Report Date: May 3, 2023

File: 110746

Report Number: 199722

Cutline Industries Ltd. and 1064413 B.C. Ltd. doing business as LifeSoils Products
680 McKenzie Road Abbotsford BC

Dear Cutline Industries Ltd. and 1064413 B.C. Ltd. doing business as LifeSoils Products,

Re: An Administrative Penalty Referral

For your information, this inspection record is being referred for an Administrative Penalty.

Inspection Details:

On March 6, 2023, the Ministry of Environment and Climate Change Strategy (Ministry) Environmental Protection Officers Taryn Angus (Officer Angus) and Katie Howett (Officer Howett) conducted an on-site inspection of the composting facility operated by Cutline Industries Ltd. and 1064413 B.C. Ltd. doing business as LifeSoils Products (LifeSoils), located at 617 McKenzie Road in Abbotsford (Facility). The inspection was conducted in response to complaints and to verify compliance with the Organic Matter Recycling Regulation (OMRR) and authorization number 110746 (Authorization). The Authorization became effective on April 19, 2021. This inspection report is being issued concurrently with Inspection Report 203661 (IR203661).

Information for this inspection was provided by Randy Dahl (Owner, LifeSoils), Jim Armstrong (Principal/Senior Environmental Scientist, AES Inc), and Brian Gaudet (Land Use Consultant, 1302222 B.C. Ltd.).

The inspection was focused on the period between January 13, 2022, to April 24, 2023 (Inspection Period) and included a review of the following documents:

- Email correspondence between Ministry Staff and the Senior Environmental Scientist between November 28, 2022, and April 24, 2023 (collectively referred to as Email Correspondence throughout this Inspection Report).
- 2023-02-24 AES Inc. LifeSoils Composting Operation OMRR Compliance (2023 Compliance Report).
- 2021-04-19 New Application Signed (Notification Form for Construction or Beginning Operation of a Compost Facility).
- 2021-06-30 Acknowledgement Letter Signed-Auth 110746 (2021 Acknowledgement Letter).
- 2007-10-18 Aquifer Classification Worksheet (Attachment 1)
- 2012-03-14 Aquifer Classification Worksheet (Attachment 2)

Below are the OMRR clauses assessed for compliance during this inspection and the associated details/findings.

Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 12 (3)(a): Compost that is not solely produced from yard waste or from untreated and unprocessed wood residuals and that meets the requirements of all of the following is Class A compost: (a) the requirements of subsection (2) (a) to (c);

Ministry of Environment and Climate Change Strategy
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Surrey BC V3R 0Y3
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Website: www.gov.bc.ca/env

Details/Findings:	The Senior Environmental Scientist explained to Officer Angus and Officer Howett that the compost produced at the Facility is derived from untreated and unprocessed wood residuals, manure, and plant matter derived from processing plants. Therefore, the compost was not solely produced from yard waste or untreated and unprocessed wood residuals, and the requirements specified in subsection (2)(a) to (c) were applicable during the Inspection Period. Officer Angus determined that LifeSoils was out of compliance with the OMRR requirements for subsections 12(2)(a) and (b), detailed as follows. **Compliance Assessment of Subsection 12(2)(a): Schedule 1, Pathogen Reduction Process:** Section 3 of Schedule 1 states that the pathogen reduction requirements for Class A compost listed in sections 4(a) to (c) of this Schedule must be met before the vector attraction reduction requirements listed in sections 2(a) and (b) of Schedule 2. Officer Angus reviewed the compost data provided for the Inspection Period and determined that the Pathogen Reduction Process requirements were not met prior to the Vector Attraction Reduction requirements listed in Section 2(a) and (b) of Schedule 2. The 2023 Compliance Report explains that LifeSoils' composting process follows Schedule 1, Section 4(b) requirements. Section 4(b) of Schedule 1 describes the static aerated pile composting method as consisting of a compost process involving mechanical aeration of the compost pile, with the compost pile insulated and a temperature of not less than 55 Degrees Celsius maintained throughout the compost pile for at least 3 consecutive days. During the on-site inspection on March 6, 2023, Officer Angus and Officer Howett observed that there was no mechanical aeration in place, and that compost piles were not insulated. The 2023 Compliance Report also explains that LifeSoils' composting process follows Schedule 1, Section 5 requirements. However, the Pathogen Reduction Process listed in Schedule 1, Section 5 of OMRR is only applicable to facilities producing compost from yard waste alone. Since the Facility is not solely producing compost from yard waste or from untreated and unprocessed wood residuals, the process listed in Schedule 1, Section 5 of OMRR is not applicable to this Facility. **Compliance Assessment of Subsection 12(2)(b): Schedule 2, Vector Attraction Reduction Process:** The 2023 Compliance Report explains that the Vector Attraction Reduction Processes used at the Facility are the processes listed under Schedule 2, Section 2(a) and (b). Section 2(a) refers to an aerobic process with specific time and temperature requirements, as well as carbon to nitrogen (C:N) requirements, while Section 2(b) refers to a curing pile method which also has specific time and temperature, and C:N requirements. Officer Angus reviewed the 2023 Compliance Report, as well as compost data provided in the Email Correspondence, and determined that the compost did not meet the C:N requirements on the following occasions: • February 10, 2022, C:N 64.6 • February 17, 2023, C:N 14.7 Officer Angus requested additional C:N data for January, September, and October 2022, as well as information to demonstrate compliance with the requirements of Schedule 2, Sections 2(b)(i) through (iv); however, this data was not provided by the time of writing this Inspection Report and compliance could not be determined for these requirements. **Compliance Assessment of Subsection 12(2)(c): Schedule 4, Quality Criteria (Column 1, Class A Compost):** Subsection 12(2)(c) explains that Class A compost must meet the requirements of Column 1 of Schedule 4 (quality criteria). Officer Angus determined that LifeSoils met the requirements of Column 1 of Schedule 4 for the sample provided for analysis conducted in February 2023. Officer Angus requested additional quality criteria data to confirm compliance for compost produced in 2022; however, data was not provided by the time of writing this Inspection Report and compliance could not be determined for these requirements for the entire Inspection Period.

