

## **Corrective Action Framework**

**Respondent:** OXY USA, Inc.

**Facility Name:** Former Cities Refinery

**Address:** 2500 Rear East Chicago Avenue

**City, State:** East Chicago, Indiana

**EPA ID:** INR 000 123 927

**Adopted Date:** 06/04/2020

**Revision Date:** TBD

The Corrective Action Framework (CAF) is a tool intended to summarize the goals and expectations of the U.S. Environmental Protection Agency – Region 5 (EPA) and OXY USA, Inc. (OXY) (Respondent) that will facilitate performance of Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Former Cities Service Oil Company (Cities) Refinery (Former Refinery). This CAF is part of and incorporated by reference into an Administrative Order on Consent (AOC) between EPA and OXY titled, OXY Refinery Facility, East Chicago, Indiana (RCRA-05-2020-0006) and dated January 24, 2020. The CAF is not a legally binding document and does not alter any legal requirements under any permit or order applicable to the Former Refinery. Nor is the CAF a substitute for a permit or order. The CAF is not expected to address every technical or administrative aspect or detail of the RFI. Rather, the CAF describes the discussions that took place during the CAF meeting held on March 12, 2020 or any subsequent meetings. The CAF also documents material exchanged during the CAF meeting(s), which are necessary for the RFI to efficiently commence. Note that this CAF is a “living document” and is subject to change considering new information or data. The CAF will be updated to reflect goals and expectations concerning the RFI as the project progresses.

The development and implementation of the corrective action will follow the process and meet the objectives outlined in this CAF. Relevant EPA guidance documents which may include, as appropriate to the facts and data of the case: the Documentation of Environmental Indicator Determination Guidance (Feb. 5, 1999); relevant portions of the Model Scopes of Work for RCRA Corrective Action and the RCRA Corrective Action Plan, OSWER Directive 9902.3-2A (May 1994); the Resource Conservation and Recovery Act Facilities Investigation Remedy Selection Track (RCRA FIRST) A Toolbox for Corrective Action; and EPA’s risk assessment guidance shall be considered during the development and implementation of the corrective action.

EPA may require supplemental information or investigation from OXY if EPA determines that any submission required under the general steps outlined in this CAF process does not provide an adequate basis to:

- (a) Determine all current human exposures to contamination at or from the Former Refinery are under control;
- (b) Determine groundwater contamination migration is stabilized; or
- (c) Select interim corrective measures that will protect human health and the environment from the release of hazardous waste and hazardous constituents at or from the Former Refinery.

The steps of the anticipated corrective action process are described below. Each of the steps builds on information developed in prior steps.

At each stage, the parties will typically begin by discussing the results of prior steps, and the impact of those results on the next measures needed to achieve the corrective action objectives. The parties may agree that upcoming steps as outlined below may be modified, consolidated, truncated, or expedited based on the results of previous steps in the corrective action process.

Where possible the nature, extent, objectives, deliverables, and timing necessary for each step of the work will be developed by consensus at an initial scoping/planning meeting or meetings. Based on that consensus, the Respondent will develop a work plan for EPA review and approval.

If the parties do not reach full consensus within the timeframes described below (or as revised by subsequent agreement of the parties), the parties may jointly decide to elevate consideration of disputes over fundamental issues they have not been able to resolve, in order to receive input and direction from senior management.

## **I. CAF Meeting Participants**

The CAF meeting was attended by:

- Mike Beedle, EPA
- Todd Gmitro, EPA
- Renee Wawczak, EPA
- Scott Buckner, CITGO
- Rick Passmore, OXY
- Mike Tomka, GHD

## **II. Historical Site Characterization**

CITGO and OXY USA, Inc. are proceeding under separate AOCs and CAFs for their respective portions of a contiguous property that was once owned by Cities. In this CAF, appropriate reference will be made when referring specifically to the CITGO Terminal, not covered by this CAF, or the Former Refinery, covered by this CAF, of the former contiguous property.

This section provides a discussion of the overall property history, a physical property description, and a summary of previous investigations. These topics will help provide some overall context to the CAF and will help guide the RFI.

