BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION

2012 ANNUAL REPORT

Compiled March 2012

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1.0 INTRODUCTION

1.1 OWNERSHIP

The Beaver Regional Landfill is solely owned by the Beaver Regional Waste Management Services Commission (the "Commission") – a Regional Services Commission incorporated under the provisions of Part 15.1 of the Municipal Government Act. The site is comprised of all of the NE, SE, and NW ¼'s of 10-50-17-W4 excepting the 21.3-acre parcel in the NW ¼ -10 owned by Mr. Doyle Booth. No other parties have any stake or share in the ownership of this facility. Please refer to Figure 1. Landfill Boundary Plan 2012.

1.2 APPROVAL AND REPORTING REQUIREMENTS

This annual report for 2012 has been compiled and submitted to Alberta Environment and Sustainable Resource Development (AESRD) to satisfy the Approval conditions and requirements as outlined in the August 29, 2007 Approval, No. 20754-01-00, a copy of which is provided in Appendix A.

The Approval contains the following reporting requirements:

- **Section 4.10.9** - The approval holder shall submit an Annual Landfill Operation Report which shall include, at a minimum, all of the following:
    - A summary of the information monitored as required in TABLE 4.10-A, TABLE 4.10-B, and TABLE 4.10-C;
    - A summary of the dates when the landfill closed or restricted access to the working face due to wind conditions;
    - A summary of the waste types stored, including their origin;
    - A summary of the landfill gas monitoring data interpretation as per Section 4.10.6;
    - All landfill scheduled inspection records;
    - A summary of the performance of the landfill run-on and run-off control systems, and;
    - A summary of any changes to the Operations Plan since the last Annual Landfill Operations Report.

- **Section 4.11.7** - The approval holder shall compile an Annual Groundwater Monitoring Program Summary Report which shall include, at a minimum, all of the following information in the Standards for Landfills in Alberta, as amended.

2.0 FORMAT

This annual report is intended to satisfy the regulatory requirements as expressed in the Approval, and to provide a summary of the principal activities conducted during 2012. This information is provided in the following format:

- A brief description of the Landfill;
- A summary of the regulatory setting of the Landfill;
- Summaries of the principal development, operating, environmental monitoring and closure activities undertaken at the Landfill by the Commission during 2012;
- A summary of the major interactions between the Commission and the public and regulatory communities during 2012;
- Reporting data required by the Approval, and;
- Appendices providing the details of information summarized and referenced in the foregoing sections of the report.

3.0 LANDFILL DESCRIPTION

Section 1.1.2(h) of the Approval defines the Landfill as being "… *all buildings, structures, storage facilities, material handling facilities, process and pollution abatement equipment, vessels, cells, roadways, berms, monitor wells, pipelines and other installations, and includes the land, located on the NE, SE, and NW of Section 10, Township 50, Rage 17, West of the 4th Meridian, that is being or has been used or held for or in connection with the Beaver Regional Class II landfill*…".

The Landfill is located approximately 3km north of Highway 14, and approximately 2km northeast of the Village of Ryley. The permitted site is surrounded by the following land uses:

- To the north by a municipal road, to the north of which is agricultural land;
- To the west by Secondary Highway 854, to the west of which lies a Class I waste management facility which is owned and operated by Clean Harbors Environmental Services Inc.;
- To the southwest by agricultural land and the sewage lagoon operated by the Village of Ryley;
- To the south by agricultural land; and
- To the east by a municipal road, to the east of which is agricultural land.

Figure 2. Basic Landfill Plan 2012 illustrates the location of the Landfill relative to surrounding geographic features.

