
ALBERTA ENVIRONMENTAL APPEALS BOARD

Report and Recommendations

Date of Report and Recommendations – July 22, 2011

IN THE MATTER OF sections 91, 92, 94, 95, and 99 of the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12;

-and-

IN THE MATTER OF an appeal filed by Harvey and Elaine Visscher and Henryk Farms Ltd. with respect to *Environmental Protection and Enhancement Act* Amending Approval No. 9995-02-01 issued to Provident Energy Ltd. by the Director, Northern Region, Environmental Management, Alberta Environment.

Cite as: *Visscher v. Director, Northern Region, Environmental Management, Alberta Environment, re: Provident Energy Ltd.* (22 July 2011), Appeal No. 10-011-R (A.E.A.B.).

BEFORE: Mr. Eric McAvity, Q.C., Panel Chair;
Mr. Gordon Thompson, Board Member;* and
Dr. Nick Tywoniuk, Board Member.

BOARD STAFF: Mr. Gilbert Van Nes, General Counsel and
Settlement Officer; Ms. Valerie Myrmo,
Registrar of Appeals; and Ms. Marian Fluker,
Associate Counsel.

PARTIES:

Appellants: Mr. Harvey and Ms. Elaine Visscher and
Henryk Farms Ltd., represented by Mr. Keith
Wilson, Wilson Law Office.

Approval Holder: Provident Energy Ltd., represented by Ms.
JoAnn Jamieson and Ms. Michelle Forrieter,
Twyman Jamieson LLP.

Director: Mr. Pat Marriott, Director, Northern Region,
Environmental Management, Alberta
Environment, represented by Ms. Alison
Altmiks, Ms. Shannon Keehn, and Ms.
Michelle Williamson, Alberta Justice.

WITNESSES:

Appellants: Mr. Harvey Visscher.

Approval Holder: Mr. Garry Dlouhy, Senior Manager, Provident
Energy Ltd.; Mr. Todd Schneider, HSE
Coordinator, Provident Energy Ltd.; Mr. Rudy
Schmidtke, Associate Vice President,
AECOM; Mr. Marcel LeBlanc, Vice President,
AECOM; and Mr. Craig Campbell, Senior
Remediation Engineer, WorleyParsons.

Director: Mr. Pat Marriott, Director, Northern Region,
Environmental Management, Alberta
Environment; Mr. Albert Liu, Industrial
Approvals Engineer, Alberta Environment; Mr.
Don Weleschuk, Contaminant Hydrogeologist,
Alberta Environment; and Mr. Ken Bullis,
Water Administration Engineer, Alberta
Environment.

* Mr. Thompson did not take part in the Hearing for reasons explained in the Report and Recommendations, and he did not participate in preparing this Report and Recommendations.

EXECUTIVE SUMMARY

Alberta Environment issued an Amending Approval under the *Environmental Protection and Enhancement Act* to Provident Energy Ltd. for the Redwater fractionation and storage facility in Sturgeon County, authorizing the construction of a fourth brine storage pond.

The Board received a Notice of Appeal from Mr. Harvey and Ms. Elaine Visscher and Henryk Farms Ltd. (the Appellants) appealing the Amending Approval.

The Board received submissions on a number of preliminary motions and determined the issues to be heard at the hearing were:

1. Is the design of the brine storage pond, including the berm, adequate to effectively mitigate risk?
2. Are the surface water assumptions and designs used in the surface water management plan adequate to effectively mitigate risk?
3. Are the surface water and groundwater monitoring plans adequate to effectively detect brine releases to minimize potential impacts?

Based on the evidence and submissions presented to the Board at the hearing, the Board recommended the Amending Approval be varied.

The Board found the fourth brine storage pond and the berm were designed and constructed to meet or exceed existing standards and specifications. The Appellants did not provide any conclusive evidence to refute the argument that all required specifications were met in the design and construction of the brine pond and berm.

The Appellants did not provide any persuasive evidence that surface water assumptions were inaccurate or that the surface water management plan did not adequately mitigate risks. The Board found the surface water and groundwater monitoring plans were adequate to minimize potential impacts. Since the monitoring program included three monitoring wells that were voluntarily installed, the Board recommended the Amending Approval be varied requiring these three monitoring wells become part of the monitoring program. In addition, the Board recommended a clause be added to the Amending Approval requiring Provident Energy to provide Alberta Environment with a remediation plan for the brine contamination on the site. This remediation plan is to be provided prior to submitting the application to renew the Approval in 2016 or prior to any application for the expansion of the existing facilities.

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I. BACKGROUND

[1] On June 28, 2010, the Director, Northern Region, Environmental Management, Alberta Environment (the “Director”), issued Approval No. 00266528-00-00 (the “*Water Act* Approval”) under the *Water Act*, R.S.A. 2000, c. W-3, to Provident Energy Ltd. (the “Approval Holder”) for the placing, constructing, operating, maintaining, removing, disturbing works, in or on any land, water, or water body located at NW 1-56-22-W4M in Sturgeon County, Alberta. On June 30, 2010, the Director issued Approval No. 9995-02-01 (the “Amending Approval”) under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12 (“EPEA”), to the Approval Holder for the Redwater fractionation and storage facility at the same location. The Amending Approval allows for the construction and operation of a fourth brine storage pond (the “Brine Pond #4”).

[2] On July 22, 2010, the Environmental Appeals Board (the “Board”) received a Notice of Appeal from Mr. Harvey and Ms. Elaine Visscher and Henryk Farms Ltd. (the “Appellants”) appealing the Amending Approval. On July 28, 2010, the Board received a Notice of Appeal from the Appellants appealing the *Water Act* Approval. The Board notified the Director and the Approval Holder of the appeals, and requested the Director provide the Board with a copy of the records (the “Record”) relating to the appeals. The Appellants, Approval Holder, and Director (collectively, the “Parties”) were asked to provide available dates for a mediation meeting, preliminary motions hearing, or hearing. The Director provided a copy of the Records on August 24, 2010, and a copy was forwarded to the Appellants and Approval Holder on September 3, 2010. Updates to the Records were received on April 12, 2011 and June 3, 2011, and subsequently provided to the Parties.