### **a. Overview of Property History**

From approximately 1929 to 1983, Empire Refining Company, and then Cities, or subsidiaries of Empire or Cities operated a refining and bulk storage terminal complex consisting of approximately 322 total acres (see Figure 1) [note: Preliminary Assessment/Visual Site Inspection (PA/VSI) refers to 300 acres], of which the crude oil

refinery operations were located on portions of the 93.5 acre Former Refinery. The refining operation ceased on or about 1972. The bulk storage terminal continued to operate subsequent to closure of the refinery and has been owned and operated by CITGO since 1983.

The 93.5-acre Former Refinery owned by OXY is bounded to the north and east by the CITGO Terminal, and to the west and south by a mix of commercial/industrial uses or vacant land. The Gary/Chicago International Airport is located to the east of the Former Cities Refinery.

b. Environmental Characteristics

Approximately 4,500 feet of consolidated bedrock, consisting of sandstones, carbonates, and shale, overlie Precambrian basement rock in northwest Indiana. The most recent stage of glaciation deposited a clay till on the surface of the bedrock. As Lake Michigan water levels fluctuated over time, a series of beaches and dunes were formed, which accounts for the deposition of thick sand deposits in the area. The water table is generally less than 6 feet deep in the area with little groundwater flow, although groundwater in the area generally flows toward the Grand Calumet River and Lake Michigan.

The land surrounding the Former Refinery is mainly industrial/commercial with some residential homes immediately adjacent to the western property boundary. The Gary Municipal Airport Air Operations Area (AOA) boundary is about 1 mile to the east of the Former Refinery. No drinking water wells are present on the Former Refinery. Additionally, no drinking water wells were identified within a 1-mile radius of the Former Refinery. Drinking water for the area is obtained from Lake Michigan. The chief water bodies in Lake County are the Grand Calumet River, Lake Michigan, and Wolf Lake, a large recreational lake. Surface water in the area is used for recreational purposes. The primary pathways of concern from the Former Refinery are surface water, which discharges to storm sewers and then to the Grand Calumet River; and onsite groundwater and non-aqueous phase liquid (NAPL) contamination which may move offsite.

c. Solid Waste Management Units/Areas of Concern

The CITGO Terminal PA/VSI dated December 2, 1991, identified three solid waste management units (SWMUs), and two areas of concern (AOCs). Since the PA/VSI concerned the CITGO Terminal and the refinery had been dismantled, none of the SWMUs or AOCs were identified at the Former Refinery. For the purposes of this investigation and CAF, the Former Refinery is considered an AOC. Different operational areas of the Former Refinery are listed below.

d. Former Operational Areas

The following presents the former operational areas at the Former Refinery:

- Coke Disposal Area
- Reformer Area
- Delayed Coking Unit Area
- #2 Fuel Oil Hydro Treating Unit
- Catalytic Cracking Unit Area
- Light Oil Pump House
- Treating Plant Area
- Crude Unit Area
- Former Alkylation Unit Area

Refer to Figure 2 for the locations of the former operational areas.

e. Previous Releases and Waste Management

Over time, waste streams have been generated and managed at the Former Refinery. These events are documented below:

Interim Measures:

In 1981, Cities removed and disposed of approximately 15,000 cubic feet of asbestos-contaminated waste material (from an unspecified location at the Former Refinery and/or CITGO Terminal) at an off-site landfill as approved by the Indiana Environmental Management Board (IEMB).

In 1982, Cities removed and disposed of approximately 600 cubic yards of asbestos piping insulation from an unspecified location at the CITGO Terminal and/or Former Refinery. The asbestos waste was disposed of at an off-site landfill as approved by the IEMB.

In 1981 or 1982, Cities stored and disposed of approximately 342,000 gallons of oil saturated tank bottoms at an off-site landfill as approved by the IEMB. The waste was generated because of clean-up operations at the abandoned refinery site.

In 1981, Cities disposed of approximately 425,000 gallons of opaque water and oil emulsion from an unspecified location at an off-site landfill as approved by the IEMB.

In 1982 or 1983, Cities disposed of approximately 3,700 cubic yards of API separator sludge (K052) (CITGO Terminal property) at an off-site landfill as approved by the IEMB. It appears that the sludge was classified as K052 because this may have been the first cleaning of the oil/water separator following the discontinuation of the refinery operations.

