

PHASE I ENVIRONMENTAL SITE ASSESSMENT BURBANK SUBDIVISION

**SW 1/4 24-39-27-W4M
RED DEER, ALBERTA**

PREPARED FOR

**1842107 ALBERTA LTD.
RED DEER, ALBERTA**

PREPARED BY

**PARKLAND GEOTECHNICAL CONSULTING LTD.
RED DEER, ALBERTA**



PROJECT No.: RD5564

DATE: DECEMBER 22, 2015

EXECUTIVE SUMMARY

ParklandGEO was commissioned by 1842107 Alberta Ltd. to conduct a Phase I Environmental Site Assessment (ESA) on the SW 1/4 24-39-27-W4M, located in Lacombe County, Alberta. The Phase I ESA was requested prior to development of the Property. Based on the available information gathered during the Phase I ESA, the following conclusions have been made:

- The Property was primarily agricultural land and in 1958 a single crude oil well was drilled on the southeast portion (LSD 3-24) and was abandoned in October, 1997. An aerial photograph review indicated that the lease site was removed prior to 1975 and a Reclamation Certificate (Certificate No.: 00372762) was issued to Canadian Oil & Gas International Inc. in October, 2015. A report outlining the summary of remedial operations was reviewed from the submitted Reclamation Certificate. The wellsite had previous hydrocarbon fraction F3 and salinity exceedences. Remedial activities were carried out on site in June, 2015 and reported the F3 impacts were excavated and removed. The SAR was elevated in the former flare pit area with a rating of "Fair". Two groundwater monitoring wells are currently present around the abandoned well. The abandoned well site is associated with moderate environmental risk due to known elevated SAR.
- The Property was primarily undeveloped agricultural land used for pasture. A building was formerly located on the northwest corner of the Property but was demolished prior to the site inspection, however the debris still remained. Two groundwater wells were located on the southeastern portion of the Property near the reclaimed wellsite. The debris was associated with low potential environmental risk based on observations.
- Surrounding the Property was primarily residential land. Residential acreages were situated north, east and south of the Property. A Canadian National Railway storage yard was located east of the Property. Agricultural land was located south and west of the Property. The surrounding areas are associated with low potential environmental risk based on land use.
- The following potential environmental issues were not found to be of concern on the Subject Property: air quality, chemical storage, drains and sumps, fill and stockpiles, freons and halons, hazardous materials storage, hazardous waste, heating and cooling systems, landfills and dump sites, lead, site runoff, mechanical equipment, oil and gas facilities, pits and lagoons, pesticides and herbicides, radioactive materials and equipment, radon, solid wastes and sewage disposal, stains and spills, underground and aboveground storage tanks, unidentified substances, urea formaldehyde foam insulation, roads, parking facilities, vegetation, watercourses, ditches and wells.

The potential environmental risk for the Property is rated as low based on current site use. Historical site use included upstream oil and gas facilities on the southeast portion (LSD 3-24) and is associated with moderate environmental risk based on historical contamination. The elevated SAR is not considered a risk to future development of the Property. No further investigations are recommended at this time.

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

ParklandGEO was commissioned by the 1842107 Alberta Ltd. to conduct a Phase I Environmental Site Assessment (ESA) on a portion of the SW1/4 24-39-27-W4M, located in Lacombe County, Alberta. The Phase I ESA was requested prior to development of the Property.

The property is referred to in this report as the "Property", "Subject Property" or "Site" as shown on Figure 1. The Property in relation to surrounding properties is shown on Figure 2.

1.2 QUALIFICATIONS

The historical searches, site inspection and report preparation was conducted by Mr. Spencer Podgurski, ATT. Mr. Podgurski has a Diploma in Land and Water Resources, majoring in Environmental Reclamation and Remediation from Olds College.

Mr. Michael McCormick, M.Eng., P.Eng., provided senior review of the final report. Mr. McCormick has a B.Sc. in Civil Engineering from the University of Alberta, and has over 24 years of consulting experience, during which time he has completed over 150 Phase I investigations and reviewed over 350 Phase I ESA reports.

1.3 PREVIOUS INVESTIGATIONS

The Wellsite Reclamation Certificate application for the 3-24 lease located in the centre east portion of the Property was obtained and reviewed, as summarized below:

"COGI 3-24-39-27-W4M Wellsite Reclamation Certificate Application Form". Prepared for Canadian Oil and Gas International Inc, Prepared by Vertex Professional Services. Facility name: COGI Joffre 3-24-39-27, License No.: 0016447. May 1, 2011.

Vertex Professional Services Ltd. prepared a reclamation certificate application which included a summary of remedial activities carried out on the Conserve II Joffre 3-24-39-27 W4M wellsite located on the Property. The remedial activities included a Phase II ESA, flare pit remediation, sump remediation, well centre remediation, two shallow groundwater monitoring programs, EM 31 and EM 38 surveys, and software modeling using the Subsoil Salinity Tool. Soil and groundwater analytical results were compared to the Alberta Tier 1 Guidelines (2010) for residential land-use.

