

ALBERTA ENVIRONMENTAL APPEALS BOARD

Report and Recommendations

Date of Report and Recommendations – February 15, 2013

IN THE MATTER OF sections 91, 92, and 95 of the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12, and section 115 of the *Water Act*, R.S.A. 2000, c. W-3;

-and-

IN THE MATTER OF notices of appeal filed with respect to *Water Act* Approval No. 00266612-00-00 and *Environmental Protection and Enhancement Act* Approval No. 236328-00-00 issued to Waste Management of Canada Corporation by the Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development.

Cite as: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (15 February 2013), Appeal Nos. 11-025-027, 030, 032-035, 038-040, 043-047, 051-053, 056, 068-069, 071, 076, 100, 104-105, 107-109, 112, 147-150, 156-159, 161, and 173-R (A.E.A.B.).

BEFORE:

Eric McAvity, Q.C., Panel Chair;
Alan Kennedy, Board Member; and
David Evans, Board Member.

BOARD STAFF:

Gilbert Van Nes, General Counsel and
Settlement Officer; Denise Black, Board
Secretary; and Marian Fluker, Associate
Counsel.

SUBMISSIONS BY:

Appellants: Lori Cramer, Chantel Cramer, Tony and Keith
Cramer, Lorne Skuba, Jim Panich, Sophie
Panich, Clinton and Stacey Kirk, Linda Kirk,
John Kirk, Hazel Lahti, Melvin Telstad, Odessa
Telstad, Kevin and Carmen Ewasiw, Darwin
Trenholm, Larry Sisson, Cecile Sisson, Betty
and Bernie Kolewaski, and Jason Dmetruk,
represented by Debbie Bishop, K2B Law
Klimek Buss Bishop; Peggy and Edward Hilts;
Cori Kuzyk; Tracy Kuzyk; Laurie and David
Genert; Morris Haig; and Joyce Haig.

Approval Holder: Waste Management of Canada Corporation,
represented by Donald Wilson, Davis LLP.

Director: Patrick Marriott, Director, Northern Region,
Operations Division, Alberta Environment and
Sustainable Resource Development,
represented by Michelle Williamson, Alberta
Justice and Solicitor General.

WITNESSES:

Appellants: Lori Cramer, Tony Cramer, Clinton Kirk, John
Kirk, Linda Kirk, Hazel Lahti, Odessa Telstad,
Darwin Trenholm, Larry Sisson, Betty
Kolewaski, and Jason Dmetruk; Thierry Page,
Odotech; Morris Maccagno, Worley Parsons
Resources & Energy; Manas Shome, Worley
Parsons Resources & Energy; G. Fred Lee, G.
Fred Lee & Associates; Cori Kuzyk; and Peggy
and Edward Hilts, and Steve Johnson,
AECOM.

Approval Holder: Pete Marshall, Adelantar Consulting; Jim Gendron, LTG Consulting; Kevin Kemball, Incremental Forest Technologies; Rolf Aslund, AECOM; Nancy Grainger, Millennium EMS Solutions Ltd.; Terry Johnson, Senior Hydrogeologist, Waste Management of Canada Corporation; and Doug Coenen, Director of Landfill Operations, Waste Management of Canada Corporation.

Director: Pat Marriott, Director, Northern Region, Alberta Environment and Sustainable Resource Development; Donna Chaw, Waste Policy Advisor, Alberta Environment and Sustainable Resource Development; Ernst Kerkhoven, Hydrologist, Alberta Environment and Sustainable Resource Development; and Don Weleschuk, Contaminant Hydrologist, Alberta Environment and Sustainable Resource Development.

EXECUTIVE SUMMARY

Alberta Environment and Sustainable Resource Development issued an Approval under the *Water Act* to Waste Management of Canada Corporation (WMCC) for the placing, constructing, operating, maintaining, removing, or disturbing works, in or on any land, water, or water body for the purpose of removing wetlands, constructing wetland compensation works, and managing surface water run-on and run-off for a landfill near Thorhild. An Approval was also issued to the WMCC under the *Environmental Protection and Enhancement Act* (EPEA) allowing for the construction, operation, and reclamation of the Thorhild Landfill (the Landfill). The Landfill will only be accepting non-hazardous wastes.

The Environmental Appeals Board (the Board) received 36 appeals of the *Water Act* Approval and 35 appeals of the EPEA Approval. The Board accepted 19 appeals of the *Water Act* Approval and 24 appeals of the EPEA Approval.

There were seven issues for the hearing held on January 14 to 17, 2013. Based on the submissions and evidence provided and a review of the record, the Board recommended the Approvals be varied to require that:

1. the testing of all groundwater wells and surface water dugouts within an eight kilometre radius of the Landfill be completed prior to accepting any wastes at the Landfill and as part of the audit conducted every three years;
2. all cells constructed at the Landfill shall be constructed with a primary geomembrane liner, a leak detection system between the primary geomembrane liner and composite liner, a composite liner, and a leachate collection system capable of maintaining the maximum acceptable leachate head above the primary liner;
3. the Approval Holder shall notify landowners downstream of the Landfill one week prior to releasing water from the surface water retention ponds;
4. the drainage from the culvert on Range Road 210 shall be properly maintained and the run-off system shall be designed to ensure the maximum amount of water that flows through the southwest culvert reaches the wetlands on the south part of the Landfill;
5. the Approval Holder shall complete a nest search to identify nesting birds at the Landfill prior to continuing with construction of the Landfill;
6. the Approval Holder shall provide notice to all residents and landowners within eight kilometres of the Landfill and the Appellants if the Approval Holder intends to apply for any amendment to an approval, licence,

permit, or authorization of any kind, or if it intends to apply for another approval, licence, permit, or authorization of any kind;

7. the Approval Holder shall implement a program to prevent clubroot entering the Landfill as part of its operations plan;
8. the groundwater monitoring wells shall be placed a maximum of 100 metres apart on the south and east perimeter of the Landfill and on the south half of the west perimeter and a maximum of 200 metres apart on the north perimeter and north half of the west perimeter of the Landfill;
9. the Approval Holder shall prepare an Emergency Response Plan for the Director to review and accept prior to the acceptance of any waste into the Landfill; and
10. the Emergency Response Plan must be developed in collaboration with residents within eight kilometers of the Landfill and the County of Thorhild and must include emergency measures to ensure the protection of surrounding residents, including how to notify residents of emergencies, emergency exit routes, and any other measures necessary to protect the public.

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I. INTRODUCTION

[1] This is the Environmental Appeals Board's report and recommendations in relation to appeals filed regarding approvals issued to Waste Management of Canada Corporation ("WMCC" or the "Approval Holder") for a landfill. The Environmental Appeals Board (the "Board") received 36 appeals of the approval issued under the *Water Act*, R.S.A. 2000, c. W-3. The Board also received 35 appeals of the approval issued under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12 ("EPEA"). The approvals were for the development of the Thorhild Landfill (the "Landfill"). The Landfill is a Class II landfill which is one that only accepts non-hazardous waste.

[2] The Board held a hearing on January 14 to 17, 2013, to hear evidence on seven issues. Based on the evidence received, the submissions provided, and the information in the record, the Environmental Appeals Board prepared this report and recommendations. The Board recommended development of the Landfill be allowed, subject to a number of variations to the approvals.

II. BACKGROUND

[3] On September 22, 2011, the Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development* (the "Director"), issued Approval No. 00266612-00-00 (the "*Water Act* Approval") under the *Water Act* to WMCC. The *Water Act* Approval was issued for the placing, constructing, operating, maintaining, removing, disturbing works, in or on any land, water, or water body for the purpose of removing wetlands, constructing wetland compensation works, and managing surface water run-on and run-off for a landfill near Thorhild, Alberta.¹ On September 22, 2011, the Director also issued Approval No.

* For all relevant times during these appeals, the Department was named Alberta Environment and Water. However, as of May 8, 2012, the Department was renamed Alberta Environment and Sustainable Resource Development. For the purposes of this Report and Recommendations, the Department will be referred to as Alberta Environment and Sustainable Resource Development ("AESRD").

¹ The landfill has two distinct areas. In this decision, the actual land where the landfill cells will be constructed will be referred to as the "Landfill Area" and the adjoining area that includes a main access road, intersections to provide access, and a crossing of a railway right-of-way, will be referred to as the "Transportation Lands." Collectively, the Landfill Area and Transportation Lands will be referred to as the "Landfill."

236328-00-00 under EPEA (the “EPEA Approval”) to WMCC for the construction, operation, and reclamation of the Landfill where more than 10,000 tonnes of waste, not including hazardous wastes, is disposed of each year.²

[4] Between September 29, 2011 and November 8, 2011, the Board received 36 Notices of Appeal appealing the *Water Act* Approval and 35 Notices of Appeal appealing the EPEA Approval (collectively the “Appellants”).³

[5] The Board wrote to the Appellants, Approval Holder, and the Director (collectively the “Parties”) acknowledging receipt of the Notices of Appeal and notifying the Approval Holder and Director of the appeals.

[6] On October 17, 2011, the Board received a Stay application of the *Water Act* Approval from Ms. Peggy and Mr. Edward Hilts. The Board asked the Hilts to answer questions in relation to the Stay request.⁴ On October 19, 2011, the Board notified the Parties the Hilts provided a *prima facie* case for a Stay. The Board asked the Approval Holder, Director, and Thorhild County to provide written submissions answering the Stay questions.

[7] On October 26, 2011, the Board received a Stay request of the Approvals from Ms. Stacy Kirk and Mr. Clinton Kirk. On November 9, 2011, the Board notified the Parties that this Stay application was dismissed because the concerns raised related to the operation of the

² Collectively, the *Water Act* Approval and EPEA Approval will be referred to as the “Approvals.”

³ The complete list of Appellants is attached in Appendix A. The appeal filed by the Confederacy of Treaty Six First Nations was dismissed for failing to respond to the Board and, therefore, their appeal is not considered in this decision. See: *Confederacy of Treaty Six First Nations v. Director, Northern Region, Operations Division, Alberta Environment and Water, re: Waste Management of Canada Corporation* (01 February 2012), Appeal No. 11-024-D (A.E.A.B.).

⁴ The Hilts were asked to respond to the following questions:

1. What are the serious concerns raised in the Appellants’ Notice of Appeal that should be heard by the Board?
2. Would the Appellants suffer irreparable harm if the Stay is refused?
3. Would the Appellants suffer greater harm if the Stay was refused, than Waste Management of Canada would suffer if the Stay was granted?
4. Would the overall public interest warrant a Stay?
5. Are the Appellants directly affected by Alberta Environment’s decision to issue the *Water Act* Approval to Waste Management of Canada? This question is asked because the Board can only grant a Stay where it is requested by someone who is directly affected.

Landfill, which would not start until late 2012, and therefore, the Kirks would not suffer irreparable harm during the time it would take for the Board to address the appeals.

[8] The Board received Stay applications of the EPEA Approval from the Hilts and Generts on November 6 and 9, 2011, respectively, and of the *Water Act* Approval from Ms. Linda and Mr. John Kirk and the Generts on November 8 and 9, 2011, respectively. The Board notified the Parties on November 14, 2011, that these Stay applications were dismissed. The Board found the concerns raised related to the operation of the Landfill and, therefore, they would not suffer irreparable harm during the time it would take for the Board to address the appeals.

[9] On November 8, 2011, the Board granted a temporary Stay of the *Water Act* Approval only as it related to the removal of the wetlands. The Board received submissions on the Stay application from the Hilts, Approval Holder, and Director between December 8 and 22, 2011.

[10] On November 25, 2011, the Board set the schedule to receive submissions on a number of preliminary matters.⁵ The Board received the participants' submissions on the preliminary matters between December 16, 2011 and April 13, 2012. The length of time to receive submissions was extended at various times at the request of the Appellants and Approval Holder. The Board provided its decision on the preliminary matters to the Parties on August 9, 2012.⁶

⁵ The preliminary matters were:

1. Did each of the Appellants file a Statement of Concern with Alberta Environment?
2. Were the Notices of Appeal filed within the time frames specified in the *Water Act*?
3. Are the Appellants directly affected by the Approvals?
4. Is the Concerned Citizens of Thorhild County Society ("CCTCS") group directly affected by the Approvals?
5. Are there any other issues raised in the Notices of Appeal that are not properly before the Board and how does this impact the validity of the Notices of Appeal?
6. How can the issues in the Notices of Appeal be consolidated into categories or groups that can be dealt with together?
7. If this matter proceeds to a hearing, what issues included in the Notices of Appeal should be considered by the Board?

⁶ See: Preliminary Motions: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (09 August

[11] The Board received a copy of the Director's record (the "Record") on November 29, 2011, and copies were provided to the Parties on January 6, 2012.

[12] On January 11, 2012, the Board notified the Parties that the temporary Stay was lifted, because the Hilts did not show there would be irreparable harm.⁷ The Hilts requested a reconsideration of the Board's decision on January 19, 2012. The Board notified the Parties on June 8, 2012, that the reconsideration request was denied. Reasons were provided in a letter from the Board on August 1, 2012.

[13] The Board notified the Parties of its decision on June 8, 2012, on whose appeals were validly before the Board. The Board accepted 19 appeals of the *Water Act* Approval and 24 appeals of the EPEA Approval.

[14] On June 22, 2012, the Board scheduled a mediation meeting for August 14, 2012, in Edmonton.

[15] On July 29, 2012, after reviewing the availability of the Parties, the Board scheduled the hearing for November 13 to 16, 2012.

[16] On August 9, 2012, the Board provided the Parties with its decision regarding the preliminary matters.⁸

[17] On August 10, 2012, the Concerned Citizens of Thorhild County Society ("CCTCS")⁹ submitted an interim costs application. Responses were received from the

2012), Appeal Nos. 11-025-059, 062-063, 068-071, 075-076, 100-112, 147-150, 156-161, 163-165, and 173-ID2 (A.E.A.B.).

⁷ See: Stay Decision: *Hilts v. Director, Northern Region, Operations Division, Alberta Environment and Water*, re: *Waste Management of Canada Corporation* (14 March 2012), Appeal No. 11-043-ID1 (A.E.A.B.).

⁸ See: Preliminary Motions: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (09 August 2012), Appeal Nos. 11-025-059, 062-063, 068-071, 075-076, 100-112, 147-150, 156-161, 163-165, and 173-ID2 (A.E.A.B.).

⁹ The CCTCS represents the following Appellants: Mr. Larry and Ms. Cecile Sisson, Mr. Jim and Ms. Sophie Panich, Mr. Tony and Ms. Lori Cramer, Mr. Keith Cramer, Ms. Chantel Cramer, Mr. Mel and Ms. Odessa Telstad, Ms. Hazel Lahti, Mr. Jason Dmetruk, Mr. Lorne Skuba, Mr. John and Ms. Linda Kirk, Mr. Clinton and Ms. Stacey Kirk, Mr. Bernie and Ms. Betty Kolewaski, Mr. Kevin and Ms. Carmen Ewasiw, and Mr. Darwin Trenholm.

Approval Holder and Director on August 29, 2012. The Board granted intervenor costs for the CCTCS to retain experts for the hearing.¹⁰

[18] The mediation meeting was held on August 14, 2012, in Edmonton. No resolution was reached at the mediation meeting but talks between the participants continued until the Hearing was held.

[19] The Board published the Notice of Hearing in the Lamont Farm ‘n’ Friends, Redwater Review, Westlock News, Edmonton Journal, and Edmonton Sun. The Board provided a copy of the Notice of Hearing to the County of Thorhild to place on its public bulletin board or website, and it was placed on the Government of Alberta and Board websites. In response to the Notice of Hearing, the Board received an intervenor request from Mr. Frank and Ms. Donna VanDenBroek. The Board denied the intervenor request.¹¹

[20] On September 6, 2012, counsel for the CCTCS notified the Board that a scheduling conflict had arisen, and she requested the hearing be rescheduled. After receiving comments from the other Parties, the Board granted the adjournment. The Board notified the Parties the Hearing was re-scheduled to January 14 to 17, 2013.

[21] On October 9, 2012, the VanDenBroeks requested a reconsideration of the Board’s intervenor decision. On October 17, 2012, the Board notified the VanDenBroeks that their reconsideration request was denied.

[22] November 13, 2012, the Hilts requested the Board order the attendance of Mr. Steve Johnson, a hydrologist who had previously done work for the Approval Holder and who was familiar with the Hilts’ property and surrounding area. No objections were received from the other Parties. On December 10, 2012, the Board ordered Mr. Johnson attend the Hearing as a witness for the Hilts.

¹⁰ See: Interim Costs: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (26 September 2012), Appeal Nos. 11-025-027, 030, 032-035, 038-040, 043-047, 051-053, 056, 068-069, 071, 076, 100, 104-105, 107-109, 112, 147-150, 156-159, 161, and 173-IC (A.E.A.B.).

¹¹ See: Intervenor Decision: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (28 September 2012), Appeal Nos. 11-025-027, 030, 032-035, 038-040, 043-047, 051-053, 056, 068-069, 071, 076, 100, 104-105, 107-109, 112, 147-150, 156-159, 161, and 173-ID3 (A.E.A.B.).

[23] On December 13 and 14, 2012, a further mediation meeting was held in Fort Saskatchewan.

[24] The Board held a hearing on January 14 to 17, 2013, in Edmonton to hear submissions on the following issues:

1. Do the terms and conditions of the EPEA Approval and *Water Act* Approval adequately protect the environment and human health? Environment includes land, wetlands, habitat, and wildlife.
2. Do the EPEA Approval and *Water Act* Approval adequately address the potential impacts of the Landfill on the groundwater and local wells?
3. Did the Director adequately consider the potential impacts of the Landfill on surface run-on and run-off and the surrounding watersheds?
4. Did the Director adequately consider the construction and operation of the Landfill? Operations include the types of waste accepted by the Landfill, including special waste, and the proposed control of dust, noise, odours, nuisance animals, and fugitive wastes.
5. Are the monitoring programs adequate to protect the environment and human health?
6. Is the Emergency Response Plan adequate?
7. Are the post closure and reclamation conditions adequate?

III. PRELIMINARY MATTERS

A. Appeals Withdrawn

[25] On November 8, 2012, Mr. Morris and Ms. Joyce Haig (Appeal Nos. 11-032, 033, and 112) notified the Board they were withdrawing their appeals.