4.0 REGULATORY SETTING

4.1 REGULATORY HISTORY

The regulatory history of the Landfill is summarized as follows:

- **12th September 1989** – a small portion of the site (now known as Stage 1) was permitted for waste disposal through Permit to Operate a Waste Management Facility W1075, as issued by the Vegreville Health Unit under the Alberta Public Health Act;
- **03rd May 1994** – an Approval to Develop/Permit to Operate was issued by Vegreville Health Unit for the development of Stage 2, including related site infrastructure;
- **12th July 1994** – a Development Permit was issued for Stage 2 by Beaver County;
- **March 1996** – application was filed with the East Central Health Authority to "*…construct and operate such additional stages as are necessary to develop out the balance of the Lands…"*. This application was subsequently re-filed with Alberta Environmental Protection in 1997 due to the transfer of legislative jurisdiction for landfills from Alberta Health to Alberta Environmental Protection in 1996;
- **13th August 1996** – a development Permit was issued to the Commission by Beaver County for landfill development on the "balance of the Lands" within NE ¼ - 10 – 50 –17 –W4M;
- **November 1996** – additional development conditions were added to the August 1996 Development Permit by the Development Appeal Board;
- **29th May 1998** – the Amending Approval to Permit W1075 was issued to the Commission by Alberta Environmental Protection;
- **13th July 1999** – the Alberta Environmental Appeal Board recommended to the Minister of Environment that the Amending Approval to Permit W1075 be modified, and that additional requirements be placed on the Commission;
- **25th August 1999** – the Alberta Minister of Environment responded to the recommendations of the Environmental Appeal Board with a Ministerial Order which varied the Amending Approval to Permit W1075;
- **24th July 2000** – Alberta Environment confirmed that the Commission response to the Ministerial Order complied with the requirements in that order;
- **17th September 2001** – a new Development Permit was issued for the development of the remainder of the landfill, superseding all previous development permits;

- **16th November 2005** – an application for the Approval Renewal was filed with Alberta Environment as required under the provisions of the Alberta Activities Designation Regulation;
- **16th November 2005** – Amendment 20754-00-04 was issued by Alberta Environment to remove the chloride concentration limits for the recirculation of leachate in the Stage 1 cell;
- **28th June 2006** – Ministerial Order 13/006 was issued by the Minister of Environment accepting the Alberta Environment Appeals Board recommendation to uphold the Director's decision on Amendment 20754-00-04, subject to conditions for the submission of supplementary clarification reports;
- **22nd August 2006 -** the term of Amending Approval 20754 was extended to September 1, 2007 by letter from Alberta Environment;
- **31st August 2006** – Five reports were filed with Alberta Environment to satisfy the Ministerial Order 13/006 conditions;
- **18th September 2006** – Alberta Environment acknowledged receipt of the five reports as required to satisfy the conditions of Ministerial Order 13/006, and;
- **29th August, 2007 –** The new and current Operating Approval No. 20754-01-00 was issued.
- **17th and 18th December, 2008 –** Alberta Environment Appeals Board heard an appeal from a local resident.
- **21st January, 2009 –** Ministerial Order 03/2009 was issued in response to recommendations from the Environment Appeals Board setting out additional conditions for Approval 20754-00-00
- **19th June 2009 –** Response to Ministerial Order 03/2009, three reports and a revised Operating Plan were submitted to the Director
- **23rd December 2009 –** Alberta Environment acknowledged receipt of the three reports as required to satisfy the conditions of Ministerial Order 03/2009, and suggested further changes to the Operating Plan.
- **2nd June, 2010 –** A revised Operating Plan was submitted to the Director incorporating changes to the stormwater management reporting protocols as suggested by the Office of the Director.

Operation of the Landfill is currently bound by the requirements of the regulatory authorizations described in Section 1 of this report. The principal requirements of the regulatory authorizations governing the Landfill are summarized in the following sub-sections of the report.

4.2 ALBERTA ENVIRONMENT APPROVAL

Operation of the Landfill is authorized by Alberta Environment in the form of Approval 0020754-01-00 under the *Alberta Environmental Protection and Enhancement Act.* The Approval contains conditions relating to a number of operational, monitoring and closure aspects of the Landfill.

4.3 DEVELOPMENT PERMIT

Operation and development of the Landfill is in accordance with the development permit No. 2001-09-17-01 issued by Beaver County on September 17, 2001, and in accordance with the County's land use bylaw 98-801. The land use bylaw was amended in December 2001 with respect to lines and grades, and again in June 2004 to remove operating hour restrictions to accommodate tentative staging and operational requirements.