The summary of environmental activities included:

- A Phase II ESA was conducted in May and June 2004 to address petroleum hydrocarbon and salinity exceedances on-site. Petroleum hydrocarbon (PHC) fraction F3 had exceedences located in the flare pit area and sodium absorption ratio (SAR) was elevated northwest of the well centre and east of the sump.
- A remedial excavation of the former sump area was completed in October 2004. Topsoil was stripped (50 m by 40 m) to an unreported depth and was stockpiled on-site. Sump materials were re-mixed with clean subsoil to meet criteria as per Guide 50. The re-mixed material was sampled and met the Tier 1 Criteria.
- The former flarepit was excavated between September 2005 and May 2011. Topsoil was stripped from an area measuring 30 m by 25 m to an unreported depth and stockpiled on-site. A single gravel seam was identified with hydrocarbon impacts previously missed in the prior Phase II ESA. The impacted area was approximately 0.3 m to 0.6 m thick. Approximately 400 tonnes of impacted soil was disposed of at the Big Valley Landfill. Clean limits were reached and the excavation was backfilled with overburden from the flarepit. Analytical results showed the backfill had SAR exceedences from 1.0 m to 1.9 m. Injection wells were installed from 0.5 m to 2.0 m to allow for the addition of a calcium water slurry to remediate the elevated SAR. It was reported that 136 kg of calcium sulphate and 136 kg of calcium nitrate were added to adjust the SAR to a "Fair" rating of 7.5 as compared to the "Good" background offsite rating. Vegetation in the flarepit area was assessed in 2014 and was found to be comparable to adjacent locations. The soil was backfilled below the rooting zone and there was no sign of vegetative stress. The soil was given a low potential risk due to the elevated SAR influencing vegetation in future years.
- A supplementary Phase II ESA conducted in August, 2009 identified PHC Fraction F3 impacts at the well centre and a remedial excavation began in September, 2009. The well centre was remediated in April 2011 by Pioneer Land & Environmental. Approximately 98 tonnes of impacted material was transported offsite, and confirmatory samples were taken from the walls and base of the excavation. The samples were below the applicable Guidelines and suitable soil was used for backfill.
- A shallow groundwater assessment was conducted in May, 2013 by Vertex to identify potential impacts from the former flare pit and drilling waste disposal areas. Seven groundwater wells were installed with screen depths at 4.5 m to 10.0 m. Groundwater exceedences included Total Dissolved Solids (TDS) and chloride. No soil exceedences were identified.
- Electromagnetic (EM) scans, EM 31 and EM 38, were conducted in August 2013 by Ceilidh Environmental which found elevated conductivity in the former flare pit area. The EM surveys also identified areas of elevated conductivity outside the lease boundary in unreported directions, similar to the identified areas on the lease.

- A second groundwater assessment was conducted in October 2013 by Vertex to determine TDS and chloride concentrations in the groundwater. TDS exceedances above 500 mg/L were identified in three wells (MW 1, MW 2 and MW 7) at 662, 554 and 534 mg/L respectively. It should be noted that a Red Deer County hydrogeology report "*Red Deer County: Red Deer County Part of the Red Deer River Basin Tp 034-039, R 21-28 W4M and Tp 034-039, R 01-04, W5M Regional Groundwater Assessment. May 2005*)." identified elevated TDS concentrations above 500 mg/L. A chloride level of 190 mg/L was identified in MW 7, and was under the Guideline of 610 mg/L so no further investigation was pursued.
- Supplemental remedial activities were carried out on site by Vertex in August 2015. Fraction F3 impacts were identified in the northeast portion of the lease site. Remedial activities started in June 2015 and approximately 286 tonnes of impacted soil was disposed of at the West Dried Meat Lake Landfill. Confirmatory samples confirmed the walls and base were below Guidelines and suitable soils was used as backfill. Additional samples were collected from the northeast production area and no salinity or hydrocarbon impacts were reported.

2.0 SITE ASSESSMENT PROCESS

2.1 OBJECTIVES AND SCOPE OF WORK

The primary objectives of this Phase I ESA were to identify environmental issues associated with the Property and to determine whether any issues identified during the assessment require an intrusive site investigation and, if so, the nature of such work. The scope of work for this assessment included:

- conducting a historical review of the Property and surrounding sites;
- interviewing and/or contacting local, municipal agencies and other parties familiar with the Property;
- conducting a site inspection of the Property to identify potential environmental concerns; and
- preparing a report summarizing the methodology and findings of this study.

Authorization to proceed with this assessment was provided by Mr. Brad Buchinski of 1842107 Alberta Ltd. on November 25, 2015.

2.2 METHODOLOGY

The scope of work was conducted in accordance with ParklandGEO's standard environmental site assessment procedures which reflect CSA requirements¹ and Alberta Environment and Parks (further referred to in this report as Alberta Environment) guidelines². Available historical information regarding the Property was reviewed to determine present and past land use and incidents or operations which could be associated with environmental concerns on the Property. Individual tasks included:

- reviewing time lapse aerial photography of the Property and surrounding region to record land use, development and historical site occupancy;
- obtaining current and historical land titles from Alberta Registries to determine past Property owners and review registered right-of-ways attached to the Property;
- searching the Alberta Environment Site Assessment Repository (ESAR), an online database of environmental assessment reports and reclamation certificates;
- contacting Alberta Environment (FOIP Records and Corporate Support Branch) to obtain information on spills or releases on local roads/highways/railways etc. and to obtain scientific/technical information routinely available or available through the Freedom of Information Act for the owners and Property;
- searching for approvals, licences, registrations and permits issued for the Property or surrounding sites under Alberta Environment's Water Act and Environmental Protection and Enhancement Act (EPEA);
- contacting Alberta Health Services to obtain any department records for the Property relative to investigations, tickets, prosecutions, landfills, waste sites, nuisance grounds, waste discharges, environmental nuisance or other environmental related events;
- contacting the County of Lacombe to obtain information on historical land-use (landfills, waste sites, nuisance grounds, waste discharges), bylaw investigations, tickets, prosecutions, reports of any other environmental issues and current zoning information;
- contacting the County of Lacombe to obtain information on environmental incidents regarding the Property and surrounding sites, investigations, tickets and prosecutions for environmental nuisance;

¹ *Phase I Environmental Site Assessment (CSA Z768-01)*. Canadian Standards Association (CSA). 2003. Ottawa, Canada.

