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September 22, 2016 10-907

Manitoba Sustainable Development
Environmental Stewardship Division
1007 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Mr. Warren Rospad, Contaminated Sites Program Specialist

Dear Mr. Rospad:

Re: Remediation Plan
Former Service Station, Carwash and Retail Fuel Facility
287 Main Street
Souris, Manitoba
Site Location No. 88001943

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).

BACKGROUND

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

The Site is a former service station, carwash and retail fuel facility located on the northwest side of Main Street between Pacific Avenue and Rosser Avenue at 287 Main Street in Selkirk, Manitoba. The City of Selkirk is located approximately 30 km to the northeast of Winnipeg, Manitoba. The Site is legally described as Lots 22 and 23, Plan 22 Winnipeg Land Titles Office (WLTO) (L Div) in River Lot (RL) 45 Parish of St Clements; and, firstly: the N ½ of Lot 69 and all of Lots 70, 71, 72 and 73 Plan 9328 WLTO (L Div), except out of all of said Lots public land Plan 100518 WLTO in RL 46 Parish of St. Clements; secondly: all that portion of Lot 69 Plan 9328 WLTO (L Div) taken for public land, Plan 5570 WLTO (closed) which lies to the east of a line drawn east of parallel with perpendicular distance 20 feet from the western limit of said Lot 69 except out of secondly all mines and minerals in RL 46 Parish of St. Clements; and, thirdly: Lots

20, and 21 Plan 22 WLTO (L Div) in RL 45 of said Parish, Plan 40983, Brandon Land Titles Office (BLTO) in SW ¼ 3-9-21WPM. The Site occupies and area of approximately 0.30 hectares. According to the City of Selkirk, the Site is zoned C3 – Central Commercial.

The Site operated as a service station (repair garage) from approximately 1967 to approximately 1995 and the Site configuration remained relatively unchanged during that time with the exception of the removal of five steel underground storage tanks (USTs) in 1989 that were replaced with four fibreglass USTs. The Site was redeveloped as a retail fuel outlet (kiosk) with a carwash (the four fibreglass USTs installed 1989 remained in use) that operated from approximately 1995 to approximately 2004. The Site was decommissioned in approximately 2004 and is currently vacant with the exception of one UST located in the vicinity of the former carwash building.

Former Site facilities from approximately 1967 to approximately 1995 included:

- a tank nest with five steel 22 730 L gasoline USTs;
- a tank nest with four fibreglass 22 730 L gasoline USTs;
- pump islands;
- service station building (repair garage) with one 2270 L waste oil UST;
- a garage building; and,
- associated product piping and dispensing equipment.

Former Site facilities from approximately 1995 to approximately 2004 included:

- a tank nest with four fibreglass 22 730 L gasoline USTs;
- pump islands;
- kiosk building;
- carwash building and one UST; 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 residential properties; to the east by Rosser Avenue beyond which is a commercial property (Money Mart and Pizza Hotline); to the south by Main Street beyond which are residential and commercial properties (Cambrian Credit Union); to the southeast by the intersection of Rosser Avenue and Main Street beyond which is a commercial property (Queens Park Motors, formerly a Petro-Canada Service Station); to the southwest by the intersection of Pacific Avenue and Main Street beyond which is a residential property; and, to the west by Pacific Avenue beyond which is a commercial property (Co-op Retail Fuel Outlet).

The topography of the area is generally flat lying. Regional surface drainage is towards Red River located approximately 500 m to the east of the Site.

RISK MANAGMENT PLAN (RMP)

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

Ingestion Pathway: the City of Selkirk is supplied with potable water from a municipal water supply system which obtains water from four municipal wells located between approximately 380 m and 460 m north, northeast and east of the Site. The wells are completed in the deeper underlying carbonate aquifer. According to the City of Selkirk there is a by-law in place that prevents the installation and use of private water wells within the City limits. A search of Manitoba Water Stewardship water well records database identified 24 water wells (17 domestic wells, two municipal wells, three test wells, one air conditioning well and one recharge well) possibly located within 500 m of the Site. However, the ingestion pathway is not considered applicable to the Site based on conditions at the Site that ensure isolation between the shallow impacted soil/groundwater and the deeper groundwater carbonate aquifer with a 5 m thickness of massive unfractured saturated fine-grained material with a bulk hydraulic conductivity less than 10^{-6} m/s.