Compliance:	Out
Actions to be taken:	Ensure that all compost process and criteria requirements under Section 12(3)(a) are met, and that time, temperature, and sampling records are kept which can demonstrate compliance with the requirements.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 12 (3)(b): Compost that is not solely produced from yard waste or from untreated and unprocessed wood residuals and that meets the requirements of all of the following is Class A compost: (b) Schedule 3, Pathogen Reduction Limits;
Details/Findings:	Schedule 3 of OMRR includes the following requirements: • Section 1 - Fecal coliform levels must be determined to be less than 1000 MPN per gram of total solids (dry weight basis) for Class A compost (not produced from yard waste alone); • Section 3 - For Class A compost (not produced from yard waste alone), 7 representative samples must be taken from every 1,000 tonnes of dry weight, or once per year whichever occurs first; • Section 5 - Fecal coliform levels for Class A compost (not produced from yard waste alone) must be met either before, or at the same time as, the vector attraction reduction requirements are met; and, • Section 6 - Fecal coliform levels must be met, and vector attraction reduction methods must be complete before Class A compost is prepared for distribution. Officer Angus reviewed the Email Correspondence provided by the Senior Environmental Scientist and determined the following: • Section 1 - Fecal coliform levels were less than 1000 MPN per gram of total solids (dry weight basis) for the analysis conducted in February 2023. No other sample results were provided, therefore compliance with this requirement could not be determined for the entire Inspection Period. • Section 3 – The Owner informed Officer Angus on April 16, 2023, that from January 13, 2022, to January 31, 2023, 16,192 m^3 (9,715.2 tonnes) of compost was produced and distributed off-site, equating to more than 2,000 dry tonnes; however, only one set of seven samples was provided for the Inspection Period when at least two sets of samples should have been provided. • Sections 5 & 6 - As identified in the previous Details/Findings Section 12(2)(b), Officer Angus determined that LifeSoils did not meet the Vector Attraction Reduction requirements. As the appropriate amount of representative samples was not collected, and the requirements for Schedule 2 Vector Attraction Reduction of OMRR were not met, LifeSoils is out of compliance with the requirements of this Section.
Compliance:	Out

Actions to be taken:	Ensure that Schedule 3 (Pathogen Reduction Limit) requirements are met. This includes collecting the required number of samples and ensuring that they all meet fecal coliform concentration limits.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 12 (3)(c): Compost that is not solely produced from yard waste or from untreated and unprocessed wood residuals and that meets the requirements of all of the following is Class A compost: (c) Schedule 5, Sampling and Analyses - Protocols and Frequency;
Details/Findings:	Section 1 of Schedule 5 specifies that all required analyses for Class A compost (not solely produced from yard waste) must be carried out at intervals of at least every 1,000 tonnes of dry weight of organic matter, or once per year, whichever occurs first. The Owner informed Officer Angus on April 16, 2023, that from January 13, 2022, to January 31, 2023, 16,192 m^3 (9,715.2 tonnes) of compost was produced and distributed off-site; however, only one set of samples was provided to Officer Angus when at least two sets of samples should have been provided for compliance verification. Officer Angus requested additional data from within the Inspection Period. Still, the data was never provided, and the Senior Environmental Scientist explained that no additional data could be provided as samples were only taken periodically throughout the Inspection Period.
Compliance:	Out
Actions to be taken:	Ensure that all required analyses are conducted at the required frequency.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 12 (3)(d): Compost that is not solely produced from yard waste or from untreated and unprocessed wood residuals and that meets the requirements of all of the following is Class A compost: (d) Schedule 6, Record-keeping.