In 1984, Cities disposed of approximately 1,700 cubic yards of oil-saturated soil from the CITGO Terminal at an off-site landfill.

In May 2008, approximately 1,500 feet of sewer lines were jetted, removing 110,000 gallons of oil/water from the industrial sewer system. The liquid was collected and disposed of off-site.

f. RCRA Regulatory History

Cities submitted a Notification of Hazardous Waste Activity Form as a generator of hazardous waste on August 18, 1980. This notification listed Cities' waste as ignitable and toxic. Subsequent manifests coded the waste as D001 and D008 (lead).

On November 19, 1980, Cities submitted another Notification of Hazardous Waste Activity Form, amending its original notification to indicate that the Former Refinery was storing waste for greater than 90 days. When the original notification was submitted, Cities planned to have already closed Tank No. 195, which contained 149,000 gallons of oil and water emulsion waste (D001, D008). By November 19, 1980, the tank had not been closed, and Cities applied for interim status as a storage facility by submitting a Part A Permit Application for the storage of waste contained in this tank.

In March 1981, EPA inspectors conducted a RCRA compliance inspection of Cities as a generator of hazardous waste. No major violations were discovered in the inspection. In May 1981, after reviewing the inspection report, EPA determined that Cities would no longer operate as a treatment, storage and disposal (TSD) facility. On March 18, 1983, CITGO took over operations of the terminal portion. CITGO submitted a Notification of Hazardous Waste Activity Form on November 28, 1983, as a generator of hazardous waste.

g. Other Permitted Activities

Air Permits:

There are no air permits associated with the Former Refinery.

Wastewater Permits:

There are no wastewater permits associated with the Former Refinery.

h. Access or Physical Constraints

Access may be obtained through coordination with the Former Refinery project manager.

i. Other Potential Areas of Investigation Based on Facility History

Prior to 1980, Cities used a surface impoundment and/or land farm, located across Cline Avenue for sludge disposal from its oil/water separator. Cities submitted a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) notification for the site in June 1981. The impoundment has not been used since the mid-

1970s. The site (IND 980 607 469) is no longer owned by CITGO or OXY. Remediation of this property and releases from this property to the Cline Avenue ditch are being addressed under a separate AOC between EPA and OXY.

j. Other

There does not appear to be any other information, reports, or agreements (e.g., Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] or state cleanup actions) related to the characteristics and history of the Former Refinery that are not covered under the above headings. This section may be amended in the future if additional information, reports, or agreements become available.

### III. Conceptual Site Model

The following section outlines the Baseline Conceptual Site Model (CSM), based on the information provided in the Investigation Results Report – Phase I dated October 31, 2019.

a. Current and Future Site Land Use

Current Land Use: None

Projected Future Land Use: Industrial or Commercial

b. Current and Future Surrounding Property Land Use

The current and future land use surrounding the property includes mixed residential, commercial, industrial with limited recreational usage.

c. Sources and Extent of Known Contamination

Sources of contamination could include hazardous waste or hazardous constituents from former petroleum refinery related operations. Previous investigations have identified the presence of select volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Sufficient data is not currently available to conclusively determine the extent of contamination. The extent of impacts of VOCs, SVOCs, 1,4-dioxane, and metals will be confirmed in subsequent phases of the RFI.

d. Contamination Transport/Migration Pathways

Contaminant transport and migration pathways include the following:

- Hydrocarbon and light non-aqueous phase liquid (LNAPL) migration through the subsurface to groundwater
- Groundwater to surface water (Grand Calumet River)
- Hydrocarbon vapor intrusion potential

e. Geology

Phase I investigation results, historical stratigraphic logs, and soil particle size analysis identify values characteristic of silty sand across both the CITGO Terminal and Former Refinery. Baseline stratigraphy is as follows:

- Shallow Fill: 0-2 feet bgs
- Silty Sand (SP-SM): 0-35 feet bgs
- Clay confining layer at 35 feet bgs

f. Hydrogeology

Phase I investigation results and historical investigations on both the CITGO Terminal and Former Refinery properties, support the following:

- Unconfined water table is generally present from approximately 1.5 to 5.5 feet bgs
- Subsurface utilities are present at the Facility
- Groundwater flow is generally to the south, however, the shallow water levels measured from historical wells were generally limited to select areas of the Facility. Shallow water levels were obtained from the Hydraulic Profiling Tool (HPT) data collected during the Phase I investigation.
- Groundwater flow velocity has been calculated at the Facility ranging from 0.01 to 0.055 feet/day; based on hydraulic conductivity (K) values ranging from 0.947 to 2.49 feet/day, hydraulic gradient (i) with average values ranging from 0.0028 to 0.0044 foot/foot, and porosity values ranging from 20% to 25% (based on assumed typical average porosities of the unconfined aquifer)

Groundwater flow direction is to be confirmed in subsequent phases of the RFI.

g. Exposure Receptors

Potential on-site exposure receptors include:

- Routine workers
- Maintenance or construction workers
- Trespassers

Potential off-site exposure receptors include:

- Routine workers
- Maintenance or construction workers
- Trespassers
- Residential

Potential off-site ecological receptors include:

- Natural area to the south
- Grand Calumet River

Exposure Point and Exposure Mediums include:

- Surface soil
- Subsurface soil
- Groundwater
- Indoor air

h. Exposure Routes

Potential exposure routes include:

- Soil dermal direct contact
- Soil or groundwater ingestion
- Soil vapor inhalation from contaminated soil or groundwater
- Inhalation of fugitive dust

It is noted that institutional or engineering controls will be employed to prevent exposure by any of these potential exposure routes, and that none of these pathways have been confirmed to exist as of this date but will continue to be investigated as part of the RFI.

i. Discussion of Unknowns and Uncertainty

The delineation of Constituents of Potential Concern (COPCs) is currently unknown and ongoing. Historical data and knowledge are being used to design a biased sampling plan for the Former Refinery.

The current COPCs, as supported by historical investigations, for soil and groundwater are as follows:

- Target compound list (TCL) VOCs (Method 8260),
- TCL SVOCs (Method 8270),
- Target analyte list (TAL) metals (Method 6010/7470) and
- 1,4-dioxane

## **IV. RFI**

a. Objectives of the Investigation

Scope and objectives of the investigation include characterization of the nature and extent of releases of hazardous waste and hazardous constituents at or from the Former Refinery that may pose an unacceptable risk to human health and the environment. The



RFI will be completed in a phased approach.

CITGO and OXY may coordinate efforts to increase efficiency and avoid duplication for elements of the corrective action of relevance to both parties. CITGO and OXY are proceeding under separate AOCs and CAFs for their respective portions of the property that was once owned by Cities.

b. Work Performed

CITGO and OXY jointly conducted a soil and groundwater screening investigation as set forth in the Site Perimeter Screening Investigation Work Plan dated April 5, 2019 (approved by EPA). The investigation utilized real-time field screening technologies designed to qualitatively detect polycyclic aromatic hydrocarbons (PAHs) and VOCs, using laser-induced fluorescence (LIF) and membrane interface probe (MIP). The Phase I screening investigation was conducted in May 2019, however due to unforeseen circumstances, (such as weather, access restrictions, equipment limitations, and safety concerns) the full scope was not completed. In August 2019, CITGO and OXY jointly conducted a supplemental screening investigation.

On September 24, 2019, CITGO and OXY met with EPA to present the Phase I results.

On October 31, 2019, CITGO and OXY submitted the Investigation Results Report – Phase I. The Phase I investigation results allowed for the completion of the Baseline CSM and will be utilized to guide additional investigation activities. Refer to the Investigation Results Report – Phase I for details on the Phase I methodology, results, and the Baseline CSM.

c. RFI Work Plan (including Sampling & Analysis Plan and Quality Assurance Project Plan)

The Respondent submitted an RFI Work Plan to EPA dated February 25, 2020, for review and approval. The RFI Work Plan (including sampling locations, vertical extent of sampling, density of sampling, and screening data), shall be reviewed and approved by EPA consistent with the approved CAF systematic planning process.

