
T. Calcium	< 123	187000	4610	91800	85100	63100	81700	82300	84700
T. Chromium	< 1.23	< 1.23	< 1.23	22.0	19.0	2.87	17.9	17.1	17.0
T. Cobalt	< 1.23	1090	3.91	27.0	28.7	< 1.23	26.9	28.6	28.5
T. Copper	< 1.23	< 1.23	< 1.23	22.3	24.0	4.82	25.3	21.9	21.6
T. Iron	ND	2580	919	161	204	1190	194	252	249
T. Lead	< 1.23	< 1.23	< 1.23	49.1	43.2	3.51	43.1	40.1	39.0
T. Magnesium	< 123	34600	11300	13700	13100	13300	13400	13500	13400
T. Manganese	ND	33900	173	30.9	28.5	60.8	30.8	49.8	48.6
T. Molybdenum	< 1.23	< 1.23	2.46	10.4	11.6	9.14	12.4	12.1	12.3
T. Nickel	< 1.23	40900	594	496	457	6.74	401	401	413
T. Potassium	ND	10700	4170	17300	16500	6650	15600	15700	15500
T. Selenium	< 1.23	1.71	< 1.23	9.05	8.96	< 1.23	6.76	6.91	7.06
T. Silver	ND	< 1.23	ND	ND	6.65	ND	ND	ND	< 1.23
T. Sodium	123	262000	516000	20600	20700	115000	23600	23700	24600
T. Thallium	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23
T. Vanadium	< 1.23	< 1.23	< 1.23	1.43	1.48	2.98	< 1.23	< 1.23	< 1.23
T. Zinc	< 1.23	26.2	1.8	59.5	86.4	20.8	66	66.7	66.4
T. Uranium	< 1.23	2.99	< 1.23	104	93.9	< 1.23	115	118	118

U - Indicates compound was analyzed for but not detected

< - The value is less than the Reporting Limit but greater than or equal to the instrument detection limit. The number shown is the Reporting Limit. The estimated concentration is in the attached lab data package.

Table 2 – Sample Bottle and Preservative Information

Sample Bottle Type	Analyses Performed	Sample Preservative Used
1 L glass wide-mouth bottle	Field Parameters -- pH, temperature & conductivity	None – analyzed in field
500 mL polyethylene bottle	Total metals	None – preserved at the laboratory
4 L plastic cubitainer	Radium 228 & 226; Uranium 238, 235, and 234; and Thorium 232, 232, 228 and 227	None

Table 3 – Summary of USEPA Field Measurement for BASF Cleveland, Ohio Site

Sample Location/ Description	BASF Pump and Treat Influent	BASF Pump and Treat Effluent	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.	Cuyahoga R. at Outfall 007	Outfall 007 Monitoring Station	Outfall 007 Discharge to Cuyahoga R.
Sample No.	S02	S03	S04	S05	S06	S07	S08
Date	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/29/13	10/29/13
Time	0926	1000	1028	1055	1120	0950	1020
Temperature (°C)	15.6	17.6	16.8	15.2	10.7	18.4	17.0
pH (S.U.)	6.80	10.54	7.53	7.48	7.60	8.20	8.38
Conductivity (µmhos/cm)	2228	2300	618	404	832	590	590