Details/Findings:	Schedule 6 of OMRR includes the following requirements: • Section 1 - Temperature and retention times must be monitored and recorded each working day during the production of Class A compost (not produced from yard waste alone). • Section 3 - Results of analysis required by this regulation must be kept at the facility for at least 36 months after the production of Class A compost (not solely produced from yard waste). • Section 4 - Results of Analysis must be made available for inspection by an officer, or sent to an inspector, upon request. Compliance Assessment: • Section 1 - Officer Angus reviewed temperature and retention time data, which demonstrated that LifeSoils monitored temperature and retention times for each working day of production for 2022. • Section 3 - LifeSoils was unable to provide Officer Angus and Officer Howett with analytical results during the on-site inspection at the Facility. • Section 4 - Analytical results were not provided to Officer Angus despite repeated requests.
Compliance:	Out
Actions to be taken:	Ensure that Schedule 6 requirements for record keeping and production of records are being met.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 12 (4): Class A compost must be derived only from organic matter.
Details/Findings:	The Senior Environmental Scientist informed Officer Angus that LifeSoils accepts the following constituents of organic matter: untreated and unprocessed wood residuals (trees, branches, roots, soil attached to the wood waste, other makeup soils (sand)), manure (chicken, cow and horse), and plant matter derived from processing plants (raw peppers) from a local greenhouse operation. The Owner informed Officer Angus and Officer Howett that chicken manure had been accepted exclusively from LifeSoil's chicken farm.
Compliance:	In

Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 23 (2)(a): A discharger must ensure that no organic matter is collected at, and no compost is distributed from, a composting facility unless a qualified professional conducts and completes an environmental impact study and produces an environmental impact study report acceptable to a director which includes, but is not limited to, (a) design of the composting facilities including buildings, works and other appurtances,
Details/Findings:	The 2021 Notification Form for Construction of Beginning Operation of a Compost Facility stated that the design production capacity for the Facility would be 20,000 tonnes per year. As a result, the 2021 Acknowledgement Letter specified that an Environmental Impact Study (EIS) was required to be completed and submitted to the Ministry by September 30, 2021. The Ministry provided an extension for the submission of the EIS to February 15, 2022; however, LifeSoils submitted their EIS to the Ministry on March 2, 2022, 15 days after the extension deadline. The Ministry reviewed the EIS and returned it as unacceptable on November 29, 2022. The Ministry provided LifeSoils with a second EIS submission extension date of January 31, 2023. The Senior Environmental Scientist requested a third extension on January 17, 2023; however, the Ministry declined the extension request on February 22, 2023. Since LifeSoils continued to collect and distribute organic matter throughout the Inspection Period, without an acceptable EIS, LifeSoils is out of compliance with the requirements of Sections 23(2)(a), (b), and (c).
Compliance:	Out
Actions to be taken:	LifeSoils is required to submit a revised EIS to EnvAuthorizationsReporting@gov.bc.ca.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 25 (2)(b): The notification required by subsection (1) must include (b) a copy of a personnel training program plan that addresses the specific training needed to operate the composting facility in compliance with this regulation.
Details/Findings:	The 2021 Acknowledgement Letter indicated that LifeSoils was to "submit a revised personal training program plan in accordance with the Compost Facility Requirements Guidance (Appendix B). The submitted personnel training program plan does not have sufficient training provisions. A copy of the guidance is available at the following link: https://www2.gov.bc.ca/assets/gov/environment/waste-management/organic-waste/biosolids/compost-facility-req.pdf ". The revised training plan was to be submitted by September 20, 2021. Officer Angus reviewed the correspondence on file and determined that LifeSoils has not submitted a revised Personnel Training Program Plan, which meets the requirements of this Section and is therefore found to be out of compliance.