[26] As a result of ongoing discussions through mediation, Mr. David and Ms. Laurie Genert (Appeal No. 11-076) notified the Board on January 11, 2013, that they were withdrawing their appeal. Mr. Kevin and Ms. Carmen Ewasiw (Appeal Nos. 11-047 and 107) and Mr. Jim and Ms. Sophie Panich (Appeal Nos. 11-147 and 149) notified the Board on January 13, 2012, that they were withdrawing their appeals.

[27] Based on these withdrawals and pursuant to section 95(7) of EPEA, the Board closed its files with respect to Appeal Nos. 11-032, 033, 047, 076, 107, 112, 147, and 149.

B. Time Schedule at Hearing

[28] The Approval Holder and CCTCS requested additional time to present evidence and arguments and for cross-examination. After hearing the submissions on these requests, the Board adjusted the Hearing schedule to accommodate the requests. The Hearing schedule was further adjusted during the course of the Hearing at the request of the various Parties.

C. Information in Power Point Presentation

[29] The Director and Approval Holder raised concerns that information in the power point presentation provided by the CCTCS during the week before the Hearing was new information and would be prejudicial if allowed in at the Hearing. The information in question related to the calculation of hydraulic conductivity of the soils under the Landfill footprint. Although the Director had notified the Board prior to the Hearing that he may request an adjournment to address the information, he advised the Board at the start of the Hearing that he was prepared to speak to this new information and would, therefore, not be seeking an adjournment.

[30] The Board allowed the information to be presented. The Board found the information was not new information since the calculation used was already referenced in the Director's Record hence, none of the Parties would be prejudiced by the information being presented in the power point presentation.

IV. DO THE TERMS AND CONDITIONS OF THE APPROVALS ADEQUATELY PROTECT ENVIRONMENT AND HUMAN HEALTH?

A. Submissions

1. Concerned Citizens of Thorhild County Society

[31] The CCTCS stated they all rely on groundwater and surface water for their household use and farming operations.

[32] The CCTCS stated the Director cannot review an application for an approval until the application is complete, and the Director may refuse an application for an approval or impose more stringent conditions than the standards set out in the regulations.

[33] The CCTCS noted the Director had concerns with aspects of the application, but he approved a conceptual plan with direction to the Approval Holder to complete the technical details as construction proceeds. The examples noted by the CCTCS included the requirement of a more detailed hydrogeological investigation at least six months prior to commencing construction in areas of concern and submitting a detailed design plan, specifications, Construction Quality Assurance Plan, and Construction Quality Control Plan three months prior to construction. The examples noted from the *Water Act* Approval included not specifying the location of the wetland compensation and not specifying the final surface water monitoring plan. The CCTCS stated there is no approved groundwater monitoring plan in the Record.

[34] The CCTCS argued the application contained general plans, intentions, and hypothetical assessments. They submitted that approvals based on conceptual plans that do not consider specifics of the site and do not include adequate modeling and monitoring cannot adequately protect the environment and human health.

[35] The CCTCS argued the loss of wetlands will change the local ecology that supports animal and plant life and will impact the ecological services provided by wetlands such as flushing and purification of water and the recharge of groundwater. They argued the loss of the wetlands may decrease water quality on the surrounding lands. They stated the wetland complex extends off-site and provides surface water drainage to lands located south of the site. The CCTCS stated the Landfill will cause a permanent loss of peat lands, and they are not aware of and the Approval Holder has not provided a method for restoring peat land.

[36] The CCTCS stated the destruction of wetlands will impact bird populations that use the wetlands for habitat. This will impact the environmental amenities of the area. The CCTCS was uncertain whether any of the recommendations included in the Approval Holder's expert wildlife assessment were taken into account in the construction of the Landfill, because the operations plan states it need not take any measures to protect wildlife in the area. The

CCTCS stated the Landfill was approved notwithstanding the Director's concern with the wildlife management plans.

[37] The CCTCS stated the Landfill will impact the aesthetics in the area given it "...will create a large hill of garbage approximately 150 feet high."¹² They stated the visual character of the neighbourhood will change because the Landfill will operate as a semi-industrial site.

[38] The CCTCS argued the Landfill will create emissions thereby reducing air quality. They stated the emissions will come from diesel trucks and other equipment transporting waste, equipment working on site, flare stacks, and dust blowing from the Landfill face. The CCTCS stated landfill gases produced include hydrogen sulfide and organosulfur compounds which contribute to odours from the Landfill.

[39] The CCTCS stated particulate matter will be generated from erosion of the cover material creating dust and from fires generated on-site. The CCTCS noted the Approval Holder did not conduct dispersion modeling.

[40] The CCTCS also noted the Approval Holder did not quantify the extent of noxious odours even though it acknowledged there will be odours. The CCTCS stated the Odotech Report concluded 39 percent of the winds near the site are calm and light, the least favourable for odour dispersion.

[41] The CCTCS expressed concern that seagulls and other scavenger birds can transport pathogens from the Landfill to surrounding farms and domestic dugouts and other water sources. The CCTCS stated litter can also be transported off-site by scavenger birds. The CCTCS argued the Landfill will attract nuisance animals such as bears, and the migration of bears and coyotes into the area poses a hazard for livestock, children, and pets.

[42] The CCTCS noted the Approval Holder's noise assessment indicates there will be a significant increase in noise at residences located within 1.5 kilometres of the Landfill. The CCTCS stated the noise assessment did not take into account the impact of tonal, impulse noises such as backup beepers and bird deterrent noise cannons. They raised the issue of the operating

¹² CCTCS' submission, dated December 4, 2012, at paragraph 59.

hours of the Landfill, which will be 5:00 a.m. to 8:00 p.m. Monday to Saturday and from 8:00 a.m. to 5 p.m. on Sundays and holidays. Therefore, there will be backup beepers during hours when residents will be resting and background noises are decreased.

[43] The CCTCS stated mercury is used in many materials that will be disposed of at the Landfill, and will be emitted through the Landfill's working face, gas vents, collection containers, and leachate. They listed other toxic gases known to come from landfills including benzene, methylene chloride, and methane.

[44] The CCTCS explained litter can be ingested by cattle, causing injury or possible death to the cattle.

[45] The CCTCS stated soil will be brought into the area that may be infected with diseases such as clubroot, unidentified soil-borne diseases, and fungi. This would be detrimental to the agriculture in the area.

2. Hilts

[46] The Hilts argued the terms and conditions in the Approvals do not adequately protect the environment and human health. They stated the location is not suitable for the Landfill, and there was no consideration of downstream residents who rely on the surface water flows.

[47] The Hilts stated they will be subjected to odours, airborne bacteria, and caustic gases, and their quality of life will suffer.

[48] The Hilts stated there are no reports or analyses from the Approval Holder or Director addressing the concerns of anyone or any lands outside the Landfill property. The Hilts expressed frustration that no one has listened to their concerns about the impacts of the Landfill.

[49] The Hilts stated there is a lack of detail in the application and supporting documents, so the impacts on other properties could not be determined or identified. The Hilts argued the Director did not gather all of the relevant information.

[50] The Hilts explained that excavation work has already started on the Landfill, negatively impacting the wetlands on the north end of the Hilts' property. They argued the loss of surface water from the Landfill property because of run-on and run-off systems will cause

their wetlands and their neighbours' wetlands to dry up and the ecosystems presently there would be unsupportable.

[51] The Hiltz requested the Approvals be reversed. They explained there was no meaningful dialogue or consideration of neighbouring residents and their properties. The Hiltz stated there was no real effort made to ensure they were protected. The Hiltz stated the public should have been given an opportunity to collaborate and explore the pros and cons of the project and be given the opportunity to become knowledgeable about the Landfill issues.

[52] The Hiltz stated the *Water Act* Approval does not deal with the impacts the Landfill will have on the headwaters of Waskatenau Creek and its tributaries and the surface water flows in the area. The Hiltz stated all the wetlands in the area are interdependent, but the Approval Holder only considered water flow patterns and wetlands on the Landfill lands and not in the surrounding areas. The Hiltz stated their land and the Approval Holder's lands are hydraulically connected to Waskatenau Creek.

[53] The Hiltz argued it is impossible for the Landfill to proceed without disturbing existing water flow paths. They argued the Approval Holder did not consider the effects on household users, traditional agriculture users, and other priority licences, and did not consider neighbouring lands.

[54] The Hiltz explained there are two sources from which they get their water. They stated in spring thaw, and when it rains, surface water on the Landfill moves from north to south, and some of this water merges with the other surface water flow on their property and then travels east to Waskatenau Creek. The Hiltz explained the surface water collects in the depressions and bogs on the Approval Holder's property, and when these areas are full, the water flows over and runs onto the Hiltz' property. The Hiltz explained the second source of water on their property comes from the west edge of the Approval Holder's property and behaves the same way as the water flow from the north side of the Landfill. The Hiltz stated these are the only sources of surface water they have and which feeds their dugouts. They explained the water sources have similar properties and volume flows. The Hiltz stated they expected some water loss because of the Landfill, but it is unacceptable to deprive them of all their surface water.

[55] The Hilts argued the onus is on the Approval Holder to find a solution that preserves their surface water sources.

[56] The Hilts explained the water channel could not be found by the Approval Holder because the water pathways are not complete until sufficient surface water fills the depressions, the water overtops the depressions, and a pathway is created.

3. Kuzyks

[57] The Kuzyks argued there will be increased exhaust emissions caused by the number of trucks hauling to the Landfill each day, thereby putting lives at risk and damaging the environment.

[58] The Kuzyks stated there will be increased noise, litter, and potential contamination as a result of the increase in traffic. They argued there is a risk to themselves, their family, and their livestock of diseases transferred by insects, birds, rodents, and windblown heavy metals.

[59] The Kuzyks stated there would be issues with odours, methane, and volatile organic compounds leaving the site, creating public health hazards and introducing toxins to the surrounding plants and wildlife. They stated there was a risk to residents to the south and southeast of the Landfill that their groundwater and surface water could get contaminated.

[60] The Kuzyks noted the county engineer had concerns with the sand lenses on the Landfill that may or may not be contiguous. The Kuzyks stated one borehole showed shale and sandstone. They argued this proves the site is not suitable for the Landfill. The Kuzyks noted the Approval Holder has identified areas on the site that are not suitable, so they questioned how they can ensure the rest of the site is suitable.

[61] The Kuzyks referred to studies done near municipal landfills, noting elevated incidences of cancers and other health issues due to the exposure to landfill gases.

4. Approval Holder

[62] The Approval Holder stated the Landfill application was complete and complied with the applicable legislation, regulations, and the Standards for Landfills in Alberta (the

“Standards”)¹³ as it provided information on the substances that will be released into the environment, construction, wastes, impacts, emergency response and contingency plans, conservation and reclamation, and public consultation. It also provided additional information in response to information requests made by the Director. The Approval Holder explained some documents are required at the application stage while other documents, such as detailed construction plans and drawings and construction quality assurance and quality control plans, are submitted at later stages as the Landfill project progresses.

[63] The Approval Holder stated that, under the EPEA Approval, the Director maintains his discretion to provide final approval of various plans prior to the commencement of construction or operations. The Approval Holder stated this allows the Director to take into consideration the most current information and to respond to potentially changing conditions.

[64] The Approval Holder explained the Development Permit was issued by the County of Thorhild (the “County”) with less expertise than AESRD. The Approval Holder submitted the Hearing should focus on whether the Approvals adequately protect the environment based on applicable environmental legislation and policies.

[65] The Approval Holder stated the Standards are the basis against which its applications were assessed and which form the foundation for the Approvals.

[66] The Approval Holder explained lands on which the Landfill is located was heavily disturbed by previous agricultural operations. The Approval Holder stated the wetlands on the Landfill were degraded by cattle, and the removal of cattle will be a benefit resulting from the Landfill.

[67] The Approval Holder explained approximately 19.6 hectares of the Transportation Lands was subject to peat harvesting prior to the Approval Holder purchasing the property. The Approval Holder stated the site was extensively drained and devoid of any vegetation, and it was likely to remain barren for many years without intervention. The Approval Holder stated the Landfill project will result in improvements to the lands, no mitigative measures are required to adequately protect the land, and the lands will be returned to a more positive state than it is currently.

¹³ Standards for Landfills in Alberta, (February 2010) Government of Alberta.

[68] The Approval Holder stated the *Water Act* Approval allows the Approval Holder to remove wetlands and construct wetland compensation works. The Approval Holder noted the Director can amend the *Water Act* Approval regarding compensation for the loss of wetland habitat if the Director believes the compensation has not been successful. The Approval Holder is required to provide a wetland compensation and monitoring summary report to the Director annually.

[69] The Approval Holder stated there will be no net loss of wetlands, and the compensation and restoration work it will undertake will result in greater wetlands value than what existed previously.

[70] The Approval Holder explained 28 hectares of wetlands were found within the Landfill lands and a further 3.84 hectares of wetlands was previously disturbed by agricultural practices. Most of the wetlands were temporary wetlands, meaning water is present above ground for short periods after spring melt or other times in the growth season.

[71] The Approval Holder stated the Provincial Wetland Restoration/Compensation Guide confirms that, in appropriate cases, wetland disturbance is acceptable as long as the developer compensates for the loss of naturally occurring wetland. Only wetlands classified as Class II or higher fall within the wetlands compensation scheme. The Approval Holder stated the peatlands are not compensable wetlands. The Approval Holder explained the peatlands are relatively small and are not part of a larger wetland complex and contribute nothing to the regional hydrological and hydrogeological regime. The Approval Holder stated the peatlands on the Transportation Lands have no value as viable wetlands.

[72] The Approval Holder explained 9.98 hectares of Class II (8.03 hectares) or greater (1.95 hectares of Class III) wetlands within the widest possible disturbance boundary could be disturbed by the Landfill project. The Approval Holder explained its wetland compensation strategy includes: (1) full restoration of two adjacent wetlands covering an area of 2.7 hectares, with the expectation the final restored wetlands will be four hectares; and (2) the construction of a 20 hectare wetlands complex on the Transportation Lands, comprising of a series of small constructed wetlands of a higher grade than those disturbed by the Landfill project. The

Approval Holder stated it is voluntarily restoring 4.4 hectares of previously disturbed peatlands along with 6.4 hectares of upland restoration.

[73] The Approval Holder stated the existing ditches on the Transportation Lands are remnants of the peat harvesting operations, and filling in the ditches is required to restore the natural surface water drainage and will assist in rewetting the site and restoring the disturbed peatlands.

[74] The Approval Holder stated the wetlands at the south end of its property are primarily Class II wetlands and are not interconnected. It explained there is a subtle berm, caused by cattle, preventing water from flowing southward off the Landfill, so the removal of cattle will be a benefit of the Landfill project.

[75] The Approval Holder submitted the combination of restored and constructed wetlands will mitigate any disturbance to compensable wetlands.

[76] The Approval Holder stated a baseline soil survey was conducted. It explained the EPEA Approval requires it to conserve topsoil from disturbed lands and use the conserved topsoil for reclamation of the Landfill. The subsoil must be salvaged to meet subsoil replacement requirements for cell closure.

[77] The Approval Holder stated it must submit a final closure plan to the Director for his approval at least 180 days prior to permanently closing the Landfill operation, and the plan must include plans for replacement of topsoil, remediation of areas affected by subsistence and differential settlement, and erosion control. The Approval Holder stated it must submit a final closure report to demonstrate final closure has been completed according to the final closure plan and it must include a description of how drainage restoration, soil replacement, erosion control, and subsistence remediation have been or will be dealt with.

[78] The Approval Holder stated a baseline vegetation survey was completed for the Landfill lands. The Approval Holder explained vegetation was addressed in its end use plan since the proposed end use is wildlife habitat and grazing. The final closure plan must describe how re-vegetation of the site has been or will be dealt with and the post-closure plan must include a plan for maintaining vegetative cover.

[79] The Approval Holder stated a baseline survey of wildlife was completed that concluded no endangered or threatened wildlife species were considered to likely inhabit the Landfill lands and no federally protected species were identified. The Approval Holder stated there is no evidence the Landfill project will have significant impacts on wildlife in the region, so no mitigative measures are necessary with respect to wildlife.

[80] The Approval Holder submitted the Approvals, when read together, provide significant protection for the environment, which in turn protects human health.

[81] The Approval Holder argued there is no evidence of disease being transferred from birds to humans or other animals as a result of the presence of a landfill. The Approval Holder stated bears and coyotes are a reality of living in rural Alberta. The Approval Holder explained it will cover the waste with daily and intermediate covers to limit the amount of waste that is available for scavenging, and an eight foot high perimeter fence will deter nuisance animals from the site.

[82] The Approval Holder stated that, even though noise will increase for some residents, noise levels will be below the levels set out in the Energy Resources Conservation Board Directive 38. The Approval Holder argued the noise from trucks hauling waste on Highway 63 will not be any more noticeable than the noise from the traffic that already uses the highway.

[83] The Approval Holder explained that, although formal noise mitigation is not required, noise will be managed through speed limits within the Landfill, perimeter berms, tree screening, and engineering controls to control noise on equipment, such as low noise back up alarms.

[84] The Approval Holder argued there is no threat regarding mercury, because it is not a volatile substance and poses no harm when covered in a landfill.

[85] The Approval Holder stated it is required to minimize the size of the working face, compact the waste, cover waste at the close of each day, establish and maintain litter controls to minimize the escape of fugitive wastes, retrieve litter that accumulates within the Landfill boundary, and retrieve all fugitive waste outside the Landfill boundary at least once per week or as authorized by the Director. The Approval Holder explained it will fence the

perimeter of the Landfill to reduce off-site litter and will provide temporary fencing and screens adjacent to the working face as necessary.

[86] With respect to the Appellants' concerns regarding soil being brought in that may be infected with diseases that could affect agriculture in the area, the Approval Holder argued that Landfill bound traffic will not carry any greater risk than any other traffic in the area.

5. Director

[87] The Director explained that an applicant for an approval or registration must comply with the requirements under EPEA, the *Water Act*, and the applicable regulations, including the *Waste Control Regulation*, Alta. Reg. 192/96, and the *Activities Designation Regulation*, Alta. Reg. 276/03. In the case of landfills, the applicant must also have regard to the Standards. The Director stated the purpose of the application review was to determine whether the impact on the environment was in accordance with the Acts and regulations.