² *Alberta Environmental Site Assessment Guidelines (Draft)*. Alberta Environment. June 2008. Edmonton, Alberta.

- contacting the Petroleum Tank Management Association of Alberta (PTMAA) to determine if any historical or current underground storage tanks are located on or in the vicinity of the Property;
- contacting the Environmental Law Centre (ELC) for information about enforcement actions against owners, current and past Property occupants, along with neighboring occupants;
- conducting a search of the Alberta Environment Provincial Groundwater Well Database for groundwater wells in the vicinity of the Property;
- contacting the current Property owner for historical and current information;
- contacting the adjacent site owners for historical and current information;
- conducting an inspection of the Property and adjacent sites noting any environmental concerns; and
- preparing a report summarizing the findings and making recommendations regarding the Property.

3.0 PROPERTY DESCRIPTION

3.1 LOCATION, SITE OCCUPANCY AND DEVELOPMENT DETAILS

Legal Description:	SW 1/4 24-39-27-W4M
Municipal Address:	South of Township Road 393A and east of Range Road 271, Lacombe County, Alberta
Current Owner:	1842107 Alberta Ltd.
Current Tenant:	Vacant
Water Supply:	None
Sewer Service:	None
Current Zoning:	Country Residential District
Property Size:	25.01 acres

3.2 PHYSICAL DESCRIPTION

The Subject Property consisted of about 25 acres of primarily undeveloped snow covered pasture land, located immediately south of Township Road 393A in Lacombe County, Alberta (Figure 1). A demolished building was situated on the northwest portion of the Property and the remainder of the land was vacant. Two manholes connected to the Town of Blackfalds sewer system were located on the east portion of the Property. A reclamation certified crude oil well was located at LSD 3-24, situated on the central eastern portion of the Property.

Surrounding the Property was primarily residential land to the north and northeast. Located east of the Property was a Canadian National Railway storage yard. To the south was a Canadian National Railway and residential developments, to the west was vacant agricultural land. Former and current oil and gas facilities were also located in the area, including the northeast, southeast and east (Figure 2).

3.3 TOPOGRAPHY AND DRAINAGE

The Property was elevated substantially in the center and sloped to the east and west. The north and east perimeter of the Property was slightly sloped to the south. No surficial runoff was present at the time of inspection but would appear to be directed south towards a ditch running parallel to the Canadian National Railway. The west half of the Property appeared to drain westerly to the central western portion of the Property. The Property was covered with approximately 5 to 10 cm of snow at the time of inspection. The closest permanent water body was the Blindman River, located approximately 140 m to the south.

3.4 REGIONAL GEOLOGY AND GROUNDWATER

A search of groundwater wells was conducted in the Alberta Environment Groundwater Information System. The search indicated that there were no wells registered on the Property, however fourteen (14) wells registered to the center of the quarter section and two wells registered with exact locations on the quarter, as summarized below:

WATER WELL DRILLING REPORTS FOR AREA

Well ID	Well Owner	Date Completed	Depth (m)	Perforated Section (m)	Use
95281	L. Albright	1975/09/26	61.26	39.62 - 60.96	Domestic & Stock
95282	Ernie Campbell	1988/05/06	67.06	45.72 - 67.06	Domestic
95286	George T. Dyck	Unknown	30.48	N/A	Domestic
158347	Ken Hankenson	1991/06/04	48.77	33.53 - 45.72	Domestic
160084	Karl Kolbenson	1991/09/27	51.82	36.58 - 50.29	Domestic
166925	Ken Playford	1992/07/06	48.77	36.58 - 42.67	Domestic
166926	Harvey Brann	1992/07/07	54.86	42.67 - 54.86	Domestic
168037	Harvey Montpetit	1992/07/07	67.06	41.15 - 53.34 & 59.44 - 65.53	Domestic
169119	Casey Vandenbrink	1992/08/12	67.06	48.77 - 67.06	Domestic
229664	Lawrence Heck / Heck's Trucking	1993/08/31	54.25	32.92 - 54.25	Domestic
229665	Jim Williamson	1993/08/27	54.86	39.62 - 54.86	Domestic
272165	Loyd Sietz	1995/08/03	48.77	33.53 - 48.77	Domestic
275166	G.T. Dyck	1982/04/14	50.29	N/A	Domestic & Stock
286581	Bowood Inc.	1996/08/13	54.86	38.10 - 54.86	Domestic
293584	Joel Veroba	1999/10/14	60.66	48.46 - 60.66	Domestic
1035130	Caraway Holdings / Ervin	2005/06/21	73.15	30.48 - 42.67 & 48.77 - 73.15	Domestic & Industrial

Fourteen (14) wells were registered to the centre of the quarter section and the exact locations were unknown. Well ID 293584 was in the northeast corner of the quarter and Well ID 1035130 was located near the centre of the quarter section and was approximately 50 m north of the Property. The wells registered to the Property had static water levels recorded at 31 to 32 m below grade. These wells also had soil profiles listed indicating shale and sandstone was encountered at approximately 25 to 26 m below grade.

4.0 HISTORICAL REVIEW

4.1 HISTORICAL OWNERSHIP AND TENANCY

A review of the current and historical ownership records for the Property is summarized below.