The soil and groundwater sampling design and procedures shall be consistent with applicable guidance, including but not limited to: Soil Screening Guidance (EPA 1996, 2002); Guidance on Choosing a Sampling Design for Environmental Data Collection (EPA 2002); and Incremental Sampling Methodology [Interstate Technology and Regulatory Council (ITRC) 2012]. Sample analysis must include the COPCs identified in Section IV(f). Contaminants of concern found above EPA-approved screening criteria must be fully delineated unless the parties agree otherwise.

Additional phases of the RFI may be required to:

- (1) Describe the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Former Refinery
- (2) Determine whether each release poses an unacceptable risk to human health and

the environment

- (3) Provide the basis for those conclusions, including an evaluation of the risks; and
- (4) Provide a basis for developing the final corrective measures for the Former Refinery

Additional phases may include an off-site groundwater and/or vapor intrusion investigation, if needed. Subsequent sampling locations, vertical extent of sampling, and density of screening data shall be reviewed and approved by EPA consistent with the approved CAF systematic planning process.

#### Sampling and Analysis Plan:

To support the several stages of the investigation, Respondent will develop a Sampling and Analysis Plan (SAP). Unless the parties agree otherwise, the SAP will include procedures to assure quality data is gathered in all stages of the corrective action, including real-time field screening technologies, and more conventional soil and groundwater sampling and analytical techniques. The SAP is included as Appendix A in the RFI Work Plan dated February 25, 2020.

#### Quality Assurance Project Plan:

Respondent will consider EPA's Data Quality Objectives Process to develop reliable data to determine the nature and extent of any soil and groundwater contamination when preparing the SAP. See Guidance for the Data Quality Objectives Process (EPA 1994).

The Quality Assurance Project Plan (e) is included as Appendix B in the RFI Work Plan dated February 25, 2020. The QAPP addresses sample analysis and data handling regarding the Work under corrective action orders, establishing Data Quality Objectives and Standard Operating Procedures to be employed during the investigation. The QAPP must include a detailed explanation of Respondent quality assurance, quality control, and chain of custody procedures for all sampling, monitoring, and analytical activities. The QAPP may be supplemented to address subsequent phases of sampling.

The QAPP will be developed consistent with "EPA Requirements for Quality Assurance Project Plans," QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans," QA/G-5, EPA/240/R 02/009, (Dec. 2002), and "Uniform Federal Policy for Quality Assurance Project Plans," Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005), or other applicable guidance as the parties agree. The QAPP must be reviewed and revised by Respondent, at a frequency of no less than five years, and updated as needed to reflect changes in project personnel and scope.

The SAP and the QAPP shall be reviewed and approved by EPA consistent with the approved CAF systematic planning process.

Field activities will begin within 60 days of EPA approval of the RFI Work Plan.

Once the Site has been sufficiently characterized to identify the nature and extent of contamination at or from the Facility that may pose an unacceptable risk to human health and the environment (including evaluation of potential cross-media contamination), an RFI Report will be prepared and submitted to EPA for review and approval no later than October 1, 2021 (unless EPA agrees to extend that deadline). The RFI Report will describe the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Facility that do or do not pose an unacceptable risk to human health and the environment, and provide the basis for those conclusions, including an evaluation of the risks. The investigation shall include a consensus driven balance between qualitative and quantitative high-resolution investigation techniques. The investigation may proceed in phases, as appropriate, to provide timely support for any interim corrective measures the Respondent may elect to perform.

d. Screening Levels

The RFI investigation will include sampling sufficient to define the vertical and horizontal extent of COPC-impacted soil and groundwater to the 2019 IDEM screening and closure tables, which are based on the 2018 EPA Regional Screening Levels (RSLs) (residential at property boundary and industrial at the Former Refinery). For chemicals with maximum contaminant levels (MCLs), they will be used in lieu of IDEM screening levels for drinking water. COPC impacts will be delineated to residential land use criteria at the property boundary, but any corrective actions will consider actual land use (i.e., industrial, on site) and may incorporate institutional/engineering controls to eliminate potential exposure pathways.