[3] The Board held a mediation meeting on October 6, 2010, in Edmonton, Alberta. No resolution was reached.

[4] On October 27, 2010, the Board set the schedule to receive submissions on a number of preliminary matters.¹ The Board's decision regarding these preliminary matters resulted in the appeal of the *Water Act* Approval being dismissed.²

[5] On February 7, 2011, the Board provided the Parties with its decision.³ The Board determined the issues for the Hearing were:

1. Is the design of the brine storage pond, including the berm, adequate to effectively mitigate risk?
2. Are the surface water assumptions and designs used in the surface water management plan adequate to effectively mitigate risk?
3. Are the surface water and groundwater monitoring plans adequate to effectively detect brine releases to minimize potential impacts?

[6] The Board received the Parties' submissions on the issues for the Hearing on June 1, 2011.

[7] On June 14, 2011, the Director notified the Board that he just discovered additional documents that form part of the Records. The Board received the updated Records from the Director on June 15, 2011, and these were subsequently provided to the Parties. Although additional Records were received from the Director on June 15, 2011, the Approval Holder notified the Board it preferred to proceed with the Hearing as scheduled, and on June 17, 2011, the Board confirmed the Appellants were also prepared to proceed with the Hearing on June 22, 2011.

¹ The preliminary matters were:

1. Was the appeal of the *Water Act* Approval filed on time?
2. Did the Appellants file a valid Statement of Concern with respect to the *Water Act* Approval?
3. Are the Appellants directly affected by the EPEA Amending Approval and the *Water Act* Approval?
4. Should the appeals of the EPEA Amending Approval and the *Water Act* Approval be dismissed on the grounds they are frivolous, vexatious or without merit? and
5. What are the issues to be heard, should one be held, with respect to the EPEA Amending Approval and the *Water Act* Approval?

² See: *Visscher v. Director, Northern Region, Environmental Management, Alberta Environment*, re: *Provident Energy Ltd.* (07 February 2011), Appeal Nos. 10-011-012-ID1 (A.E.A.B.).

³ See: *Visscher v. Director, Northern Region, Environmental Management, Alberta Environment*, re: *Provident Energy Ltd.* (07 February 2011), Appeal Nos. 10-011-012-ID1 (A.E.A.B.).

[8] The Hearing was held in Edmonton, Alberta, on June 22, 2011.

II. SUBMISSIONS

A. Appellants

1. Design of Brine Storage Pond #4

[9] The Appellants explained they own lands in the Heartland Region⁴ of Sturgeon County immediately east of the Approval Holder's plant and site of the proposed Brine Pond #4. They stated the North Saskatchewan River is located on the east side of their lands, and there is a high level of industrial development in the area surrounding their land.

[10] The Appellants explained the Approval Holder operates existing brine ponds at the site, and Brine Pond #4 is intended to hold up to 329,754 m³ of brine. The Appellants stated the existing brine ponds (Ponds #1, #2, and #3), as well as the expansion (Brine Pond #4), are the subject of the Amending Approval. The Appellants stated there is known soil and subsurface contamination in the area of the existing and new brine ponds that continues to migrate toward the Appellants' lands and the North Saskatchewan River. The Appellants noted the original Approval does not require the Approval Holder to remediate the contamination, but it should.

[11] The Appellants explained brine is water that has been "contaminated" with high levels of sodium chloride and is a known soil sterilant. The Appellants stated the harmful environmental effects of brine are well known, including:

1. Plant growth is inhibited by reducing plant uptake of water, causing chloride and sodium toxicity.
2. Soil quality is impacted by crusting, inhibiting water movement through soil, and reducing soil tilth.
3. Groundwater can be contaminated by brine spills and leaching brine ponds.

⁴ The Heartland Industrial Area is 582 square kilometers of industrial land within the City of Fort Saskatchewan, the Counties of Lamont, Strathcona, and Sturgeon, and the City of Edmonton. It is a site set aside for midsize and large industrial purposes, including the production and processing of oil, gas, and petrochemicals, as well as advanced manufacturing.

4. Brine spills move quickly through subsoils and can spread a considerable distance from the original source.
5. Brine is harmful and has a deleterious effect on aquatic environments and wildlife, including birds and ducks.

[12] The Appellants stated Brine Pond #4 is located on high ground adjacent to a natural water course that flows into a defined ravine that flows into the North Saskatchewan River. The Appellants explained their lands and the river are down gradient of the existing and proposed brine ponds and the areas of known contamination. The Appellants stated the Approval Holder has been unable to contain the brine in its existing brine ponds, and the contamination is moving at a rate greater than predicted by the Approval Holder, but neither the Approval Holder nor the Director have taken steps to abate the rate at which the contamination plume is moving towards the Appellants' land and the North Saskatchewan River.

[13] The Appellants stated the site contains sand lenses and the subsurface contains pathways for the contaminant plume's accelerated migration, but the Amending Approval does not address this risk.

[14] The Appellants noted the original EPEA Approval and the Amending Approval require the Approval Holder to follow specified procedures when stripping and conserving topsoil at the pond sites, including Brine Pond #4, but the Approval Holder stripped topsoil prior to having obtained the Amending Approval and has not stored the topsoil in accordance with the requirements of the Amending Approval.

[15] The Appellants stated the Amending Approval regulates all four brine ponds, and known contamination from one of the ponds now affects two of the ponds. The Appellants submitted that nothing substantive is being done to mitigate the risk, and simply letting the contamination plume migrate at rates greater than predicted by the hydrogeologists is not mitigation.

[16] The Appellants argued the Approval Holder should not be allowed to build and operate new brine ponds until it fixes the leaking ones and the contamination caused by the

leaking ponds is removed. The Appellants believed the Approval Holder should first use its financial resources to fix the environmental problems before it expands its operations.