Location	From dd/mm/yyyy	To dd/mm/yyyy	Title #	Owner
SW-24-39-27- W4M	12/11/2015	CURRENT	152 352 832	1842107 Alberta Ltd.
	12/05/2015	12/11/2015	152 139 881 +1	Bradley & Christine Buchinski
	26/01/2015	12/05/2015	150 027 290	
	25/06/2008	26/01/2015	082 254 195	June E. Dyck
	25/06/2008	25/06/2008	082 254 194	
	05/07/2006	25/06/2008	062 288 785	George T. & June E. Dyck
	19/12/1973	05/07/2006	182 S 270	
	04/04/1966	19/12/1973	240 P 217	Kenneth L. Carlson
	11/10/1963	04/04/1966	72 D 202	Frederick Louis Flater
	09/11/1962	11/10/1963	207 C 196	
	09/11/1962	09/11/1962	206 C 196	Beatrice Elizabeth Stewart
	25/10/1949	09/11/1962	232 Q 139	Frederick Garfield Stewart

The Property is the remainder of the southwest quarter of section 24, township 39, range 27, west of the fourth meridian. Bradley and Christine Buchinski had previously owned the Property since January, 2015, prior to selling it to the current owner, 1842107 Alberta Ltd. in November, 2015.

4.2 HISTORICAL AIR PHOTO REVIEW

Aerial photographs were reviewed for the years 1950, 1962, 1966, 1975, 1982, 1989, 1993, 2001, 2009 and 2013. The aerial photographs were obtained from Alberta Environment and Abacus Datagraphics, and are included in Figures 4 to 13.

Year	1950	<ul style="list-style-type: none"> The Property was undeveloped and the east portion appeared to be used for agricultural purposes. Township Road 393A bordered the Property immediately to the north and east. The Canadian National Railway bordered the Property to the south. The Briar Road was located approximately 20 m southeast of the Property. The Red Deer River was located approximately 130 m south of the Property. Surrounding land appeared to be natural and agricultural land.
Job	49-1	
Roll	AS152	
Line	5206	
Photo #	55	
Year	1962	<ul style="list-style-type: none"> A lease site was situated at LSD 3-24 on the east central portion of the Property. Burbank Road was constructed approximately 50 m southeast of the Property. A residential development was present approximately 210 m northeast of the Property.
Job	4086-68	
Roll	AS824	
Line	5208	
Photo #	93	
Year	1966	<ul style="list-style-type: none"> The Property was relatively unchanged. A development was present approximated 20 m northwest of the Property. Earthwork construction was present immediately northeast of the Property, reconstructing Township Road 393A.
Job	R133-42	
Roll	AS947	
Line	5209	
Photo #	195	
Year	1975	<ul style="list-style-type: none"> The lease site on the Property at 3-24 was reduced in size, with the flare pit being removed. Earthwork construction was visible approximately 50 m east of the Property. Additional development was present on the site to the northwest of the Property.
Job	75-169 PAN NW	
Roll	AS1439	
Line	3	
Photo #	246	

Year	1982	<ul style="list-style-type: none">• A building was present in the northwest corner of the Property.• The remainder of the Property was relatively unchanged.• additional development was present on the adjacent site to the northwest.• Residential development was present approximately 90 m to the south.• Earthwork construction was present to the east of the Property.
Job	82-86P	
Roll	2562	
Line	13AS	
Photo #	212	
Year	1989	<ul style="list-style-type: none">• The Property remained relatively unchanged.• Burbank Crescent was constructed approximately 10 m northeast of the Property.• The remainder of the surrounding area was relatively unchanged.
Job	E89-024	
Roll	AS3956	
Line	35	
Photo #	13	
Year	1993	<ul style="list-style-type: none">• The Property was relatively unchanged.• Additional development was present on the site immediately northwest of the Property.• The land to the north was developed into a residential subdivision.• Burbank Crescent was extended and located approximately 230 m north of the Property.• Burbank Close was constructed approximately 270 m northeast of the Property.
Job	93-176	
Roll	AS4417	
Line	25	
Photo #	5	
Year	2001	<ul style="list-style-type: none">• The Property remained relatively unchanged.• The surrounding land use was relatively unchanged.
Job	01-037	
Roll	AS5173B	
Line	3	
Photo #	30	
Year	2009	<ul style="list-style-type: none">• The Property was relatively unchanged• The surrounding area remained relatively unchanged.
Job	09-287	
Roll	AS5469B	
Line	13E	
Photo #	71	
Year	2013	<ul style="list-style-type: none">• The Property and surrounding area remained relatively unchanged.
Photo obtained from Abacus Datagraphics.		

5.0 CORRESPONDENCE AND INTERVIEWS

5.1 SUMMARY OF INTERVIEWS

5.1.1 Subject Property

Mr. Brad Buchinski, Property Owner, was interviewed during the site inspection on December 2, 2015. Mr. Buchinski stated that he had owned the Property since January, 2015 and it was approximately 25 acres. A storage shed that was developed between 1975 and 1982 was demolished prior to the inspection and a debris pile was present and awaiting disposal. Near the debris pile was a second small shed (Photograph 12). The shed was built on a footing and had a clay and gravel floor with no underground facilities. Mr. Buchinski reported that the building was checked for chemicals, wastes or any other potential environmental contaminants before demolition. It was reported that no chemicals were found, only hay and old tires. Near the debris pile, several rusted and empty drums were observed, a paint can was also located amongst the debris. A copy of the report and Reclamation Certificate (Certificate No.: 00372762) for the Canadian Oil & Gas International Inc. well that was located on site within LSD 3-24 was given to ParklandGEO for review. It was also stated that the Ember Resources Pipeline was removed from the Property, however the Right-of-Way was still registered on Abacus Datagraphics. No known environmental issues or concerns with the Property or nearby area were reported.