5.0 DEVELOPMENT AND IMPROVEMENTS

5.1 CELL DEVELOPMENT

No landfill cell development activities were undertaken by the Commission during the 2012 operating year. The bulk of waste accepted at the landfill was placed in Phase 2 of Stage 4; construction for which was completed on June 25, 2011. A copy of the full CQA report for the construction was provided to AESRD as part of the 2011 Annual Report**.**

The Commission is currently working on the design specifications for Stage 5 which will be constructed during 2013. Documentation and construction reports for this landfill cell will be provided to AESRD as required.

5.2 SITE IMPROVEMENTS

No site improvements were made during the 2012 operating year.

6.0 REPORTING REQUIREMENTS

6.1 STORM WATER CONTROL SYSTEMS

The storm water control system is designed to prevent surface run-off from leaving the landfill property. Surface run-off is directed by ditches to the northeast and west storm water ponds. Storm water is pumped from the northeast pond to the west pond as needed to prevent overflow and to allow for release.

Storm water from the west storm water detention pond was released to the designated release point in the tributary to Bible Creek as per the Stored Water Release Notification Protocol (June 17, 2009). Advance notification was provided to AESRD and affected neighbour(s) by letter dated November 7, 2012; a copy of the letter is included in Appendix C. The storm water release from the West Detention Pond began November 13, 2012 and was halted November 27, 2012; a duration of approximately 349 hours over 15 days. The total stormwater released is calculated to be approximately 19,817m^3. Storm water analytical reports are provided in Appendix B.

Figure 3. Landfill Surface Water Drainage Plan, illustrates the storm water collection network employed at the landfill during 2012.

6.2 APPROVAL TABLE 4.10-A (OPERATIONS – MONITORING AND REPORTING REQUIREMENTS)

6.2.1 Weight and Type of Solid Waste Received and Removed

The types and quantities of waste received during 2012 are summarized in Table 1.

Table 1. Summary of Waste Quantities Received During 2012.

WASTE TYPE	*QUANTITY (tonnes)
MSW	192,769.17
C & D	744.06
Contaminated Soil	332,001.72
Special Waste	33,085.24
Liquid Waste *(Containerized – see description in 6.2.2 below)*	501.55
Total	**559,101.74**

*Note: Totals reflect the amount of waste placed in the landfill. Other materials accepted at the landfill for recycling or re-use (e.g. scrap metal, clean concrete, used oil) are detailed in Section 6.3.9.

6.2.2 Volume and Type of Liquid Waste Received

A total of 501.55 tonnes of liquid waste was received at the Landfill during 2012. This waste was comprised of outdated liquor received in containers of less than 5 litres each.

6.2.3 Hazardous Wastes Detection

A minimum target frequency of 10% of all inbound loads of MSW and C&D waste are randomly inspected for hazardous and prohibited wastes. Identification is by visual inspection and/or by interviews with waste haulers. Daily load inspections are performed and documented. Details of these inspections are documented and retained in the Operating Record.

In addition, the landfill attendants and equipment operators are constantly monitoring the tipping face and all offloading vehicles for any indications of the presence of unacceptable materials. Any offending materials are immediately recovered and removed from the site in accordance with the provisions of the Operations Plan.

Materials rejected during 2012 are summarized in Table 2. Details of all material rejected are recorded and retained in the official Operating Record.

Table 2. Summary of Rejected Waste During 2012.

Month	Waste Material	Reason for Rejection	Source
March	Propane Cylinder (1)	Do not accept	Beaver County Resident
April	Barrels (2)	Ends not removed	Beaver County Resident
	Jerry Cans (3) – Miscellaneous Waste	Unidentified Liquid	Beaver County Resident
June	Propane Cylinders (2)	Do not accept	Beaver County Resident
July	Propane Cylinders (4)	Do not accept	Beaver County Resident
	Paint Thinner / Caulking	Do not accept	Beaver County Resident

In all instances, residents were advised about the Annual Toxic Waste Roundup and the Edmonton Eco Centre for their Household Hazardous waste. During the first half of the year, residents were advised to take their propane bottles to local propane tank dealers for exchange or drop off. During the second half of 2012, the Commission began to accept empty propane cylinders into storage cages for recycling by DBS Environmental.