2. Surface Water Assumptions and Designs

[17] The Appellants stated the Approval Holder applied for the Amending Approval on March 5, 2010. They stated that, since the Director was led to believe that no earth work had started prior to issuance of the Amending Approval, conditions were included in the Amending Approval regarding soil stripping, separating soil classes, and separating storage piles. The Appellants noted the Approval Holder accepted these conditions knowing it had already stripped all of the topsoil and subsoil and put them in a single pile in 2008.

[18] The Appellants argued the design assumptions have not been met since the damage has already been done with respect to soil conservation.

[19] The Appellants explained Brine Pond #4 is being constructed on the highest point of land in the area, and it adjoins a natural water course that flows directly into a creek on the north side of the site. They stated the creek flows directly into the North Saskatchewan River. The Appellants submitted the most effective mitigation of risk is for the Approval Holder to not place a brine pond in this location.

[20] The Appellants stated they farmed the lands in the area for a number of years. The Appellants explained there is substantial spring runoff flows through the area of Brine Pond #4, and it is not clear to them whether the Approval Holder's drainage plan properly accounts for this.

3. Monitoring Plans

[21] The Appellants argued the Amending Approval applies to all four ponds, not just Brine Pond #4. The Appellants know there have been brine releases and the contamination plume is moving toward their lands and the North Saskatchewan River. The Appellants stated there are sand lenses and other natural and man-made conduits (pipelines) that can accelerate the

movement of the contamination plume. The Appellants stated the plume will get larger and the environmental impact will be greater.

[22] The Appellants argued the groundwater monitoring well locations and depths are not adequate to properly monitor the groundwater impacts already occurring. The Appellants noted the Approval Holder has been unable to stop the migration of the known subsurface salt water contamination toward the Appellants' land, and adding additional brine storage further exacerbates the movement of the known contamination plume given the effects of gravity. The Appellants suggested that documents in the Records indicate the contamination has already left the plant site and presumably crossed onto the Appellants' land.

[23] The Appellants recognized the Approval Holder has acknowledged it has had problems with its brine ponds. The Appellants stated the Approval Holder failed to point out that its own consultants identified deficiencies in the groundwater monitoring program, particularly as it relates to shallow groundwater monitoring.

[24] The Appellants noted the Approval Holder represented to the Board in its submissions on the preliminary matters that it will take 300 years for the contamination plume to reach the Appellants' land. The Appellants stated the drill logs in the Records show there have been numerous instances where samples taken for geotechnical purposes found wet sand lenses and other potential groundwater pathways. The Appellants noted that none of the existing or proposed monitoring wells have been placed in these locations.

[25] The Appellants stated the Approval Holder discounted the potential for the bedrock interface to increase the speed of the migration of the contamination plume down gradient toward the Appellants' land and the river. The Appellants noted the Approval Holder's consultants observed the heterogeneity of the till may lead to higher groundwater flow velocities on a local scale.

4. Additional Comments

[26] The Appellants noted EPEA recognizes impacts to property as an adverse effect, and the ongoing contamination, its migration towards the Appellants' land, the Approval

Holder's failure to clean it up, and the Approval Holder's plan to further intensify the storage of "hazardous materials" in brine ponds all impact the Appellants' property value.

[27] The Appellants stated the Director assumed the Approval Holder would construct the berms in the manner directed in the Amending Approval. The Appellants stated proper construction processes are needed to ensure the elevated berms have sufficient integrity to safely hold the brine and avoid a wall failure. The Appellants stated the construction started before the Amending Approval was issued, which speaks to the premise upon which the Director granted the Amending Approval and raises questions whether the conditions imposed were adequate. The Appellants argued it undermines the Approval Holder's claim that there is no risk to the Appellants' land or the North Saskatchewan River.

B. Approval Holder

1. Design of Brine Storage Pond #4

[28] The Approval Holder submitted Brine Pond #4 meets all applicable requirements and effectively mitigates risk to the surrounding environment through design controls and mitigation measures.

[29] The Approval Holder stated the facility is located approximately 30 kilometres northeast of Fort Saskatchewan in an area zoned heavy industrial. The Approval Holder explained it purchases natural gas liquids from producers and fractionates the liquids into finished products including ethane, propane, field grade butane, and condensate. The Approval Holder stated Williams Energy (Canada) Inc. ("Williams") has a separate and distinct business at the site where it fractionates olefinic liquids into products that include propylene, propane, normal butane, alkyl refinery feedstock, and olefinic condensate. The Approval Holder stated the various fractionation and storage facilities at the site are owned by the Approval Holder, Williams, or both, but the Approval Holder is the holder of the original Approval and Amending Approval.

[30] The Approval Holder stated Brine Pond #4 allows for a more efficient operation of the natural gas liquids storage caverns on site by improving the ability to empty ponds and

complete maintenance repairs to the synthetic liners of the brine ponds and pumping equipment in a timely manner. The pond system, comprised of Ponds #1 to #4, will hold more than 100 percent of the cavern storage capacity.

[31] The Approval Holder explained there are three existing brine ponds operating at the site. The east pond has a primary geosynthetic liner and compacted clay liner with a sand and weeping tile collection system between the two liners. The Approval Holder stated it will be adding a second synthetic liner and Geonet system to the east pond next year. The other two ponds have dual synthetic liner systems and all three existing ponds have leak detection systems and are continually monitored.

[32] The Approval Holder acknowledged there is historical brine contamination located on-site from the original, unlined brine pond constructed in the 1970s that utilized the approved technology of the day, which was only a compacted clay liner. The pond, now referred to as Pond #1, was subsequently upgraded to include a geosynthetic liner. The Approval Holder stated it reports annually on the status of the contamination and works closely with Alberta Environment to ensure mitigative measures are employed to manage any risk to the surrounding environment. The Approval Holder stated it is in the process of implementing a full-scale groundwater remediation strategy to actively manage the contamination.

[33] The Approval Holder noted the groundwater monitoring results have demonstrated that all soil contamination is located and contained on the site, and electromagnetic surveys and soil tests support the monitoring well data.

