Clifton

14 January 2022

Attention: Mr. Geoff Houston (gehouston@suncor.com)
Company: Suncor Energy Product Partnership
Address: Box 1720, Station N
Calgary, Alberta T4P 0A2

Remedial Options Analysis
Hounsfield Heights Area
1620 – 14th Avenue NW
Calgary, Alberta

File CG3418/ 013

1.0 Introduction

Clifton Engineering Group Inc. (Clifton) was retained by Suncor Energy Products Partnership (Suncor) to perform a Remedial Options Analysis (ROA) in support of the Revised Remediation Plan (Version 3.0) dated 31 March 2021. The Revised Remediation Plan (Version 3.0) stated the following:

> *To further assess the potential implementation of additional active remedial measures in Lion's Park and the community of Hounsfield Heights as a means of plume expansion control, a remedial options analysis will be completed. The remedial options analysis will screen a variety of remedial methods which could potentially be targeted for select areas that are exhibiting increasing trends in the CoPCs or are displaying relatively higher concentrations of the CoPCs. These additional measures would be targeted either within Lion's Park or the community of Hounsfield Heights with the goal of supporting natural attenuation by reducing the concentrations in these areas in an expedited manner. The screening analysis would consider a variety of factors including, but not limited to, technology effectiveness, technology feasibility and impact and disruption to the local area. This task is scheduled to begin in the first quarter of 2021.*

The purpose of focussing the ROA on areas within Lion's Park and the community of Hounsfield Heights is pursuant to Item 6 of the Ministerial Order 09/2020, which states the following:

> *"6. Within 3 months of the date of the Ministerial Order issues in EAB Appeals 17-069-070 and 18-012, the Parties shall file an amended Remediation Plan for review and approval with the Director. The amended Remediation Plan shall make the remediation in the Hounsfield Heights neighbourhood and Lions Park the first priority for any active remediation. The amended Remediation Plan shall include a schedule of implementation."*

The Revised Remediation Plan (Version 3.0) and the Ministerial Order 09/2020 relate to the subsurface soil, soil vapour, and groundwater contamination which originated at the former service station located in the North Hill Mall area and migrated to the south beneath Lion's Park and the community of Hounsfield

Heights. Throughout this report, the term Site will be used to define to original source zone (North Hill Mall area) and surrounding areas, including, Lion's Park, and the community of Hounsfield Heights. A Site Location Plan and Surrounding Land Use map has been presented as Figure 1 of the attachments.

2.0 Background

The current location of the North Hill Shopping Centre Kal-Tire was originally developed as a service station and automotive centre in 1958. The service station was located at the Shopping Centre on a property owned by Sears and operated as a Sears Service Centre from 1958 to 1984. From 1984 to 1995, the facility was operated under license as a Sunoco Service Station. An addition to the automotive centre building was constructed in 1982, and a separate gas bar kiosk was added in 1989. The original underground storage tanks (USTs) were replaced in 1984, and in October 1995, fuel storage and dispensing facilities at the gas bar were decommissioned. The former Sears Service Centre continues to operate under license to Kal-Tire.

Following the decommissioning of the service station in 1995, several environmental site assessments (ESAs) were completed across the entire Site which revealed the presence of Petroleum Hydrocarbons (PHCs) within the soil and groundwater, in addition to Liquid Petroleum Hydrocarbons (LPH). The PHCs and LPH are suspected to have resulted from a release from the USTs associated with the former automotive service station on the previously owned Sears property. A detailed description of the Environmental Site Assessments (ESAs) completed between 1995 and 2012 is presented in the *Updated Site Management Plan (2014) – North Hill Mall Area, Calgary, Alberta* (22 September 2014) and the *Updated Site Management Plan (2014) Final Version, Hounsfield Heights – Briar Hill Community, Calgary, Alberta* (11 July 2014). A description of the environmental work, or reference to the environmental work, completed between 2012 and 2021, is presented in the Revised Remediation Plan (Version 3.0), 31 March 2021.

All reports referenced above can be accessed for review through the Alberta Environment and Parks (AEP) Environmental Site Assessment Repository database by entering a PBL search for Plan 8210266.