6.2.4 Location of Waste Deposited

Waste received throughout the year 2012 was placed in Stage 4, Phases 1 and 2. Stage 4, Phase 1 received only contaminated soils; a portion of which was used in Stage 4, Phase 2 for daily cover. Stage 4, Phase 2 received all waste types during 2012. Figure 2. Basic Landfill Plan 2012 illustrates the location of Stage 4, Phases 1 and 2 where waste was placed during 2012.

Detailed coordinates for the placement of all manifested wastes (i.e. contaminated soils and wastes requiring special handling) are documented and retained in the Operating Record. A monthly summary of reports is prepared and retained in the Operating Record to document the landfilling progress and the locations in which waste was deposited during the month. A daily record is maintained using GPS coordinates to document the location of waste deposited during the day.

6.2.5 Working face width

As in previous years, a working face width of 20 m was used as an operating target for routine operations during 2012. The face was surveyed and staked during the year to assist in achieving this target. No significant deviations from this target are identified in the site operating records.

6.2.6 Daily Cover Thickness

In accordance with the provisions of Section 4.3.13 of the Approved Operating Plan, daily cover was applied when required to ensure that no waste was left exposed for more than 24 hours. When daily cover was required, it was applied at a minimum thickness of 150 mm. Due to the cohesive nature of the clay cover materials available at the site, actual cover thicknesses are expected to have generally exceeded this minimum.

No clay from onsite stockpiles was needed for daily cover in 2012. Rather, contaminated soils with low levels of hydrocarbon or chloride contamination were used for daily cover. This was done in such a manner as to ensure that there would not be any leaching from the contaminated soils to the storm water detention ponds.

6.2.7 Intermediate Soil Cover

During 2012, inside intermediate soil cover was placed to an average thickness of about 0.3 metres over lifts of waste to provide a solid base for truck and equipment traffic and subsequent lifts of waste. This intermediate cover is breached prior to placement of subsequent lifts of waste to accommodate downward migration of leachate and upward migration of landfill gas. On landfill stages that are not actively accepting waste, intermediate soil cover is used to maintain access roads for truck and equipment traffic.

Intermediate side cover was also placed upon outside slopes to an average thickness of 0.3 metres over lifts of waste to completely cover waste from view and wind. Maintenance of this cover is completed as needed on all landfill slopes.

Other intermediate soil cover uses included construction of access roads and ramps within the active landfill cell. Table 3 below summarizes where approximately 33,060m^3 of intermediate cover soil were used during 2012.

Table 3. Intermediate Soil Cover Used During 2012.

Location of Use	Type of Intermediate Cover (m^3)			Totals (m^3)
	Inside	Side	Other	
Stage 1	540	1,815		2,355
Stage 2		135		135
Stage 4, Phase 2	14,685	14,655	1,230	30,570
Totals	**15,225**	**16,995**	**840**	**33,060**

Information regarding the inventory of topsoil and subsoil stockpiled at the Landfill for future closure and reclamation is included in section 6.3.14.

6.2.8 Reclamation Test Plots

Reclamation test plots to demonstrate and evaluate the effectiveness of alternative capping and reclamation configurations to support vegetation on a sustainable basis were installed in 2008 on the west slope of the Stage 3 Cell. These test plots are a condition of the Approval as set out in Section 3.2.5 of the Approval Application. These test plots were to be monitored for a period of three years to demonstrate and confirm sustainable performance. At the end of this term, an assessment of the soil and vegetation were to be conducted.