Compliance:	Out
Actions to be taken:	LifeSoils is required to submit a revised Personnel Training Program Plan which meets the requirements of this Section.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 26 (2)(a): The receiving, storage, processing and curing areas of a composting facility must comply with all of the following: (a) be located on asphalt, concrete or another similar impermeable surface that is capable of withstanding wear and tear from normal operations and that will prevent the release of leachate into the environment;
Details/Findings:	Officer Angus and Officer Howett observed the composting Facility's receiving, storage, processing, and curing areas at the time of the on-site inspection. The Senior Environmental Scientist informed Officer Angus and Officer Howett that paving had been conducted since the last inspection on January 12, 2022 (IR182205); however, additional paving is still required and is planned to be completed in Spring 2023. Officer Angus and Officer Howett observed the receiving, storage, and curing areas are located on concrete. However, the processing area had concrete only to the midpoint under a compost pile; beyond the midpoint, the pile was located on bare ground. Since the processing area of the composting Facility was not located on an impermeable surface capable of preventing the release of leachate to the environment throughout the Inspection Period, LifeSoils is out of compliance with the requirements of this Section. The previous IR182205, dated March 7, 2022, determined that LifeSoils was out of compliance with Section 26(2)(a) of OMRR for not ensuring that all areas of the composting Facility (receiving, storage, processing and curing) were on an impermeable surface capable of preventing the release of leachate into the environment. The Ministry response for IR182205 was a Warning. The non-compliance associated with Section 26(2)(a) of OMRR is being referred for an Administrative Penalty.
Compliance:	Out
Actions to be taken:	Ensure that all receiving, storage, processing and curing areas of the composting Facility are located on an impermeable surface capable of withstanding wear and tear from normal operations and that will prevent the release of leachate into the environment.

Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 26 (2)(b)(i): The receiving, storage, processing and curing areas of a composting facility must comply with all of the following: (b) have a roof or cover, or a prepared surface, designed to prevent (i) the surface collection of water around the base of organic matter and compost, and
Details/Findings:	During the on-site inspection, Officer Angus and Officer Howett observed the Facility's receiving, storage, processing, and curing areas. Officer Angus and Officer Howett observed that the receiving, storage, and curing areas were located either under a cover/roof or on a prepared surface designed to prevent the surface collection of water around the base of the organic matter and compost (Photos 1 through 4). However, Officer Angus and Officer Howett observed that the processing area had concrete only to the midpoint under the compost pile, and beyond the midpoint, the pile was located on bare ground, and the surface collection of water around the base of organic matter was observed (Photos 5 and 6). Since the Facility did not have a roof or prepared surface designed to prevent the surface collection of water around the base of organic matter and compost throughout the entire processing area, LifeSoils is out of compliance with the requirements of this Section. The previous IR182205, dated March 7, 2022, determined that LifeSoils was out of compliance with Section 26(2)(b)(i) of OMRR for not ensuring that all areas of the composting Facility (receiving, storage, processing and curing) were undercover, or on a prepared surface designed to prevent the surface collection of water around the base of organic matter and compost. Officer Angus observed water collecting around the base of the receiving area. The Ministry response for IR182205 was a Warning. The non-compliance associated with Section 26(2)(b)(i) of OMRR is being referred for an Administrative Penalty.
Compliance:	Out
Actions to be taken:	Ensure that all receiving, storage, processing and curing areas of the Facility have a roof or cover or a prepared surface designed to prevent the surface collection of water around the base of the organic matter and compost.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 26 (2)(b)(ii): The receiving, storage, processing and curing areas of a composting facility must comply with all of the following: (b) have a roof or cover, or a prepared surface, designed to prevent (ii) run-off water from entering the receiving, storage, processing and curing areas;

Details/Findings:	Officer Angus and Officer Howett observed the Facility's receiving, storage, processing, and curing areas during the on-site inspection. Officer Angus and Officer Howett observed that the receiving, storage, and curing areas were located either under a cover/roof or on a prepared surface designed to prevent run-off water from entering these areas (Photos 1 through 4). However, Officer Angus and Officer Howett observed that the processing area had concrete only to the midpoint under the compost pile, and beyond the midpoint the pile was located on bare ground, and the surface collection of water around the base of organic matter was observed (Photos 5 and 6). Since the Facility did not have a roof or prepared surface designed to prevent run-off water from entering the entire processing area, LifeSoils is out of compliance with the requirements of this Section.
Compliance:	Out
Actions to be taken:	Ensure that all receiving, storage, processing and curing areas of the Facility have a roof or cover or a prepared surface designed to prevent run-off water from entering the area.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 26 (2)(c): The receiving, storage, processing and curing areas of a composting facility must comply with all of the following: (c) have a leachate collection system designed, constructed, maintained and operated to reuse leachate, or to remove leachate, from the receiving, storage, processing and curing areas.
Details/Findings:	When observing the receiving, storage, processing and curing areas, Officer Angus and Officer Howett observed that there was no leachate collection system designed, constructed, maintained, and operated to reuse or remove leachate. The Senior Environmental Scientist informed Officer Angus that two 70,000 L tanks had been purchased to collect leachate but still needed to be installed. The previous IR182205, dated March 7, 2022, determined that LifeSoils was out of compliance with Section 26(2)(c) of OMRR for not ensuring that all areas of the Facility had a leachate collection system. The Ministry response for IR182205 was a Warning. The non-compliance associated with Section 26(2)(c) of OMRR is being referred for an Administrative Penalty.
Compliance:	Out