[88] The Director explained the Standards are an expression of the policy of AESRD regarding landfill regulation and are designed to protect the environment and public safety.

[89] The Director argued the CCTCS is not correct in suggesting the Director must balance environmental, social, and economic concerns when considering an application for an EPEA approval. The Director acknowledged he may issue or refuse to issue an approval, and if an approval is issued, it is subject to any terms and conditions the Director considers appropriate.¹⁴

[90] The Director stated that, in making his decision, he considers other relevant factors such as: (1) whether the requirements imposed can be achieved; (2) whether the requirements are consistent with similar facilities in similar circumstances; (3) whether the decision reflects a consideration of the evidence provided by the applicant and Statement of Concern filers; and (4) whether the discretion exercised serves the purposes of the legislation.

¹⁴ Section 68(3) of EPEA provides:

“The terms and conditions of an approval may be more stringent, but may not be less stringent, than applicable terms and conditions provided for in the regulations.”

Section 38(3) of the *Water Act* states:

“The Director may issue an approval subject to any terms and conditions that the Director considers appropriate.”

[91] The Director explained the proposed Landfill footprint (the area that will be used to deposit waste) covers approximately 85 hectares and the maximum top of waste height is 45 metres above surrounding ground elevation. The total air space of the Landfill is approximately 23,000,000 m³ and the Landfill has an estimated operating lifespan of approximately 40 years. The wastes accepted include municipal wastes, construction and demolition debris, and special waste, including sulphur containing wastes, asbestos wastes, treated biomedical wastes, and hydrocarbon-contaminated soil. These special wastes have specific handling requirements in order to be deposited in a Class II landfill.

[92] The Director stated the nature and potential impacts of a Class II landfill are well known, and the risks can be higher or lower depending on groundwater flow rates and direction, proximity to receptors, design and engineering of the facility, and types of wastes accepted. The Director explained the risks are mitigated through processes and practices set out in the Standards, which are science based.

[93] The Director stated the EPEA Approval complies with the requirements in the Standards, and in some cases, the Landfill proposed in the application exceeded the Standards such as: (1) setbacks; (2) clay till conductivity; (3) no exceptional aquifer within 46 metres of the Landfill, even though Standards only require 30 metres; (4) geosynthetic clay liner layer at leachate collection system pumps in addition to the composite liner;¹⁵ and (5) storm water pond design capacity greater than volume generated from a one in 25 year, 24 hour storm. The Director also noted the conditions in the Approvals that coincide with the requirements in the Standards.¹⁶

¹⁵ A “composite liner” is defined in the EPEA Approval as:

“...a liner comprised of:

- (i) clay material that:
 - (A) has been compacted to achieve an in-place hydraulic conductivity of 1×10^{-9} metres/second or less; and
 - (B) has a minimum thickness of 0.6 metres at all points, measured perpendicular to the slope; and
- (ii) a high density polyethylene geomembrane that:
 - (A) has a minimum thickness of 60 mil; and
 - (B) has been placed directly on the top surface of the compacted clay.”

¹⁶ See: Hearing Exhibits 14 and 15.

[94] The Director stated the *Water Act* Approval protects wetlands, downstream water users, and water bodies, and supports the Standards by: (1) surface water management system must be constructed in accordance with the plans approved by the Director; (2) the aquatic environment, human health, and public safety must be protected while conducting activities authorized under the *Water Act*; (3) surface water that leaves the site must be of good and sufficient quality so that downstream users are not negatively impacted; (4) downstream water bodies are protected from siltation and erosion; (5) wetlands impacted are compensated for; and (6) the Director can amend the Approvals in response to monitoring results.

[95] The Director explained that, since the Approvals were issued, updates of various plans are required including: (1) design plans and specifications for construction of Cell 1, the leachate pond, east and west storm ponds, and associated run-on/run-off controls were submitted to the Director; (2) design plan and specifications for the surface water management system amended by the discovery of an additional culvert is before the Director; and (3) revised Groundwater Monitoring Plan was submitted and an updated plan was submitted on July 9, 2012, but is not yet authorized.

[96] The Director stated there must be a balance between development and the environmental issues. He recognized people do not want to live next to a landfill.

B. Analysis

[97] One of the issues raised by the Appellants was the lack of consultation, discussion, and continued opportunities to be involved with issues related to the Landfill. The Landfill intends to remain operational for at least 40 years with at least an additional 25 years for post-closure maintenance and monitoring. It is in the Approval Holder's best interest, as a corporate neighbour, to ensure opportunities are provided to the community to discuss operations at the Landfill on an ongoing basis. These opportunities should allow for constructive discussions. During direct evidence provided by the Approval Holder, it expressed a willingness to include some of the Appellants in community groups organized by the Approval Holder. The Board strongly recommends the Approval Holder uphold its commitment to include some of the Appellants, particularly those who live within eight kilometers of the Landfill, on its community advisory groups. In order for the Appellants to have confidence in the Landfill's design and

operation, the Approval Holder must be able to communicate openly and honestly on an ongoing basis about the Landfill.

[98] At the hearing the Hilts explained they received a lot of information at the Hearing regarding the operation and construction of the Landfill and the role the Director plays in ensuring the Landfill operates as required under the Approvals. The Hilts stated they believe there is also a better relationship now between them and the Director. The Board is optimistic this will be the start of improved communication between all of the Parties and others in the community.

[99] Based on the submissions and evidence provided at the Hearing, the Director adequately reviewed the application provided by the Approval Holder for the construction and operation of the proposed Landfill. Although some of the information provided by the Approval Holder was limited or provided descriptions in a general context, the Board believes there was sufficient information for the Director to make his decision that the proposed site was adequate to support a landfill. In reviewing the application and in preparing the Approvals, the Board believes the Director took into consideration the applicable legislation, regulation, and standards.

[100] The Approvals require the Approval Holder to provide information in stages as the project progresses. Although the iterative components of the Approvals do not provide all of the information to those who have concerns prior to the start of the proposed project, such as the Appellants, the Board understands it may be appropriate in certain cases. It allows the Director to ensure the conditions the Approval Holder must operate under takes into consideration the most recent data and standards.

[101] The Approvals expire in 2021, 10 years from the date of issuance. At that time all of the terms and conditions in the Approvals will be reviewed taking into consideration all of the data collected over the 10 year period and any new developments in the construction and operation of landfills. Public notice of the renewal of the Approvals must be given and residents in the area will be allowed to submit Statements of Concern regarding the Landfill operations. The residents can notify Alberta Environment and Sustainable Resource Development at any time if they feel the Approval Holder is not operating in accordance with the terms and conditions of the Approvals.

[102] During closing arguments, the Director argued the Approvals should be confirmed as issued and that recommendations should not be made to the construction requirements or monitoring requirements. The reason provided was that the Approvals either met or exceeded the Standards and are consistent with other landfill approvals in Alberta.

[103] The Board recognizes the importance of consistency. However, the Director has the ability under section 68(3) of EPEA to include terms and conditions into an approval that exceeds regulatory requirements. In a legal hierarchy, regulations supersede standards; therefore, if the Director can include terms in approvals that exceed regulations, he has the ability to include terms in approvals that exceed standards. It does not seem reasonable to argue the Director is strictly bound by the Standards when issuing an approval as this would result in the Director's discretion being fettered. Each landfill site will vary as a result of hydrogeological conditions, hydrological features, weather conditions, topography, proximity to residents, and a number of other variables. The Director must take the specific conditions of the site into consideration when assessing whether an approval should be issued and if issued, the terms and conditions that should be included.

[104] In the Board's view, this site is marginal for a landfill. Although the soil under the actual Landfill footprint meets the hydraulic conductivity specified in the Standards, there are potential areas of sandier soils located around the footprint. There are areas within the Landfill property that are not suitable for a landfill and which were identified by the Approval Holder's consultants. The Board notes the footprint of the Landfill has been modified to address this concern. The site is also located within the headwaters of Waskatenau Creek, which eventually flows into the North Saskatchewan River. If any contaminants manage to reach Waskatenau Creek, they could then easily reach the North Saskatchewan River. These factors indicate a conservative approach must be taken in the construction and operation to ensure protection of the environment and human health.

[105] The Board appreciates the concerns expressed by all of the Appellants. Most of them have been living in the area for years, some for decades, and the idea of having a Class II Landfill that will be accepting more than 10,000 tonnes of waste per year in their backyard was never anticipated and will have undoubtedly a negative impact on their lives.

[106] Although the Approval Holder argued the Landfill will improve the lands it is sited on and no mitigative measures need to be taken, the Board considers it prudent the Approval Holder take all necessary measures to minimize its impacts on the site and surrounding area. After the site is reclaimed, it will not be like it is currently. There will be a 45 metre high “hill” in an area that was described as being “relatively flat.” The Board recognizes the Approval Holder will do its best to reestablish wetlands on its property, and the Director has the responsibility to ensure these efforts succeed.

[107] The Approval Holder stated formal noise mitigation measures are not required, but it did admit some residents will be subjected to increased noise levels. Considering the Approval Holder is bringing its operations to a rural area, it should implement whatever measures it can to reduce its impacts on its neighbours. The Board encourages the Approval Holder to implement its plans to reduce the noise impacts as described in its operations plan and to implement additional measures if required.

[108] The Appellants raised concerns regarding the potential traffic going to and from the Landfill. As stated in the Preliminary Issues decision, the Board does not have the jurisdiction to deal with transportation matters. This falls under the jurisdiction of the municipality.¹⁷

[109] The Appellants asked the Board to recommend an environmental impact assessment (“EIA”) be completed prior to the Landfill continuing with construction and prior to the start of operation. As indicated in the Board’s decision on the issues, the Board does not have the jurisdiction to require an EIA be completed.¹⁸

¹⁷ See: Preliminary Motions: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (09 August 2012), Appeal Nos. 11-025-059, 062-063, 068-071, 075-076, 100-112, 147-150, 156-161, 163-165, and 173-ID2 (A.E.A.B.) at paragraph 136.

¹⁸ See: Preliminary Motions: *Cramer et al. v. Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development*, re: *Waste Management of Canada Corporation* (09 August 2012), Appeal Nos. 11-025-059, 062-063, 068-071, 075-076, 100-112, 147-150, 156-161, 163-165, and 173-ID2 (A.E.A.B.) at paragraph 136.

C. Summary

[110] The Board is of the opinion the Director did not err in issuing the Approvals and took into consideration the relevant legislation and policies. The Approvals meet the minimum requirements as set out in the applicable regulations and standards. However, given the location of the Landfill, the environmental factors and human considerations, it would be prudent to require more protective conditions. Therefore, the Board recommends the Approvals be varied as discussed below to minimize the risks to the environment and human health.

V. DO THE APPROVALS ADEQUATELY ADDRESS POTENTIAL IMPACTS OF THE LANDFILL ON GROUNDWATER AND LOCAL WELLS?

A. Submissions

1. CCTCS

[111] The CCTCS explained most of the members are farmers who depend on clean well water for domestic use and watering livestock. The CCTCS stated the Approval Holder indicated it would conduct sampling and testing of neighbouring landowners' water wells within five kilometres of the Landfill, but even though the CCTCS members requested the testing be completed, it has not been done.

[112] The CCTCS stated their expert reported the existence of an aquifer underlying the Landfill or adjacent to it cannot be ruled out based on the information provided. They noted their expert concluded that:

- a) The average hydraulic conductivity of the clayey deposits does not meet the Standards;
- b) Data on the stratigraphy directly below the proposed Landfill ... is lacking across a wide area of the Landfill [Area];
- c) The lateral continuity of sandy deposits in the Landfill [A]rea and their possible connection with regional interglacial melt water channels has not been investigated; and

- d) A number of investigation boreholes across the site were improperly abandoned, likely compromising the natural hydrogeologic protection properties of the site.”¹⁹

[113] The CCTCS noted the Approval Holder has not finalized a groundwater monitoring program. They stated the most recent groundwater monitoring plan assumes 10 metres of glacial till beneath the Landfill Area and fails to consider areas of stratigraphic uncertainties.

[114] The CCTCS expert witness from Worley Parsons testified the geometric K (a measure of hydraulic conductivity) for the wells tested completed only in clay till was 7.1×10^{-9} m/s, which essentially meets the Standards. However, the geometric K for the wells completed at higher levels, including clay, sand, and silt, but excluding bedrock contact, was 2.3×10^{-8} m/s, which does not meet the Standards.

[115] The CCTCS stated there were no real measurements taken below the Landfill footprint to the bedrock, and there is no way to estimate what conditions exist below the 6.8 metres that was measured.

2. Hilts

[116] The Hilts argued the Approvals do not adequately address the impacts of the Landfill on groundwater and local wells.

[117] The Hilts explained that, prior to the excavation on the Landfill lands, the surface water flowed from north of the Approval Holder’s lands to the south and also from the west of Range Road 210, through the culvert to the east, and then south. The water flowed from the Approval Holder’s lands onto the Hilts’ property and then into the Waskatenau Creek system. The Hilts stated the excavation on the Landfill has blocked their surface water sources. The Hilts stated there would also be less water re-directed to their lands as a result of the Landfill operations.

[118] The Hilts stated there was a lot of surface water that flowed over the Approval Holder’s lands which were critical to the Hilts and others downstream. The Hilts stated the Approval Holder chose to ignore the surface water issues and proceeded with excavation for the

¹⁹ CCTCS’ submission, dated December 4, 2012, at paragraph 79.

purpose of taking all the water that had traditionally passed over the Landfill lands and blocking the surface water flow to implement the run-on and run-off programs.

[119] The Hiltz stated the Approval Holder has not provided a proven plan regarding the re-direction of the surface water flows to the Hiltz' property. They expressed concern that the Approval Holder will not correctly construct a water way for the surface water beginning at the culvert under Range Road 210, directing the surface water around the Landfill project, and then into the Hiltz' property. The Hiltz argued the surface water flows should be the same as pre-excavation. The Hiltz argued the Approval Holder will be taking most of the surface water from the culvert.

[120] The Hiltz argued the Director failed to take into consideration the effect the Landfill would have on their surface water flows and the re-directed water from the culvert at Range Road 210.

[121] The Hiltz requested proof the plan proposed by the Approval Holder will guarantee surface water flows southward given the elevation.

[122] The Hiltz stated the Approval Holder has only considered its own property and disregarded the requirement to consider impacts on neighbouring properties.

[123] The Hiltz requested the Approvals be reversed.

3. Kuzyks

[124] The Kuzyks stated testing on the Landfill site failed to show the land is suitable for a landfill. They noted most of the test wells were not deep enough to establish the geology of the lands, but they showed significant sand deposits. It was unclear whether the sand deposits were contiguous. The Kuzyks stated the site is one of the worst places to locate a landfill because it is at the headwaters of two streams that flow into the North Saskatchewan River and is over a groundwater recharge area. They argued this proves the site is not suitable for the Landfill. The Kuzyks stated fractured bedrock was found in borehole logs of wells drilled on the site. They argued allowing the Landfill at this location would be detrimental to the residents' groundwater and safety.

4. Approval Holder

[125] The Approval Holder explained landfill development can only occur where the underlying materials are sufficiently thick and meet the standards for hydraulic conductivity.

[126] The Approval Holder explained it retained a hydrogeologist to conduct a hydrogeological assessment of the site. The Approval Holder stated 117 boreholes were drilled, 94 of which were completed as monitoring wells. The deepest borehole, at 45.74 metres below ground level, was 10 metres deeper than required by the Standards. The Approval holder stated groundwater quality and lateral hydraulic conductivity was determined for each monitoring well.

[127] The Approval Holder stated the subsurface conditions at the site have been thoroughly investigated and are well understood. The Approval Holder noted the following hydrogeologic conditions exist: (1) the waste footprint is underlain by at least 10 metres of clay till deposits with a mean hydraulic conductivity of 5.3×10^{-9} m/s, which is less than the required maximum hydraulic conductivity specified in the Standards; (2) the depth to groundwater below the waste footprint ranges from one to approximately four metres below ground level; (3) lateral groundwater movement in the clay is estimated to be eastward at less than two centimeters per year; (4) no exceptional aquifers were identified beneath the waste footprint and none are expected to underlie the Landfill lands; (5) the bedrock beneath the clay till is characterized by shale with minor sandstone and clay and is not expected to be of a fractured non-porous nature and not subject to karst development. The Approval Holder stated that, based on these findings, the hydrogeologic conditions beneath the waste footprint are suitable for landfill development.

[128] In response to the CCTCS' consultant's report ("Worley Parsons"), the Approval Holder stated: (1) Worley Parsons' conclusions regarding the geometric mean hydraulic conductivity of the clay till underlying the waste footprint included two values excluded by the Approval Holder's consultant as being not representative; (2) a correction was made to the hydraulic conductivity of one well lowering the corrected geometric mean hydraulic conductivity from 7.1×10^{-9} m/s to 5.3×10^{-9} m/s; (3) inter-till sandy deposits, which contained a substantial percentage of clay and silt, were found in localized and often discontinuous pockets; (4) the geometric mean horizontal hydraulic conductivity of the sandy deposits was 1.4×10^{-7} m/s and not expected to transmit water readily; (5) the material most relevant to determining the overall

rate of groundwater movement was the lower permeability clay till material that surrounds the silty sand deposits; (6) additional drilling was undertaken in the areas where silty sands were found to delineate the extent of these materials; (7) silty sands do not exist at greater depths under the waste footprint; (8) if silty sand materials are exposed during excavation, it will be overexcavated and replaced with clay till compacted to appropriate specifications; (9) shallower boreholes will likely be removed during grading and cell construction and those boreholes that extend beyond the base of the Landfill will be decommissioned appropriately; (10) the site meets or exceeds required standards; and (11) the closest downgradient water wells are located approximately 1.1 kilometres to the southeast.

[129] The Approval Holder noted its consultant's conclusions were supported by the Director's hydrogeologist.

