

May 18, 2016

10-3256

Manitoba Conservation and Water Stewardship
1007 Century Street
Winnipeg, Manitoba
R3H 0W4

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Attention: Mr. Warren Rospad, Contaminated Sites Program Specialist

Dear Mr. Rospad:

Re: Remediation Plan
Former Petroleum Bulk Plant
Menzie Avenue
Oakburn, Manitoba
Site Location No. 88005986

The following Remediation Plan (RP) is presented on behalf of Imperial Oil Limited (Imperial). The proposed plan includes the implementation of periodic risk management activities and reporting, as outlined below, for the referenced property (the Site) and adjacent selected off site locations (Study Area).

BACKGROUND

For your reference, the Study Area is shown on Drawing No. 1, and a Site plan showing former facilities and monitoring well locations on-Site and off-Site is presented as Drawing No. 2.

The Site is a former petroleum bulk plant located on the north side of Menzie Avenue between Main Street and Allan Street in Oakburn, Manitoba. The Village of Oakburn is located approximately 289 km to the northwest of Winnipeg, Manitoba. The Site is legally described as Lot 1, Plan 34625 NLTO, subject to special reservations as to mines minerals and other matters as particularly defined in the original grant from the crown in SE ¼ 28-18-23 WPM. The Site occupies an area of approximately 0.14 hectares. According to the Village of Oakburn, the Site is zoned as general development (commercial).



The Site operated as a petroleum bulk plant from approximately the 1940s to approximately 1989. The Site was decommissioned in approximately 1989 and is currently vacant.

Based on historical information, former Site facilities located on-Site from approximately the early 1940s to approximately 1989 included:

- eight aboveground storage tanks (ASTs);
- an office/warehouse building;
- a warehouse building;
- auxillary buildings; and,
- associated product piping and dispensing equipment.

Contaminants of concern (CoC) associated with former Site operations include petroleum-related compounds.

The Site is bordered to the north by a vacant commercial property (formerly a rail line); to the east by a commercial property (The Meat Man); to the south by Menzie Avenue, beyond which are residential and commercial properties (post office and a vacant property with the foundation of a former building); and, to the west by a commercial property (vacant), beyond which is a grain elevator.

The regional topography of the area is generally flat. Regional surface drainage is towards Oak River located approximately 900 m southwest of the Site.

RISK MANAGEMENT PLAN (RMP)

In developing this RMP, the following receptors/exposure pathways were evaluated:

Ingestion Pathway: the Village of Oakburn obtains potable water from private residential wells. The nearest private well is located approximately 5 m to the west of the Site (owned by The Meat Man). Based on conversations with the Village of Oakburn and local residents during a water well survey completed 2012, the following water wells were identified: one domestic use well and one decommissioned municipal use well (WW1) located approximately 5 m and 20 m on the adjacent property to the south and west of the Site, respectively; one domestic use well located approximately 20 m to the southwest of the Site; one domestic use water well located approximately 60 m to the northeast of the Site on Highway 21; one domestic use water well located approximately 100 m to the north of the Site on Margaret Street; two domestic use water wells located approximately 95 m and 100 m to the southeast of the Site at 112 and 114 Main Street, respectively; one domestic use water well located approximately 150 m to the southwest of the Site on Allan Street; and, one domestic use water well located approximately 170 m to the southwest of the Site on Main Street. As such, the ingestion pathway is considered applicable to the Site.

Freshwater Aquatic Life (FAL) Pathway: according to topographic maps, the nearest surface water body is an unnamed pond/marsh located approximately 180 m to the north of the Site. However, the FAL exposure pathway is not considered applicable to the Site, as the groundwater migration from the Site is expected to be >500 years to reach the unnamed pond/marsh based on hydraulic conductivity testing at the Site.

Livestock Watering Pathway: no livestock or irrigation pathways appear to exist within 500 m of the Site; therefore, the livestock watering pathway is currently not considered applicable for the Site.

Vapour Inhalation Pathway: while the property is vacant/idle, residential properties are located with 30 m of the Site; therefore, the vapour inhalation pathway is considered applicable for the Site.

Direct Contact Pathway: the Site and surrounding lands are either covered in vegetation or gravel, or are paved; therefore, the direct contact pathway is currently not considered applicable for the Site. This pathway would be re-evaluated if excavation within impacted areas were planned.