Freshwater Aquatic Life (FAL) Pathway: the nearest surface water body is the Red River located approximately 500 m to the east of the Site. As there are no permanent environmentally significant water bodies located within 500 m of the Site, the FAL exposure pathway is currently not considered applicable for the Site.

Livestock Watering Pathway: no known livestock wells are located 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 and commercial properties are located within 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.

Subsurface investigations were completed between 1988 and 2004. During the investigations a total of 30 boreholes (all completed with monitoring wells) and 26 test pits were advanced on-Site. A tank nest excavation was completed on-Site in 2004. Soil and groundwater samples were collected and submitted for laboratory analysis of one or more of the following: benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbon (PHC) fractions F1 to F4, total petroleum hydrocarbons (TPH), total extractable hydrocarbons (TEH), polycyclic aromatic hydrocarbons (PAHs), mineral oil and grease, glycols, metals and, lead scavengers, specifically 1,2-dibromoethane (DBA) and 1,2-dicholorethane (DCA). Soil and groundwater analytical results were compared to the following criteria for fine-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 petroleum-related parameters at various locations on Site in soil and groundwater.

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

1. A long term groundwater monitoring and sampling program (every three years, 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 monitoring and sampling program, as described below, is proposed to be implemented to maintain an audit of groundwater conditions and to assess the potential migration of impacted groundwater. The following work would be implemented once every three years:

- 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;
- 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 Sustainable Development 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.

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 ≤ 0	< 90 % and COV ≥ 1	No Trend
S ≤ 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 Sustainable Development 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 Sustainable Development. 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

As noted above, there are third parties who currently and/or historically handled petroleum products in proximity to the Site. Currently, there is no direct evidence that the impacts identified on and off-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.