Mr. Sheldon Burns of Vertex Professional Services Ltd., was interviewed by ParklandGEO regarding the wellsite located at LSD 3-24 on the Property. Mr. Burns was involved with the wellsite from 2004 until the reclamation application was completed and a certificate was granted in October 2015. Vertex were contracted to prepare the reclamation application for Canadian Oil & Gas International. The wellsite reportedly operated from 1959 until the late 1970's or early 1980's. Remedial activities on site included a Phase II ESA, flare pit remediation, sump remediation, well centre remediation, two shallow groundwater monitoring programs, an EM 31 and EM 38 survey and software modeling within the Subsoil Salinity Tool. Most recently, while installing a groundwater monitoring well, an area with hydrocarbon impact was found. The hydrocarbons from the sump that did not get mixed properly so an excavation was carried out in June, 2015 to remove these impacts. Hydrocarbon impacts in soil were remediated to the Alberta Tier 1 Guidelines. Mr. Burns reported elevated SAR locations on site but was not an issue with the Alberta Energy Regulator. A Plains Midstream was currently located on the south portion of the Property along with several low pressure pipelines registered to the Chain Lakes Gas Co-op. A former pipeline was located on the Property but was requested to be removed by the former land owner, Mr. George Dyck, for potential future development of the Property. Mr. Burns reported no known hydrocarbon impacts regarding the former wellsite, however an elevated SAR was reported. No known environmental issues or concerns of the nearby area were reported.

5.2 REGULATORY SEARCHES

Correspondence with Federal, Provincial and Municipal regulatory agencies is presented in Appendix B, and is summarized below.

5.2.1 Federal

The National Pollutant Release Inventory (NPRI), compiled and maintained by Environment Canada and updated up to 2014, was searched for significant releases for the Property and adjacent properties. The search reported no releases for the Property or nearby area.

5.2.2 Provincial

5.2.2.1 FOIP

An inquiry was made to the Alberta Environment FRCS (FOIP Records and Corporate Support) Branch for routinely available scientific/technical information for current or historical tenants of the Property. The Alberta Environment Routine Disclosure and Freedom of Information and Protection of Privacy Act results reported no records for the Property.

5.2.2.2 ESAR

The online Environmental Site Assessment Repository (ESAR), compiled and maintained by Alberta Environment, was searched for routinely available scientific/technical information for the Property and nearby sites. The search indicated there were no records for the Property or nearby sites.

The ESAR was searched for records of Wellsite Reclamation Certificates applied or issued for the Property or the surrounding 500 m. The search indicated one Wellsite Reclamation Certificate for the Property and one for a nearby site:

- On October 8, 2015, a reclamation certificate (No. 00372762) was issued to Canadian Oil & Gas International Inc. for the well located at 3-24, in the east central portion of the Property. The well was found to comply with the conservation and reclamation requirements of Part 6 of the Act.
- On August 28, 1990, a reclamation certificate (No. 9437) was issued to Esso Resources Canada Limited for the well located at 5-24-39-27-W4M, approximately 330 m northwest of the Property. The surface of the land was found to be in satisfactory condition.

5.2.2.3 PTMAA

An inquiry was made to the Petroleum Tank Management Association of Alberta (PTMAA) to determine if any petroleum storage tanks are presently or have historically been located on the Property. There were no records associated with the Property. Review of the Reclamation Certificate indicated that an above ground storage tank (AST) containing approximately 60 m³ of oil was located on the lease during the duration of upstream oil and gas activities.

5.2.2.4 AER

A request was made to the Alberta Energy Regulator (AER) and a search was conducted through the Abacus Datagraphics website to determine if there have been any upstream gas or oil wells, pipelines or licenced facilities on the Property or adjacent sites. The search results are summarized below:

- An abandoned crude oil well (Licence No. 0016447) was registered on the central eastern portion of the Property at LSD 3-24. The well was registered to Canadian Oil & Gas Ltd. and was drilled on December 26, 1958 and abandoned on October 30, 1997. The well was reclamation certified on October 8, 2015.
- An abandoned crude oil pipeline (Licence No. 675-1) ran east-west from LSD 3-24-39-27-W4M to LSD 1-23-39-27-W4M, through the central portion of the Property. The pipeline was licensed to Ember Resources Inc.
- On the south portion of the Property was an operational crude oil pipeline (Licence No. 13268-3) registered to Plains Midstream Canada ULC. The pipeline ran from LSD 2-24-39-27-W4M to LSD 1-14-39-27-W4M.
- Approximately 420 m to the southwest was an abandoned well (Licence No. J0006027K) located at LSD 13-13. The well was registered to Chevron Canada Limited and was drilled in 1953 and was reclamation exempt.
- Approximately 420 m to the northeast was crude oil well (Licence No. 011305) located at LSD 7-24. The well was registered to Canadian Oil & Gas International Inc. and was drilled in 1985.
- Approximately 490 m to the west was a crude oil well (Licence No. 0014566) located at LSD 1-23. The well was registered to Canadian Oil & Gas International and was drilled in 1958.

The AER was contacted and a search was conducted through the Abacus Datagraphics website to determine if there have been any incidents, complaints or spills on the Property or adjacent sites. The search indicated that there were no incidents, complaints or spills registered to the Property however records were found for nearby sites:

- Approximately 100 m to the west, a spill was registered at LSD 4-24 on October 21, 2005 (Incident No. 20052516). The source of the spill was a crude oil pipeline (Licence No.675-1) registered to BP Canada Energy Company, currently owned by Ember Resources Inc.. The leak was caused by a mechanical equipment failure and approximately 1 m³ of crude oil was released. The clean-up date was recorded as February 3, 2006.

5.2.2.5 Environmental Law Centre

The Environmental Law Centre was contacted regarding the following owners: 1842107 Alberta Ltd., George T. Dyck and Kenneth L. Carlson. Search results indicated no records for these owners.