[130] The Approval Holder stated the design of the Landfill provides further groundwater protection. The Approval Holder explained any new cell must include a composite liner, leachate collection system, and groundwater monitoring system. The Approval Holder stated any leachate pond must include a primary geomembrane liner, a secondary geomembrane liner, and a secondary leachate collection system between the primary and secondary liners. The Approval Holder explained it proposed a composite liner consisting of a 1.5 millimetre thick high density polyethylene ("HDPE") geomembrane liner placed in direct contact with a 0.6 metre thick compacted clay liner with a hydraulic conductivity of less than 1×10^{-9} m/s. The Approval Holder stated the proposed liner meets the Standards.

[131] The Approval Holder explained its leachate management system will use a network of pipes that will collect leachate so it can be removed, treated, and properly disposed of. The leachate collection system will be surrounded by permeable material so the leachate naturally drains into the collection system. Moving leachate out of the system limits the impacts leachate may have on the liner system.

[132] The Approval Holder explained baseline groundwater testing was conducted within a three kilometre radius of the Landfill, and water well data were collected from the Provincial database for wells within five kilometres of the Landfill. The Approval Holder stated it collected water completion details, water usage, and water quality information from

participating landowners within a 2.4 kilometre radius from the Landfill. It stated it tested wells or water sources on properties where access was allowed. The Approval Holder was willing to work with neighbours who have not yet had their wells tested.

5. Director

[133] The Director stated the most significant potential impacts to groundwater are from leachate escaping the liner and being released into the environment, but the risk is mitigated by several layers of protection, back up, and redundancy. The Director stated:

“The landfill’s design, construction and operation mitigate the risks through performance standards required of the natural geologic material underlying the waste disposal area, the liner, the leachate collection system, a surface water management system, waste acceptance and handling processes and extensive associated monitoring systems.”²⁰

[134] The Director explained the regional groundwater flow is generally southward. Surficial aquifers are limited across the region and are mainly associated with buried channel aquifers.

[135] The Director stated the Landfill site: (1) is underlain by at least 10 metres of clay till deposits, which is better than the 8 metres of clay till deposits required in the Standards; (2) the clay till deposits have a mean hydraulic conductivity of 5.3×10^{-9} m/s, which exceeds the required minimum hydraulic conductivity specified in the Standards; (3) the depth to shallow groundwater beneath the waste footprint ranges from one metre to four metres below ground level; (4) lateral groundwater movement in the clay till is estimated to be eastward at less than two centimeters per year; (5) no exceptional aquifers were identified beneath the waste footprint and none are expected to underlie the Landfill lands within 46 metres of the waste footprint; and (6) bedrock beneath the clay till is characterized by shale with minor sandstone and coal, and is not anticipated to be a fractured non-porous nature and not subject to karst formations.

[136] The Director stated the risk of leachate migration is very low given the geologic conditions at the site and the natural attenuation that geologic conditions can provide if leachate migrates past the liner. The Director explained that, with a mean hydraulic conductivity of 5.3×10^{-9} m/s, any leachate that may penetrate the liner would travel horizontally through the geologic

²⁰ Director’s submission, dated December 19, 2012, at paragraph 79.

material at a rate of 0.17 metres per year, meaning it would take 55 years to travel through the required 10 metres of natural clay till. The Director stated the leachate would lose some of its negative attributes during that time as some constituents would be attenuated as they travel through the clay till.

[137] The Director stated that, if site conditions encountered during cell construction differ from those expected as stated in the application, a re-design may be required and submitted for authorization prior to proceeding. He noted the EPEA Approval identified two areas which require additional investigation and may require a re-design, specifically the west boundary of Cell 2 and the south boundary of Cell 4.

[138] The Director stated geomembranes are effective impermeable materials used widely as liners. He explained it is known and assumed that, during the manufacturing process, minute pinholes exist in the membrane, but intimate contact with the compacted clay layer increases the performance of the liner and reduces permeability of the geomembrane liner and risk of migration. The Director explained the EPEA Approval requires a composite liner, which is a geomembrane placed directly on a compacted clay liner with a hydraulic conductivity not greater than 1×10^{-9} m/s and compacted to a thickness of not less than 0.6 metres.

[139] The Director explained the application included a geosynthetic clay liner underneath the sumps (leachate collection system) in addition to the geomembrane and compacted clay liner required by the Standards, and even though such a liner is not necessary, the proposal was accepted by the Director and incorporated into the EPEA Approval.

[140] The Director stated the leachate collection system is designed to collect leachate from the Landfill cell and remove it. The lower retention time results in a leachate that has lower concentrations of dissolved organic and inorganic compounds. The Director noted the EPEA Approval requires the maximum leachate head within a cell be maintained at less than 300 millimetres until the end of post closure.

[141] The Director explained the surface water management system is comprised of a run-on and run-off control system that minimizes the amount of water that comes into contact with waste, ensures the protection of surface water, and minimizes the impacts to the local hydrologic system.

[142] The Director explained the EPEA Approval restricts the kinds of wastes accepted at the Landfill. He stated liquid wastes are prohibited to minimize the potential for generation of leachate. The Director stated waste acceptance policies are in place to minimize the types of waste that negatively contribute to leachate quality or unexpected risks. The Director explained special wastes are not hazardous wastes but are wastes that need special handling to ensure no negative impacts to the environment and to minimize nuisances.

[143] The Director stated the groundwater monitoring program provides effective, timely, and reliable reporting of any potential negative impacts to groundwater so that remediation steps can be taken before negative impacts occur. The Director explained the groundwater monitoring wells must provide an accurate representation of upgradient and downgradient groundwater quality. The Director stated the groundwater monitoring wells cannot be spaced more than 200 metres apart, but can be less than 200 metres if hydrogeological conditions merit closer spacing.

[144] The Director explained the EPEA Approval requires closer spacing to conduct a focused groundwater investigation of the hydrology along the west boundary of Cell 2 and the south boundary of Cell 4 where there is the possibility the adjacent geologic material does not meet the hydraulic conductivity criteria set in the Standards. He noted that construction of these cells is not permitted until the hydrogeology in these areas is determined.

[145] The Director stated the waste footprint must be a minimum of 30 metres from the Landfill property line to establish a compliance boundary for monitoring and early detection purposes, and groundwater performance standards must be met within the compliance boundary at all times during the lifespan of the Landfill.

[146] The Director confirmed the Approval Holder submitted the Groundwater Monitoring Plan in December 2011, but he had supplementary questions. An updated proposal was submitted on July 9, 2012, and it will be authorized when all of the Director's questions have been answered satisfactorily. No waste can be placed into the cell before the Groundwater Monitoring Plan is authorized by the Director.

B. Analysis

[147] During the Hearing there was a great deal of discussion and questioning regarding the hydraulic conductivity calculations for the Landfill site and the sampling depth of the boreholes used in the analysis.

[148] It is clear from the Record the AESRD staff reviewed the information in the application. They determined there were some issues with the site that required additional data collection. The hydrogeologist reviewing the application for the Director stated his concerns regarding the possible sand lenses would be addressed by including a double liner system and additional monitoring.²¹ In fact, in the draft version of the EPEA Approval, there was a requirement the Landfill be constructed with a primary geomembrane liner, a leak detection system between the primary geomembrane liner and composite liner, a composite liner, and a leachate collection system capable of maintaining the maximum acceptable leachate head above the primary liner.²² In addition, the groundwater monitoring wells were to be spaced no more than 100 metres apart.²³ AESRD recognized there were requirements in the draft EPEA Approval that exceeded the standards.²⁴ It was not until after the Director received feedback from the Approval Holder that the conditions in the Approvals were changed to only meet the minimum Standards with respect to the monitoring requirements and the liner construction in the cells. The Board questions the practice of having a project proponent have the ability to alter a draft approval to suit its needs. It is understandable to have the proponent review the draft approval to make sure the terms and conditions can be physically met. A proponent should not be able to effect a change in the approval's conditions to lower recommended requirements for a site to the minimum standards even though the Director feels it is appropriate that, given the site, additional measures should be taken to ensure protection of the environment and human health.

²¹ See: the Record at page 16914, email from Terence Ko to Don Weleschuk, which states, in part: "The main issue that I had (which would have been addressed by a double liner system and a shorter distance between monitoring wells) was the uncertainty with the extent of the sands encountered at boreholes 33, 48 and 60."

²² See: the Record at pages 16823 and 16824.

²³ See: the Record at pages 16907 and 16840.

²⁴ See: the Record at pages 16751 and 16752.

[149] The AESRD hydrologist who expressed concern regarding the sand lenses and who preferred the double liner system, eventually accepted the composite liner on the basis that additional testing would be completed prior to cell construction in the areas of concern. This condition was included in the EPEA Approval. Although the Director may have considered this adequate to allow the Landfill to be constructed, the Board considers a more conservative approach needs to be taken given the evidence presented and the concerns raised by the AESRD hydrologist. The double liner system is the preferable choice in the circumstances of this case.

[150] Given the site is acceptable to construct the Landfill but with some limitations, the Board considers it essential the Approval Holder obtain accurate baseline data regarding the water wells and surface water storage ponds, including dugouts, within an eight kilometre radius of the Landfill boundary. In addition, data should also be gathered on the water wells and dugouts of the other Appellants to these appeals that live outside the eight kilometre radius. The baseline data collected must include both quantity and quality analyses. An independent third party consultant should be retained by the Approval Holder to conduct the data collection and analyses. Since access to the water wells and dugouts must be obtained from the landowners, the Board strongly encourages the Appellants allow the Approval Holder's consultant to access their property to gather the required data. Results of the analyses should be provided to the respective landowner.

[151] If a landowner does not want their water sources tested, they must notify the Approval Holder. If the Approval Holder makes a genuine effort to obtain permission to access the properties and the landowner does not respond or refuses access, this does not mean the Approval Holder is not complying with the terms and conditions of the Approvals.

[152] The CCTCS argued the presence of the sandy deposits within the glacial till material make the site unsuitable for a landfill. Based on the information presented, it appears the sandy deposits are in discrete pockets and do not extend over any great distances. Since particle size determines the rate of groundwater flow, whether it is vertical or lateral flow, soil composition is an important factor in determining site suitability for a project such as a landfill. Since the sandy deposits are of limited size and extent, it will be the hydraulic conductivity of the predominantly clay deposits that would determine groundwater flow rates within the material underlying the Landfill footprint. If there had been evidence of more continuous sand lenses

beneath the waste footprint, then it may have been an indication the site was unsuitable. As there does not appear to be any significant sand lenses under the waste footprint, it is the hydraulic conductivity of the clay that needs to be assessed to determine whether the site is adequate for a landfill. The mean hydraulic conductivity of the clay till was found to be 5.3×10^{-9} m/s, which falls within the acceptable range found in the Standards and is, therefore, an acceptable, albeit marginal, site to construct the Class II Landfill.

[153] During direct evidence, the Approval Holder confirmed its intent to use a double liner system in its Landfill. However, during questioning by the Board after closing arguments, the Approval Holder stated the Development Permit only applied to the first cell, and stated the double liner system would only be used in the first cell and subsequent cell construction would include only a composite liner. Based on the closing arguments, there was no indication the Approval Holder would voluntarily continue with the more protective construction criteria, including the double liner system.

[154] Although the Director argued the terms and conditions of the Approvals should be consistent with other landfill approvals in the Province, he included some terms and conditions that exceed the Standards and, therefore, are not necessarily consistent with other landfill approvals. The Board considers this reasonable since the Director must have the option to increase the design criteria specifications for any project beyond the Standards if site specific conditions warrant such action. The application submitted by the Approval Holder included an additional geomembrane liner underneath the leachate collection system. The Director accepted this design, even though it was not necessary under the Standards, and incorporated it into the initial EPEA Approval before feedback was received from the Approval Holder. The Director could also have accepted the double liner construction in all the Landfill cells. This additional liner provides another layer of security for the environment and those living in the area.

[155] Given the presence of sandy pockets in the waste footprint and more extensive sand lenses just outside the waste footprint, and the existence of peat areas indicating wet conditions existed on-site at some time, the Board considers it appropriate to take additional measures to ensure the groundwater in the area is protected.

[156] When all of the factors of this site are considered, including hydrogeology, hydrology, and proximity to domestic wells and dugouts, the Board believes it would be prudent to install a liner system that is more protective of the environment and human health. Therefore, the Board recommends the EPEA Approval be amended to include the condition that all cells constructed at the Landfill will be constructed with a primary geomembrane liner, a leak detection system between the primary geomembrane liner and composite liner, a composite liner, and a leachate collection system capable of maintaining the maximum acceptable leachate head above the primary liner.

[157] The Approval Holder stated in its evidence its intention to implement the testing programs for surrounding water wells and dugouts. This work was to be completed prior to accepting wastes into the Landfill. The Board considers this a valuable task, not only for the adjoining landowners but also for the Approval Holder. This collection of baseline data will provide a benchmark to which future data will be compared to determine if the Landfill is causing an adverse effect on the surface and groundwater sources. It will also provide the data necessary to determine if water from the run-on and runoff ponds on the Landfill site meet the necessary parameters to be released. Therefore, the Board recommends the EPEA Approval be amended to include a condition requiring the testing of all groundwater wells and surface water dugouts within an eight kilometre radius of the Landfill be completed prior to accepting any wastes at the Landfill. This condition is contingent on the landowners granting access; if the landowner refuses access, the Approval Holder needs to document the attempts made to attain access. If a landowner refuses access, it does not prevent the Approval Holder from proceeding with its operations, including accepting waste, if the Director authorizes it in writing.

[158] The initial testing prior to the Approval Holder accepting any waste provides baseline data. To ensure there are no impacts on water wells and dugouts in the area, the Board recommends the Approval Holder test all groundwater wells and surface water dugouts within an eight kilometre radius of the Landfill every three years as part of its independent third party audit.

[159] The Approval Holder admitted the hydraulic conductivity value was incorrectly calculated for one of the boreholes. When the error was realized, a corrected value was provided. The Board would have assumed Worley Parsons, the technical experts for the

CCTCS, would have recalculated their computations taking the corrected value into consideration and then explain to the Board the effects on their calculation of hydraulic conductivity and geometric K. However, this was not completed.

C. Summary

[160] The Board recommends the Approvals be amended to include a condition requiring the testing of all groundwater wells and surface water dugouts within an eight kilometre radius of the Landfill be completed prior to accepting any wastes at the Landfill. Regular testing will be conducted every three years as part of the independent third party audit.

[161] The Board recommends the Approvals be amended to include the condition that all cells constructed at the Landfill be constructed with a primary geomembrane liner, a leak detection system between the primary geomembrane liner and composite liner, a composite liner, and a leachate collection system capable of maintaining the maximum acceptable leachate head above the primary liner.

VI. WERE THE POTENTIAL IMPACTS ON SURFACE RUN-ON AND RUN-OFF ON THE SURROUNDING WATERSHEDS ADEQUATELY CONSIDERED?

A. Submissions

1. CCTCS

[162] The CCTCS stated the Landfill site is located in the headwaters of Waskatenau Creek. They explained there is a natural drainage swale from the north of the Landfill that runs east and south with the shallow groundwater and surface water generally flowing in the same direction. They noted there is some local drainage to the south and west.

[163] The CCTCS argued the Landfill will change the local surface and ground water regimes, because water entering the Landfill site will no longer continue onward to neighbouring properties except where impoundment of surface water on the site fails or overflows. This will impact adjacent landowners who rely on spring runoff and drainage through the swale, and there is the potential for contamination of surface water.

[164] The CCTCS stated the application for the Landfill only contained conceptual drawings and plans for surface water impoundment and drainage, and there was little information on the controls and specifications.

[165] The CCTCS argued that potential water contamination and changes to the surface water regime would affect neighbouring properties and those located within the drainage pathway from the Landfill to Waskatenau Creek.

[166] The CCTCS explained some of the dugouts in the area are fed by surface water, particularly spring runoff. They stated water wells are an important source of domestic and agricultural water for local residents, but the Landfill is located in a groundwater recharge area.

[167] The CCTCS noted the Approvals provide containment for a one in 25 year flooding event, but other Alberta landfills have been required to provide containment for a one in 100 year flooding event. They argued offsite release of contaminated water and sediments is an adverse risk to downstream landowners and the aquatic life in Waskatenau Creek.

[168] The CCTCS noted their consultant concluded that:

- “a) The management of runoff from large storm events is unclear;
 - i. Alteration in drainage patterns could lead to decreased flow to NW 18-61-20 W4M and increased potential for flooding in the area of the improved swale to the east;
 - ii. The operation plan for the storm water management system should support the goal that downstream water users are not adversely affected by the development;
 - iii. The risk that constructed drainage ditches and off-site watercourses may erode during extreme storms or flood events is not well understood;
 - iv. The proposed frequency of surface water quality monitoring may not provide an accurate representation of the expected background water quality; and
 - v. The potential effects of the Landfill on groundwater – surface water interactions have not been assessed.”²⁵

[169] Members of the CCTCS argued the Landfill will impact the streams and wildlife in the area, reducing their enjoyment of their properties.

²⁵ CCTCS’ submission, dated December 4, 2012, at paragraph 87.

[170] The CCTCS stated there is a lot of peat land in the area, demonstrating there was water there at one time. They noted water entered trenches as pipelines were built in the area, indicating there are sand deposits in the area.

[171] The CCTCS stated that, during wet years, the Landfill lands were under water, and they questioned how the Approval Holder will be able to handle the wet years.

[172] The CCTCS stated the Approval Holder needs to consider overflow routes should the ponds overflow.

2. Hilts

[173] The Hilts argued the Director did not adequately consider the potential impacts on the surrounding watersheds. The Hilts explained AESRD staff and Approval Holder staff visited the Landfill site a number of times, but they did not talk to the Hilts about how they would be impacted, and meetings that were arranged, were cancelled.

[174] The Hilts noted the Approval Holder is allowed to release water from the storage ponds. They suggested the surrounding residents should be notified when the release occurs. The Hilts stated that, if the released water is contaminated, the contamination will enter Waskatenau Creek which flows into the North Saskatchewan River.

[175] The Hilts stated they received 90 percent of their surface water from water that flowed through the Landfill lands, but now that construction has blocked the surface water flows, they only receive 10 percent of what normally flowed to their property.

3. Kuzyks

[176] The Kuzyks stated livestock drink from the creeks, dugouts, and sloughs fed by the runoff from the Landfill site, and residents depend on runoff and groundwater for their drinking and household use. The Kuzyks argued that, over time, leachate containing toxic substances and heavy metals will enter the water supply.