3.0 Current Remedial Approach

As part of the Revised Remediation Plan (Version 3.0), the contamination at the Site is being remediated through the use of a dual phase vapour extraction (DPVE) system which is operating in the north portion of Hounsfield Heights, a permeable reactive barrier (PRB) installed along 11th Avenue NW and through the processes of natural attenuation. The DPVE system consists of extraction wells installed in the alleyway along 13th Avenue NW and along 16th Street NW and the alleyway between 15th Street and 16th Street NW. The DPVE system has been operating since 2011. A detailed analysis of the performance of the DPVE was documented in the Clifton report *Liquid Petroleum Hydrocarbon Assessment* (29 June 2021). The PRB consists of PlumeStop® which is an activated liquid carbon barrier which was injected along 11th Avenue NW between 15th Street NW and 16A Street NW. The PlumeStop® barrier was installed in December 2019. The installation was supplemented by co-injecting oxygen release compound (ORC) with the PlumeStop® barrier. Natural attenuation is monitored as part of the semi-annual groundwater monitoring and sampling program.

This ROA is being focused on areas outside of the influence of the current active remedial systems (DPVE and PRB), and within Hounsfield Heights and Lion's Park, which have shown increasing trends of the contaminants of potential concern (CoPCs) or have been categorized as localized "hot-spots".

4.0 Applicable Areas for the ROA

To approach the ROA, Clifton first reviewed the available groundwater data collected from monitoring wells beyond the influence of the DPVE and PRB systems. This groundwater data was then assessed to identify the wells which were showing an increasing trend in concentrations of the CoPCs based on a Mann Kendall Analysis and wells which showed relatively higher concentrations of CoPCs. The monitoring wells (BH1906, BH1907, BH1924, MW6005, and BH1979) which showed relative higher concentrations (>1 ppm for benzene) were considered to represent localized "hot-spots". While monitoring wells BH1907, BH1944, BH1977, BH2005, and BH2006 indicated an increasing trend for either benzene, 1-2-dichloroehtane (1,2-DCA), or both compounds.

These monitoring well locations which either had an increasing trend or are considered "hot-spots" were clustered in two distinct areas, Lions Park (BH1906, BH1907, BH1924, and MW6005) and Hounsfield Heights, south of 11th Avenue NW (BH1944, BH1977, BH1979, BH2005, and BH2006). Figure 2 of the attachments highlights the locations of these monitoring wells.

5.0 Data Gaps

While there have been multiple investigations conducted on the Site, there are still unknowns and assumptions of the current conditions of the soil, groundwater, and soil vapour in select areas of the Site.

6.0 Remedial Objectives

The overall and long-term remedial objective of the Site is to degrade, destroy, or reduce PHC contamination to concentrations below the applicable site guidelines required for regulatory closure. This objective is documented within the Revised Remediation Plan (Version 3.0).

In terms of this ROA, the objectives are to assess potential remedial options which could be applied in areas that have been defined as "hot spots" and/or are showing increasing trends in concentration of the CoPCs. The Technical ROA Objective is to reduce hot-spot concentrations and reverse increasing concentration trends to expedite achieving regulatory closure guidelines within these specific areas. Completing remediation in these specific areas will aid in completion of the overall remedial objectives for the Stie.

If additional remedial measures are implemented at the Site, further Site characterization may be required. In addition, there is the potential need for pilot scale studies, which can help to refine the performance based objectives for the given remedial approach being assessed.

7.0 Remedial Options Analysis

In general, remedial methods fall into two broad categories: i*n-situ* and *ex-situ*. Within each of these broad categories, the methods can be further divided into physical, chemical, biological or a combination of these approaches.

The Site was assessed through a remedial options screening matrix (Tables 1-3). This screening matrix provides a high-level assessment of methods which may be most suitable for the specific areas of the Site.

Only remedial technologies which are technically and logistically feasible and applicable to the CoPCs were assessed. The logistical feasibility considered constraints such as potential access issues and the basis that the Site is located within an infrastructure dense urban area. As an example, an excavation of contaminated soil in the Hounsfield Heights area was not assessed as it would not be feasible to complete due to presence of residential properties, infrastructure, and the depth of contamination.

Based on this, there are four remedial technologies (Soil Vapour Extraction, Chemical Oxidization Injections, Enhanced Biodegradation using Oxygen Release Compound (ORC) injections, and the installation of a Permeable Reactive Barrier (PRB) using Activated Carbon injections supplemented with ORC along the PRB) that were assessed in the screening matrix (Table 2) for Lions Park. There were three remedial technologies (Soil Vapour Extraction, Chemical Oxidization Injections, and Enhanced Biodegradation using ORC injections) that were assessed in the screening matrix (Table 3) for Hounsfield Heights south of 11 Avenue NW.