In October 2012, the Commission retained Paragon Soil and Environmental Consulting (through AECOM) to conduct the soil and vegetation assessment of the pilot study area. The findings of the assessment were compiled in a report titled "Soil and Vegetation Assessment of the Land Capping Pilot Study Area for the Beaver Regional Landfill" and dated October 2012. The findings of the assessment are currently being discussed with AESRD with respect to future landfill capping requirements at the Landfill. For reference, a copy of the report is included in Appendix C.

6.2.9 Leachate Level Management

The Approval requires that leachate be removed from the sumps when levels exceed 0.3 m above the lowest point on the liner excluding the sumps. The Approval also requires monthly monitoring of leachate levels within the Landfill. However, monitoring was done at least weekly during 2012, or more frequently during periods of high leachate accumulation. The maximum leachate levels observed for each month are shown in the following Table 4.

Table 4. Summary of Leachate Level and Depth Measurements 2012.

Month	Maximum leachate depth (m) or elevation (mASL)				
	Stage 1 (trigger for removal = 675.5mASL)	**Stage 2** (trigger for removal = 1.865m)	**Stage 3** (trigger for removal = 676.9mASL)	**Stage 4, Phase 1** (trigger for removal = >1.300m)	**Stage 4, Phase 2** (trigger for removal = <28.776m)
January	675.413	1.820	676.625	1.217	34.730
February	675.314	1.860	676.648	1.227	34.830
March	675.246	1.820	676.682	1.235	34.710
April	675.378	1.850	676.712	1.252	34.690
May	675.422	1.850	676.738	1.261	34.690
June	675.374	1.850	676.772	1.221	34.660
July	675.412	1.850	676.792	1.264	34.710
August	675.347	1.850	676.821	1.269	37.380
September	675.314	1.840	676.836	1.276	36.350
October	675.471	1.830	676.848	1.221	34.740
November	675.282	1.820	676.866	1.276	36.140
December	675.317	1.840	676.894	1.236	36.180

6.2.10 Leachate Quality

Leachate samples from each of the active sumps were tested on an annual basis as required by the Approval. The approximate locations of these sumps are illustrated on Figure 2. Basic Landfill Plan 2012. The detailed laboratory analysis from the March 29, 2012 sampling event is provided in Appendix D.

6.2.11 Landfill Gas Monitoring

The landfill gas-monitoring network is comprised of four sub-surface monitoring probes at the locations illustrated in Figure 1 of the C.E. Moell & Associates spring and fall monitoring reports located in Appendix E. Landfill gas monitoring was conducted in accordance with the Landfill Gas Monitoring Plan set out in the Operations Plan. Monitoring was conducted by C.E. Moell and Associates on behalf of the Commission on May 26 and September 21, 2012.

C.E. Moell and Associates reported the 2012 field measurements from the landfill gas monitoring system indicate the absence of either detectable methane or abnormal pneumatic pressures within the shallow subsurface bounding landfill areas. As such, no recommendations arose from the 2012 landfill gas monitoring events. The summary of the gas monitoring procedures and details of monitoring results are provided in section 4.0 of the C.E. Moell & Associates spring and fall monitoring reports included in Appendix E.

6.3 MISCELLANEOUS DATA

6.3.1 Wastes Requiring Special Handling

Wastes requiring special handling were accepted at the landfill during 2012 including contaminated soils, abattoir wastes (cattle under 30 months – non SRM), animal carcasses (cattle under 30 months – non SRM), asbestos, and other restricted non-hazardous wastes. Wastes requiring special handling require approval from the MEP or CAO/GM prior to acceptance and must be accompanied by a special waste manifest. Handling and disposal is done in accordance with the approved Operations Plan and the Commission's Health and Safety Policy. Detailed coordinates for the placement of all manifested wastes (i.e. contaminated soils and wastes requiring special handling) are documented and retained in the Operating Record. A monthly summary of reports is prepared and retained in the Operating Record to document the landfilling progress and the locations in which waste was deposited during the month. A daily record is maintained using GPS coordinates to document the location of waste deposited during the day. The Beaver Regional Landfill is not accepting any SRM wastes.