5.2.2.6 AEPEA

A search was conducted of Alberta Environment approvals, licences, registrations and permits issued under the Water Act and AEPEA (Alberta Environmental Protection and Enhancement Act) for the Property. There was one active and four inactive listings for the quarter section, as summarized below:

- The active listing, Notice 00363334-00-00 was received from South Red Deer Regional Wastewater Commission on January 9, 2015 for pipelines and telecommunication lines crossing a water body at SW 35-38-27-W4M and affecting the Red Deer River.
- Notice 00346461-00-00 was received from South Red Deer Regional Wastewater Commission on January 28, 2014 for pipelines and telecommunication lines crossing a water body affecting a wetland - non peatland at NW 1-38-27-W4M.
- Notice 00350901-00-00 was received from Atco Gas and Pipelines Ltd. May 20, 2014 for pipelines and telecommunication lines crossing a water body affecting an Unclassified Unnamed Stream at SE 1-38-27-W4M.
- Notice 00359630-00-00 was received from South Red Deer Regional Wastewater Commission October 31, 2014 for pipelines and telecommunication lines affecting the Red Deer River at SW 35-38-27-W4M.
- Document 00248849-00-00 was held by Don A. and Ruby L. Johnson, under provisions of the Water Act within SW-34-38-27-W4M. This license is expired.

5.2.2.7 Groundwater Wells

A search of groundwater wells was conducted in the Alberta Environment Groundwater Information System. The search indicated that there were no domestic wells registered to Property. Fourteen (14) wells registered to the center of the quarter section and their exact locations were unknown and two well were registered with exact locations, the closest well being situated approximately 340 m north of the Property.

5.2.2.8 Alberta Health Services

The Alberta Health Services office of Environmental Public Health was contacted regarding landfills, waste sites, nuisance grounds or environmental incidents on file regarding the Property. The results were not received by ParklandGEO at the time of report issue.

5.2.3 Municipal and Local

A search was conducted with the County of Lacombe Planning and Department office for any landfills, waste sites, nuisance grounds or environmental related incidents on file regarding the Property and surrounding sites. Mr. Jesse Mcphail, Planning Intern, reported that there were no environmental incidents were on file regarding the Property.

A search was conducted with the County of Lacombe Emergency Services Department regarding environmental records concerning on the Property. The search was not received by ParklandGEO at the time of report issue.

6.0 SITE INSPECTION RESULTS

An inspection of the Property was conducted on December 2, 2015 by Mr. Spencer Podgurski, ATT of ParklandGEO to assess for environmental concerns on the Property. Site photographs are included in Appendix A.

6.1 SITE APPEARANCE

The Property was located east of Blackfalds in the Burbank Subdivision, immediately south of Township Road 393A. The Property appeared to be used as pasture land. Two groundwater monitoring wells were located on the eastern half of the Property. A demolished building was located in the northwest corner of the Property. Several empty rusted metal drums were located amongst the debris along with a paint can. The demolished building had a clay and gravel floor with no basement and was built on a footing.

6.2 GENERAL SITE INFORMATION

6.2.1 Property

The Site was accessed from Township Road 393A to the north, and a former lease road ran south along the raised central portion of the Property to the former lease site (Photograph 1). The central and southern portions of the Property were treed and elevated compared to the remainder of the Property (Photographs 2, 3, 9 and 10). A Telus pedestal was located immediately outside the Property boundary to the northeast (Photograph 4). Two manholes were located in the eastern portion of the Property and were reported to be owned by the town of Blackfalds and to be used for sewage system connection (Photograph 5). Vents in connection to the Town of Blackfalds sewer system were located outside the east fence line along with markers for the Plains Midstream Canada ULC Pipeline that was on the Property (Photograph 6). Two groundwater monitoring wells that remained from the reclaimed wellsite were located on the Property, as it was requested by the landowner to leave the wells in place for any potential future use (Photographs 7 and 8). A Canadian National Railway was located to the south of the Property (Photograph 9). The west portion of the Property had some fenced in areas related to the historic land use for grazing (Photographs 10 and 11). In the northwest corner of the Property was a pile of miscellaneous debris located next to a shed (Photograph 12). The debris belonged to an old shed that was torn down and awaiting removal (Photographs 13 through 16). The demolished wood shed was constructed on a footing with a clay and gravel floor, it was reportedly used for hay storage.

On the southeast portion of the Property was an reclamation certified (Certificate No.: 372762) abandoned crude oil well (License No.: 0016447) that was drilled in December, 1958, and was abandoned in October 1997. In this area two of the reported seven groundwater monitoring wells were identified (Photographs 7 and 8). The remainder of the Property was pasture land that was predominantly sloped to the south. It was reported by the landowner that the Ember Resources Pipeline (License No.: 675-1) on the Property was removed but the Right-of-Way was still registered on Abacus Datagraphics. Chain Lakes Gas Co-op had several low pressure gas lines located on the north portion of the Property.

6.3 ADJACENT LAND USE

The site was surrounded by the following properties at the time of the assessment:

Direction from Property	Current Property Tenant/Owner
North	Township Road 393A, residential developments and Highway 597
East	Township Road 393A and a Canadian National Railway storage yard
South	Canadian National Railway, residential developments and the Blindman River
West	Residential developments and agricultural land

The closest gas station was a Husky Cardlock located approximately 1.5 km northwest of the Property.

Environmental concerns were not noted on any of the other adjacent sites during the assessment. Any environmental information obtained, reviewed and collected concerning the adjacent and nearby sites is summarized in Section 5.0. Information indicated no records of significant environmental issues and the sites are not suspected to pose significant environmental risk to the Property.

7.0 ENVIRONMENTAL ISSUES

Information regarding significant environmental issues is summarized below.

7.1 AIR EMISSIONS AND QUALITY

No sources of air emissions were observed on the Property during the assessment.

7.2 ASBESTOS CONTAINING MATERIALS (ACMs)

There were no potential asbestos-containing materials noted during the site inspection.

7.3 CHEMICAL USING ACTIVITY AND CHEMICAL STORAGE

No chemical use was noted at the Property during the inspection. Drums were observed around the demolished shed.