[34] The Approval Holder explained construction of Brine Pond #4 started after receiving the Amending Approval, and it was constructed in accordance with the design provided to the Director.

[35] The Approval Holder stated it has contacted the Appellants on numerous occasions over the past eight years to discuss access issues and operational changes at the site. The Approval Holder stated the Appellants often expressed their concerns regarding the current operations at the site. Their concerns have included the brine contamination, air emissions, and

potential loss of agricultural productivity. The Approval Holder acknowledged the relationship with the Appellants has broken down in recent years.

[36] The Approval Holder explained Brine Pond #4 is on the west side of the facility and is 1.2 kilometres from the Appellants' land. The Approval Holder stated it is aware the Appellants are concerned the additional brine pond may impact their land or the North Saskatchewan River by possibly exacerbating the historical contamination from the east pond. The Approval Holder stated it attempted to alleviate the Appellants' concerns by providing information on the design and operation of Brine Pond #4, and it has committed to adding two new monitoring wells to the east and southeast of Brine Pond #4.

[37] The Approval Holder explained Brine Pond #4 has been designed, constructed, and will be operated in accordance with the requirements of EPEA and the Amending Approval. The Approval Holder stated the design for Brine Pond #4 was based on the *Guidelines for Alberta Brine Storage Reservoirs, March 1, 1978 and 1991 Addendum* (the "Reservoir Guidelines"), the *Alberta Dam and Canal Safety Guidelines*, and the *Canadian Dam Association (2007) Guidelines*.

[38] The Approval Holder explained a geotechnical investigation was conducted prior to designing the pond to characterize the general soil stratigraphy within the pond footprint. The soils consisted of approximately 200 millimetres of topsoil underlain by approximately 300 millimetres of medium plastic clay or clay fill underlain by clay till. The floor of the pond was designed to be above the groundwater table.

[39] The Approval Holder explained the berms include a 3 to 1 grade on both the inner and outer embankments, resulting in a six metre increase in width at the base of the berm for every metre of height. The design includes a 1.75 metre freeboard. The top of the berm includes a 5 metre wide road allowance for inspection and other access.

[40] The Approval Holder noted the *Canadian Dam Safety (2007) Guidelines* requires a minimum factor of safety of 1.5 for long term performance of the berms, and the berms for Brine Pond #4 are designed to a minimum safety factor of 1.61. The Approval Holder stated the *Alberta Dam and Canal Safety Guidelines* classifies the brine ponds as "very low" consequence,

which means that, in the unlikely event of a dam failure, potential consequences would involve no fatalities and only minor damages beyond the owner's property.

[41] The Approval Holder explained the freeboard was set at 1.75 metres, which includes an additional one metre freeboard over what is required to accommodate the estimated maximum hourly wind speed and gust speed. A 1.75 metre freeboard is sufficient to prevent overtopping through wind and wave action.

[42] The Approval Holder stated that, during construction, proctor density tests were completed on the berms, sump house pad, base of the pond, access road, and wet well backfill, and the compaction results indicated the brine pond met and exceeded the required compaction specifications and will perform as designed.

[43] The Approval Holder stated the berms have been designed and built not to fail, and it could not conceive of a foreseeable failure resulting in a major release from the pond with the possible exception of an earthquake or terrorist attack, both of which are extremely unlikely.

[44] The Approval Holder explained the pond design includes a composite liner system comprised of primary and secondary high density polyethylene ("HDPE") liners separated by a Geonet drainage layer. The HDPE liners, which are 60 millimetres thick, are compatible for use with brine and are ultraviolet resistant. The composite liner was laid on compacted clay till slopes and clay till sub grade.

[45] The Approval Holder explained the Geonet provides a conduit for the movement of brine between the liners to the leak detection monitoring location for early detection and removal. The Approval Holder stated the leak detection system consists of a gravel drain connected to the Geonet in the space between the primary and secondary liners, which is connected to the upstream toe of the berm. The gravel drain connects to a leak detection well, which is monitored continuously through the Distributive Control System ("DCS"). The Approval Holder stated the floor of Brine Pond #4 slopes to the detection well.

[46] The Approval Holder explained that, in the event there is a problem with the primary liner, the leak would be detected by the leak detection system, contained by the second liner, and the liner would be promptly repaired. It stated that, in the highly unlikely event that

both the primary and secondary liners failed, the brine would be captured by the compacted clay base that makes up the walls and base of the pond. The leak detection system would still detect the leak, the pond would be emptied, and the liner system would be promptly repaired.

[47] The Approval Holder listed additional mitigation and control measures, including:

1. Strict adherence to a quality control program during installation of the liner system to prevent leaks through the liner due to improper installation.
2. The leak detection systems on all four brine ponds are monitored continuously through the DCS and include alarm points to indicate significant changes in the flow from these systems. Flow changes detected require immediate attention.
3. If leaks are detected through regular monitoring, all brine in the pond will be pumped to either a cavern, one of the other three ponds, or an injection well to empty the pond. Once emptied, the liner would be repaired.
4. On a periodic basis, the pond will be completely emptied and visually inspected to ensure the integrity of the liner.
5. To prevent pond overtopping, the pond will be visually monitored at least once per shift during operations. If the brine appears to be approaching the 1.75 metre freeboard level, it will be reported to the shift operator, who will then cease pumping brine to the pond. The site is also continuously monitored through a closed circuit camera system.
6. During heavy rainfall events, the pond level will be closely monitored and more frequent observations will be made via the closed circuit camera system in the control room. If the freeboard is being encroached upon, brine will be pumped to another pond, cavern, or an injection well.
7. The outer berm faces will be vegetated to reduce the potential for erosion. The berms will be inspected on a regular basis, and if erosion channels begin to form on the berms, they will be immediately repaired.

[48] The Approval Holder expects the brine will remain fully contained within Brine Pond #4, and the risk to the public and the environment will remain very low.

2. Surface Water Assumptions and Designs

[49] The Approval Holder stated the surface water management plan for the facility was developed to provide adequate drainage and effectively mitigate risk to the environment.