IDEM published background levels for metals may be used to segregate Former Refinery-related risk from background risk.

e. Adaptive Approach

An adaptive approach should be used in the RFI Work Plan to identify flexible and adaptable sampling approaches (e.g., iterative sampling) that could improve the efficiency and timeliness of the investigation by reducing the number of field mobilizations and/or exchanges between parties during phases of the investigation (dynamic strategies and high resolution). Decisions on the need for further data collection will be made by professional judgment based on the quantitative and qualitative evaluation results, and in consultation with the EPA.

f. Sampling Analysis

Characterization will include analysis for the following COPCs: initial screening will include TCL VOCs (Method 8260), TCL SVOCs (Method 8270), TAL metals (Method 6010/7470), and 1,4-dioxane. The COPCs may be reduced during subsequent phases of the RFI, as agreed to by the parties.

g. Modeling

Risk assessment models may be used, if appropriate, based on Former Refinery conditions. The types of models, assumption, and use of models will be discussed with the EPA.

h. CSM

Using all sampling data from the Former Refinery and informed by information about historical operations and physical setting of the Former Refinery, Respondent will create and maintain a project lifecycle CSM. EPA's systematic planning process - the Environmental Cleanup Best Management Practices: Effective Use of the Project Life Cycle Conceptual Site Model (EPA 2011) shall be considered in the preparation of the CSM. A Baseline CSM was included in the Investigation Results Report – Phase I dated October 31, 2019 and will be updated following subsequent phases of the RFI.

The CSM will identify all locations at the Former Refinery for which Respondent knows of present or past treatment, storage, disposal, or management of hazardous waste or hazardous constituents and describe the current conditions at said locations. The CSM must include a data management and visualization plan. Respondent will update the CSM regularly to reflect additional data collection. CSM updates may be completed utilizing the RCRA First Tool 5: Conceptual Site Model Iterative Evaluation/Update Tool.

After each stage of data collection, EPA will discuss with Respondent whether the following Environmental Indicators have been achieved, and if not, what measures may be appropriate to achieve these benchmarks:

- All current human exposures to contamination at or from the Former Refinery are under control. That is, there are no significant or unacceptable exposures for any media known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above risk-based levels and for which there are complete pathways between contamination and human receptors.
- Migration of contaminated groundwater at or from the Former Refinery is stabilized, that is, the migration of all groundwater known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above acceptable levels is stabilized to remain within any existing areas of contamination as defined by monitoring locations designated at the time of the demonstration. In addition, any discharge of groundwater to surface water is either insignificant or currently acceptable according to an appropriate interim assessment.

The parties will work together consistent with the approved CAF systematic planning process to demonstrate and document achievement of these Environmental Indicators as promptly as possible.

i. Risk Assessment

All Work Plans for each stage of the investigation must identify or reference CAF-approved risk screening criteria appropriate for current and potential future use scenarios. The Former Refinery will be evaluated for commercial/industrial use, although some neighboring areas beyond the perimeter are residential. Each step of the investigation must evaluate releases for their potential to pose unacceptable risk to human health and the environment. Risk assessment approaches will be part of the parties' initial discussions at each stage of the process.

Any risk assessments must estimate human health and ecological risk under reasonable maximum exposure for both current and reasonably expected future land use scenarios. In conducting the risk assessments, Respondent will consider the Risk Assessment Guidance for Superfund (RAGS) or other appropriate EPA guidance. Respondent will use appropriate conservative screening values when screening to determine whether further investigation is required. Appropriate screening values, which will be determined by EPA after consultation between EPA and OXY, may include those derived from Federal MCLs, EPA RSLs for Chemical Contaminants, EPA Region 5 Ecological Screening Levels, RAGS, OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air Publication 9200.2-154, Indiana Screening Levels, and EPA technical documents and tools.