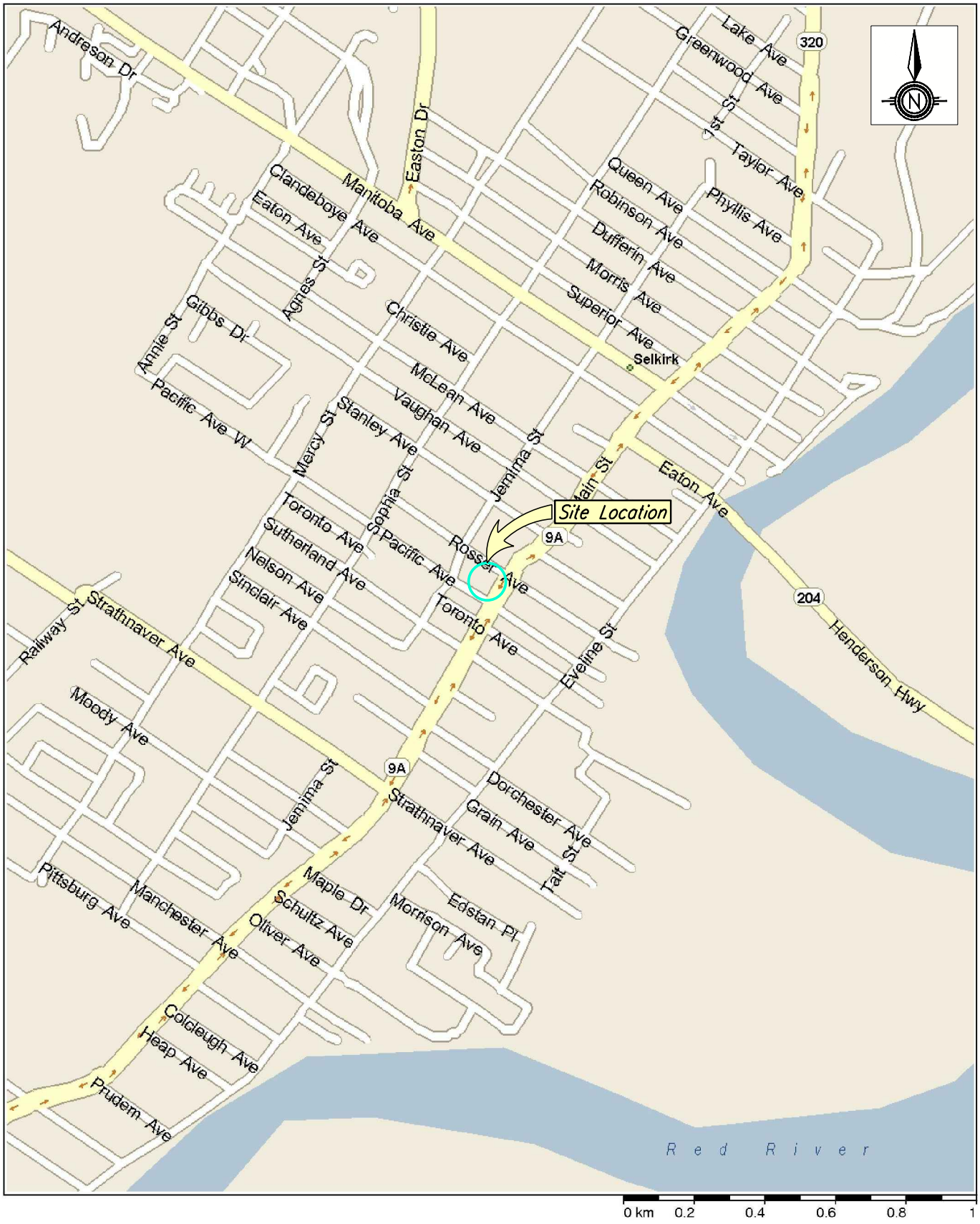
Respectfully submitted,

PARSONS INC.,

Kim Faubert, AScT.

Gary S. Karp, P.Geo.