Eco Soil Contact: the eco-soil pathway is considered applicable for the Site.

Several subsurface investigations were completed between 1994 and 2013. During the investigations a total of 11 boreholes (8 completed with monitoring wells) and 13 test pits were advanced on-Site and off-Site. A tank nest excavation was also completed in 1993. Soil and groundwater samples were collected and submitted for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbon (PHC) fractions F1 to F4, lead and lead scavengers, specifically 1,2-dibromoethane (DBA) and 1,2-dichloroethane (DCA). The soil and groundwater analytical results were compared to the following criteria for coarse-grained soil and commercial land use: Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines; CCME Canada Wide Standards for Petroleum Hydrocarbons in Soil; and, Ontario Ministry of Environment and Climate Change (MOECC) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environment Protection Act. Concentrations above the referenced criteria were identified for various petroleum-related parameters in soil and groundwater.

The potential exposure risks associated with key pathways of concern are proposed to be managed through the following key actions:

1. A long term groundwater monitoring and sampling program (annually, which appears appropriate given the stability of the areal extent of impacts), as described below, will continue to be implemented.
2. The potential assessment of concentration trends over time using Mann-Kendall analyses to assess natural attenuation, may be conducted, if required, to assess Site conditions over time.

Additional management details are described below.

1. MONITORING AND SAMPLING PROGRAM

A long term groundwater and soil vapour monitoring and sampling program, as described below, is proposed to be implemented to maintain an audit of subsurface conditions and to assess the potential migration of impacts. The following work would be implemented on an annual basis:

- monitor selected wells for water levels during the sampling event (Drawing No. 2);
- collect groundwater samples from selected monitoring wells for laboratory analysis of a suite of petroleum-related parameters;
- maintain and repair monitoring wells, as required; and,
- compare the groundwater analytical results to the applicable criteria presented under the MOECC *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*;

Key monitoring wells include those located between identified Site impacts (to soil and groundwater) and local receptors. Monitoring and sampling frequency may be modified depending on findings such as permeability, distance to receptors, concentrations trends and the presence or absence of applicable receptors over time; Imperial will notify Manitoba Conservation if changes to the RMP are proposed (see below).

2. MANN-KENDALL ANALYSIS

As noted, a Mann-Kendall statistical trend analysis may be used to assess temporal trends to assess the relationship between groundwater quality beneath the Site and off-Site areas.

Mann-Kendall is a non-parametric test for linear trends and is well suited for analyzing concentration trends in data over time. The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate that measurements taken later in time tend to be larger than those taken earlier, while negative values indicate a decrease in concentrations over time.

The confidence in the trend is then calculated using a Kendall probability table. By assessing the S statistic along with the number of samples, the Kendall probability table provides the probability (p-value) of rejecting the hypothesis that there is no trend for a 0.05 level of significance. The confidence in the trend percentage is then calculated by subtracting the p-value from 1 and multiplying by 100% (i.e. 0.05 level of significance is a 95% confidence level).

The coefficient of variation (COV) is a statistical measure of how the individual data points vary about the mean value and is calculated by dividing the standard deviation by the mean. Values less than 1 indicate that the data show less dispersion about the mean while values greater than 1 indicate that the data show a higher degree of scatter about the mean. Low levels of confidence correspond to stable or no-trend conditions, depending on the degree of scatter (AFCEE 2006).

Using the above measures, a concentration trend for each monitoring location will be determined according to the decision logic outlined in Table 1 below, using the COV and confidence in trend as a qualitative measure of the statistical strength of the trend:

Table 1. Concentration Trend Decision Logic

Mann-Kendall Statistic (S)	Confidence in Trend	Concentration Trend
$S > 0$	> 95 %	Increasing
$S > 0$	90 - 95 %	Probably Increasing
$S > 0$	< 90 %	No Trend
$S \leq 0$	< 90 % and $COV \geq 1$	No Trend
$S \leq 0$	< 90 % and $COV < 1$	Stable
$S < 0$	90 - 95 %	Probably Decreasing
$S < 0$	95 %	Decreasing

(Adapted from AFCEE 2006)

3. REPORTING

Reports will be prepared and submitted to Manitoba Conservation and Water Stewardship upon completion of the work. A summary of monitoring and sampling results will be provided. Reporting and the development of additional risk management actions will be implemented if contaminants of concern are shown to pose a risk of impacting identified receptors. This may include additional Site work or modelling of contaminant travel time/fate and transport model results, etc. (see below).