The remedial approaches were ranked based on their ability to meet technical objectives, effectiveness, duration, relative cost, disturbance, and regulatory acceptance. A ranking system of 0 to 4 was used to provide a relative comparison between the methods, where a 4 represents an optimal result and a 0, a sub-standard result. The ROA ranking system is presented in Table 1 of the attachments.

8.0 Discussion and Conclusions

Through the ROA we have screened a variety of remedial methods that could be utilized on select portions of the Site. These remedial methods were based on the ability to reduce hot-spot concentrations and reverse increasing concentration trends.

Tables 2 and 3 present the ROA screening matrix results. The remedial methods for each area have been ranked below based on the results presented in the matrices.

Lions Park

1. PRB using activated carbon
2. SVE
2. Enhanced Biodegradation (ORC)
2. Chemical Oxidization

South of 11 Avenue

1. Enhanced Biodegradation (ORC)
1. Chemical Oxidization
2. SVE

For each specific area, the remedial methods ranked within one to two points which is reflective of the fact that we only screened remedial options which were feasible and applicable to the Site. If additional remedial measures are implemented on-Site, the selected approach should consider not only the Technical

ROA objectives set forth in this document, but also the overall remedial objectives for the entire Site set forth in the Revised Remediation Plan (Version 3.0).

Lastly, it should be noted that prior to the selection and implementation of additional measures to help expedite remedial progress, a further examination of the applicability of the domestic use aquifer (DUA) pathway across the entire Site will be undertaken. It is anticipated that this work will be completed within the first half of 2022. If the data supports the elimination of the DUA pathway across the Site, the ROA will then be updated to reflect the revised remediation guidelines.

Closure

These remedial options are based on our current understanding of your requirements for this project. We would welcome any questions or comments you may have and look forward to working with you on this project. Should you have any concerns regarding these remedial options or require additional information, please contact our office at (403) 263-2556 or stephen_dabadie@clifton.ca.

Yours Truly,

Clifton

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Permit to Practice P014800

PERMIT TO PRACTICE
CLIFTON ENGINEERING GROUP INC.
RM SIGNATURE:
RM APEGA ID #: 55585
DATE: 2022-01-14
PERMIT NUMBER: P014800
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Attachments

Figure 1 – Site Location and Surrounding Land Use
Figure 2 – Monitor Well Location Plan and Remediation Areas

Table 1 – Ranking System
Table 2 – Remedial Options Screening Matrix – Lions Park
Table 3 – Remedial Options Screening Matrix – Hounsfield Heights South of 11 Avenue NW