7.4 DRAINS AND SUMPS

No drains or sumps were located on the Property.

7.5 FILL AND STOCKPILES

Miscellaneous debris was located on the Property in the northwest corner where a shed was formerly located. The debris pile was found to contain scrap metal, scrap wood, yard waste and several rusted metal drums. The metal drums were empty, however minimal residual paint was located within the paint can.

7.6 FREONS AND HALONS

No halon fire extinguishers were observed on the Property at the time of inspection.

7.7 HAZARDOUS MATERIAL USE AND STORAGE

No hazardous materials were noted on the Property.

7.8 HAZARDOUS WASTES

No hazardous wastes were noted on the Property.

7.9 HEATING AND COOLING SYSTEMS

No heating or cooling systems were located on the Property at the time of inspection.

7.10 LANDFILLS AND DUMPS

No landfills or dumps were registered with the government agencies on or in the vicinity of the Property. No signs of landfills or dumps were noted during the assessment.

7.11 LEAD

No lead-containing materials were observed on the Property.

7.12 LIQUID EFFLUENTS AND SITE RUNOFF

There were no liquid discharges observed from the Property or surface water run-off at the time of the inspection. The site was covered in approximately 5 to 10 cm of snow at the time of inspection.

7.1 MECHANICAL EQUIPMENT

No permanent mechanical equipment was present on the Property.

7.14 MERCURY

There were no sources of mercury observed on the Property.

7.15 METHANE

The Property was not located within a wetland area and no evidence of historical domestic waste landfills or dumps on the Property were found. However the demolished shed and corresponding debris was located on site temporarily.

7.16 OIL AND GAS FACILITIES

On the south east portion of the Property was an abandoned crude oil well (License No.: 0016447) registered to Canadian Oil & Gas International Inc. that was drilled in December, 1958, and was abandoned in October 1997. The well was reclamation certified (Certificate No.: 372762) on October 8, 2015. An abandoned Ember Resources Pipeline (License No.: 675-1) was located on the central portion of the Property but was reportedly removed but the right-of-way was still registered on Abacus Datagraphics. An operational crude oil Plains Midstream Canada ULC pipeline (License No.: 13268-3) was located on the southern portion of the Property.

7.17 PESTICIDES AND HERBICIDES

There were no pesticides or herbicides observed on the Property.

7.18 PITS AND LAGOONS

No pits or lagoons were noted on the Property nor were any reported during correspondence with any provincial or municipal departments.

7.19 POLYCHLORINATED BIPHENYLS (PCBs)

There were no sources of PCBs noted during the site inspection

7.20 RADIOACTIVE MATERIALS AND EQUIPMENT

Radioactive materials and equipment were not observed on the Property during the inspection.

7.21 RADON

Historically, large portions of Canada were not considered to have a significant risk of radon exposure, however in June 2007, Health Canada decided to lower the action level for radon from 800 Bq/m³ to 200 Bq/m³ based on international standards and newer scientific research. This is reflected in recent changes to the National Building Code and the associated Alberta Building Code (2014). Radon is a gas formed by the breakdown of uranium, a natural radioactive material found in all soil and rock. Long-term exposure to radon is the second leading cause of lung cancer after smoking. Health Canada found that: approximately 7% of homes have high levels of radon; radon levels vary significantly across the country; and that there are no areas of the country that are 'radon free,' but there are areas of the country where high levels of indoor radon are more prevalent.

For most of the year, the air pressure inside a building is lower than the pressure in the soil surrounding the foundation. This difference in pressure draws air and other gases contained in the soil, including radon, into the interior. Gas containing radon can enter a building through any opening where the foundation, basement or floor slab contacts the soil. These openings will be present even in newer, well-built structures. Potential entry routes for radon include cracked foundations or slabs, areas with exposed soil or rocks, openings for utility lines or the gap between the floor slab and wall, sumps, etc.

Materials used to construct a building - stone, bricks, cement/concrete, or granite, for example - are not a significant source of radon. Natural materials taken from the ground, like granite or concrete aggregate, can contain some uranium and may have higher levels of radiation or radon, but in the vast majority of cases these levels are not significant.

Workplace exposure to radon is addressed by guidelines for naturally occurring radioactive materials (NORM). Details are given in the Canadian Guidelines for Management of Naturally Occurring Radioactive Materials (Prepared by the Canadian NORM Working Group of the Federal Provincial Territorial Radiation Protection Committee. Revised 2011).

Incidentally Exposed Workers are employees whose regular duties do not include exposure to NORM sources of radiation. They are considered as members of the public who work in an occupational exposure environment and, as such, the annual effective dose limit for these workers is 1 mSv. The sievert (Sv) is the unit of Effective Dose of radiation, and accounts for the total effect of different types of radiation on different parts of the body.

Radon released from soil beneath a building gives rise to an average indoor background concentration of about 45 Bq/m³, but much higher values are possible in some areas. This concentration is variable with time; therefore long-term assessment measurements are recommended. As radon concentration can vary considerably, Health Canada is recommending that all workplaces be assessed for potential elevated levels. The derived working limit (DWL) for radon is 200 Bq/m³. Where the annual average concentration of radon gas is expected to be above 200 Bq/m³, measurements should be made to estimate the average annual radon gas concentration.

Currently the Subject Property is undeveloped, and as such the potential exposure of future building occupants to radon cannot be assessed. However, for any future building it is assumed that the design and construction will follow the requirements of the National Building Code which would limit the potential radon exposure. Upon construction a long-term test to measure the interior radon concentration is recommended as part of a standard health and safety program, as per Health Canada's recommendation.