Actions to be taken:	Ensure that a leachate collection system has been designed, constructed, maintained, and operated to rescue leachate or to remove leachate from the receiving, storage, processing and curing areas.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 26 (3): Leachate that is not collected and reused in the composting process must not be discharged into the environment unless authorized under the Act.
Details/Findings:	Since the previous inspection (IR#182205), the Senior Environmental Scientist informed Officer Angus that the stormwater collection sump had been filled in. The Senior Environmental Scientist also informed Officer Angus that water was used to suppress the fires that occurred on October 9 and November 28, 2022, and then the water was subsequently reintroduced into the composting process (IR203661). As identified in previous inspection reports (IR#128402 and IR#182205), there are two mapped aquifers located beneath the Facility that are separated by glacial till but likely to be hydraulically connected. The upper aquifer consists of sand and gravel, has a relatively shallow water table (10 m below ground surface), and is highly productive, with many wells pumping at rates greater than 10 L/s. As such, the aquifer was determined to be highly vulnerable to contamination (Attachments 1 and 2). During the inspection, Officer Angus and Officer Howett observed leachate being discharged to ground near the storage and curing area where concrete was removed, on the west side of the Facility and on the southeast side of the Facility (Photos 7 and 8). No sections in OMRR authorize these discharges, and Officer Angus confirmed that these discharges were unauthorized. The previous IR182205, dated March 7, 2022, determined that LifeSoils was out of compliance with Section 26(3) of OMRR for not collecting and reusing leachate in the composting process and for discharging leachate into the environment. The Ministry response for IR182205 was a Warning. The non-compliance associated with Section 26(3) of OMRR is being referred for an Administrative Penalty.
Compliance:	Out
Actions to be taken:	Ensure that there are no unauthorized discharges of leachate from the Facility to the environment.
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 27: The amount of organic matter in a composting facility must not at any time exceed the total design capacity of the facility.

Details/Findings:	The Owner informed Officer Angus on April 16, 2023, that from January 13, 2022, to January 31, 2023, 16,192 m^3 (9,715.2 tonnes) of compost was produced and distributed off-site, which is below the 20,000 tonne total design capacity of the Facility.
Compliance:	In
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 28: At least half of the compost stored at a composting facility must be removed annually from the facility beginning in the third year after facility start-up.
Details/Findings:	The Owner informed Officer Angus on April 16, 2023, that from January 13, 2022, to January 31, 2023, 16,192 m^3 (9,715.2 tonnes) of compost was produced and distributed off-site.
Compliance:	In
Requirement Description:	**Environmental Management Act, Organic Matter Recycling Regulation (18/2002) (EMA)** 29 (1)(a): Residuals from the composting process must (a) be stored so as to prevent vector attraction, and
Details/Findings:	The Senior Environmental Scientist informed Officer Angus and Officer Howett that residuals from the composting process were re-introduced into the composting process and that there were no issues with vector attraction.
Compliance:	In
Requirement Description:	**Environmental Management Act, Environmental Management Act** 6 (3): Subject to subsection (5), a person must not introduce or cause or allow to be introduced into the environment, waste produced by a prescribed activity or operation.

Details/Findings:	Composting operations are prescribed operations defined under Schedule 2 of the Waste Discharge Regulation as "composting organic wastes or other feedstocks". Subsection 2(1) of OMRR states: "For the purposes of the Act, compostable materials and recyclable materials continue to be a waste until dealt with in accordance with this regulation." Class A compost is defined in OMRR as "compost that meets the requirements of Section 12". LifeSoils was determined to be out of compliance with Sections 12(3)(a), 12(3)(b), 12(3)(c), and 12(3)(d), as detailed above in this inspection report. Since LifeSoils failed to comply with sections 12(3)(a), 12(3)(b), 12(3)(c), and 12(3)(d) of OMRR, the material produced during the Inspection Period is considered a waste and not Class A compost. By distributing this material to a third party, LifeSoils has caused, or allowed, waste produced during a prescribed operation to be discharged into the environment and is thereby out of compliance with EMA Section 6(3).
Compliance:	Out
Actions to be taken:	Ensure that the composting operations produce Class A compost that meets the requirements of Section 12 of OMRR.