Appendix A – Terms and Conditions

Figures

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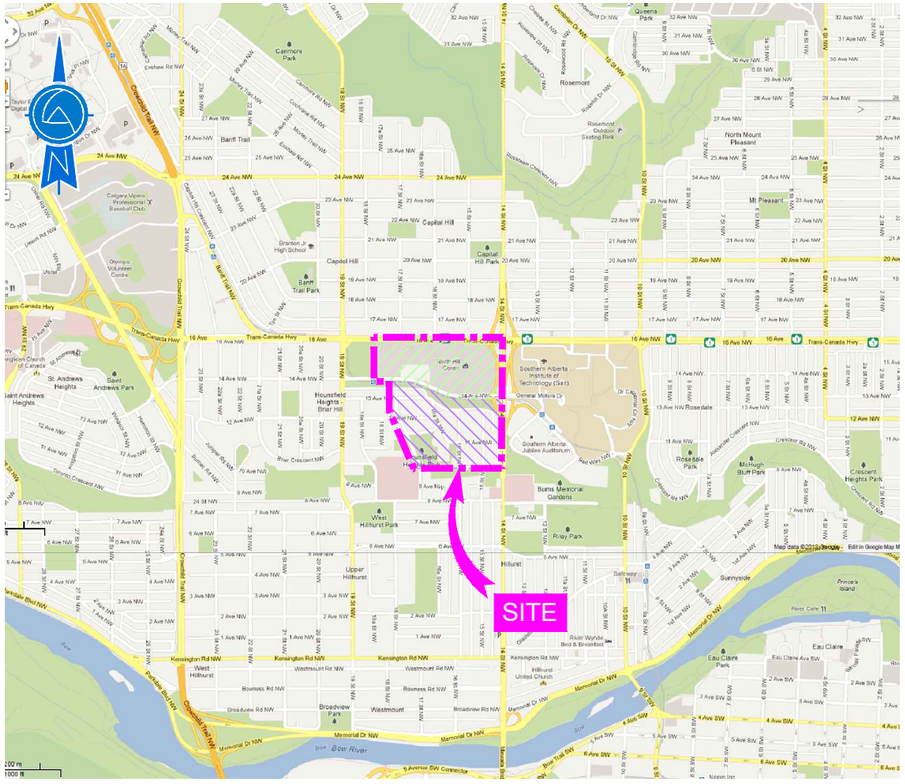
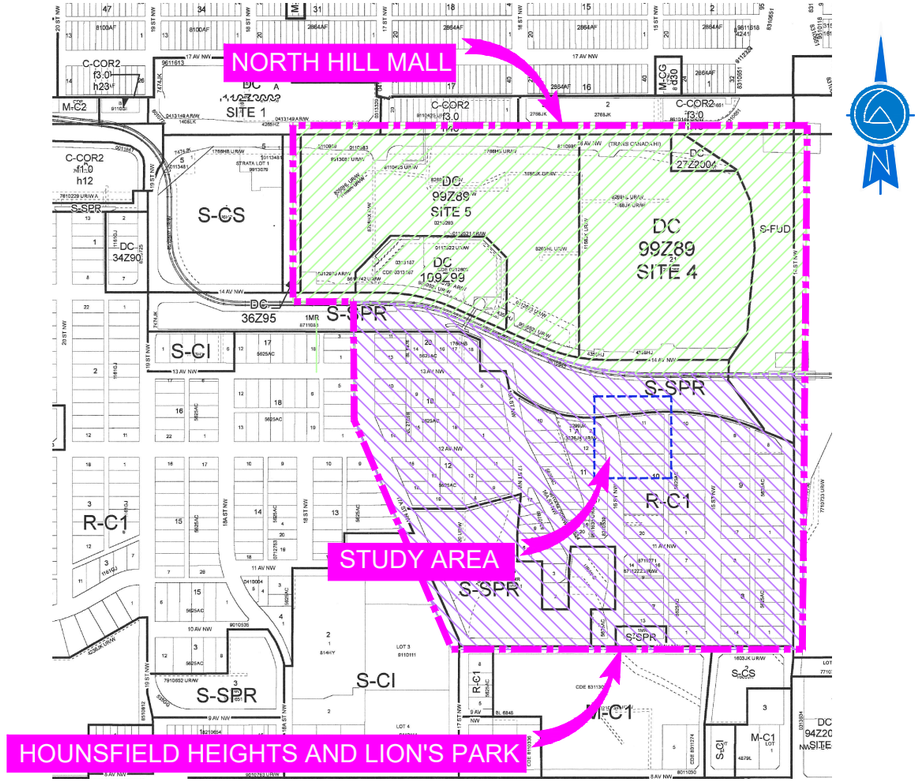


GENERAL SITE LOCATION

SCALE 1:30,000

0 0.5 1.0 1.5 km



SURROUNDING LAND USE

SCALE 1:7,500

0 100 200 300 m

LEGEND:

- SITE BOUNDARY
- MALL AREA
- HOUNSFIELD HEIGHTS AREA
- CITY OF CALGARY BY-LAW ZONING
- STUDY AREA

LAND USE DISTRICTS:

RESIDENTIAL - CONTEXTUAL ONE DWELLING DISTRICT	R-C1
MULTI-RESIDENTIAL - CONTEXTUAL LOW-PROFILE DISTRICT	MC-1
MULTI-RESIDENTIAL - CONTEXTUAL GRADE-ORIENTED DISTRICT	MC-G
COMMERCIAL - CORRIDOR 2 DISTRICT	C-COR2
SPECIAL PURPOSE - SCHOOL, PARK, AND COMMUNITY RESERVE DISTRICT	S-SPR
SPECIAL PURPOSE - COMMUNITY INSTITUTION DISTRICT	S-CI
SPECIAL PURPOSE - COMMUNITY SERVICE DISTRICT	S-CS
SPECIAL PURPOSE - FUTURE URBAN DEVELOPMENT DISTRICT	S-FUD
DIRECT CONTROL DISTRICT	DC

NOTES:

1. CITY OF CALGARY ROAD MAP PROVIDED BY CANADIAN CARTOGRAPHICS CORPORATION, 2012.
2. LAND USE MAP PROVIDED BY THE CITY OF CALGARY.