Table 1 - USEPA Sample Collection Information for BASF Cleveland, Ohio Site

Sample No. 14CM01	Sample Type	Collection Date Time	Sample Description	Sampling Method
R01	Grab	10/25/13 0810	**Field Blank Sample** – Blank Samples were prepared for Total Metals and RAD analyses.	Distilled deionized water from the Region 5 Cleveland Office was collected in a quart glass jar and poured into total metals and RAD sample containers. These samples were placed in a cooler with the other samples for delivery to U.S. EPA NAREL.
S02	Grab	10/25/13 0926	**Influent to BASF Pump and Treat Groundwater System** – Samples were collected from the pipe discharging groundwater to the influent tank at BASF's groundwater treatment plant. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar was used to collect waster from a discharge pipe on top of the influent tank at BASF's groundwater treatment plant. Water was poured into total metals and RAD sample containers.
S03	Grab	10/25/13 1000	**Effluent from the BASF Pump and Treat Groundwater System** – Samples were collected from the effluent tank at BASF's groundwater treatment plant. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar was used to collect water from a discharge pipe on top of the influent tank at BASF's groundwater treatment plant. Water was poured into total metals and RAD sample containers.
S04	Grab	10/25/13 1028	**Outfall 007 Monitoring Station** – Samples were collected from the wet well containing a flow meter formerly used to monitor the Outfall 007 discharge. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar attached to a pole was used to collect water from the end of the Outfall 007 flow measurement flume. Water was poured into total metals and RAD sample containers.
S05	Grab	10/25/13 1055	**Outfall 007 Discharge** - Samples were collected from the Outfall 007 discharge structure located along the Cuyahoga River. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar attached to a pole was used to collect water discharging from the top of the Outfall 007 discharge structure located along the Cuyahoga River. Water was poured from the glass jar into total metals and RAD sample containers.
S06	Grab	10/25/13 1120	**Cuyahoga River at Outfall 007** - Samples were collected from the area where outfall 007 discharge mixed with river water. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar attached to a pole was used to collect water from the area where the Outfall 007 discharge mixed with river water. Water was poured from the glass jar into total metals and RAD sample containers.
S07	Grab	10/29/13 0950	**Outfall 007 Monitoring Station** – Samples were collected from the wet well containing a flow meter formerly used to monitor the Outfall 007 discharge. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar attached to a pole was used to collect water discharging from the top of the Outfall 007 discharge structure located along the Cuyahoga River. Water was poured from the glass jar into total metals and RAD sample containers.
S08	Grab	10/29/13 1020	**Outfall 007 Discharge** - Samples were collected from the Outfall 007 discharge structure located along the Cuyahoga River. Samples were collected for Total Metals and RAD analyses.	A 1 liter glass jar attached to a pole was used to collect water discharging from the top of the Outfall 007 discharge structure located along the Cuyahoga River. Water was poured from the glass jar into total metals and RAD sample containers.
D09	Grab	10/29/13 1020	**Outfall 007 Discharge** - Samples were collected from the Outfall 007 discharge structure located along the Cuyahoga River. Samples were collected for Total Metals and RAD analyses. This sample is a duplicate of the S08 sample.	A 1 liter glass jar attached to a pole was used to collect water discharging from the top of the Outfall 007 discharge structure located along the Cuyahoga River. Water was poured from the glass jar into total metals and RAD sample containers.

On the morning of October 29, 2013, U. S. EPA personnel returned to the site and collected grab samples at the Outfall 007 monitoring location and the Outfall 007 discharge location. Measurements for temperature, pH and conductivity were also performed at both sampling locations by the U.S. EPA team which consisted of Mark Conti and Mark Moloney. The weather during the sampling was sunny and dry.

Laboratory analysis for metals and radionuclide were performed by USEPA National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. Radionuclide analyses included Radium 226 and 228; Uranium 234, 235, and 238; and Thorium 227, 228, 230 and 232.

A summary of the sampling information for this project is presented in Table 1. The sampling time identified for a grab sample in the table is the time at which sampling began at that location. Table 2 lists the types of sample bottles and preservatives used during this sampling project for each analysis. Photographs of the five sampling locations are included as Appendix A.

1.4 Sample Custody and Shipping Information

Sampling was performed by Mark Moloney, U.S. EPA Region 5, OECA - Cleveland Office and Mark Conti, U.S. EPA Region 5, OECA - Cleveland Office. All samples were tagged, put in a sealed plastic bag and placed in a cooler. After being sealed in coolers with a custody tag, the samples were shipped via United Parcel Service to U.S. EPA NAREL for analysis. Copies of the chain-of-custody forms are included as Appendix B.

2. SAMPLING RESULTS

The samples were analyzed by the U.S. EPA National Air and Radiation Environmental Laboratory in Montgomery, Alabama. The methods used by this laboratory to analyze the samples collected during this project are shown below.

Actinides (Uranium) by Extraction Chromatography – Analysis Procedure: NAREL U-EICHROM
Radium-228 in Environmental Matrices – Prep Procedure: NAREL RA-03; Analysis Procedure: NAREL Ra-05
Radium-226 in Environmental Matrices – Analysis Procedure: NAREL Ra226-EICHROM
Actinides (Thorium) by Extraction Chromatography – Analysis Procedure: NAREL TH-EICHROM
Total Metals – SW846 6020A

Table 3 contains field measurements (temperature, pH and conductivity) made by U.S. EPA personnel during this sampling project. Table 4 contains metals results. Table 5 contains radionuclide results. Further information regarding the sample analyses can be found in the laboratory analysis reports included in Appendix C. Radionuclide results are presented graphically in Appendix D.