Compliance History:
2019-01-14 IR 114809 Warning Unauthorized 6(3): Environmental Management Act 6 (3)
2019-05-28 IR 128402 AMP: Environmental Management Act 6 (3)
2019-12-16 IR 143509 Advisory
2021-07-07 IR 165607 Notice
2022-01-12 IR 182205 Warning 120(6): Organic Matter Recycling Regulation (18/2002) (EMA) 26 (2)(a); 26 (2)(b)(i); 26 (2)(c); 26 (3)

The Ministry of Environment Compliance and Enforcement Policy and Procedure (C&E Policy) prescribes common requirements and procedures for all Ministry staff to ensure consistent and risk-based assessment and response to non-compliance. Using the Non-Compliance Decision Matrix, the compliance determination for this inspection has been assessed as **Level 2, Category C, Administrative Monetary Penalty.**

More information about Environmental Compliance, the Non-Compliance Decision Matrix, and reporting and data submission requirements can be found at the links below:
General compliance information:
www.gov.bc.ca/environmentalcompliance
Non-Compliance Decision Matrix information:

Please be advised that this inspection report may be published on the provincial government website within 7 days.

Below are attachments related to this inspection.

If you have any questions about this letter, please contact the undersigned.

Yours truly,

Taryn Angus
Environmental Protection Officer

Attachments:
1) Photo 1. View of the Receiving Area.
2) Photo 2. View of the Receiving Area.
3) Photo 3. View of the Storage Area.
4) Photo 4. View of the Storage Area.
5) Photo 5. View of the Processing Area.
6) Photo 6. View of the Processing Area Located on Bare Ground.
7) Photo 7. View of Leachate Discharge on the West Side of the Facility.
8) Photo 8. View of Leachate Discharge on the Southeast Side of the Facility.

Deliver via:
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Photo 1. View of the Receiving Area.

Photo 2. View of the Receiving Area.

Photo 3. View of the Storage Area.

Photo 4. View of the Storage Area.

Photo 5. View of the Processing Area.

Photo 6. View of the Processing Area Located on Bare Ground.

Photo 7. View of Leachate Discharge on the West Side of the Facility.

Photo 8. View of Leachate Discharge on the Southeast Side of the Facility (as indicated by the orange arrows).

AQUIFER CLASSIFICATION WORK SHEET

DATE: October 18, 2007 (Updated March 15, 2012 by Z. Hammond)

AQUIFER MAPPER:

AQUIFER LOCATION: Abbotsford

AQUIFER NUMBER: 0015

NTS MAP SHEET: 092G/1

BCGS TRIM Maps (1:20,000):

CLASSIFICATION: I A **RANKING: 20**

Aquifer Size: 98 km^2

Aquifer Boundaries:
The extents of the aquifer boundary to the west of BCBS Map Sheet 92g009 were mapped in 2007 with no details provided. The majority of the aquifer boundary within BCBS Map Sheet 92g009 was based on surficial geology mapping limits of Sumas Drift deposits. A topographical low was used to delineate a portion of the eastern aquifer boundary. International border limits that coincide with the extent of available data were used for the southern aquifer boundary.

Aquifer Priority Rating for Observation Wells: 77.26

Geologic Formation (overlying):
Sumas Drift deposits generally described as recessional glaciofluvial and ice-contact deposits, glaciolacustrine deposits, as well as lodgment and minor flow till (Armstrong, 1980).

Geologic Formation (aquifer): Sand and Gravel. Sumas drift, glacial outwash. The interlayering of primarily till or clay with sand and gravel deposits has the potential to result in multiple stacked aquifers that are partially confined or perched. Perched aquifers may coalesce with underlying aquifers. The aquifer may be hydraulically connected to underlying Aquifer No. 28.

Major Aquifer System Type: 4a. Characterized as unconfined glaciofluvial outwash or ice contact sand and gravel aquifers, generally formed near or at the end of the last period of glaciation.

Confined/Unconfined: Unconfined with the potential for some areas being partially confined where overlying till is present.

Vulnerability:
High. Confining materials above the aquifer occurs in isolated areas. The geologic sediments found above the water table generally have a medium to high permeability. The average depth to the water table is 6.25 m and is considered to be shallow. Based on the above, the aquifer vulnerability is considered high.