[50] The Approval Holder stated the site drainage is described in the report titled Overall Drainage Plan – Provident Energy Facility in Redwater, Alberta, which document forms part of the Record.⁵ The Approval Holder explained the proposed drainage system to accommodate Brine Pond #4 was designed to convey flows from a 1 in 25 year event. The Approval Holder stated the plan will be modified as appropriate based on site conditions and to accommodate new developments.

[51] The Approval Holder stated Brine Pond #4 is located on a ridge running roughly east to west. The Approval Holder explained surface runoff flowing north of the ridge flows down gradient and is directed through culverts crossing Township Road 561 into a defined drainage course that leads to the North Saskatchewan River. Runoff from developed areas of the site is captured by a ditch and berm system, which extends from the northwest corner of Brine Pond #4 and directs the runoff toward a culvert equipped with a control gate prior to its release across Township Road 561. The control gate provides the ability to contain the flow of runoff onsite before it drains across Township Road 561.

[52] The Approval Holder stated surface runoff from the process area located in the northeast corner of the site, is directed through separate drainage ditches into a storm water pond equipped with a control gate at the outlet. The storm water pond releases the runoff into a drainage course that leads to the North Saskatchewan River, and the control gate provides the ability to contain the flow of runoff within the storm water pond, preventing it from being released into the drainage course until necessary.

⁵ See: Tab 10 of the Record.

[53] The Approval Holder explained surface runoff flowing south of the ridge is directed toward perimeter ditches surrounding the railway line. The perimeter ditches divide surface runoff into two areas with runoff flowing south from undeveloped areas east and south of Brine Pond #4 draining down a chute and through a series of culverts and ditches before draining across the railway line into a ditch along Township Road 560. The Township Road ditch drains into a channel that flows east into the North Saskatchewan River. Surface runoff flowing south from the area surrounding Brine Pond #4 berm and other developed areas within the site, drains down a separate chute and through a separate series of culverts and ditches toward a culvert equipped with a control gate. The control gate contains the flow of runoff onsite before it drains across the railway line into a ditch along Township Road 560 and into a channel that flows east into the North Saskatchewan River.

[54] In the unlikely event of a release from Brine Pond #4, the Approval Holder explained that any such release would have the potential to flow off the ridge in either a northward or southward direction and will be managed as follows:

1. A minor release flowing north of the ridge would flow around the cavern pads and be captured by a ditch and berm system. The ditch is upstream of a berm that extends from the northwest corner of Brine Pond #4. The discharge would be directed toward an 800 millimetre diameter culvert equipped with a control gate that would prevent discharge from being released across Township Road 561 and into the drainage course that flows east into the North Saskatchewan River.
2. A minor release flowing south of the ridge would flow into a perimeter ditch and be directed east around the railway line and down a chute, through a series of culverts and ditches to a 900 millimetre diameter culvert equipped with a control gate. The control gate would prevent discharge from being released across the railway line and into the drainage course that flows east into the North Saskatchewan River. Depending on the size of the release, there is the potential that a portion of the brine could flow south into the perimeter ditch and be directed west around the railway line into the ditch along Township Road 560. Temporary containment measures would be required to prevent the brine from

reaching the North Saskatchewan River.

3. Any brine would be quickly removed with the surficial soils, thereby preventing the migration of the brine into the groundwater.

[55] The Approval Holder submitted that, if there is a brine release, its control systems, continuous monitoring, and drainage plan will effectively mitigate the risk to the existing drainage course and the North Saskatchewan River.

3. Monitoring Plans

[56] The Approval Holder explained storm water in the processing area is captured in the storm water pond located north of the existing facilities and is released in accordance with the release parameters specified in the Amending Approval. The Approval Holder stated storm water in the non-processing area is managed in accordance with its Storm Water Management Procedure.⁶

[57] The Approval Holder stated the groundwater monitoring network at the time of the application for Brine Pond #4 consisted of 39 overburden and 5 bedrock groundwater wells, but the system has been expanded to consist of 56 monitoring wells completed at various depths in the overburden and bedrock. The Approval Holder stated the groundwater monitoring network is intended to provide long term monitoring of changes to groundwater conditions that may indicate minor releases from the pond that are not detected by the primary leak detection system. The Approval Holder explained initially five wells, four shallow wells and one deep well, were to be installed adjacent to the outer toe of the four berm walls of Brine Pond #4, but subsequent to construction and in response to the Appellants' concerns, the groundwater monitoring network was upgraded to eight monitoring wells, including two additional shallow wells on the east side and one additional deep well on the west side. The Approval Holder stated the additional wells were installed to provide additional data to address concerns that impacts from Brine Pond #4 could migrate to the east and overlap with historical contamination.

⁶ See: Director's Record, Tabs 7, 8, and 10: Overall Drainage Plan – Provident Energy Facility in Redwater, Alberta (June 2010) and amendments.

[58] The Approval Holder stated the groundwater monitoring network for Brine Pond #4 was based on the proposed design of the pond and the hydrogeological conditions in the area. The hydrogeological conditions were assessed on the groundwater monitoring network for the facility and supplemented with data from the pond area including geotechnical assessment boreholes and pre-construction groundwater assessment wells.

[59] The Approval Holder stated the following conditions were found to exist at the site:

1. The surficial geology consisted of a thin veneer of organic topsoil or clay fill overlying silty clay and clay till deposits. The clay till extended to a depth of approximately 12 metres below grade in the pond area. Interbedded sand lenses were identified in the clay till at various locations across the site, and two of the nine boreholes in the pond area intersected sand lenses. A pre-glacial clay, silt, and sand deposit is present beneath the till at some locations within the facility and a 0.5 metre thick layer of sand and gravel was encountered in the deep monitoring well in the pond area. Underlying the till and pre-glacial deposits is bedrock.
2. The shallow groundwater zone in the area of Brine Pond #4 is located within the till deposit, about 4 to 5 metres below the pre-existing ground surface. The expected groundwater flow is to the southeast.
3. The average groundwater velocity is expected to be less than one metre per year.
4. A slight downward vertical gradient is expected in the pond area. The deeper sand and gravel layer below the till was more conductive than the overlying till, so the estimated groundwater velocity in this material would be approximately 2 to 3 metres per year.
5. The proposed monitoring well network includes wells located in the shallow groundwater zone and the deeper bedrock contact zone.