ENGINEER

Clifton

CLIENT

SUNCOR ENERGY PRODUCTS PARTNERSHIP

PROJECT

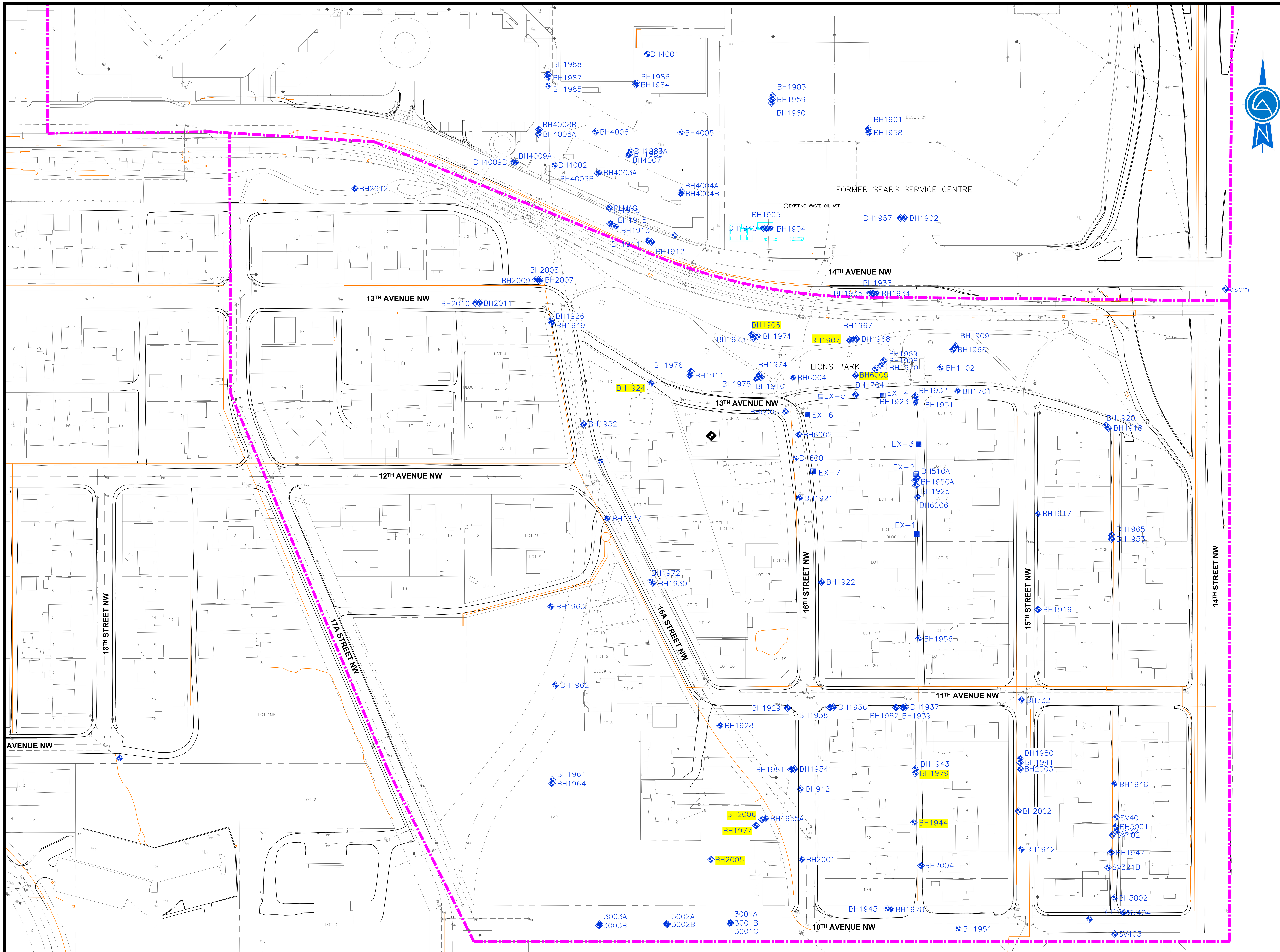
REMEDIAL OPTIONS ANALYSIS
HOUNSFIELD HEIGHTS AND LION'S PARK
1620-14th AVE NW CALGARY, ALBERTA