Productivity:
High. Reported well yields have a wide range between 0.01 to 126 L/s with a median of 1.57 L/s and an average of 5.83 L/s based on 253 records. The geometric mean of 1.85 L/s indicates a moderately productive aquifer; however, productivity is considered high given that over 80 wells having yields above 3 L/s with over 40 wells with yields above 10 L/s.

Depth to Water Table:
The depth to static water level ranged from 0.3 to 47.87 m with a median of 6.25 m and an average of 8.87 m based on 478 records. The depth to the water table is considered to be shallow.

Direction of Groundwater Flow:
Based on topography, a component of groundwater may flow to the north towards the Fraser River, to the east, and to the west.

Recharge:
Recharge to the aquifer is likely from direct infiltration of precipitation, localized perched groundwater systems, and from local creeks or lakes.

Domestic Well Density:
The level of density was calculated at 6.9 wells/km^2 using all wells since well use was not available for a majority of wells. The domestic well density is considered moderate.

Type of Water Use:
Multiple Uses. Groundwater is used for private domestic, water supply, irrigation, and commercial/industrial purposes based on a review of available well record information for BCGS Map Sheet 92g009.

Reliance on Source:
Conjunctive. There are water licenses along local creeks and springs that are also used to meet local water demands.

Conflicts Between Users:
None documented.

Quantity Concerns (type, source, level of concern):

Quality Concerns (type, source, level of concern):
There is a regional nitrate issue and local pesticide contamination has been documented.

Comments:

Worksheet prepared by Erin Park, from information in *Copy of Aquiferdatbase w attributes sep-12-07 (ep).xls*. Prepared on October 18, 2007.

References:

Bernardinucci J. and K Ronneseth, 2002. Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater. BC Ministry of Water, Land and Air Protection, Water Air and Climate Change Branch, Water Protection Section.

Armstrong, J.E., 1980. Surficial Geology, Mission, British Columbia. Geological Survey of Canada, Map 1485A, scale 1:50 000.

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Abbotsford

AQUIFER NUMBER: 0015

CLASSIFICATION: I A **RANKING VALUE: 20**

Classification Component:

Level of Development:
Aquifer productivity is considered moderate based on well yield. Demand is considered high based on domestic well density, numerous water supply, commercial/industrial, and irrigation wells, as well as numerous large diameter well installations. There is a heavy level of development in relation to aquifer productivity.

Level of Vulnerability:
High level of vulnerability to surface contamination.

Ranking Component:

	Ranking Value
Productivity:	**3**
Vulnerability:	**3**
Size:	**3**
Demand :	**3**
Type of Use:	**3**
Quality Concerns:	**3**
Quantity Concerns	**2**
Total:	**20**

Statistical Summary of Well Record Data for Aquifer # 0015

	Well Depth (ft)	***Depth to Water (ft)***	***Depth to Bedrock (ft)***	***Reported Well Yield (gpm)***
Number of Wells	667	478	0	253
Maximum	298	157	UNK	2000
Minimum	5	1	UNK	0.10
Average	56	29	UNK	93
Median	43	21	UNK	25
Geometric Mean	44	21	UNK	29

AQUIFER CLASSIFICATION WORKSHEET

DATE:	14-Mar-12
AQUIFER REFERENCE NUMBER:	28
DESCRIPTIVE LOCATION OF AQUIFER:	Clearbrook
NTS MAP SHEET:	093G01
BCGS MAP SHEET:	092g009

CLASSIFICATION: IIC **RANKING: 14**

Aquifer Size: 69 km^2

Aquifer Boundaries:

The majority of the northern and eastern aquifer boundary coincides with the limits of the Sumas Drift deposit. A topographical low was used to delineate a portion of the eastern aquifer boundary. International border limits that coincide with the extent of available data were used for the southern aquifer boundary. The southwestern limit generally follows the extent of wells with lithology information that indicate the presence of a significant confining layer (i.e., greater than 15 m thick). Local topographical highs were used to delineate the northwestern extent of the aquifer. Solid lines have been used for boundaries having a high degree of certainty while dash lines indicate a lesser degree of certainty.

Aquifer Sub-type: 4b

Characterized as a confined sand and gravel aquifer underneath till, in between till layers, or underlying glaciolacustrine deposits.

Aquifer Priority Rating for Observation Wells: 69.58

Geologic Formation (overlying materials):

Sumas Drift deposits generally described as recessional glaciofluvial and ice-contact deposits, glaciolacustrine deposits, as well as lodgment and minor flow till (Armstrong, 1980). Glaciomarine deposits, marine sediments, and minor till of the Fort Langley Formation are also present.