[60] Based on these findings, the Approval Holder explained it expects any impacts to the groundwater will be observed first in the shallow groundwater bearing zone, prior to any significant vertical migration. The Approval Holder stated the ongoing monitoring program

allows for the timely implementation of mitigative measures should increasing chloride trends be identified in the groundwater.

[61] The Approval Holder stated the results of a geophysical assessment completed for the area around Brine Pond #4 and the groundwater monitoring results will be used to establish baseline conditions for the area. The Approval Holder explained the regular monitoring of the groundwater network and the periodic geophysical assessments of the pond area will allow for identification of changes in the subsurface conditions which would indicate possible issues with the containment system of the pond. The Approval Holder stated that, based on the estimated groundwater velocities, sufficient time exists for the implementation of remedial measures long before any potential off-site migration of salt impacted groundwater could occur.

[62] The Approval Holder noted the results of the groundwater monitoring program will be reviewed annually and, if required, alterations to the program will be discussed with the Director.

4. Additional Comments

[63] The Approval Holder submitted the Board should consider whether sections 2(b) and (d) of EPEA⁷ is relevant to the Board's consideration of Brine Pond #4. The Approval Holder stated the Board considers whether the environmental impacts from a proposed project have been properly prevented and mitigated on a case by case basis.

[64] The Approval Holder stated the onus is on the Appellants to provide sufficient evidence to demonstrate the Director's decision should be reversed or varied. The Approval Holder explained Brine Pond #4 is needed to enhance the growth and efficiency of the facility,

⁷ Sections 2(b) and (d) of EPEA state:

“The purpose of this Act is to support and promote the protection, enhancement and wise use of the environment while recognizing the following: ...

- (b) the need for Alberta's economic growth and prosperity in an environmentally responsible manner and the need to integrate environmental protection and economic decisions in the earliest stages of planning;...
- (d) the importance of preventing and mitigating the environmental impact of development and of government policies, programs and decisions....”

and it is the Board's task to evaluate the design of Brine Pond #4 and the mitigation measures to determine whether the Approval Holder can operate in an environmentally responsible manner.

[65] The Approval Holder submitted Brine Pond #4 has been designed and constructed to fully contain the brine in the pond. The Approval Holder stated the probability of brine escaping from both liners into the subsurface is very low, and the chances of it escaping without detection are even lower. The Approval Holder explained that, if a release did occur, there are several controls and mitigation measures in place, including the monitoring system, the surface runoff plan, and the groundwater monitoring system, to effectively mitigate any risk to the surrounding environment.

[66] The Approval Holder submitted the risk of any release from Brine Pond #4 exacerbating the historical contamination on site is remote. The Approval Holder stated the Board can only consider the Amending Approval for the new brine pond and not reopen the existing approvals.

[67] The Approval Holder submitted the Amending Approval should be confirmed as issued by the Director.

[68] The Approval Holder submitted that each of the Parties should bear their own costs.

C. Director

1. Design of Brine Storage Pond #4

[69] The Director explained the terms of the Amending Approval require the Approval Holder to construct Brine Pond #4 in accordance with the application, implement an overall site drainage plan, conduct a baseline geophysical assessment around the new pond, and adjust its groundwater monitoring program. The Director requested the Board recommend the Amending Approval be upheld as issued.

[70] The Director stated the design of Brine Pond #4, including the berm, satisfied the regulatory requirements of EPEA and the policies of Alberta Environment. The Director explained the regulatory requirements mitigate surface and groundwater risks through design

requirements that minimize the likelihood of overtopping of the pond walls or failure of the liner system. He added the leak detection and monitoring requirements provide further assurance.

[71] The Director stated Brine Pond #4 is 3.5 metres deep from grade with a 3.75 metre retaining wall above grade for a total depth of 7.25 metres and an approximate volume of 320,000 m³, including one metre of wave spill protection. The Director noted the design of Brine Pond #4 complied with the requirements of the Reservoir Guidelines and the *Action Leakage Rate Guideline* (May 1996), and the berm complied with the requirements of Part 6 of the *Water (Ministerial) Regulation*, Alta. Reg. 205/98, and the *Canadian Dam Association (2007) Guidelines*.

[72] The Director stated he accepted the third-party engineering consulting firm's consequence assessment which concluded Brine Pond #4 is a very low risk.

[73] The Director stated the Approval Holder was required to construct Brine Pond #4 as described in the application. The Director explained the design:

1. includes two 60 millimetre HDPE liners for both the primary and secondary liners, a collection system, and an early leak detection system in accordance with the liner requirements of the Reservoir Guidelines; and
2. the HDPE liner system is laid overtop of clay till subgrade and compacted clay till fill.

[74] The Director noted the limits in the Amending Approval remain unchanged from the initial Approval other than the addition of the Action Leakage Rate value for the Brine Pond #4 sump. The Director explained the Action Leakage Rate is a modeling prediction that calculates the amount of leakage that would occur through the top liner of a double liner system based on two holes per hectare, each with a diameter of two millimeters. The Director stated the Action Leakage Rate is used in designing the pond to ensure remedial measures can always be taken on any leakage that occurs, and the leak detection and collection system is designed to control any leakage prior to migration through the secondary liner. The Director stated the actual leakage collected in the leakage collection system is lower than the Action Leakage Rate. The Director noted the Approval Holder is required to monitor the leak detection system.

[75] The Director stated the geophysical assessment of the plant was completed in 2011, including a baseline geophysical assessment around Brine Pond #4. The Director explained the recurring geophysical assessments are intended to provide information on current chloride distribution, concentration, and movement, and will assist in detecting new leaks or spills prior to detection in the monitoring wells.