6.3.2 Revisions to the Operations Plan

There were no changes or revisions to the operating plan in the year 2012. The Commission would like to note that a Legal Compliance Audit was completed by AECOM January 22 – 24, 2012 in support of the current ISO 14001:2004 Environmental Management System. One result of this audit will be a complete review of the current Operations Plan to ensure legal compliance. The Commission will provide a copy of the revised Operations Plan to AESRD for review upon completion.

6.3.3 Emergency Response

The following emergency response activities occurred during 2012:

- September 26, 2012: During the evening of September 26, a fire ignited on the active landfill face. Landfill staff were notified at 23:58 hours by telephone and the local Emergency Services arrived at 01:10 hours. The area of waste impacted by the fire was approximately 20m x 40m. Emergency crews extinguished the fire quickly and remained on site for approximately 2 hours to soak the waste and monitor for hot-spots. Affected waste was segregated away from active tipping faces until staff were confident there was no further risk from the material. The waste was then disposed as per normal practices. The source of the fire could not be confirmed. The report prepared by the Beaver Emergency Services Commission is included in Appendix F.

6.3.4 Complaints

One complaint was received on October 4, 2012 under Reference Number 263767. The complaint was received at AESRD on October 3, 2012 from an adjacent landowner alleging large clouds of dust were blowing from the Landfill onto adjacent properties to the southeast. It was determined the dust was not from the Landfill activities, but was generated by the earth-moving at the Equity Industrial Park in Beaver County (located on adjacent land directly south of the Landfill). Documentation of the concerns can be found in Appendix F.

6.3.5 Environmental and Compliance Audits

Internal landfill inspections are performed weekly by landfill staff and are reviewed by the Supervisor, Landfill Services (SLS) and the Manager, Environmental Systems and Projects (MEP). Monthly internal audits are completed by landfill staff, the SLS, MEP or the Health, Safety and Environmental Safety Coordinator. The results are tabulated with assignment to the responsible staff member to rectify any fault or omission. An example of the monthly inspection reports is provided in Appendix F.

The following external audits were performed in 2012:

- December 21, 2011: The Beaver County Regional Fire Chief conducted a fire inspection on December 21, 2011. No adverse observations were noted. No fire inspection was completed in 2012. The Fire Inspection report is included in Appendix F.

- June 7, 2012: AESRD Environmental Protection Officer, Mr. Allan Underschultz conducted an inspection of the Landfill. Documentation regarding the inspection is included in Appendix F.

- July 31, 2012: The 2012 Waste Receiver Assessment Program (WRAP) was initiated by a consortium of upstream oil and gas producers. The purpose of a WRAP assessment is to determine the environmental exposure and risk associated with the producers utilizing third party waste receivers for the treatment and disposal of oilfield wastes. The waste receivers provide a wide range of services including, but not limited to, treatment facilities, transfer stations, landfill disposal, sub-surface injection, and incineration facilities. The Environmental Risk Assessment was conducted by Wotherspoon Environmental Inc. A copy of the report is maintained in Commission files and is available for viewing upon request.

6.3.6 Other Operational Issues

During 2012, landfill scale calibration checks were done by Pacific Scales Ltd. on January 11 and April 5. Both inspections passed and the scales were re-certified. In addition to the Commission's permanent scale, a rental scale was used between May 4, 2012 and August 14, 2012. This scale was calibrated during installation at the Landfill. Calibration records are kept on file by the Commission.

An annual fly over was conducted on September 22, 2012. From this, a new contour map and photo mosaic were prepared.