Geologic Formation (aquifer): Sand & Gravel

Primarily sand and gravel with some wells having screened intervals inferred to be instrumented in sand material. The interlayering of primarily till or clay with sand and gravel deposits has the potential to result in multiple stacked aquifers that are confined to partially

confined. The aquifer may be hydraulically connected to overlying Aquifer No. 15 in areas where confining materials are absent or where deep channels exist.

Confined/Partially Confined/Unconfined: Confined

Vulnerability: Low - C

The thickness of the predominant confining unit above the aquifer material ranges from 1.22 to 105.46 m with a median of 14.02 m and an average of 19.30 m based on 383 well records. The depth to the bottom of the primary confining layer ranges from 4.27 to 187.76 m with a median of 30.18 m and an average of 35.29 m. The overlying sediments appear to be laterally extensive and thick in the western portion of the aquifer; however, the coverage decreases to the east with variable thickness. The depth to water is moderately shallow. Based on the above, the aquifer vulnerability is considered low.

Productivity: Moderate – 1.60 L/s

Reported well yields have a wide range between 0.004 to 126 L/s with a median of 1.26 L/s and an average of 5.32 L/s based on 23 records. Productivity is considered moderate based on a geometric mean of 1.60 L/s. Wells flagged as having a pump test have yields ranging from 0.5 to 12.62 L/s. Aquifer productivity may be higher based on over 40 wells having yields above 10 L/s.

Depth to Water: Moderately Shallow - Average 18.85 m

The depth to static water level ranged from free flowing to 82.30 m with a median of 16.76 m and an average of 18.85 m based on 318 records. The static water level is sometimes higher than the bottom of the confining unit indicating the aquifer is under pressure at some locations. Artesian conditions were noted at two wells located in the northwestern portion of the aquifer.

Direction of Groundwater Flow:

Groundwater likely flows north towards the Fraser River, east, and south based on topography.

Recharge:

Recharge to the aquifer is likely from direct infiltration of precipitation and/or slow downward leakage.

Domestic Well Density: Moderate – 4.1 wells/km^2

The level of density was calculated at 4.1 wells/km^2 using wells identified for domestic and unknown uses and is considered to be moderate.

Type of Water Use: Multiple Uses

Groundwater is used for private domestic, water supply, irrigation, and commercial/industrial purposes based on a review of well record information.

Reliance on Source:

Conjunctive. There are water licenses along local creeks and springs that are also used to meet local water demands.

Conflicts between Users:

None documented.

Quantity Concerns:

Deepening of wells reported at a few wells.

Quality Concerns:

Water quality concerns reported at a few wells including elevated nitrate and iron levels.

Comments:

References:

Bernardinucci J. and K Ronneseth, 2002. Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater. BC Ministry of Water, Land and Air Protection, Water Air and Climate Change Branch, Water Protection Section.

Armstrong, J.E., 1980. Surficial Geology, Mission, British Columbia. Geological Survey of Canada, Map 1485A, scale 1:50 000.

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Clearbrook

AQUIFER REFERENCE NUMBER: 28

AQUIFER SUB-TYPE: 4b

AQUIFER PRIORITY RATING FOR OBSERVATION: 69.58

CLASSIFICATION: IIC **RANKING: 14**

Classification Component:

Level of Development: Aquifer productivity is considered moderate based on well yield. Demand is considered high (see below). There is a moderate level of development in relation to aquifer productivity.

Level of Vulnerability: Moderate level of vulnerability to surface contamination.

Ranking Component:	*Ranking Value:*
Productivity:	2
Vulnerability:	1
Size:	3
Demand*:	3
Type Of Use:	3
Quality:	1
Quantity:	1
Total:	**14**

** Demand has been assessed subjectively. Demand is based on domestic well density, numerous water supply, irrigation and commericial/industrial wells, several large diameter wells (i.e., greater than 25 cm) as well as general knowledge of well use and land use in the area. Demand assumes that the reported well capacity is the amount of water used, which can be misleading. The reported well capacity is often higher than actual use.*

Statistical Summary of Well Data for Aquifer # 28

Total number of wells available for statistical analysis:

	Depth to Bedrock (m bgs)	Well Depth (m bgs)	Depth to Water (m bgs)	Reported Est. Well Yield (L/s)	Est. Thickness of Confining Materials (m)
Number of Wells	1	383	318	311	383
Minimum	67.67	6.10	Artesian	0.00	1.22
Maximum	67.67	188.98	82.30	126.18	105.46
Median	67.67	39.32	16.76	1.26	14.02
Average	67.67	44.02	18.85	5.32	19.30
Geometric Mean	67.67	39.54	15.16	1.60	12.90