TITLE

SITE LOCATION AND SURROUNDING LAND USE

DESIGNED	SCALE: AS SHOWN	DATE: 2021-08-26
DRAWN: DMP	PROJECT NO.: CG3418 E13	FIG.: 1
CHECKED: MF	FILE NO.: CG3418-E13.01	

A:\Projects\Calgary\CG3418E13\CURRENT DRAWINGS\CG3418-E13.01.dwg, 08/26/2021 8:47:21 AM



LEGEND

- SITE BOUNDARY
- EXTRACTION WELL
- LRT TRACKS
- FENCE LINE
- LEGAL LINE
- FORMER FACILITY/FEATURE
- BUILDING
- GROUNDWATER MONITORING WELL
- BOREHOLE
- ABANDONED / DAMAGED MONITORING WELL
- INCREASING CONCENTRATION TREND OR LOCALIZED HOT SPOT (BH1924)

UTILITY LINES & SYMBOLS

- NATURAL GAS LINE
- SANITARY SEWER
- STORM SEWER
- WATER
- CATCH BASIN
- FIRE HYDRANT
- LIGHT STANDARD
- MANHOLE
- UTILITY POLE

NOTES:

1 DRAWING COMPILED FROM PLANIMETRIC FILES SUPPLIED BY THE CITY OF CALGARY (INCLUDING U/G UTILITIES) & FROM SITE ASSESSMENT INFORMATION. ADDITIONAL REFERENCES FROM SEACOR ENVIRONMENTAL ENGINEERING INC., DRAWINGS 149-5A11.DWG, 149-5A6.DWG.

0 10 20 30 40 50 m

PLOT SIZE 22x34

ENGINEER	Clifton
CLIENT	SUNCOR ENERGY PRODUCTS PARTNERSHIP
PROJECT	REMEDIAL OPTIONS ANALYSIS HOUNSFIELD HEIGHTS AND LION'S PARK 1620-14th AVE NW CALGARY, ALBERTA
TITLE	MONITORING WELL LOCATION PLAN AND REMEDIATION AREAS

DESIGNED	SCALE 1:1000	DATE 2021-08-26
DRAWN DMP	PROJECT NO. CG3418 E13	FIG. 2
CHECKED MF	FILE NO. CG3418-E13.02	

Tables

TABLE 1 - RANKING SYSTEM

SCORE	0	1	2	3	4
Ability to Meet Technical Objectives	Will not achieve objectives	Major limitations which may outweigh meeting objectives	Will achieve objectives with moderate limitations	Will achieve objectives with minimal limitations	Will fully achieve objectives
Effectiveness	***Not effective*** *Effective treatment zone - Technical limitations - Requirement for re-application - Potential by-products/waste -*	***Effectiveness limited by 5+ factors*** *Effective treatment zone - Technical limitations - Requirement for re-application - Potential by-products/waste -*	***Effectiveness limited by 3-4 factors*** *Effective treatment zone - Technical limitations - Requirement for re-application - Potential by-products/waste -*	***Effectiveness limited by 1-2 factors*** *Effective treatment zone - Technical limitations - Requirement for re-application - Potential by-products/waste -*	***Effective with minor limitations*** *Effective treatment zone - Technical limitations - Requirement for re-application - Potential by-products/waste -*
Duration (time to eliminate "hot-spot" and/or reverse increasing trends)	> 10 years	> 5 years	3-5 years	1-3 years	< 1 year
Cost	**$$$$$**	**$$$$**	**$$$**	**$$**	**$**
Disturbance (land disturbance, traffic impacts, dust, noise, odours)	Initial disturbance -major Subsequent disturbance -major Long-term infrastructure - required	Initial disturbance -major Subsequent disturbance -moderate Long-term infrastructure - likely required	Initial disturbance -moderate Subsequent disturbance -moderate Long-term infrastructure - likely required	Initial disturbance -moderate Subsequent disturbance -minimal Long-term infrastructure - potential	Initial disturbance -minimal Subsequent disturbance - none Long-term infrastructure - none
Regulatory Acceptance	Not accepted by Regulators	Major concerns and low probability of acceptance	Moderate concerns and additional information required	Acceptance is likely with minor concerns	Accepted by Regulators