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

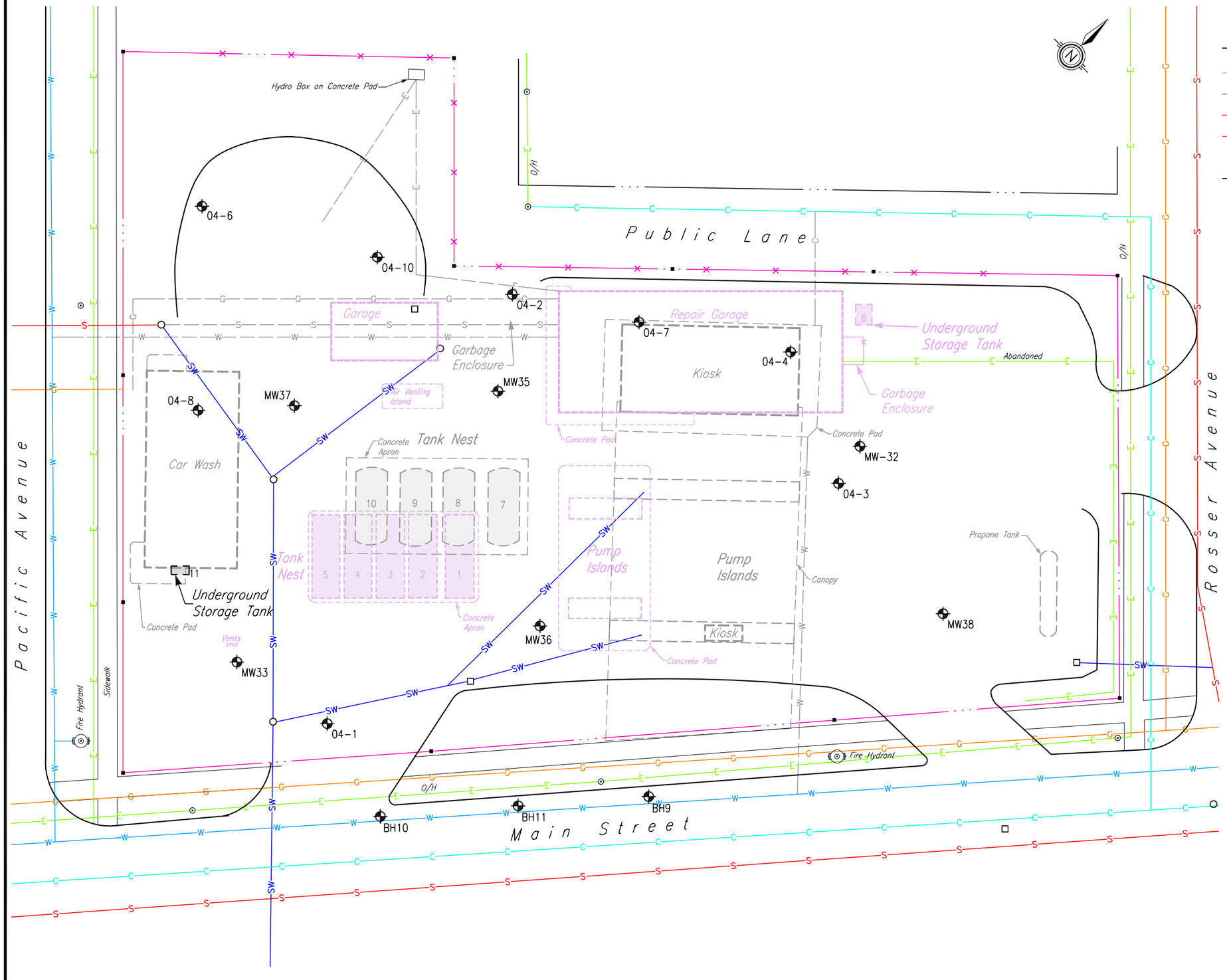


REFERENCE: Microsoft Streets and Trips, 2009.

Site Location Map

Imperial Oil
287 Main Street, Selkirk, Manitoba

Drawn: MLM	Page Size: 8.5 x 11 in	Ref. No.: 10-907
Reviewed: KAF	File No.: 907T049	Date: 2016/09/15
PARSONS		Drawing No.: 1



LEGEND

- Former Feature, 1967 to 1995
- Former Feature, 1995 to 2004
- Property Line, Surveyed 2013
- Fence On Property Line, Surveyed 2010
- Property Boundary Pin
- Fence on Property Line
- Monitoring Well
  - BH9 to BH11 by O'Connor, 1988
  - MW32 to MW38 by Aqua Terre, 2003
  - 04-1 to 04-4, 04-6 to 04-8 and 04-10 by AMEC, 2004
- 2010/12/31 Date Format: yyyy/mm/dd

Tank Chart

Tank	Type	Capacity	Product	Status
1	Steel UST	22 730 L	Gasoline	Removed, 1989
2	Steel UST	22 730 L	Gasoline	Removed, 1989
3	Steel UST	22 730 L	Gasoline	Removed, 1989
4	Steel UST	22 730 L	Gasoline	Removed, 1989
5	Steel UST	22 730 L	Gasoline	Removed, 1989
6	Steel UST	2 270 L	Waste Oil	Removed, 1989
7	Fibreglass UST	27 300 L	Gasoline	Removed, 2004
8	Fibreglass UST	27 300 L	Gasoline	Removed, 2004
9	Fibreglass UST	27 300 L	Gasoline	Removed, 2004
10	Fibreglass UST	27 300 L	Gasoline	Removed, 2004
11	Unknown	Unknown	Unknown	Inactive

NOTE: All features are approximate.

REFERENCE: AMEC drawings dated 2004/10.
Barnes & Duncan survey dated 2013/07/13.

0 5 10 15m

Scale 1:300

Site Plan

Imperial Oil
287 Main Street, Selkirk, Manitoba

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Reviewed: KAF	File No.: 907S050	Date: 2016/09/15
PARSONS		Drawing No.: 2

Ref.: S-75-P