[177] The Kuzyks noted that 74 percent of the wetlands on the Landfill lands will be impacted by the development. They stated wetlands are needed to cleanse the environment and

provide habitat for many species of wildlife and vegetation. The Kuzyks questioned whether the Approval Holder will be able to restore previously disturbed bogs and run-off control ponds.

4. Approval Holder

[178] The Approval Holder stated it is required to construct run-on and run-off control systems to manage surface water flows resulting from one in 25 year, 24 hour duration rainfall events.

[179] The Approval Holder stated it cannot allow run-on to enter the active areas of the waste footprint, and it cannot release any substances from the run-off control system to the surrounding watershed except as authorized. Releases from the run-off control system can occur only when the release water complies with water quality limits identified in the Approvals.

[180] The Approval Holder explained surface water will be diverted away from the Landfill using ditches, thereby ensuring the water does not come into contact with either the active area of the waste footprint or the other operations on site.

[181] The Approval Holder explained the run-off control system consists of a series of ditches and ponds designed and constructed to capture drainage from the developed portions of the site. The Approval Holder explained the Landfill project is delineated into three drainage basins, and each basin is designed to incorporate a run-off control facility to capture run-off flows from the capped portions of the waste footprint and other developed areas of the Landfill site. The Approval Holder explained each pond is designed to contain run-off from a one in 25 year, 24 hour rainfall event plus one third the annual run-off volume. The additional one third annual run-off volumes will provide greater storage capacity than is required in the Standards.

[182] The Approval Holder explained that discharge is permitted, but outflows must comply with applicable water quality standards and is limited to the allowable discharge rate. The Approval Holder stated discharge from the west and south ponds will be discharged over land and then flow to the wetlands in the southern portion of the Landfill, and water from the east pond will be discharged to an outlet that will convey flows via the Range Road 205 roadside ditch towards the existing improved swale. The Approval Holder explained the surface water management system will be developed to coincide with the development of the waste footprint.

The Approval Holder stated internal ditches located around the perimeter of each active Landfill cell will direct run-off into permanent ditches at the perimeter of the waste footprint and subsequently into the appropriate pond.

[183] The Approval Holder explained the east pond would be capable of holding 85 percent of a 100 year rainfall run-off volume above the one in 25 year, 24 hour rainfall event, and the west and south ponds could store 100 percent of the 100 year rainfall run-off volume above the one in 25 year, 24 hour rainfall event.

[184] The Approval Holder stated the flows to the improved swale are constricted by the existence of a culvert across Range Road 205, but if the swale floods, the water will not reach the active area of the waste footprint.

[185] The Approval Holder explained: (1) the glacial till over the Landfill lands is interpreted as an aquitard so it will provide negligible groundwater discharge to surface water bodies; (2) low permeability clay till underlying the site and the lack of significant interconnected permeable units results in surface water accumulation in depressions; (3) the water table is typically between one and four metres below surface; (4) infiltrating precipitation or surface water provides recharge to groundwater underlying the site; and (5) no springs have been identified in the area or at the Landfill.

[186] The Approval Holder stated the Landfill project has been designed to generally replicate surface water flow patterns that existed prior to construction, so there will be no adverse effect on the environment.

[187] The Approval Holder explained: (1) surface water collects in depressions over a majority of the Landfill in the west and south, and the east portion drains into an improved swale leading towards the headwaters of Waskatenau Creek; (2) much of the drainage basin to the west of the Landfill no longer flows onto the Landfill because of Range Road 210, except for three culverts adjacent to the Landfill and a culvert outside the Landfill; and (3) one of these culverts could convey surface water flow to the Landfill.

[188] The Approval Holder explained the surface water in the region flows generally from the northwest to the southeast towards Waskatenau Creek and the North Saskatchewan River, but at a local site level, the Landfill contains numerous closed basins that direct surface

water drainage internally. The Approval Holder stated surface water from upstream lands collects on the west side of Range Road 210 and is directed to the south via a ditch adjacent to the road, preventing the flows from reaching the Landfill from the west and limiting surface water flow onto the Landfill.

[189] The Approval Holder stated the fence and cattle disturbance along the southern border of the Landfill resulted in a subtle berm that prevents water from flowing off the Landfill. The Approval Holder stated there is minimal surface water flow through the Landfill onto the Hilts' property. The Approval Holder argued the issues the Hilts may suffer with respect to surface water pre-dates the Landfill project.

[190] The Approval Holder stated the surface water management plan has been designed to generally replicate surface water flow patterns that existed prior to construction of the Landfill.

[191] The Approval Holder noted: (1) the area north of the Landfill, which includes a low spot resulting from a disturbed wetland with no defined outflow channel, will be restored; (2) as a result of the east-west run-on control berm and ditch, there may be no change in the flow of water to the south in dry years and an impact on the Landfill will only occur in wet years; (3) surface water flows from upstream lands are controlled by culverts across Township Road 614 and Range Road 205, and given the size of the culverts, upstream lands are likely to flood during large flood events regardless of the Landfill's presence; (4) lands downstream of the Landfill will not experience any significant difference in flood flows due to flood control created by the culvert across Range Road 205; and (5) there should be no significant change in flood levels on the Landfill and upstream as a result of the development.

[192] The Approval Holder explained there are two circumstances where water from the Landfill may be conveyed to the improved swale: (1) run-on may be captured by the north run-on ditch and conveyed to the swale, but there is no risk this water will come into contact with the active part of the waste footprint; and (2) affected run-off may be conveyed by a second ditch to the east pond from which water will be discharged to an outlet ditch that conveys flows via the Range Road 205 roadside ditch towards the improved swale. However, water will only be discharged when applicable water quality standards are met and limited to the discharge rate

allowed. The Approval Holder submitted the Landfill project poses no risk to Waskatenau Creek.

[193] The Approval Holder stated there is no continuously defined drainage path through the southwest quarter section of the Landfill located directly north of the Hilts' property. The Approval Holder submitted a field investigation did not support the Hilts' allegation that there are two discrete creek systems through the Landfill. The Approval Holder argued there is minimal surface water flow through the Landfill lands to the Hilts' property and, therefore, there is no evidence the Landfill project will cause any material change to surface water flows from the Landfill lands to the Hilts' property.

5. Director

[194] The Director explained the surface water management system ensures the surrounding watershed is protected and any impacts are negligible by: (1) mimicking natural surface water flows as much as possible to downstream users; (2) minimizing the amount of surface water removed from the watershed; and (3) ensuring the quality of the surface water that comes into contact with activities at the Landfill is good and is acceptable for release to the surrounding watershed.

[195] The Director stated the information provided by the Approval Holder in the approval review process was critically evaluated, and supplementary information requests were sent to ask questions and request amendments to ensure potential impacts to surface water were well understood and properly mitigated. The Director stated his staff also visited the site.

[196] The Director stated that after the Approvals were issued, the Approval Holder submitted detailed design and construction plans.

[197] The Director explained the Landfill is within the upper region of the Waskatenau Creek watershed and the terrain is relatively flat. He stated two main catchments intersect the Landfill. The primary drainage pathways are in the northeast and the south, and there is no drainage towards the west. The Director stated a small portion of the northwest watershed will become part of the northeast watershed after development.

[198] The Director stated the precise location of the west to east flow drainage does not appear to be any defined drainage channel.

[199] The Director stated there is a topographic high on the Approval Holder's property just north of the Hilts' property, so the southernmost portion of the Landfill lands drains towards the Hilts and would provide water to the wetland on the Hilts' property.

[200] The Director explained the Approval Holder identified a culvert that passes water from the west side of Range Road 210 towards an existing dugout on the Landfill lands. The dugout would drain towards the wet areas on the southern edge of the Landfill property and then flow onto the Hilts' lands.

[201] The Director noted the dugout coincides with the location of one of the Approval Holder's surface water retention ponds, so the Approval Holder proposed to build ditches to direct any flow from the west side of Range Road 210 that crosses to the Approval Holder's lands around the storage pond towards the wet areas to the south of the Landfill. A temporary ditch will be constructed to direct the flow until a final ditch is constructed with the development of the southern cells.

[202] The Director explained the surface water retention ponds are required to accommodate a one in 25-year, 24-hour rainfall event but, in addition, the Approval Holder designed the ponds to accommodate one-third of the average annual run-off. The Director stated the east pond is designed to hold an additional 4,400 m³ of water for fire suppression and a 1.5 metre freeboard, while the west and south ponds have an additional 0.6 metre freeboard.

[203] The Director explained the ponds were designed assuming three annual releases and run-off was 20 percent of the total volume of precipitation. The Director noted this is a cautious presumption since historically only five percent of rainfall in the Waskatenau Creek watershed reaches the surface drainage system.

[204] The Director stated the ponds are designed to accommodate the one in 25-year rainfall event when the ponds are 64 percent full, but it is expected the ponds would usually be less than 50 percent full. If a one in 100 year event occurs when the ponds are 64 percent full, water levels would encroach 0.26 metres into the freeboard in the west pond, and 0.18 and 0.28

into the east and south ponds freeboard, leaving 0.32 metres of freeboard in all three storage ponds.

[205] The Director stated the impacts on average and low flow at closure will be minimal, because the site will be returned to a state that is hydrologically similar to the pre-development state.

[206] The Director stated that, under optimal operating conditions, the water quality released from the storm ponds is expected to be good, and the water is not to be released when the quality is poor. The Director explained that, in the event the Approval Holder was delayed or unable to release the water from the storm ponds due to water quality concerns, flows in streams immediately downstream of the Landfill could be reduced five to 10 percent. The Director stated these impacts would be relatively small, rare, and temporary. Virtually all of the water collected in the run-off control system is expected to be released downstream.

[207] The Director explained the operations plan must include release plans that ensure the ponds can capture run-off from a large storm event and the natural flows are mimicked as much as practicable.

[208] The Director noted the Approval Holder will conduct baseline water quality sampling upstream and downstream, including the improved swale, prior to accepting any waste. The Director noted sampling will be done prior to and during each discharge. The Director stated that prior to any release from the surface water retention ponds, the retained water will be sampled to confirm it meets discharge criteria, and samples will be taken at the point of discharge at the improved swale or south wetland to assess background conditions of the water. During discharge, upstream and downstream samples of the improved swale and downstream of the south wetland will be analyzed to determine the water quality of the receiving waterbody.

[209] The Director stated the Hilts and Cramers would be impacted the most, and the impacts on Mr. Dmetruk would be minimal given he is located 12 kilometres downstream of the swale. The Director stated there would be no surface water quality impacts on the remaining Appellants.

B. Analysis

[210] The Approval Holder argued there are not two discrete creek systems through the Landfill lands as alleged by the Hilts. What the Approval Holder may be basing its arguments on is the use of the word “creek.” It may have been more appropriate to use a term such as “water course.” All Parties acknowledged the existence of the northern water course through the improved swale. The Hilts referred to another water course that flows from the culvert at Range Road 210 along the west side of the Landfill lands and onto the wetlands on the southern edge of the Landfill lands and eventually onto the Hilts’ property. The Approval Holder explained it will be maintaining a ditch to re-direct water from the culvert around the Landfill. This indicates there are two water courses on the Landfill lands that must be considered in any surface water management plan that is developed.

[211] The Landfill is located in a rural area, but there are residents, such as the Hilts and Cramers who live less than one kilometre downstream of the Landfill property. The Approval Holder acknowledged that when it is released, run-on water will be directed from the Landfill property to the wetland complex on the southern edge of WMCC’s property and then flow into the wetlands on the Hilts’ property. It is important in any surface water management plan the Approval Holder develops that steps are included to ensure downstream landowners are not negatively impacted by the Landfill operations.

[212] During direct evidence, the Approval Holder stated it discovered an additional culvert in 2012 that it had not been previously aware of adjacent to the west perimeter at the south end of the Landfill. This culvert diverts water from the west side of Range Road 210 to the wetland complex on the east side of the road and at the south end of the Landfill property, immediately north of the Hilts’ property. The Approval Holder explained the majority of the water that currently flows onto the Hilts’ property comes from the west of Range Road 210 through that culvert. To ensure the quantity of water the Hilts currently receives is not impacted to any degree as a result of the Landfill, the Board recommends the EPEA Approval be amended to ensure the drainage from the culvert is properly maintained and the run-off system is designed properly to ensure the maximum amount of water that flows through the southwest culvert

reaches the wetlands on the south part of the Landfill property, thereby allowing the water to reach the Hilts.

[213] The Appellants expressed concern regarding the timing of the releases from the water retention ponds on the Landfill site. The Approval Holder will be testing not only the water in the ponds prior to release, but also the water quality above and below the release point to ensure the water qualities are equivalent. Water quality must be determined prior to any release from the run-on and run-off ponds. The water must meet specific parameters identified in the Approvals and must be comparable with background quality.

[214] The Approval Holder has determined the total amount of water flowing south from the Landfill will not change significantly, but the timing of the water flow and the rate of flow will be changed. The Appellants explained their farming operations could be impacted depending on the timing of the releases. In order to minimize the impacts on downstream landowners, the Approval Holder needs to notify the landowners who may be impacted prior to any release from the ponds. Therefore, the Board recommends the EPEA Approval be amended to require the Approval Holder notify landowners downstream of the Landfill one week prior to releasing water from the surface water retention ponds. Notification should be in writing, either by mail or email, by telephone, and if possible, every effort should be made to provide direct notification and contact back prior to the release. The landowners and renters that live on or rent the following quarters are to be notified: (1) sections 3, 4, 5, 6, 7, 8, 9, 10, 17, and NE, SE, and SW 18-61-20-W4M; (2) sections 29, 30, 31, and 32-60-20-W4M; (3) sections 1, 12, SE and SW 13-61-21-W4M; and (4) sections 25 and 36-60-21-W4M. The Approval Holder does not have to provide notice of the releases to any of these landowners or renters who notify the Approval Holder indicating that they do not need notification. The Approval Holder needs to take into account all landowner responses to any notice of an intended release of water prior to releasing the water, and the potentially affected landowners need to work cooperatively with the Approval Holder because they cannot cause the Approval Holder to contravene the Approvals.

C. Summary

[215] The Board recommends the Approvals be amended to require the Approval Holder notify landowners downstream of the Landfill property one week prior to releasing water

from the surface water retention ponds. These properties include: (1) sections 3, 4, 5, 6, 7, 8, 9, 10, 17, and NE, SE, and SW 18-61-20-W4M; (2) sections 29, 30, 31, and 32-60-20-W4M; (3) sections 1, 12, SE and SW 13-61-21-W4M; and (4) sections 25 and 36-60-21-W4M.

[216] The Board recommends the EPEA Approval be amended to ensure the drainage from the culvert on Range Road 210 shall be properly maintained and the run-off system shall be designed to ensure the maximum amount of water that flows through the southwest culvert reaches the wetlands on the south part of the Landfill.

VII. CONSTRUCTION AND OPERATION OF THE LANDFILL

A. Submissions

1. CCTCS

[217] The CCTCS noted the EPEA Approval required the Landfill be constructed and operated in accordance with the application, but the application only contained preliminary and conceptual plans based on assumptions, not evidence, of site suitability. The CCTCS noted the Approvals allow for minor adjustments in the plans that do not alter performance, but there is no direction of what constitutes a minor adjustment or what constitutes equivalent performance. The CCTCS argued this leaves too much discretion to the Approval Holder.

[218] The CCTCS stated the Approval Holder proposes the very minimum for the liner of the Landfill which, according to the CCTCS, is not sufficient for a landfill of this size.

[219] The CCTCS noted the development permit issued to the Approval Holder by the County of Thorhild requires a double synthetic liner together with a height restriction for the Landfill cells at 45 metres above natural grade at build out, whereas the Approvals only require compacted clay in contact with a synthetic liner and a maximum height of 713 metres above sea level.

[220] The CCTCS argued the proposed liner was not specifically designed for a landfill disposing 500,000 tonnes of waste per year.

[221] The CCTCS noted the Approval Holder recognized there is the possibility of point defects in the synthetic liner as a result of mechanical damage or local seam failure. The

CCTCS argued that, if the liner system is dependent on the Approval Holder's Construction Quality Control Plan, then the EPEA Approval should not have pre-dated the pre-approval of the Construction Quality Control Plan. The CCTCS stated the general statements of what will be in the Construction Quality Control Plan does not adequately protect the environment or human health especially when the Approval Holder identified construction as the cause of leaks.

[222] The CCTCS noted the Approval Holder stated additional testing on the actual material to be used in the construction will be required during the construction of the compacted clay. The CCTCS argued this demonstrates the Approval Holder is relying on undefined quality control measures and soil uncertainties to meet the Standards, and the Director approved the Landfill without knowing that the Standards can be met. The CCTCS also noted the EPEA Approval does not address concerns relevant to synthetic liner construction such as the effects of exposure to the elements.

[223] The CCTCS noted the Approval Holder plans to address odours, litter, dust, and nuisance animals by covering the site with other waste. They stated the operations plan does not provide trigger points for when additional efforts are required to minimize dust, odour, litter, and nuisance animals.

[224] The CCTCS stated the operations plan does not address noise control, such as the use of low frequency beepers and horns. The CCTCS explained the operations plan only states the Approval Holder will enforce the speed limit of trucks with no details how it will be enforced. Some of the members of the CCTCS stated they have already been impacted by the noise resulting from construction of the Landfill.

[225] The CCTCS stated the operations plan indicates litter will be controlled by cover and pick up with additional pick up on windy days, but there is no indication how a windy day will be determined, how long it will take to retrieve the litter, or how the Approval Holder intends to obtain consent from landowners to collect litter. The CCTCS argued that their members should not have to be faced with the risk of their cattle consuming litter from the Landfill.

[226] The CCTCS stated dust, litter, noise, nuisance animals, and odours can only be managed by operational procedures, but the Approval Holder has a poor record of its operation of landfills.

[227] The CCTCS argued the buffer between the waste footprint and adjacent properties should be expanded to a minimum of 1.6 kilometres to reduce the likelihood of impacts on surrounding residents.

[228] The CCTCS stated that even though hazardous wastes are not accepted at the Landfill, there are a number of chemicals, many of which may not be regulated, that can leach into groundwater and make it unusable by humans and animals or impact the environment.