If volatile or semi-volatile organic compounds discovered in soil or groundwater exceed the 2019 IDEM screening and closure tables values in locations with regularly occupied buildings, Respondent must also submit a vapor intrusion investigation work plan for EPA review and approval. Soil, groundwater, and NAPL vapor intrusion will be assessed using the OSWER June 2015 VI Technical Guidance 9200.2-154 and Documentation for EPA's Implementation of the Johnson and Ettinger Model to Evaluate Site Specific Vapor Intrusion into Buildings, version 6.0, September 2017. For the purposes of evaluating and addressing the vapor intrusion to the indoor air inhalation pathway in connection with any release of petroleum, the process outlined in the ITRC Petroleum Vapor Intrusion Guidance Document (PVI-1, Oct 14) may be followed. Occupational exposure limits will be used to assess on-Former Refinery worker exposures which are subject to Occupational Safety and Health Administration (OSHA) regulations. RME risk estimates will be used for off-Former Refinery exposures. They will also be developed for future on-Former Refinery worker exposures to evaluate vapor intrusion risks in the hypothetical scenario in which the Former Refinery is no longer subject to OSHA regulation. If and when Respondent first receives verified data showing an exceedance, it will promptly notify EPA, and within 60 days of that notice, the project managers and other appropriate persons will meet to discuss the scope, expectations, timing, and objectives for the Vapor Intrusion Investigation Work plan. These discussions will consider current and reasonably anticipated future uses of property potentially requiring assessment and management of potential vapor intrusion issues. Since there are no occupied buildings on the property, indoor air exposure is not an applicable exposure route.

j. Use of Historical and Third-Party Site Data

No third-party data has been agreed to be used as part of the Former Refinery characterization activities.

k. Health and Safety Plan

A site-specific Health and Safety Plan (HASP) has been prepared for the Former Refinery.

l. Community Involvement and Environmental Justice

The Respondent has established a public repository at the public library located at 2401 East Columbus Drive, East Chicago, Indiana for information regarding site activities, and conduct public outreach and involvement activities. Information can also be found on the public EPA webpage at:

<https://www.epa.gov/hwcorrectiveactionsites/hazardous-waste-cleanup-former-cities-service-refinery-east-chicago-indiana>.

m. Administrative Requirements

Respondent will provide quarterly progress reports to EPA by the fifteenth day of the month after the end of each quarter. The report will list work performed to date, data collected, problems encountered, any community involvement, project schedule, and percent project completed.

The parties will communicate frequently and in good faith and will meet (either by phone or in-person) on at least a semi-annual basis to discuss the work proposed and performed as part of the RFI.

Respondent will consider green remediation best management practices when developing remediation plans and activities. Respondent will document such consideration in reports, documentation, and plans Respondent submits to EPA. This includes, but is not limited to, consideration of green remediation practices for site investigation, excavation, and surface restoration, integrating renewable energy into site cleanup, soil vapor extraction and air sparging, pump and treat technologies, landfill cover, and energy production activities, as applicable.

Respondent will consider job creation, both temporary and permanent, when developing remediation plans and activities. Respondent will report on number and types of jobs created in reports, documentation, and plans Respondent submits to EPA.

n. RFI Schedule

April 5, 2019: The Phase I Screening Investigation Work Plan was submitted to EPA and was subsequently approved.

May 2019: Phase I Screening Investigation field activities were completed. The full scope of work was not completed during this field mobilization.

August 2019: Supplemental Phase I Screening Investigation field activities were completed.

September 24, 2019: CITGO, OXY, and EPA project managers met to discuss the results of the Phase I Soil and Groundwater Screening Investigation.

October 31, 2019: CITGO and OXY submitted a data report for the Phase I screening investigation activities, including a Baseline CSM.

February 25, 2020: OXY submitted an RFI Work Plan, including a SAP and QAPP, for EPA review and approval.

Within 45 days of the effective date of the order, OXY and EPA project managers will meet to discuss the expectations, level of detail, timing, and objectives for the CAF and provide to EPA for review and approval a draft CAF. A conference call between OXY and EPA was held on March 12, 2020.

Within 60 days of EPA approval of the Work Plan: RFI field activities begin.

By no later than October 1, 2021: Provide an investigation report to EPA for review and approval (unless EPA agrees to extend that deadline) to describe the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Facility that do or do not pose an unacceptable risk to human health and the environment, and provide the basis for those conclusions, including an evaluation of the risks.

This CAF will be revised considering new information or data, to reflect the progress of the work, and if subsequent phases of the RFI are required to provide timely support for any interim corrective measures the Respondent may elect to perform. Subsequent proposed phases shall be reviewed and approved by EPA consistent with the approved CAF systematic planning process.

## **V. Interim Measures**

Previous interim measures have been described in Section II above. No additional interim measures are identified at this time but may be implemented with EPA consent if deemed necessary.