[76] The Director stated the Amending Approval required implementation of an Overall Site Drainage Plan to ensure comprehensive site-based management of industrial runoff.

[77] The Director explained Brine Pond #4 is located on the western side of the Approval Holder's site and is furthest away from the Appellants' land, which is approximately 1.2 kilometres away.

[78] The Director stated that existing stormwater management ditches, including gated culverts, would intercept overland flows of brine and should prevent off-site releases. He added that, in order for overland flow of brine to occur, there would have to be multiple failures in the monitoring, infrastructure, and emergency response systems. The Director noted the Approval Holder conducted a risk assessment and has emergency response plans in place to ensure no environmental impacts occur in the unlikely event of a leak or spill.

[79] In the Director's opinion, the design of Brine Pond #4 is adequate to effectively mitigate risk.

2. Surface Water Assumptions and Designs

[80] The Director noted that neither the Amending Approval nor the original Approval refer to a surface water management plan. The Director stated clauses in the original Approval require an industrial runoff control system and sets limits, and the Amending Approval requires implementation of an Overall Site Drainage Plan.

[81] The Director explained the Overall Site Drainage Plan assesses the existing site drainage system, proposes drainage improvements, and integrates the new development area into the overall site drainage management. He stated the Overall Site Drainage Plan improves the

industrial runoff management practices at the facility and minimizes potential risks for unauthorized industrial runoff releases.

[82] The Director noted the Overall Site Drainage Plan identified new ditches and three new industrial runoff control gates for site drainage improvement, and the operation practices for the industrial runoff culvert control gate system were also improved.

[83] The Director identified the following elements of the industrial runoff control system and Overall Site Drainage Plan that were included in the original Approval, Amending Approval, and the application:

1. roadways on the tops of the retaining walls of Brine Pond #4 are graded so precipitation will be collected in the pond;
2. precipitation on the exterior slopes of Brine Pond #4 will be collected in the stormwater management ditch system which includes two existing ditches south of the pond and new ditches north of the pond;
3. adjustments to the Approval Holder's operating procedures for stormwater culvert control gates; and
4. two existing perimeter ditches south of Brine Pond #4 were designed and constructed for a flow velocity of 0.9 metres per second at the design discharge, which was taken to be the peak flow rate resulting from a 100-year storm for perimeter ditch #1 and a 25-year storm for perimeter ditch #2. Perimeter ditch #1 intercepts surface runoff prior to it reaching the railway line and perimeter ditch #2 accommodates drainage from the railway line and the area between the two perimeter ditches.

3. Monitoring Plans

[84] The Director noted the Amending Approval and original Approval do not refer to surface water, but the original Approval refers to industrial runoff and industrial wastewater. The Director stated most of the groundwater monitoring and reporting requirements and the

industrial runoff and wastewater requirements are contained in the original Approval, not the Amending Approval.

[85] The Director stated that, under the original Approval, there are 44 groundwater monitoring wells around existing plant infrastructure and ponds, and leak detection collection sumps and under drain sump systems are used with the three pre-existing brine storage ponds. He explained the Amending Approval, based on the application, adds the following:

1. four additional groundwater monitoring wells in proximity to Brine Pond #4 have been added to the existing monitoring network, including shallow monitoring wells, one existing and three new, located on each side of Brine Pond #4, and a deep monitoring well located on the east side of Brine Pond #4;
2. the new monitoring wells will be tested to establish baselines for future monitoring; and
3. leak detection system for Brine Pond #4 along with continuous monitoring.

[86] The Director noted the Amending Approval added four clauses related to groundwater, including authorizing changes to the groundwater monitoring program, a requirement for geophysical assessments, specifying remediation standards, and specifying requirements where the Director finds the Groundwater Monitoring Report deficient.

4. Additional Comments

[87] The Director stated the Board's jurisdiction is restricted to considering the Amending Approval. The Director submitted the Appellants need to demonstrate how the Amending Approval has a direct and adverse effect on them as compared to statements of generalized concerns over pre-existing historical issues, overall dissatisfaction with having land located adjacent to an industrial facility, or other issues related to the facility. The Director stated the operation and design of the existing facility is not before the Board except as it relates to the subject of the Amending Approval.

[88] The Director requested the Board decline to hear evidence and argument from the Appellants that: (1) amount to a rehearing of matters raised in preliminary proceedings; (2)

challenges existing authorizations issued under EPEA and the *Water Act* that are not before the Board; (3) goes beyond the scope of the issues set by the Board; and (4) exceeds the jurisdiction of the Board.

[89] The Director submitted the Board should recommend to the Minister the Amending Approval be confirmed as issued.

D. Preliminary Matters

[90] At the commencement of the Hearing on June 22, 2011, the Appellants objected to having Mr. Gordon Thompson sitting as one of the panel members. The Appellants explained they became aware that Mr. Thompson is employed by the North Saskatchewan River Alliance (the “Alliance”) when reviewing the panel’s biographies the night before the Hearing. The Appellants argued there was a perceived bias, because some of the experts appearing on behalf of the Approval Holder worked for companies that are members of the Alliance. As members of the Alliance, representatives from these companies could potentially sit on the Board of Directors and could, conceivably, affect Mr. Thompson’s employment by the Alliance.

[91] After hearing from the Parties and assessing the arguments presented, the Board determined the Hearing should proceed but without Mr. Thompson sitting on the panel.

[92] The Board is concerned the Appellants waited until the commencement of the Hearing before raising their concerns about the constitution of the Hearing panel. The biographies of all of the Board members are provided to the appellants and approval holders at the time the appeal is filed. The biographies are also publically available on the Board’s website. As a practice, the Board routinely provides the names of the panel well in advance of a hearing to ensure there are no conflicts with the parties.