[229] The CCTCS explained the waste deposited in plastic bags will inhibit the mixing of wastes and water thereby prolonging the time leachate can develop as the bags deteriorate. The CCTCS explained this affect can be minimized by shredding the waste and making it more homogeneous.

[230] When asked by the Board how the Landfill should be constructed at the site, CCTCS' witness, Dr. Lee, recommended: (1) a double composite liner with leak detection systems between the liners; (2) shredding all of the waste to make a homogeneous waste to enhance decomposition; (3) a plastic cover liner to keep the waste dry post-closure; and (4) a monitoring system.

2. Hilts

[231] The Hilts stated the Landfill will accept a variety of hazardous chemicals that, if not properly handled, can result in fire and serious health hazards.

[232] The Hilts expressed concern that, once the Landfill is built, the Approval Holder will apply to change it to a Class I (hazardous) landfill because the lack of available waste will drive the change. The Hilts acknowledged the whole process would start again, but then there will be an existing facility ready to operate as a Class I landfill.

[233] The Hilts noted the Approvals do not require separate cells and leachate collection systems for the special wastes. The Hilts stated the special wastes cannot be mixed with the regular waste.

[234] The Hiltz also raised the question of whether the Approval Holder intends to bring wastes in by rail since the train goes by the site and there are two quarters of land beside the Hiltz' property where the rail system could deliver waste. The Hiltz stated there is no requirement for the Approval Holder to disclose this development except through the municipal rezoning notice. The Hiltz argued the Approval Holder should disclose all its future plans upfront.

[235] The Hiltz stated the EPEA Approval should require more detail, including specifying that fugitive wastes will be picked up on a specific day of the week. This would demonstrate a commitment to keeping the neighbours' properties clean.

[236] The Hiltz noted the control of seagulls will be either through misting or noise cannons. They questioned where the seagulls would go. The Hiltz were concerned the seagulls would go to their property since their property adjoins the Approval Holder's property.

[237] The Hiltz recommended the setbacks for each cell should be 450 metres from the Approval Holder's property line, and the setback should include the berms and water basins, not just the waste footprint.

3. Kuzyks

[238] The Kuzyks stated the amount of waste the Landfill will bring could result in high amounts and levels of toxic chemicals and soils with high levels of heavy metals if the facility is not monitored by an independent third party consultant. They recommended a third party also monitor the wastes being brought into the facility.

[239] The Kuzyks raised questions regarding the sampling and inspection rates for the waste coming onsite. They also questioned the integrity of the liner and likelihood that it could be impacted or damaged by sharp objects or chemicals. The Kuzyks asked how sulphuric acid, dioxins, and furans are produced in the Landfill and how levels are controlled.

[240] The Kuzyks raised operational concerns, including how the leachate level will be measured to ensure the head limitations are kept safe.

[241] The Kuzyks noted there is no cap on the tonnage of waste accepted.

[242] The Kuzyks questioned how seagulls will be controlled at the Landfill. The Kuzyks asked the litter strewn from trucks be picked up at regular intervals.

4. Approval Holder

[243] The Approval Holder explained detailed construction plans and specifications must be submitted to the Director prior to each major stage of construction.

[244] The Approval Holder stated the plans submitted with the application were preliminary, but they included detailed drawings with real shapes, sizes, and depths and sufficient information to allow the Director to decide if the proposed facility is adequate to meet regulatory expectations. The Approval Holder stated it is after the approval has been issued that an approval holder must prepare and submit construction plans and specifications that are consistent with the preliminary design plans.

[245] The Approval Holder stated the site is suitable for Landfill development, but in an abundance of caution, the EPEA Approval requires the Approval Holder to conduct further hydrogeological investigation in certain areas and, if the Approval Holder encounters site geological conditions during construction that were not considered in the application, it must submit an updated design plan and specifications to the Director.

[246] The Approval Holder explained that, as construction progresses, it must provide design plans and specifications, a quality assurance plan, and a construction quality control plan, and if the design plan and specifications deviates from the application, the Approval Holder may not begin construction until the Director gives written authorization. The Approval Holder stated it cannot deviate from the design plans and specifications unless the deviation is a minor adjustment to suit field conditions and it will result in equivalent design performance.

[247] The Approval Holder stated the composite liner complies with the Standards. The Approval Holder argued that, even though the Standards are expressed as minimum requirements, it does not suggest compliance with the Standards provides inadequate protection. The Approval Holder explained the composite liner it proposed consists of a 1.5 millimetre thick HDPE geomembrane liner placed in direct contact with an underlying 0.6 metre thick compacted clay liner with a hydraulic conductivity of less than 1×10^{-9} m/s. The Approval holder stated

composite liners are effective based on the virtual impermeability of the HDPE geomembrane liner and the low hydraulic conductivity of the underlying compacted clay layer. The Approval Holder stated additional soil testing to confirm the expected hydraulic conductivity of the glacial clay till demonstrates good practice.

[248] The Approval Holder noted the EPEA Approval prevents it from disposing of hazardous wastes as defined in the *Waste Control Regulation*, bulk liquid waste, domestic wastewater, explosives, radioactive waste, biomedical waste, and ozone depleting substances. The Approval Holder explained special wastes are not hazardous wastes but are wastes that require special handling to ensure no negative impacts to the environment and ensure minimal nuisances.

[249] The Approval Holder noted the Standards require all necessary measures be taken to control nuisances, such as litter, fires, disease vector, odour, and dust. The Approval Holder stated the EPEA Approval requires the nuisance control procedures set out in the operations plan be implemented.

[250] The Approval Holder noted the EPEA Approval requires dust control measures be implemented. The Approval Holder stated its operations plan incorporates dust control measures including: (1) internal haul roads will be sprayed with water from site pond and dust suppression additive to control dust from vehicular travel and other activities at the Landfill; (2) waste material with the potential for being dusty will be wetted prior to and during unloading and covered immediately; (3) enforced speed limits within the Landfill; and (4) vegetation will be introduced to problem areas.

[251] The Approval Holder noted noise will increase for some residents, but the noise levels will be below levels set out by the Energy Resources Conservation Board Directive 38. The Approval Holder stated that, even though formal noise mitigation is not required, noise will be managed by: (1) speed limits within the Landfill lands; (2) perimeter berms; (3) tree screening; and (4) engineering controls to reduce noise on equipment.

[252] The Approval Holder stated it will implement infrastructure and operational practices to control odours. The Approval Holder explained it will cover odourous waste materials immediately with other incoming waste materials or cover materials. The Approval

Holder stated that if the waste is extremely odourous, it may choose not to accept the waste or schedule a special receiving time to accommodate the material and the handling required to adequately suppress the odours.

[253] The Approval Holder stated it prepared an odour monitoring plan to prevent and monitor odours. The Approval Holder explained it will ensure the active working face is kept as small as possible and will place daily cover with a typical thickness of 150 millimetres. The Approval Holder explained it will maintain an up-to-date odour monitoring map, and the odour monitoring team will monitor performance and conditions near the Landfill and will be able to respond quickly to any observed condition. The Approval Holder stated it will operate a 24 hour community hotline and will maintain staff on a 24 hour basis to respond to the odour monitoring team observations and third party complaints.

[254] The Approval Holder stated on-site water will be managed to minimize potential mosquito breeding areas. It explained that if rodents or birds become a nuisance, then appropriate measures will be taken, including covering the waste with daily and intermediate covers to limit the amount of waste available for scavenging. The Approval Holder stated a combination of deterrents will be used to discourage birds and rodents, and an eight foot high fence around the site will discourage other scavengers.

[255] The Approval Holder explained the EPEA Approval requires the Approval Holder to control fugitive wastes by: (1) minimizing the size of the working face; (2) compacting the waste; (3) covering the waste with soil or other cover material immediately after closing each day; (4) establishing and maintaining litter controls to minimize the escape of fugitive waste from the Landfill; (5) maintaining recycling storage areas in a clean and orderly manner; (6) implementing dust control measures; (7) retrieving litter that accumulates within the Landfill; and (8) retrieving all fugitive waste outside the Landfill at least once per week or as otherwise authorized by the Director. In addition to the requirements above, the Approval Holder stated it will monitor wind direction and orientate operations at the Landfill accordingly. The Approval Holder submitted all of these steps will minimize fugitive waste within the Landfill and the surrounding area.

[256] The Approval Holder stated it has a positive compliance track record in Alberta and there is no need to presume that it will not take all necessary measures to control nuisances within the Landfill. Therefore, according to the Approval Holder, it is not necessary for the EPEA Approval to contain detailed and specific requirements with respect to nuisance issues.

5. Director

[257] The Director stated the Standards establish the criteria the Director must consider regarding the construction and operation of the Landfill, including landfill design and specification, construction details, construction quality assurance and quality control requirements, operations plan, waste acceptance policies and procedures, nuisance and wildlife management, liquid waste restriction, and management plans for leachate, subsurface landfill gas, groundwater, and surface water.

[258] The Director explained the waste acceptance policies ensure the types of wastes accepted at the Landfill are approved for acceptance and all prohibited wastes are screened and rejected, thereby minimizing the types of waste that negatively contribute to leachate quality, nuisances, or unexpected risks.

[259] The Director confirmed the Landfill will not be able to accept any hazardous wastes, which include wastes that are corrosive, toxic, flammable, highly reactive, and combustible. The Director explained risks associated with different types of non-hazardous waste is already factored into the requirements for siting, design, operations, closure, and reclamation of a Class II landfill. The Director explained the section titled “special wastes” in the EPEA Approval refers to unique waste types that require special handling requirements when disposed in a landfill to ensure protection of the environment and human health. The Director stated the five types of special wastes that require special handling at the Landfill are: (1) asbestos waste; (2) sulphur wastes; (3) non hazardous oilfield waste; (4) treated biomedical waste; and (5) dead animals or animal parts.

[260] The Director stated that disposal of asbestos at the Landfill is not likely to result in airborne asbestos that will affect nearby residents, because the waste must be double bagged at the time of collection and immediately covered in the Landfill cell. The Director stated there should not be any issues with mercury air emissions due to the co-disposal of the very small

amount of mercury with other wastes. The Director noted mercury is a parameter measured in landfill leachate, and if the level exceeds 0.2 mg/l, the leachate must be treated or disposed of as a hazardous waste.

[261] The Director noted that landfills must have standard operational procedures in place that take into account the effects of strong winds. He explained waste must be immediately covered on windy days to prevent the release of fugitive wastes, and landfills may use portable litter screens orientated to catch litter based on the wind direction.

[262] The Director stated the Approval Holder must provide litter retrieval procedures in the operations plan.

[263] The Director stated the Approval Holder must implement effective seagull control and limit the amount of waste exposed to the seagulls.

[264] The Director stated it is possible neighbours could be exposed to higher levels of airborne particulates and chemicals, but modeling and other studies need to be done to determine if there are any effects on human health and quality of life. The Director stated the best way to address odours is to have operating procedures in place that take into account strong winds and to cover waste.

B. Analysis

[265] The Appellants expressed their frustration in their ability to obtain information about the Landfill in a timely manner. This has led to an atmosphere of mistrust between the Appellants and Approval Holder. The communication between the Parties needs improvement to encourage positive working relationships and potentially repair the rift that has developed in the community. The Board suggests the Approval Holder develop a way to share information and encourage meaningful discussions on the environmental and safety programs taking place at the Landfill, any proposed changes in the operation of the Landfill, or any amendments to its Approvals it may be seeking. These discussions need to occur on an ongoing basis.

[266] In addition, the Board strongly suggests the Approval Holder include residents living within eight kilometers of the Landfill and the Appellants in discussions regarding the various plans that need to be developed under the Approvals, including the various monitoring

plans and emergency response plan. This can be through community advisory panels, but residents living within eight kilometers of the Landfill and the other Appellants should be invited to sit on the advisory panels.

[267] The Approval Holder recognized there will be odours that will be generated by the Landfill, and it acknowledged it must take steps to minimize all odours. In addition, the Approval Holder must develop an odour management plan. It is strongly recommended the odour management plan is developed with input from those residents within eight kilometers of the Landfill.

[268] The Appellants expressed concern regarding the potential for nuisance animals and scavenger birds being vectors to transporting diseases and contaminating water sources, particularly surface water dugouts. The Approval Holder must include in its operations plan some method of controlling nuisance animals and scavenger birds to prevent the spread of diseases due to the Landfill.

[269] The Appellants raised concerns regarding the potential of soil coming into the Landfill contaminated with clubroot, thereby increasing the risk of clubroot spreading into the area. The Approval Holder acknowledged steps would be taken to minimize the risk of soil contaminated with clubroot from entering the Landfill. The Board understands there are practices that can be taken to minimize the risks with clubroot, including not accepting soils from sites known to be infested with clubroot. Therefore, the Board recommends the EPEA Approval be amended to require the Approval Holder implement a program to prevent clubroot entering the Landfill as part of its operations plan.

[270] As the operations plan is developed, the Board considers it essential the Approval Holder initiate meaningful and timely consultation with the residents within eight kilometers of the Landfill boundary and the other Appellants. The consultation needs to take into consideration the concerns related to litter, noise, odours, nuisance animals, and dust.

[271] The Board strongly encourages the Approval Holder organize annual general meetings that are open to the public to distribute information about the Landfill operations and data collection. The Board also suggests the Approval Holder develop a website to post all of the information it is required to submit to the Director and any other pertinent information

including data collected and an explanation of what the data represents. The public should have access to this website, and to ensure everyone has the opportunity to see the information, a copy of the reports and data submitted to the Director should also be provided to the local library. The information should also be provided directly to those residents within eight kilometers of the Landfill who provide updated addresses or email addresses annually.

[272] The Board recommends the Approvals be amended to require the Approval Holder notify the Appellants and residents within eight kilometres if it intends to seek an amendment to any of the required approvals, licences, or permits. In order for the Approval Holder to provide this information, any of the Appellants who would like notification of possible amendment applications or the results of any monitoring or testing, would be required to notify the Approval Holder annually and provide their contact information and how they would like to receive the information, whether it be by email or mail.

[273] In the application for the Approvals, the Approval Holder stated it would mitigate impacts on wildlife by engaging a qualified avian biologist to conduct a nest search prior to the initiation of any clearing activities within the construction area. From the information available in the Record, the submissions, and the responses provided at the Hearing, the Board is not satisfied the information and steps that should have been taken to minimize impacts on bird species in the area were completed. Therefore, the Board recommends the EPEA Approval be amended to include a condition requiring the nest search be completed prior to any further construction on the site.

[274] The Appellants expressed a concern that, given the Landfill is being constructed to Class I standards, the Approval Holder will start to accept hazardous wastes. The EPEA Approval clearly states this is a non-hazardous Landfill. If the Approval Holder decides in the future to start accepting hazardous wastes, it would have to seek an amendment to its Approvals. This would start the process of public involvement, including filing Statements of Concern and, if needed, filing Notices of Appeal. Any amendment to the type of wastes accepted at the Landfill would include public notice, and direct notice should be provided to residents within an eight kilometre radius from the Landfill and any of the other Appellants who provide contact information to the Approval Holder.

C. Summary

[275] The Board recommends the Approvals be amended to require the Approval Holder complete a nest search to identify nesting birds at the Landfill prior to continuing with construction of the Landfill.

[276] The Board recommends the Approvals be amended to require the Approval Holder to provide notice to all residents and landowners within eight kilometres of the Landfill and to the Appellants if the Approval Holder intends to apply for any amendment to an approval, licence, or permit of any kind, or if it intends to apply for another approval, licence, or permit of any kind.

[277] The Board recommends the EPEA Approval be amended to require the Approval Holder implement a program to prevent clubroot entering the Landfill as part of its operations plan.

VIII. MONITORING PROGRAMS

A. Submissions

1. CCTCS

[278] The CCTCS stated monitoring systems need to be specific to the site because factors that determine exposure to health risks are unique to each site. These factors include types of chemicals present, quantity and age of the waste, geology, hydrogeology, lining and capping of the site, presence of gas and leachate collection systems, use of surrounding areas, and drinking water extraction points.

[279] The CCTCS argued the Landfill containment systems are subject to deterioration and breach, and many elements are buried and therefore difficult to inspect, maintain, and repair.

[280] The CCTCS argued the Approval Holder's monitoring system for odours is not effective.

[281] The CCTCS noted the Record does not contain an approved groundwater monitoring plan. They noted the latest draft shows groundwater monitoring wells with 200 metre spacing even though the County Development Permit requires a 100 metre spacing. The

CCTCS stated there are not enough monitoring wells and they are not spaced close enough together. They stated a monitoring well measures what is occurring within a one foot radius, so with the wells spaced 100 metres apart, there are 98 metres not being monitored leaving a low probability of detecting contamination.

[282] The CCTCS explained their consultants concluded the Approval Holder: (1) did not define the hydrogeological characteristics of the site or surrounding area; (2) did not define potential pathways of groundwater flow; and (3) ignored reported areas of higher permeability on the site. The CCTCS argued no groundwater monitoring plan the Approval Holder proposes will effectively protect groundwater.

[283] The CCTCS noted the Approval Holder intends to monitor surface water after an unexpected event, but this will not provide background information about background water quality.

[284] The CCTCS argued the assessment of landfill gases is inadequate and provides no specific information about the Landfill site. They noted the Approval Holder modeled a municipal solid waste facility near Calgary, but the climate is different between Calgary and Thorhild. In addition, they stated the United States Environmental Protection Agency Landfill Gas Emissions Model (“LandGEM”) model used by the Approval Holder is unreliable for predicting landfill gas generation due to its failure to properly account for the moisture content of the wastes, a primary factor in determining landfill gas generation, and for the manner in which landfill gas can be expected to be generated. The CCTCS argued the landfill gas monitoring program set out by the Approval Holder is inadequate because: (1) gas monitoring probes spaced at 300 metre intervals around the perimeter of the Landfill can readily miss some of the preferential pathways through which landfill gases can migrate offsite; and (2) semi-annual monitoring for low or no concentration is inappropriate as landfill gas production will be delayed as long as the landfill cover prevents significant amounts of water entering the wastes.

[285] The CCTCS recommended an odour monitoring system that could provide objective results and a way to measure the distance the odours travel.

2. Hilts

[286] The Hilts noted the Approval Holder is only monitoring its property. They argued neighbouring properties should also be monitored, since airborne particles could reach their home and cause health issues.