Note: Rankings for each factor are relative to one another

TABLE 2 - REMEDIAL OPTIONS SCREENING MATRIX - LIONS PARK

	Remedial Options	Treatment Matrix	Ability to Meet Technical Objectives		Effectiveness		Duration		Cost		Disturbance		Regulatory Acceptance		TOTAL SCORE
			Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	
IN-SITU	**Soil Vapour Extraction**	Soil and Groundwater	3	Will achieve objectives with minimal limitations	3	**1 Limitation** **Effective treatment zone** - Based on testing of the DPVE system in 2021 the radius of influence may be up to 70 m. **Technical limitations** - The limitations on are on the technology to effectively extract contamination from the soil and groundwater into the vapour phase, at lower concentrations this technology is limited. **Requirement for re-application** - No additional re-application, the system can continuously run. **Potential by-products/waste** - Extracted vapours require treatment prior to discharge.	2	**3-5 years**	3	**$$** Based on using the existing DPVE system in Lions parks and adding extraction lines and wells.	1	**Initial** - major disturbance to install extraction lines and wells in the park. **Subsequent** - unlikely a requirement for follow up work. **Long-term infrastructure** - long term extraction lines and wells in the park below the surface. The current DPVE system will remain in Lions Park.	3	Acceptance is likely with minor concerns	**15**
	Chemical Oxidation	Soil and Groundwater	3	Will achieve objectives with minimal limitations	2	**4 Limitations** **Effective treatment zone** - Limited to 2 - 3 m **Technical limitations** - The technology is limited in the requirement to contact contaminated groundwater. Ability to inject and make contact with all contaminated media is limited to the placement of injection points. **Requirement for re-application** - There may be rebound of contamination from upgradient sources and there will likely need re-application of the product. **Potential by-products/waste** - May alter groundwater chemistry and potential off-gassing.	4	**< 1 year** Initial injection program will be completed within 1 year, though additional injections may be required after 1-3 years based on potential re-bounding.	1	**$$$$**	2	**Initial** - moderate disturbance across the park with a drilling rig and injection equipment. There may be potential daylighting and off-gassing. Some oxidants are more highly reactive. **Subsequent** -likely additional disturbance in select areas for additional injection events. **Long-term infrastructure** - none.	3	Acceptance is likely with minor concerns	**15**
	Enhanced Biodegradation (ORC injections)	Soil and Groundwater	3	Will achieve objectives with minimal limitations	2	**3 Limitations** **Effective treatment zone** - Limited to 2 - 3 m **Technical limitations** - The technology is limited in requiring a suitable environment to promote aerobic biodegradation. The ability to inject and adequately distribute the product is limited to the placement of injection points. **Requirement for re-application** - There may be rebound of contamination from upgradient sources and there will likely need re-application of product. **Potential by-products/waste** - May alter groundwater chemistry.	3	**1-3 years**	2	**$$$**	2	**Initial** - moderate disturbance across the park with a drilling rig and injection equipment. There may be potential daylighting. **Subsequent** -likely additional disturbance in select areas for additional injection events. **Long-term infrastructure** - none.	3	Acceptance is likely with minor concerns	**15**
	Permeable Reactive Barrier (PRB) - Activated Carbon Injections supplemented with ORC along the PRB.	Groundwater	3	Will achieve objectives with minimal limitations	2	**4 Limitations** **Effective treatment zone** - Limited to 1.5 - 2 m **Technical limitations** - Ability to inject and adequately distribute the product is limited to the placement of injection points. The PRB is only passively treating contaminated groundwater as it passes through the wall and is not actively reducing concentrations in the target areas. **Requirement for re-application** - May require re-application of activated carbon injections and re-application of ORC injections. **Potential by-products/waste** - May alter groundwater chemistry.	3	**1-3 years** Performance of the PRB will be dependent how far the performance well and hot spot areas are from the PRB. Initial concentration decreases will be seen within 1-3 years within the injection zone and immediately down-gradient, though it will take longer to see concentration decreases further down gradient.	2	**$$$**	3	**Initial** - minimal to moderate disturbance specific to the north portion of the park with a drilling rig and injection equipment. There may be potential daylighting. **Subsequent -may have** additional disturbance in select areas for additional injection events. **Long-term infrastructure** - none.	3	Acceptance is likely with minor concerns	**16**