4. FURTHER WORK

Additional work may be completed over time, such as, for example, additional groundwater monitoring and sampling events or increased sampling frequency, or the addition of investigation(s) for the purposes of evaluating the RMP strategy or replacing/repairing existing wells. After completion of such works, reports will be submitted to Manitoba Conservation. Proposed decreases to the groundwater monitoring and sampling frequency would be submitted for approval (as a revised RMP plan or addendum) and a remedial action plan (RAP) would be submitted for approval if active Site remediation (for example, the excavation of impacted soil and entrained groundwater or the installation of a contaminant recovery system) were to be implemented.

POTENTIAL THIRD PARTY ISSUES

Currently, there is no direct evidence that the impacts identified on-Site are related to third parties; however, Imperial will request that potential third party issues be addressed if further investigation suggests off Site contributors to impacts within the study area.

Imperial also confirms that, pursuant to a letter from the Director dated February 4, 2016, Imperial has been granted a 270 day extension to submit an Application for Determination of Responsibility for this site.

CLOSURE

This remedial action plan report has been prepared and the work referred to in this report has been undertaken by Parsons Inc. (Parsons), for Imperial Oil Limited (Imperial). It is intended for the sole and exclusive use of Imperial, its affiliated companies and partners and their respective agents, employees and advisors (collectively, "Imperial"). Any use, reliance on or decision made by any person other than Imperial based on this report is the sole responsibility of such other person. Imperial and Parsons, make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by Parsons, with respect to this report and any conclusions or recommendations made in this report reflect Parsons', judgement based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information examined at the time of preparation of this report. This report has been prepared for scientific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report.

Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by Imperial, copying or distributing of this report or use of reliance on the information contained herein, in whole or in part, is not permitted without the expressed written permission of Parsons. Nothing in this report is intended to constitute or provide a legal opinion.

We trust that the enclosed information is satisfactory for your present requirements. Should you have any questions or concerns, please contact the undersigned.

Respectfully submitted,

PARSONS INC.,



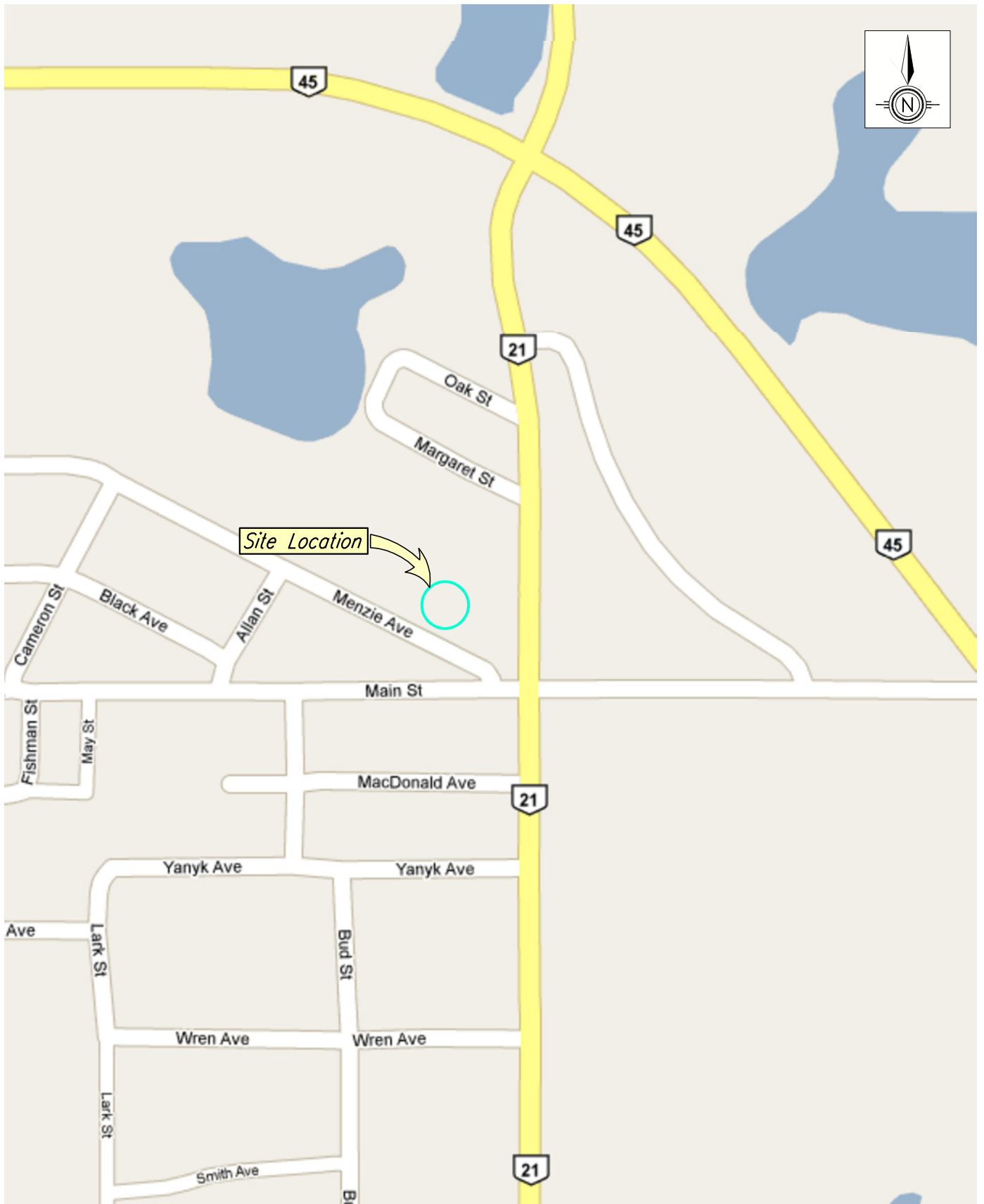
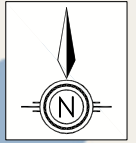
Kim Faubert, ASCT