[287] The Hilts noted the Approval Holder used climate data from Edmonton and Redwater to assess the site, but the Approval Holder should have used the data from the weather station located on Highway 63 across from the Transportation Lands.

3. Kuzyks

[288] The Kuzyks asked that an independent consultant provide a monitoring program for the Landfill.

4. Approval Holder

[289] The Approval Holder explained it must continuously monitor the type of waste received, the type of material removed, and detect hazardous waste, and it must observe the cover material for nuisance management. The Approval Holder stated it must monitor the general location of waste deposited daily and track public complaints regarding nuisance and its responses daily. The Approval Holder stated it must record each time fugitive waste is retrieved off-site, check final and intermediate cover daily when cover is applied, and observe the working face daily. The results of the monitoring must be provided to the Director annually. The Approval Holder explained it must provide an annual operations report that provides a summary of monitoring regarding operations, leachate, landfill gas, and run-off as well as performance issues and inspections of the Landfill.

[290] The Approval Holder stated the EPEA Approval requires leachate be monitored at specific intervals and the results provided to the Director annually. The Approval Holder explained it must inspect the Landfill site for leachate breakout and take certain steps if a leachate breakout occurs.

[291] The Approval Holder stated it is required to develop an action leakage rate for the sumps associated with the secondary leachate collection system and must develop a leak

detection response action plan that must be implemented in the event of an exceedance of the action leakage rate.

[292] The Approval Holder stated it must prepare and implement a subsurface landfill gas monitoring program to monitor subsurface landfill gas yearly and report to the Director annually. The Approval Holder noted maximum levels for subsurface landfill gas is stipulated in the EPEA Approval.

[293] The Approval Holder explained its landfill gas monitoring program includes: (1) subsurface gas monitoring probes installed around the waste footprint where gas migration is considered most likely and adjacent to on-site buildings at a spacing of not more than 300 metres; (2) a landfill gas analyzer will be used to measure methane and other gases; (3) landfill gas will be measured monthly initially and, if no or low concentrations are measured, a semi-annual program will be implemented; (4) a landfill gas contingency plan will be implemented including re-sampling, risk assessment, and remediation; and (5) a landfill gas monitoring network will be developed in stages with the development of the waste footprint.

[294] The Approval Holder stated subsurface landfill gas migration potential will be very low due to the composite liner system, the surrounding geology, and the generally high groundwater elevations.

[295] The Approval Holder stated it is obliged to maintain the landfill gas monitoring program for a minimum of 25 years post-closure and until the quality and quantity of landfill gas generated meets objectives that show the Landfill has stabilized.

[296] The Approval Holder explained a key factor in determining landfill gas composition is rainfall, and the difference in average rainfall between Calgary and Thorhild is relatively small, the difference is not material in modeling landfill gas generation. The Approval Holder submitted the LandGEM is a generally accepted model for predicting landfill gas generation.

[297] The Approval Holder explained it must develop a surface water monitoring program, and it is required to monitor the water for specific parameters prior to each release and during any unanticipated release from the run-off control system. The Approval Holder explained baseline surface water samples were taken at numerous locations in August 2010 and

April 2011, and additional samples will be taken in 2013, if sufficient quantities of water are available. The Approval Holder stated samples will be taken at the sample locations as well as the surface water ponds prior to and during each discharge event.

[298] The Approval Holder stated it must prepare a groundwater monitoring program. The groundwater monitoring program must include groundwater monitoring wells constructed no more than 200 metres apart, a detailed process for decommissioning groundwater monitoring wells, and a detailed process for establishing groundwater quality control limits. The Approval Holder noted the EPEA Approval requires specific parameters be monitored according to a schedule authorized by the Director. The Approval Holder explained the 200 meter spacing of the groundwater monitoring wells complies with the Standards.

[299] The Approval Holder stated its hydrogeological studies demonstrate the site is suitable for landfill development.

[300] The Approval Holder submitted the monitoring programs are adequate to protect the environment and human health.

5. Director

[301] The Director explained monitoring is required for leachate, surface water, groundwater, and subsurface landfill gas. He stated performance monitoring occurs with respect to operations. The Director stated that every three years, the Landfill must be audited by an independent third party auditor to determine compliance with the terms and conditions of the EPEA Approval.

[302] The Director explained the Approval Holder conducts environmental monitoring within the Landfill to ensure early detection of issues, because neighbouring properties are not always accessible for monitoring purposes.

[303] The Director stated the Groundwater Monitoring Program must provide effective, timely, and reliable reporting to the Director of any potential negative impacts to the surrounding groundwater. The Director stated the Groundwater Monitoring Program will provide early warning if there are issues with the liner and leachate collection system performance.

[304] The Director stated the EPEA Approval specifies the frequency and parameters to be monitored, including a requirement for baseline monitoring.

[305] The Director explained groundwater sampling is to occur twice a year and reported annually to the Director. He stated the Groundwater Monitoring Program must ensure the constituents of the waste are contained, and if the waste is not being contained by the liner, then the Groundwater Monitoring Response Plan would be triggered as well as oversight by the Director. The response plan will require verification and evaluation of the data, a determination of the cause and magnitude of the situation, and implementation of a mitigation plan to prevent potential impacts to the environment.

[306] The Director explained landfills are required to maintain subsurface landfill gas levels below the explosive limits throughout the active life and post-closure period. The landfill gas explosive limits are controlled by implementing landfill gas collection systems. The Director explained there will be gas monitoring probes around the perimeter of the Landfill and adjacent to on-site buildings, and they will not be spaced more than 300 metres apart. Measurements will be taken monthly initially to discern background concentrations over the four seasons, and then semi-annually monitoring will be implemented.

B. Analysis

[307] The Board questions why the groundwater monitoring plan provided by the Approval Holder to the Director states it will implement a monitoring program with monitoring wells 200 metres apart. The existing County Development Permit requires 100 metre spacing of the monitoring wells. As it is a requirement of the Development Permit, it would seem reasonable that the monitoring plan provided to the Director should be consistent with what is actually occurring at the Landfill. In order for the Approval Holder to comply with all of the required approvals, licences, and permits, the Approval Holder must operate the Landfill according to the strictest conditions, which in the case of monitoring, would be the County Development Permit. Based on the requirements of the Development Permit, the Approval Holder should be installing the monitoring wells 100 metres apart. Although the Standards may only require a 200 metre spacing, the groundwater monitoring plan provided to the Director should reflect what is actually occurring at the site. [See the Board's discussion of the ability of

the Director to impose conditions stricter than what is required in the Standards at paragraphs 103 of this Report and Recommendations.]

[308] The CCTCS asked for water monitoring wells be placed a minimum of 100 metres apart to minimize the risk of contaminate movement being undetected between the monitoring wells. The Board considers the monitoring system and the recording and reporting of the data collected one of the most important aspects of the operations system at the Landfill. It is one of the systems for early detection of any problems. An efficient and thorough monitoring system will not only provide protection to neighbouring properties, it will also provide information to the Approval Holder that will allow it to respond quickly to any issues, reducing the potential impacts and liabilities. The groundwater flow on the Landfill is generally from the northwest towards the south, and the secondary flow from on the west side of the Landfill from the culvert under Range Road 210 and then south. Since it is less likely there will be impacts to the northwest, monitoring wells would not have to be spaced as closely together, and the 200 metre maximum would be adequate for that area of the Landfill.

[309] Therefore, the Board recommends the EPEA Approval be amended to require the groundwater monitoring program include monitoring wells 100 metres apart on the south and east perimeters of the Landfill as well as the south half of the west perimeter. Monitoring wells can be placed a maximum of 200 metres on the north perimeter and north half of the west perimeter of the Landfill perimeter.

[310] In discussing odour control, the Director stated modeling and other studies need to be done to determine if there are any affects on human health and quality of life due to airborne particulates and chemicals. It would seem practical to conduct such a study or modeling prior to the start of operations at the Landfill. This would be a preventative measure and instead of a reactive step. The data collected should be objective and comparable over time.

[311] The Hilts suggested monitoring should be extended to include neighbouring properties. The Board agrees it may be of some value to include monitoring off the Landfill lands. However, if such a condition was placed in the Approvals, compliance would be contingent on the Approval Holder obtaining consent from the neighbouring landowner to access the site to install, read, and maintain the monitoring system. If the Approval Holder can obtain

access from the landowners, it would be valuable to include monitoring sites on neighbouring properties.

C. Summary

[312] The Board recommends the Approvals be amended to require groundwater monitoring wells be placed a maximum of 100 metres apart on the south and east perimeters as well as the south half of the west perimeter of the Landfill and a maximum of 200 metres apart on the north perimeter and north half of the west perimeter of the Landfill perimeter.

IX. EMERGENCY RESPONSE PLANS

A. Submissions

1. CCTCS

[313] The CCTCS argued that neither the magnitude nor the probability of emergencies have been assessed, such as the risk of fire. They stated methane gas, which is expected to form part of the gas generated from the Landfill, can migrate from the Landfill due to a breach of cover materials or other reasons and can potentially become the cause of explosions.

[314] The CCTCS stated the Approval Holder's Emergency Response Plan relies on the surrounding area's emergency services, but the Approval Holder failed to assess the time it would take for the Landfill site to be serviced in case of an emergency and the ability of the services to adequately respond to the risks associated with landfill emergencies.

[315] The CCTCS noted the Emergency Response Plan only provides procedures for personnel; no detailed procedure was provided for emergencies to those in the vicinity of the landfill such as an evacuation plan or notification system.

2. Hilts

[316] The Hilts explained Thorhild is serviced by the Thorhild Fire Department and Newbrook Fire Department, both of which are maintained by a small number of volunteers. The Hilts believed these fire departments would be unable to handle a fire at the Landfill due to lack of training, equipment, and people.

3. Kuzyks

[317] The Kuzyks noted an emergency response plan ensures the safety of the site personnel and the general public, but they questioned whether the Approval Holder could provide the emergency services for the Landfill and the neighbouring community. The Kuzyks explained there are only 17 volunteer firefighters in Thorhild County, and most work outside the County.

4. Approval Holder

[318] The Approval Holder explained its operations plan must include an emergency response plan. The Approval Holder stated its Emergency Response Plan includes a communication plan for all emergencies including fires, spills and releases, bomb threats, barred or unacceptable waste, asbestos releases, first aid and medical emergencies, demonstrations or labour unrest, severe weather, and persons experiencing emotional difficulties. The Approval Holder stated the emergency response plan is intended to maximize the safety of site personnel, the general public, and the environment. It contains emergency contact and directional information for regional emergency response contacts.

[319] The Approval Holder explained that, as a result of discussions with the County Emergency Response officials, the Landfill development plan was amended to include access to the east surface water pond for the County fire trucks to use as a source of water

[320] The Approval Holder submitted the Emergency Response Plan is adequate.

5. Director

[321] The Director explained the Emergency Response Plan forms part of the operations plan. The Director stated the purpose of the Emergency Response Plan is to ensure the safety of people inside the facility and the surrounding area and to protect the environment.

[322] The Director stated the Emergency Response Plan needs to address three main aspects of emergency preparedness: (1) an on-site and off-site communication plan to be implemented in the event of an emergency; (2) a fire prevention and response plan to be

developed in consultation with the local fire department and Alberta Lands and Forest, where applicable; and (3) an emergency evacuation plan for the public and operating personnel.

B. Analysis

[323] The Appellants raised concerns with the proposed Emergency Response Plan developed by the Approval Holder. An Emergency Response Plan needs to not only address employee or on-site situations, it must also include plans for potential impacts on neighbouring residents. Therefore, the Board recommends the EPEA Approval be amended to include the requirement that the Emergency Response Plan must include plans for emergency response procedures for neighbouring residents and that the Emergency Response Plan be provided to all residents and landowners within eight kilometers of the Landfill. The Emergency Response Plan must include emergency measures to ensure the protection of surrounding residents, including how to notify residents of emergencies, emergency exit routes, and any other measures necessary to protect the public.

[324] The Emergency Response Plan must be developed interactively, in consultation with neighbours and the County of Thorhild. The Board understands that the County of Thorhild is not in a position to provide the support necessary to make sure all emergencies at the Landfill can be dealt with properly and quickly. The Approval Holder explained one of its storage ponds will be constructed to hold additional water for use by the County of Thorhild's emergency personnel. The Approval Holder needs to discuss with the County of Thorhild the best access route to the pond and how it will gain access when needed. This needs to be included in the Emergency Response Plan.

[325] The Approval Holder stated it will also use its earth moving equipment as part of the fire suppression program. The Emergency Response Plan has not been finalized, but the Board presumes fire fighting infrastructure will be part of the construction of the Landfill cells. If it is not included, the Approval Holder should consider designing the Landfill with these structures in place.

C. Summary

[326] The Board recommends the Approvals be amended to require the Approval Holder prepare an Emergency Response Plan for the Director to review and accept prior to the acceptance of any waste at the Landfill. This Emergency Response Plan must be developed in collaboration with residents within eight kilometers of the Landfill perimeter and the County of Thorhild and must include emergency measures to take to ensure the protection of surrounding residents, including how to notify residents of emergencies, emergency exit routes, and any other measures necessary to protect the public.

X. POST-CLOSURE AND RECLAMATION

A. Submissions

1. CCTCS

[327] The CCTCS argued a 25 year post-closure period is inadequate to protect public health, groundwater, and surface water. The CCTCS stated a post-closure plan must be based on evidence that indicates the Landfill is no longer a contamination source.

[328] The CCTCS stated post-closure maintenance must be achieved to prevent the formation of gases and leachate. The CCTCS explained water can penetrate the clay cover through natural permeability, cracks that develop in the clay layer, and differential settling. They suggested a plastic sheeting be included as part of the post-closure cover.

[329] The CCTCS stated the reclamation plans are inadequate. They explained a landfill use should not include a feature that may contribute to the compromise of the low permeability character of the cover material. Instead, it should protect the integrity of the cover to keep moisture out of the waste for as long as the waste will be a threat to produce leachate or landfill gas. The CCTCS stated the proposed greenhouse, tree farm, and potential aspects of habitat restoration could adversely impact the ability of the cover to prevent water from entering the wastes. The CCTCS stated the site is not conducive to any natural use because the area will be prone to landfill gas emissions including volatile organic compounds.

[330] The CCTCS stated the Approvals were issued even though AESRD had concerns with the adequacy of the reclamation proposal and the Approval Holder's inability to explain how it would undertake naturalization.

[331] The CCTCS noted there is no specificity in the wetland restoration plan or evidence it would be effective.

2. Hilts

[332] The Hilts argued the Approval Holder should be responsible for the Landfill and any associated problems forever. They stated Thorhild should not bear the burden of financial impacts after 25 years has expired. The Hilts were not confident the water system will be protected.

3. Kuzyks

[333] The Kuzyks raised a concern regarding the length of time a hazard exists at the Landfill compared to the expected duration of the liner. They noted leachate contains dissolved organic matter, inorganic macro compounds, heavy metals, and compounds such as halogenated organics and polychlorinated biphenols (PCBs), which are highly toxic, resist environmental degradation, and have potential significant impacts on human health and the environment.

4. Approval Holder

[334] The Approval Holder explained the Standards include specific requirements with respect to final landfill closure and post-closure, including the need to provide detailed plans at various stages of the process.

[335] The Approval Holder stated the post-closure is a minimum of 25 years following final closure, but post-closure continues until certain standards are met, including standards for groundwater quality, subsurface landfill gas concentration, and leachate constituents and volume. The Approval Holder explained it is required to protect and maintain the integrity of the final cover and surface water drainage systems, and maintain, operate, and monitor the groundwater monitoring system, leachate collection system, and landfill gas control system.

[336] The Approval Holder stated the detailed closure plan and post-closure plan must be submitted to the Director 180 days prior to implementation.

[337] The Approval Holder noted the EPEA Approval conditions mirror the Standards. The Approval Holder stated, as part of post-closure, it must provide plans for maintaining the: (1) integrity of the final cover systems; (2) surface water run-on and run-off systems; (3) groundwater monitoring systems; (4) landfill gas monitoring system; and (4) leachate collection and monitoring system. It is also required to provide plans for: (1) remediating areas affected by subsidence and differential settlement; (2) erosion control; and (3) maintaining vegetative cover.

[338] The Approval Holder stated its obligations with respect to post-closure will last for a minimum of 25 years and for as long as necessary to adequately protect the environment.

[339] The Approval Holder explained it is required to provide enough security to cover the cost of abandoning the facility and reclaiming the site when operations cease. It stated the amount of security is reviewed annually and may be adjusted by the Director at any time.

[340] The Approval Holder stated the end use plan contemplates wildlife habitat and grazing and is consistent with existing land use in the area. The Approval Holder explained: (1) the swales and berms will control and enhance drainage and reduce soil erosion; (2) the vegetation proposed was selected for its effectiveness in preventing water infiltration; (3) there will be no trees planted on the Landfill cover; (4) the improved swale will be set back a minimum of 900 metres from the Landfill footprint; and (5) intermediate fill slopes and covers will be built to in a way to prevent ponding.

[341] The Approval Holder stated there will be no net loss of wetlands and there will actually be an increase in wetland size and quality.

5. Director

[342] The Director stated the post-closure and reclamation provisions in the EPEA Approval reflect what is required in the Standards. The Director explained the final closure and post-closure plans and reclamation requirements must be developed considering the site and environmental conditions of the day. Therefore, only conceptual plans are approved at this time with detailed final closure plans submitted within 180 days of final closure.

[343] The Director noted the Standards require the post-closure period to continue until the waste in the Landfill no longer poses a risk to the environment and that assessment cannot start until 25 years post-closure. The Director explained that, although there are a minimum number of years for the post-closure period, the actual number of years until the end of post-closure is site specific and performance based. The Director explained the end of the post-closure period is determined scientifically by measuring different parameters that assess the level of risk posed to the environment. He stated the groundwater quality must meet performance standards, subsurface landfill gas concentrations must be below explosive limits, and leachate quality must be essentially of similar quality to groundwater chemistry.

[344] The Director explained moisture is the key limiting parameter to the generation of leachate and landfill gas. He stated proper construction and maintenance of the final cover to the requirements set out in the Standards and the EPEA Approval will prevent water infiltration and control the quality of leachate generated over time.