7.22 SOLID WASTES AND SEWAGE DISPOSAL

There were no signs of uncontrolled disposal of solid waste at the Property. Two manholes connected to the Town of Blackfalds sewer system were situated on the east portion of the Property.

7.23 STAINS AND SPILLS

There have been no reportable spills on the Property and surface stains were not noted during the site inspection. However it should be noted there was approximately 5 to 10 cm of snow on the Property which limited the inspection.

7.24 UNDERGROUND (USTs) AND ABOVE GROUND STORAGE TANKS (ASTs)

No underground or aboveground storage tanks were reported with PTMAA or observed on the Property.

7.25 UNIDENTIFIED SUBSTANCES

There were no unidentified substances observed on the Property at the time of the assessment.

7.26 UREA FORMALDEHYDE FOAM INSULATION (UFFI)

There was no urea formaldehyde foam insulation observed on the Property.

7.27 UTILITIES, ROADS, PARKING FACILITIES AND RIGHT-OF-WAYS

Township Road 393A was located immediately north of the Property. A Telus pedestal was located northwest of the northwest portion of the Property. Chain Lakes Gas Co-op had several low pressure pipelines on the northern portion of the Property. A Pipeline Right-of-Way was registered Ember Resources Inc. in the center of the Property, however the pipeline was reportedly removed. A Plains Midstream Canada ULC pipeline ran on the southeast portion of the Property. A Canadian National Railway line was located immediately south of the Property.

7.28 VEGETATION

Vegetation was noted throughout site as the majority of the Property was undeveloped with the exception of the demolished shed. Grass was found throughout the whole Property. Shrubs and trees were found in the southern and the central half of the Property.

7.29 WATERCOURSES, DITCHES AND STANDING WATER

No watercourses bordered the Property and standing water was not observed at the time of inspection. The Blindman River was located approximately 140 m to the west of the Property.

7.30 WELLS

Two groundwater monitoring wells were located on site and were associated with the reclaimed well. No water wells were located on the Property, however there were fourteen (14) wells registered to the center of the quarter section and two with exact location, the closest well (Well I.D. 1035130) was located approximately 50 m north of the Property.

8.0 ASSESSMENT AND RECOMMENDATIONS

ParklandGEO was commissioned by 1842107 Alberta Ltd. To conduct a Phase 1 ESA on a portion of the SW 1/4 24-39-27-W4M, located in Lacombe County, Alberta. The Phase I ESA was requested prior to development of the Property. Based on the available information gathered during the Phase I ESA, the following conclusions have been made:

- The Property was primarily agricultural land and in 1958 a single crude oil well was developed on the southeast portion (LSD 3-24) and was abandoned in October, 1997. A Reclamation Certificate (Certificate No.: 00372762) was issued to Canadian Oil & Gas International Inc. in October, 2015. A report outlining the summary of remedial operations was reviewed from the submitted Reclamation Certificate. The wellsite had previous hydrocarbon fraction F3 and salinity exceedences. Remedial activities were carried out on site in June, 2015 and reported the F3 impacts were excavated and removed. The SAR was identified to be 7.5 in areas 1.0 to 1.9 mbg in the former flare pit area with a rating of "Fair". Two groundwater monitoring wells are currently present around the abandoned well. The abandoned well site is associated with moderate environmental risk due to known elevated SAR.
- The Property was primarily undeveloped agricultural land used for pasture. A building was located on the northwest corner of the Property but was demolished prior to the site inspection, however the debris still remained. The debris was associated with low potential environmental risk based on observed debris.
- Surrounding the Property was primarily residential land. Residential acreages were situated north, east and south of the Property. A Canadian National Railway storage yard was located east of the Property. Agricultural land was located south and west of the Property. The surrounding areas are associated with low potential environmental risk based on land use.
- The following potential environmental issues were not found to be of concern on the Subject Property: air quality, chemical storage, drains and sumps, fill and stockpiles, freons and halons, hazardous materials storage, hazardous waste, heating and cooling systems, landfills and dump sites, lead, site runoff, mechanical equipment, oil and gas facilities, pits and lagoons, pesticides and herbicides, radioactive materials and equipment, radon, solid wastes and sewage disposal, stains and spills, underground and aboveground storage tanks, unidentified substances, urea formaldehyde foam insulation, roads, parking facilities, vegetation, watercourses, ditches and wells.

The potential environmental risk for the Property is rated as low based on current site use. Historical site use included upstream oil and gas facilities on the southeast portion (LSD 3-24) and is associated with a moderate environmental risk based on historical contamination and elevated SAR. The elevated SAR is not considered a risk to future development of the Property. No further investigations are recommended at this time.

9.0 LIMITATIONS AND CLOSURE

The American Society for Testing and Materials Standard of Practice notes that no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of a standardized environmental site assessment protocol is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the Subject Property, given reasonable limits of time and cost.

This report has been prepared for the exclusive use of **1842107 Alberta Ltd.** and their approved agents. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. PARKLAND GEOTECHNICAL CONSULTING LTD., and The ParklandGEO Consulting Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. No other warranty, expressed or implied, is made.

We trust that this report meets with your current requirements. If there are any questions, please contact the undersigned at 403-343-2428.

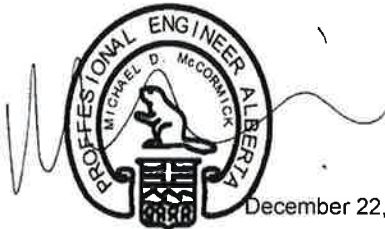
Respectfully Submitted,

PARKLAND GEOTECHNICAL CONSULTING LTD.
APEGA Permit to Practice #07312



Spencer Podgurski, ATT
Environmental Technician

Reviewed by:



December 22, 2015

Michael McCormick, M.Eng., P.Eng.
Principal Geo-Environmental Engineer