Respondent may propose to conduct interim corrective measures in advance of the final corrective measures. Interim corrective measures may include, but are not limited to, measures necessary to control human exposures to contamination or to stabilize the migration necessary to control current human exposures to contamination or to stabilize the migration of contaminated groundwater. At least 90 days prior to commencing any proposed interim corrective measures, Respondent must submit a work plan and a project schedule for EPA review and approval. The EPA Project Manager(s) will determine whether any public participation activities are appropriate prior to acting on the request for

approval.

## **VI. Goals and Expectations**

Prior to and during the CAF meeting, EPA and OXY identified the following goals and expectations:

a. Land Use/Reasonably Expected Future Use in Relation to Characterization and Remediation

Future on-site land use expected to be limited to prohibit residential use as defined by Indiana law. An environmental covenant will be executed to ensure non-residential future use.

b. Existing Background Conditions and Consideration in RFI

Background metal characterization or use of metals background data approved by IDEM may be used in the RFI.

c. Use of Historical and Third-Party Site Data

Existing data from previous investigations may be used for site characterization in the RFI. EPA will consider environmental data collected from adjacent property owned or leased by third parties.

d. Groundwater Use/Process for Addressing Groundwater Contamination, including State, Federal, and Local Requirements

No drinking water wells are present on the Former Refinery. Additionally, no drinking water wells were identified within a 1-mile radius of the Former Refinery. The RFI and any corrective measures will consider actual and potential future groundwater use in the area including, but not limited to, off-site sources of contamination and local use restrictions. At present, the City of East Chicago does not have an existing environmental ordinance prohibiting the use of groundwater as potable. An environmental covenant will be executed prohibiting the use of groundwater as a potable source.

e. Vapor Intrusion

Vapor intrusion will not be assessed on site due to the absence of regularly occupied buildings. Vapor intrusion mitigation systems may be required in future institutional controls. Depending on groundwater and/or soil gas data from the RFI, off-site vapor intrusion assessments may be necessary.

f. Ecological Assessment

Currently no habitat is present at the Former Refinery; therefore, no ecological assessment is required.



g. Coordination with Other Programs

Corrective action will be coordinated with IDEM, as necessary.

h. Risk Range Issues (Target Cancer Risk and Non-Cancer Hazard Index)

Off-site risk assessments will be based on a cumulative cancer risk of 1E-4 to 1E-6 and a non-cancer hazard index of 1. On-site risk assessments will be based on a cumulative cancer risk of 1E-4 and a non-cancer hazard index of 1.

i. Expected Process for Addressing Remediation

The RFI will include an investigation to sufficiently characterize source areas of contamination including NAPL.

j. Source Removal vs. Source Control (Containment)

Source removal versus source control will depend on locations of impacts and the collection of additional data. Source areas which contribute to ongoing groundwater contamination may be removed or remediated. Off-site contamination in soil above residential risk criteria may be removed to the extent feasible.

k. Use of Institutional Controls and/or Engineering Barriers

Institutional controls and engineered barriers may be used to prevent exposure. Institutional controls may include soil management plans for areas above industrial risk criteria. Pathway elimination approach (environmental restrictive covenant) is likely to be employed to address prohibitions on potable use of groundwater and future non-residential uses. Institutional controls and engineered barriers will comply with IDEM regulations.

l. Format for Data/Information Exchange/Submissions

EPA believes electronic submittals will be sufficient for purposes of review. Report copies can be submitted in electronic format via electronic mail, on USB Flash Drives or can be uploaded to a document sharing website created by Respondent. If any deliverables include maps, drawings, or other exhibits that are larger than 8.5 inches by 11 inches, Respondent shall also provide EPA with paper copies of such exhibits. Routine correspondence between technical experts can be accomplished via electronic mail. The Respondent has established a public repository at the public library located at 2401 East Columbus Drive, East Chicago, Indiana for information regarding site activities, and conduct public outreach and involvement activities. Information can also be found on the public EPA webpage at:

<https://www.epa.gov/hwcorrectiveactionsites/hazardous-waste-cleanup-former-cities-service-refinery-east-chicago-indiana>.