[345] The Director stated it is unlikely a landfill in Alberta will generate leachate in a strength that would remain a risk to groundwater hundreds to thousands of years into the future. He stated studies indicate landfill gas generation rates reach a maximum at the time of closure and levels drastically decline within 40 years of closure.

[346] The Director stated a geomembrane cover layer or cap is not required in Alberta's climate where precipitation is less than evaporation. The Director stated the final cover requirements as required in the EPEA Approval is an effective barrier to the entrance of water into waste post-closure, and cover systems designed to suit the specific site conditions will reduce the quantity of leachate generated over time.

B. Analysis

[347] The Director explained the Government of Alberta holds security from the Approval Holder for post-closure and reclamation of the Landfill. The amount of the security is reviewed annually and is adjusted to reflect the level of disturbance at the site and whether any reclamation has taken place. This method of calculating the security is consistent with other landfills in Alberta and is a financial matter that this Board has no jurisdiction to alter.

[348] Actual reclamation of the Landfill will not occur for a few years. However, as construction proceeds, the Approval Holder must plan and prepare for reclamation of the site and take the necessary steps to promote effective reclamation. The proposed reclamation strategies need to be included in the operations plan since reclamation starts when construction starts and is only complete when a certificate is issued, at the earliest, in 65 years. Reclamation has to be right in the first instance. As part of the post-closure and reclamation, every effort should be made by the Approval Holder to reduce the visual impacts the 45 metre high “hill” will make on the landscape.

[349] There was some discussion as to what would be the most effective material to use to cap the Landfill cells. The EPEA Approval requires the Approval Holder to submit a detailed reclamation plan 180 days prior to the closure of the Landfill. This plan must be approved by the Director. This gives the Director the ability to require the Approval Holder to use the most effective approved capping material at the time of the closure.

C. Summary

[350] The Board makes no recommendations on the post-closure and reclamation of the Landfill as the terms and conditions in the Approvals are adequate at this time.

XI. RECOMMENDATIONS

[351] The Board recommends the Landfill development be allowed to proceed subject to the Approvals being varied to require:

1. the testing of all groundwater wells and surface water dugouts within an eight kilometre radius of the Landfill be completed prior to accepting any wastes at the Landfill and as part of the audit conducted every three years;
2. all cells constructed at the Landfill shall be constructed with a primary geomembrane liner, a leak detection system between the primary geomembrane liner and composite liner, a composite liner, and a leachate collection system capable of maintaining the maximum acceptable leachate head above the primary liner;

3. the Approval Holder shall notify landowners downstream of the Landfill property one week prior to releasing water from the surface water retention ponds;
4. drainage from the culvert on Range Road 210 shall be properly maintained and the run-off system shall be designed to ensure the maximum amount of water that flows through the southwest culvert reaches the wetlands on the south part of the Landfill;
5. the Approval Holder shall complete a nest search to identify nesting birds at the Landfill prior to continuing with construction of the Landfill;
6. the Approval Holder shall provide notice to all residents and landowners within eight kilometres of the Landfill and to the Appellants if the Approval Holder intends to apply for any amendment to an approval, licence, or permit of any kind or if it intends to apply for another approval, licence, or permit of any kind;
7. the Approval Holder shall implement a program to prevent clubroot entering the Landfill as part of its operations plan;
8. the groundwater monitoring wells shall be placed a maximum of 100 metres apart on the south and east perimeter as well as the south half of the west perimeter of the Landfill and a maximum of 200 metres apart on the north perimeter and north half of the west perimeter of the Landfill;
9. the Approval Holder shall prepare an Emergency Response Plan for the Director to review and accept prior to the acceptance of any waste at the Landfill; and
10. the Emergency Response Plan must be developed in collaboration with residents within eight kilometers of the Landfill and the County of Thorhild and must include emergency measures to take to ensure the protection of surrounding residents, including how to notify residents of emergencies, emergency exit routes, and any other measures necessary to protect the public.

[352] With respect to sections 100(2) and 103 of EPEA, the Board recommends that copies of this Report and Recommendations, and of any decision by the Minister, be sent to the following:

1. Ms. Debbie Bishop, K2B Law Klimek Buss Bishop, on behalf of the CCTCS;
2. Mr. and Ms. Hilts;
3. Mr. and Ms. Kuzyk;
4. Ms. Michelle Williamson, Alberta Justice and Solicitor General, on behalf of the Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development; and
5. Mr. Donald Wilson, Davis LLP, on behalf of WMCC.

XII. COSTS

[353] The CCTCS, Hilts, Kuzyks, and Approval Holder reserved their right to submit a final costs application. The Board requests that an application for costs be provided to the Board within two weeks of the date of the Minister's Order with respect to this Report and Recommendations. The Board will then provide the Parties with information regarding the submission process should a costs application be made.

Dated on February 15, 2013, at Edmonton, Alberta.

- original signed -
Eric McAvity, Q.C.
Panel Chair

- original signed -
Alan Kennedy
Board Member

- original signed -
David Evans
Board Member

Appendix A

List of Appellants

EPEA Approval No. 236328-00-00

Cecile Sisson (11-053)	Morris and Joyce Haig (11-112)
Odessa Telstad (11-068)	Sophie Panich (11-147)
Melvin Telstad (11-069)	Cori Kuzyk (11-148)
Hazel Lahti (11-071)	Jim Panich (11-149)
Laurie and David Genert (11-076)	Larry Sisson (11-150)
Lorne Skuba (11-100)	Peggy and Ted Hilts (11-156)
Linda Kirk (11-104)	Tracy Kuzyk (11-157)
John Kirk (11-105)	Jason Dmetruk (11-158)
Kevin and Carmen Ewasiw (11-107)	Chantel Cramer (11-159)
Lori Cramer (11-108)	Betty and Bernie Kolewaski (11-161)
Tony and Keith Cramer (11-109)	Darwin Trenholm (11-173)

Water Act Approval No. 00266612-00-00

Lori Cramer (11-025)	John Kirk (11-040)
Chantel Cramer (11-026)	Peggy Hilts and Edward Hilts (11-043)
Tony and Mr. Keith Cramer (11-027)	Hazel Lahti (11-044)
Lorne Skuba (11-030)	Melvin Telstad (11-045)
Morris Haig (11-032)	Odessa Telstad (11-046)
Joyce Haig (11-033)	Kevin and Carmen Ewasiw (11-047)
Jim Panich (11-034)	Larry Gordon Sisson (11-051)
Sophie Panich (11-035)	Cecile Sisson (11-052)
Clinton and Stacey Kirk (11-038)	Betty Kolewaski (11-056)
Linda Kirk (11-039)	



ALBERTA

ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT

*Office of the Minister
MLA, Drayton Valley-Devon*

Ministerial Order

29 / 2013

Environmental Protection and Enhancement Act
R.S.A. 2000, c. E-12.

Water Act, R.S.A. 2000, c. W-3.

Order Respecting Environmental Appeals Board Appeal Nos. 11-025 et al.

I, Diana McQueen, Minister of Environment and Sustainable Resource Development, pursuant to section 100 of the *Environmental Protection and Enhancement Act*, make the order in the attached Appendix, being an Order Respecting Environmental Appeals Board Appeal Nos. 11-025 et al.

Dated at the City of Edmonton, in the Province of Alberta, this 10th day of May, 2013.

Diana McQueen
Minister

Appendix

Order Respecting Environmental Appeals Board Appeal No. 11-025 et al.

With respect to the decision of the Director, Northern Region, Operations Division, Alberta Environment and Sustainable Resource Development (the "Director") to issue Approval No. 00266612-00-00 (the "*Water Act* Approval") under the *Water Act*, R.S.A. 2000, c. W-3 and Approval No. 236328-00-00 under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12 (the "EPEA Approval") (collectively the "Approvals") to the Waste Management of Canada Corporation (the "approval holder"), I, Diana McQueen, Minister of Environment and Sustainable Resource Development, order that the decisions of the Director to issue the Approvals are varied as follows:

1. Section 1.1 of the *Water Act* Approval is amended by adding the following immediately after subsection (f):
 - (f.1) "eight kilometre radius" means:
 - (i) north Section 19, north Section 20, north Section 21, north Section 22, north Section 23, northwest Section 24, and Sections 25 to 36, Township 60, Range 20, West of the 4th Meridian;
 - (ii) north Section 20, north Section 21, north Section 22, north Section 23, north Section 24, Sections 25 to 29, and Sections 32 to 36, Township 60, Range 21, West of the 4th Meridian;
 - (iii) Sections 1 to 17, south Section 18, northeast Section 18, and Sections 20 to 36, Township 61, Range 20, West of the 4th Meridian;
 - (iv) Sections 1 to 5, Sections 8 to 17, Sections 20 to 29, and Sections 32 to 36, Township 61, Range 21, West of the 4th Meridian;
 - (v) Sections 1 to 18, Township 62, Range 20, West of the 4th Meridian; and
 - (vi) Sections 1 to 5, and Sections 8 to 17, Township 62, Range 21, West of the 4th Meridian;
 - (f.2) "landfill" means all buildings, structures, cells, storage facilities, material handling facilities, process and pollution abatement equipment, vessels, trenches, roadways, berms, monitoring wells, pipelines, and other installations, including the land, located on the Section 19, Township 61, Range 20, West of the 4th Meridian and the northwest of Section 18, Township 61, Range 20, West of the 4th Meridian, that is being or has been used or held for or in connection with the Thorhild Class II landfill;".
2. The *Water Act* Approval is amended by adding the following immediately after section 3.2:

“3.3 Thirty days before the approval holder applies for any approval, licence, or permit of any kind, or any amendment to any approval, licence, or permit of any kind, with respect to the landfill, the approval holder shall provide written notice by regular mail to all residents, occupants, and landowners within the eight kilometre radius of the landfill.”.

3. Section 1.1.2 of the EPEA Approval is amended by adding the following immediately after subsection (s):

“(s.1) “eight kilometre radius” means:

- (i) north Section 19, north Section 20, north Section 21, north Section 22, north Section 23, northwest Section 24, and Sections 25 to 36, Township 60, Range 20, West of the 4th Meridian;
- (ii) north Section 20, north Section 21, north Section 22, north Section 23, north Section 24, Sections 25 to 29, and Sections 32 to 36, Township 60, Range 21, West of the 4th Meridian;
- (iii) Sections 1 to 17, south Section 18, northeast Section 18, and Sections 20 to 36, Township 61, Range 20, West of the 4th Meridian;
- (iv) Sections 1 to 5, Sections 8 to 17, Sections 20 to 29, and Sections 32 to 36, Township 61, Range 21, West of the 4th Meridian;
- (v) Sections 1 to 18, Township 62, Range 20, West of the 4th Meridian; and
- (vi) Sections 1 to 5, and Sections 8 to 17, Township 62, Range 21, West of the 4th Meridian.”.

4. The EPEA Approval is amended by adding the following immediately after section 2.1.6:

“2.1.7 Thirty days before the approval holder applies for any approval, licence, or permit of any kind, or any amendment to any approval, licence, or permit of any kind, with respect to the landfill, the approval holder shall provide written notice by regular mail to all residents, occupants, and landowners within the eight kilometre radius of the landfill.

2.1.8 Before accepting any waste at the landfill, the approval holder shall sample and analyze all of the surface water dugouts identified in 4.11.6(d.1) for the parameters specified in Table 4.10-D, and provide the Director with a written report, satisfactory to the Director, detailing the results of this work.

2.1.9 Before accepting any waste at the landfill, the approval holder shall sample and analyze all of the groundwater wells identified in 4.11.6(d.1) for the parameters specified in the Groundwater Monitoring Program authorized in writing by the Director, and provide the Director with a written report, satisfactory to the Director, detailing the results of this work.

- 2.1.10 Where the approval holder is required by this approval to undertake sampling on land not owned by the approval holder, and the owner or occupant of the land refuses to provide the approval holder with access to the land on reasonable terms (including providing access at no cost), the Director may relieve the approval holder of the requirement to undertake the sampling on that land for that sampling event upon receiving written proof of the approval holder's reasonable attempts to gain access."
5. Section 3.1.6 of the EPEA Approval is amended by repealing and replacing the phrase "for any new cell shall" with the phrase "for all cells shall".
6. Section 3.1.6(a) of the EPEA Approval is amended by repealing and replacing it as follows:
- "(a) a double liner system consisting of
- (i) a primary liner composed of a high density polyethylene geomembrane that has a minimum thickness of 60 mil;
 - (ii) a composite liner; and
 - (iii) a leak detection system between the primary liner and composite liner;"
7. Section 3.1.6(b) of the EPEA Approval is amended by repealing and replacing the phrase "leachate head above the liner" with the phrase "leachate head above the primary liner".
8. Section 3.1.13 of the EPEA Approval is amended by repealing and replacing it as follows:
- "3.1.13 The approval holder shall maintain:
- (a) the integrity of the liners at the landfill;
 - (b) the integrity of the leak detection system; and
 - (c) the integrity of the leachate collection systems.
- 3.1.14 Prior to commencing or continuing any construction at the landfill, the approval holder shall:
- (a) complete a manual search of the landfill to identify any nesting birds;
 - (b) report the results of the search to the Director in writing; and
 - (c) perform any actions required by the Director in writing."

9. The EPEA Approval is amended by adding the following immediately after section 3.2.1:
- “3.2.2 The approval holder shall design and construct the run-off control system to ensure that the maximum amount of water flows through the southern-most culvert crossing Range Road 210 and on to the southern part of the landfill and the lands to the south of the landfill.”.
10. Section 4.1.4(a) of the EPEA Approval is amended by repealing and replacing it as follows:
- “(a) leachate collection systems;
- (a.1) leak detection system;”.
11. Sections 4.1.7, 4.1.8, and 4.1.9 of the EPEA Approval are amended by repealing and replacing these sections as follows:
- “4.1.7 The approval holder shall audit the landfill to assess compliance with the terms and conditions of this approval at least once every three years.
- 4.1.7.1 The audit required in 4.1.7 shall be conducted by an independent third party environmental consultant or organization.
- 4.1.8 As part of the audit required in 4.1.7, the approval holder shall:
- (a) sample and analyze all of the surface water dugouts identified in 4.11.6(d.1) for the parameters specified in Table 4.10-D;
- (b) sample and analyze all of the groundwater wells identified in 4.11.6(d.1) for the parameters specified in the Groundwater Monitoring Program authorized in writing by the Director; and
- (c) provide the Director with a written report, satisfactory to the Director, as part of the Audit Report, detailing the results of this work.
- 4.1.9 The approval holder shall have the results of the audit required in 4.1.7 compiled into an Audit Report that is satisfactory to the Director.
- 4.1.9.1 The approval holder shall submit the Audit Report required in 4.1.9 to the Director as part of the Annual Landfill Operation Report required in 4.10.13.”.
12. Section 4.2.2 of the EPEA Approval is amended by adding the following immediately after subsection (b):
- “(b.1) a program to prevent the soil-borne plant disease known as clubroot (*Plasmodiophora brassicae*) from entering the landfill;”.

13. Section 4.2.2(f) of the EPEA Approval is amended by repealing and replacing it as follows:

“(f) the Emergency Response Plan in 4.2.6.”.

14. The EPEA Approval is amended by adding the following immediately after section 4.2.5:

“4.2.6 The approval holder shall prepare an Emergency Response Plan in collaboration with the County of Thorhild and the residents, occupants, and owners within the eight kilometre radius of the landfill.

4.2.7 The Emergency Response Plan required in 4.2.6 shall include:

- (a) emergency measures to ensure the protection of the surrounding residents;
- (b) how to notify residents of the emergencies;
- (c) identification of emergency exit routes;
- (d) any other measures necessary to protect the public; and
- (e) any other matters specified by the Director in writing.

4.2.8 The approval holder shall submit the Emergency Response Plan to the Director for review and acceptance, and the approval holder shall not accept any waste at the landfill until obtaining the written acceptance of the Director.”.

15. The EPEA Approval is amended by adding the following immediately after section 4.6.4 and Table 4.6-A:

“4.6.5 The approval holder shall not release water from the run-off control system unless seven days prior to the release the approval holder provides direct written notice, delivered by hand (or by e-mail where the person has authorized notice to be provided by e-mail), to the properties of the residents, occupants, and owners of:

- (a) northeast Section 23, northwest Section 24, Section 26, northeast Section 34, and west Section 35, Township 60, Range 20, West of the 4th Meridian; and
- (b) west Section 3, Section 9, north Section 8, Section 17, south Section 18, and southwest Section 20, Township 61, Range 20, West of the 4th Meridian.

4.6.6 The approval holder shall maintain the southern-most culvert crossing Range Road 210 and run-off control system to ensure that the maximum amount of water flows through the culvert and onto the southern part of the landfill and the lands to the south of the landfill.”.

16. Section 4.10.13(f) of the EPEA Approval is amended by repealing and replacing it as follows:
 - “(f) any changes to the Operations Plan;
 - (f.1) any Audit Report required in 4.1.9 prepared during that year; and”.
17. Section 4.11.1(b) of the EPEA Approval is amended by repealing and replacing it as follows:
 - “(b) groundwater monitoring wells shall be constructed no more than 100 metres from the nearest groundwater monitoring well as measured along:
 - (i) the south half of the west side of the compliance boundary;
 - (ii) the south side of the compliance boundary; and
 - (iii) the east side of the compliance boundary;
 - (b.1) groundwater monitoring wells shall be constructed no more than 200 metres from the nearest groundwater monitoring well as measured along:
 - (i) the north half of the west side of the compliance boundary; and
 - (ii) the north side of the compliance boundary;”.
18. Section 4.11.6(d) of the EPEA Approval is amended by repealing the phrase “within at least a three kilometre radius of the landfill” and replacing it with the phrase “within the eight kilometre radius of the landfill”.
19. Section 4.11.6 of the EPEA Approval is amended by adding the following immediately after subsection (d):
 - “(d.1) a map showing the location of all surface water dugouts and groundwater wells, regardless of use, within the eight kilometre radius of the landfill;”.
20. Section 4.11.6(e) of the EPEA Approval is amended by repealing the phrase “within a five kilometre radius of the landfill” and replacing it with the phrase “within the eight kilometre radius of the landfill”.