6.3.7 Supervising Operator and Certified Operators

The operations management of the Beaver Regional Landfill is under the direction and control of the Manager, Environmental Systems and Projects (MEP), Mr. Aaron Hills. The MEP manages the following certified senior operators who are responsible for overseeing and performing daily routine landfilling operations activities:

- Supervisor, Landfill Services: Mr. Kevin Bugge, Certificate No. CR0033
- Landfill Operator, Lead Hand: Mr. Richard Dueck, Certificate No. 0123
- Landfill Operator, Lead Hand: Mr. Arno Purin, Certificate No. 0246 and SWANA No. 93918 –Certified Landfill Technical Associate certificate
- Supervisor, Collection and Transportation: Mr. Russell Kowalchuk, Certificate No. 0250

The MEP reports to the Chief Administrative Officer and General Manager of the Beaver Regional Waste Management Services Commission, Pierre Breau, P. Eng. The CAO / GM is responsible for all Commission operations and administrative services. An organizational chart is included in Appendix G.

6.3.8 Communities Serviced and Estimated Populations

The Beaver Regional Landfill provides direct waste disposal services for the communities that comprise the Commission (i.e. Beaver County, the Town of Tofield, the Town of Viking, the Village of Holden and the Village of Ryley). The Landfill also provides disposal services for several regional communities. The populations of these communities as published by Statistics Canada for the most recent census (2011) are presented in Table 5. In addition, the Landfill receives waste from a variety of private commercial haulers which are not specifically associated with individual communities.

Table 5. Summary of Community / Regional Populations.

Community	Population
Beaver County	5,689
Town of Tofield	2,182
Town of Viking	1,041
Village of Holden	381
Village of Ryley	497
Town of Vermilion	3,930
Vermilion River County	7,905
Cold Lake	13,839
Bonnyville	6,216
Municipal District of Bonnyville (no.87)	11,191
Parkland County*	30,568
Town of Stony Plain*	15,051
City of Edmonton**	1,159,869

* *The Commission services one of four transfer stations in Parkland County, which also serves the Town of Stony Plain.*

** *The City of Edmonton has two primary options for disposal; the waste received at the Commission landfill only represents a portion of their total disposal requirements.*

6.3.9 Waste Storage and Recycling

There was no waste stored at the landfill site during 2012. The Commission operates various recycling activities at the Landfill, including:

- Pesticide container recycling is operated by Beaver County and Alberta Agriculture as a service to the local farm community. Pesticide containers (triple-rinsed) are received and stored in a dedicated pesticide container storage building and containers are shredded and removed from the site on an annual basis.
- Tire recycling facility operated in cooperation with the Alberta Recycling Management Authority. Old tires are received, sorted and stored in bunkers for recycling and removed as volumes dictate.
- Used oil is received and stored in a dedicated used oil tank while used oil filters and empty plastic oil jugs are received and stored in dedicated 205 litre barrels for recycling. The oil tank and filter barrels are serviced as required by Safety-Kleen Canada Inc. or GFL Environmental. Used oil from landfill equipment and vehicles is re-used in a used oil burner to create heat for the main landfill shop. Excess used oil is added to the used oil tank for recycling.
- Electronics recycling bin operated in cooperation with the Alberta Recycling Management Authority. Electronic components are received and stored in an enclosed roll-off container for removal and recycling as required.
- Wet cell batteries recycling operated in cooperation with DBS Environmental. Used batteries are received and stored in a special container for removal and recycling as required.
- White goods and miscellaneous metals are received and stored in an open stockpile for recycling. Any appliances containing refrigerant gases are separated, and the refrigerant removed by a certified technician prior to recycling. All metals are baled and shipped to a steel foundry for recycling on an annual basis or as volumes require.
- Clean concrete is received and stockpiled for future recycling. Periodically, depending on the accumulated volume, a portable crusher is brought in to crush the concrete for re-use as a road base construction material. During 2012, 1489.55 tonnes of clean concrete were accepted.
- Paint recycling is operated in cooperation with the Alberta Recycling Management Authority. Waste paint and waste paint material is received and stored in a special container for removal and recycling as required by DBS Environmental.

6.3.10 Fugitive Waste Retrieval Reporting.

Fugitive litter recovery is done on an ongoing daily basis by the landfill maintenance employee. Additional temporary staff are brought in to assist when required.
The Commission aggressively controls fugitive litter at the tipping face through a combination of measures as outlined in the Operations Plan.