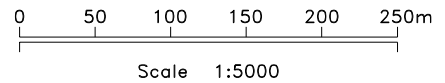
Gary S. Karp, P. Geo.

Distribution: Addressee (1)
Imperial Project Manager (1)





REFERENCE: Google Map, 2011



SSM: 3256 2016 RMP

Site Location Map

Imperial Oil
Menzie Avenue, Oakburn, Manitoba

Drawn: MLM

Page Size: 8.5 x 11 in

Ref. No.: 10-3256

Reviewed: KAF

File No.: 3256T039

Date: 2016/04/21

PARSONS

Drawing No.: 1

LEGEND

- Former Feature
- Property Line, Surveyed 2011
- Property Boundary Pin
- ⊙ Water Well
- ⊕ Monitoring Well
BH1, BH4 and BH5 by O'Connor, 1994
BH-U1 to BH-U3 Unidentified by Others
BH-6 to BH-10 by Parsons, 2013

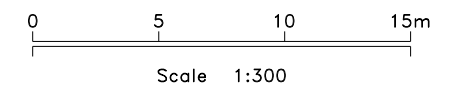
2010/12/31 Date Format: yyyy/mm/dd

Utilities

- All utility lines are underground unless noted as O/H - overhead.
- ⊙ Utility Pole
 - E— Electricity

Tank Chart				
Tank	Type	Capacity	Product	Status
1	AST	18 180 L	Unknown	Removed, 1989
2	AST	18 180 L	Unknown	Removed, 1989
3	AST	18 180 L	Unknown	Removed, 1989
4	AST	18 180 L	Unknown	Removed, 1989
5	AST	Unknown	Unknown	Removed, 1973
6	AST	Unknown	Unknown	Removed, 1973
7	AST	Unknown	Unknown	Removed, 1973
8	AST </td <td>Unknown</td> <td>Unknown</td> <td>Removed, 1973</td>	Unknown	Unknown	Removed, 1973

NOTE: All features are approximate.
 REFERENCE: Drawing from Land Surveyor's Office dated 1987.
 Surveyor's Staking Certificate dated 2006/10/13.
 Barnes & Duncan survey dated 2011/05.



Site Plan		
Imperial Oil Menzie Avenue, Oakburn, Manitoba		
Drawn: MLM	Page Size: 11 x 17 in	Ref. No.: 10-3256
Reviewed: KAF	File No.: 3256S040	Date: 2016/04/21
PARSONS		Drawing No.: 2