TABLE 3 - REMEDIAL OPTIONS SCREENING MATRIX - HOUNSFIELD HEIGHTS SOUTH OF 11 AVENUE NW

	Remedial Options	Treatment Matrix	Ability to Meet Technical Objectives		Effectiveness		Duration		Cost		Disturbance		Regulatory Acceptance		TOTAL SCORE
			Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	Score	Discussion	
IN-SITU	**Soil Vapour Extraction**	Soil and Groundwater	3	Will achieve objectives with minimal limitations	3	**1 Limitations** **Effective treatment zone** - Based on testing of the existing DPVE system in Lions Park in 2021, the radius of influence may be up to 70 m. **Technical limitations** - The limitations on are on the technology to effectively extract contamination from the soil and groundwater into the vapour phase, at lower concentrations this technology is limited. The effectiveness of this technology in this area may be limited. **Requirement for re-application** - No additional re-application, the system can continuously run. **Potential by-products/waste** - Extracted vapours require treatment prior to discharge.	2	**3-5 years**	1	**$$$$**	1	**Initial** - major disturbance to install extraction lines and wells, install the SVE system, run communication and power lines. **Subsequent** - unlikely to require follow up work. **Long-term infrastructure** - A continuously running SVE system will need to be installed.	3	Acceptance is likely with minor concerns	**13**
	Chemical Oxidation	Soil and Groundwater	3	Will achieve objectives with minimal limitations	2	**4 Limitations** **Effective treatment zone** - Limited to 2 - 3 m **Technical limitations** - The technology is limited in the requirement to contact contaminated groundwater. Ability to inject and make contact with all contaminated media is limited to the placement of injection points. **Requirement for re-application** - There may be rebound of contamination from outside sources and there may be the need for re-application of the product. The PlumeStop PRB along 11 Avenue should limit higher concentrations to migrate back into this area. **Potential by-products/waste** - May alter groundwater chemistry and potential off-gassing.	4	**< 1 year** Initial injection program will be completed within 1 year, though additional injections may be required after 1-3 years based on potential re-bounding.	1	**$$$$**	2	**Initial** - moderate disturbance across the park and alleyway with a drilling rig and injection equipment. There may be potential daylighting and off-gassing. Some oxidants are more highly reactive. **Subsequent** -likely additional disturbance in select areas for additional injection events. **Long-term infrastructure** - none.	3	Acceptance is likely with minor concerns	**15**
	Enhanced Biodegradation (ORC injections)	Soil and Groundwater	3	Will achieve objectives with minimal limitations	2	**3 Limitations** **Effective treatment zone** - Limited to 2 - 3 m **Technical limitations** - The technology is limited in requiring a suitable environment to promote aerobic biodegradation. The ability to inject and adequately distribute the product is limited to the placement of injection points. **Requirement for re-application** - There may be rebound of contamination from outside sources and there may be the need for re-application of the product. The PlumeStop PRB along 11 Avenue should limit higher concentrations to migrate back into this area. **Potential by-products/waste** - May alter groundwater chemistry.	3	**1-3 years**	2	**$$$**	2	**Initial** - moderate disturbance across the park and alleyway with a drilling rig and injection equipment. There may be potential daylighting. **Subsequent** -likely additional disturbance in select areas for additional injection events. **Long-term infrastructure** - none.	3	Acceptance is likely with minor concerns	**15**

Appendix A

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Appendix A – Terms and Conditions

This report was prepared by Clifton Engineering Group on behalf of Suncor Energy Products Partnership. It is intended for the sole use and exclusive use of and Suncor Energy Products Partnership, their affiliated companies and partners and their respective insurers, agents, employees and advisors (collectively known as Suncor). The material in it reflects Clifton Engineering Group best judgment available to it at the time of preparation. Any use that a third party makes of this report, or any reliance on or decisions to be made based on it, other than by Suncor, are the responsibility of such third parties. Clifton Engineering Group and Suncor accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty expressed or implied is made.

No conclusions should be made based on this report regarding any concentrations of substances in other areas of the Site. Other Contaminants of Concern may be present at the Site in areas that were not investigated. Clifton Engineering Group accepts no responsibility for any deficiencies or inaccuracies in the information provided in this report that are the direct result of intentional or unintentional misrepresentations, errors or omissions of the persons interviewed, or information reviewed.

No environmental site investigation or remediation can wholly eliminate uncertainty regarding environmental conditions in connection with a property. This investigation is intended to reduce, but not eliminate the uncertainty regarding environmental conditions. Conclusions regarding the condition of the Site do not represent a warranty that all areas within the site and beneath structures are of the same quality as those sampled. Further, contamination could also exist in forms not indicated by the investigation.

The work was based in part upon the environmental quality guidelines and regulations in effect when the work was begun. Future regulatory changes may require reassessment of the findings of this investigation.

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