A fugitive waste retrieval log is maintained on a daily basis and reported in the Monthly Activities Summary Report. This report shows the location waste was retrieved and volume of waste retrieved. These reports have been placed in the Operating Record.

6.3.11 Groundwater Monitoring

Groundwater monitoring was conducted in the spring and fall of 2012 by C.E. Moell and Associates on behalf of the Commission in accordance with the approved Groundwater Monitoring Plan. The current groundwater-monitoring network includes:

- 30 on-site groundwater monitoring wells around the Landfill;
- A groundwater interceptor trench, and;
- Two privately owned off-site dug-out systems.

After the spring sampling event, C.E. Moell and Associates recommended the testing parameters for groundwater monitoring well MW 01-07 be expanded to include a "*comprehensive suite of volatile organic compounds (VOCs). This suggestion arises from the fact that total organic carbon and chemical oxygen demand (TOC and COD) have typically been reported at substantially high concentrations throughout the monitoring history, reflective of a water carrying higher than normally-encountered concentrations of presumably oxidizable and other organic compounds."* This additional testing was conducted during the fall sampling event and the results indicated the landfill area is not the source of the elevated TOC. General findings from the 2012 spring and fall reports include:

- *"From the hydrogeologic interpretations contained herein, there is no indication that the Beaver Regional Landfill has affected or influenced groundwater chemistry within the various hydrostratigraphic zones underlying the site. This conclusion is based on the analytical results for groundwater samples drawn from a well system designed to monitor potential subsurface migration pathways from the engineered landfill area."*

- There is no indication that the operation of the Landfill has affected the quality of water in either privately-owned dug-out.
- No recommendations arose from the results of the 2012 fall sampling event.

The detailed reports describe and interpret the results of the 2012 monitoring events and are provided in Appendix E.

6.3.12 Closure and Post-Closure care

There were no closure activities or post-closure care measures undertaken in 2012.

6.3.13 Estimate of Landfill Space Remaining

The ultimate capacity of the Landfill (N.E ¼ and SE ¼ - 10 as approved) is estimated to be 36,177,000 m^3. *(Reference Table 3 – Section 3.1.1.3 of the 2005 Approval Renewal Application document.)*

The net volume of air space consumed in 2012 was calculated to be 81,525 m^3 in the Stage 4, Phase 1 Cell and 352,564 m^3 in the Phase 2 of Stage 4. Total airspace consumed in 2012 was 434,089 m^3. The cumulative air space consumed from commencement of operations in 1995 through to December 31, 2012 is calculated to be 4,200,149 m^3.

The developed airspace remaining (to elevation of 710mASL) in the Stage 4, Phase 2 cell is calculated to be 141,789 m^3 with 86,818 m^3 remaining in Stage 4, Phase 1 for a total of 228,607 m^3. The 2012 year end survey and contour map is included in Appendix H.

The total air space remaining (developed and developable) in the Landfill (NE ¼ and SE ¼- 10 combined as approved) is calculated to be 31,976,851 m^3.

6.3.14 Topsoil and Subsoil Management

A volumetric survey was completed by AMEC Geomatics during November 28 – 30, 2012 to confirm the current inventory of topsoil, clay and subsoil in stockpiles at the Landfill for future closure and reclamation activities. Survey volumes are presented in tabular format along with a stockpile location map in Appendix H.

6.4 OTHER REPORTING

A visitor's log is kept at the Scale for anyone entering the landfill site. Copies of the log are incorporated into the monthly reports which are placed and retained in the Operating Record.

7.0 CLOSURE

This report has been prepared by the Beaver Regional Waste Management Services Commission, owner and operator of the landfill facility, incorporating information provided by the Commission's respective consultants of record.

The information provided in this report is, to the best of my knowledge, an accurate representation of the 2012 activities at the Beaver Regional Landfill.

Respectfully submitted,
Beaver Regional Waste Management Services Commission

Digitally signed by Pierre Breau
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Pierre Breau, P. Eng.
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March 30, 2013

Aaron Hills
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