[93] In this case, the appeal was filed in July 2010. The Parties were notified of the composition of the Hearing panel on February 23, 2011. In fact this panel decided the preliminary matters and the Appellants expressed no concerns even though they had the Records with the reports prepared by the different consulting companies. On June 13, 2011, the Board notified the Parties that Mr. Marcel LeBlanc of AECOM, a witness for the Approval Holder, did

consulting work for the Alberta Capital Region Wastewater Commission (the “Commission”) while Mr. Thompson was the general manager of the Commission. At that time, the Board asked the Parties if they had concerns with Mr. Thompson remaining on the panel because of the connection to Mr. LeBlanc. None of the Parties expressed concerns with Mr. Thompson continuing as a panel member. It appears to the Board the Appellants had several opportunities to raise their objections of the panel appointed to hear the appeal well before the Hearing.

[94] The Board does not believe there would have been a conflict with having Mr. Thompson sit as a panel member to hear the appeal. The Board is entirely confident his decision in this matter would have been unbiased. However, the test is not whether there is actual bias but, rather, whether there is a perceived bias. Even though there appeared to be no legal basis to require Mr. Thompson to step down from the panel, it has been the Board’s practice to deal with bias and any perception of bias issues extremely conservatively. Therefore, the Board elected to remove Mr. Thompson from the Hearing panel, and he did not participate in the Hearing or in the preparation of this Report and Recommendations.

[95] Under section 6(2) of the *Environmental Appeal Board Regulation*, Alta. Reg. 114/93 (the “Regulation”), a Hearing panel is to have 1, 3, or 5 members. The Hearing opened with three members. Section 6(3) of the Regulation provides that majority of the panel will constitute a quorum, so, in this case, two Board members constitute a quorum. All of the Parties agreed to proceed with a two member panel. Therefore, the Hearing was heard and these recommendations were prepared by the remaining two panel members.

E. Analysis

[96] Under section 99 of EPEA, the Board must provide a report to the Minister and include recommendations on whether the Amending Approval should be confirmed, reversed, or varied. After reviewing and considering the Record, the file, and written and oral submissions, the Board is recommending the Amending Approval be varied.

[97] The Board does not agree with the Director’s comment that the Appellants are not directly affected. The Board determined in the preliminary motions hearing that the Appellants are directly affected, and the Hearing was held to hear evidence on the issues raised by the

Appellants. What the Board has found, based on the evidence and arguments presented, is that the Appellants will not be impacted by the construction and operation of Brine Pond #4. This is different from the preliminary question of directly affected.⁸

[98] The site on which Brine Pond #4 is constructed is an industrial site within the Alberta Heartland Heavy Industrial Area. The Appellants' land, situated adjacent to the Approval Holder's site, is essentially surrounded by heavy industry or lands slated for heavy industrial projects.

[99] The initial facility was constructed in 1974 with operations starting around 1976. The facility was built to meet the standards of the day, but brine stored in the original pond leaked through the clay liner, which was the requirement at that time. The Approval Holder purchased the facility and took over the operations in 2003. The Approval Holder acknowledges there is contamination on the site and stated it is endeavoring to take steps to remediate the site.

[100] The historic brine contamination on the facility site was not an issue considered by the Board except when looking at the integrated operations and monitoring plans and as it relates to the construction and operation of Brine Pond #4. The Board is not in a position to comment on the proposed plan included in the Groundwater Remediation Strategy mentioned by the Approval Holder, because the Board did not hear evidence on the complete plan. The Board only heard generalized descriptions. The development of a remediation strategy was not identified as an issue for the Hearing, so the Board did not anticipate the Parties would provide detailed evidence on the expected nature of the groundwater remediation plan. However, as discussed below, the Board has determined it will address the remediation plan in a limited way because of the integrated nature of the brine operations and an acknowledgement by the Approval Holder that it would be in order to do so.

⁸ See: *Court v. Alberta (Director, Bow Region, Regional Services, Alberta Environment)*, 1 C.E.L.R. (3d) 134 (Alta. Q.B.) ("*Court*"). At paragraph 75 of the *Court* decision the Court of Queen's Bench stated:

"To achieve standing under the *Act*, an appellant is required to demonstrate, on a *prima facie* basis, that he or she is 'directly affected' by the approved project, that is, there is a potential or reasonable probability that he or she will be harmed by the approved project. Of course, at the end of the day, the Board, in its wisdom, may decide that it does not accept the *prima facie* case put forward by the appellant. By definition, *prima facie* cases can be rebutted. Indeed, in this case, while the Applicant's *prima facie* case was not rebutted in the preliminary stages, the Applicant's

1. Design of Brine Storage Pond #4

[101] The Appellants raised concern in their Notice of Appeal and in their submissions regarding the structure of the berm and its ability to withstand erosion and whether Brine Pond #4 was constructed according to the required standards.

[102] The onus is on the Appellants to provide evidence that demonstrates the design of Brine Pond #4 and the berm are inadequate to protect the environment. In this case, the Appellants adduced minimal evidence or arguments regarding the structure of the pond and berm.

[103] The Appellants brought forward concerns that were based on speculation. They had concerns Brine Pond #4 was not built to standards because, they alleged, top soils from the area were cleared prior to the Amending Approval being issued. The Approval Holder explained it had authority from Sturgeon County to prepare the site and store clay by the site of the future Brine Pond #4. The Approval Holder stated that construction on the actual pond and berm structure was not started until after the Amending Approval was issued, and it was required to build Brine Pond #4 and the berm to applicable standards. The Approval Holder confirmed any concerns regarding the storage of the topsoil and subsoil were rectified at the beginning of June 2011. The topsoil and subsoil were moved to different locations on site and were distinctly separated.

[104] The Approval Holder and Director provided detailed information on the way Brine Pond #4 was designed and what safety features were incorporated into the structure to minimize the risk of leaks or overflows. Based on the information and evidence provided, the Board finds Brine Pond #4 meets or exceeds the design and construction criteria for ponds and berms of this nature, as required under the Reservoir Guidelines, the *Alberta Dam and Canal Safety Guidelines*, and the *Canadian Dam Association (2007) Guidelines*. The pond has a double liner system with a leak detection system between the two layers. It is underlain with compacted clay. The berm was constructed with a 1.75 metre freeboard which allows for an

added one metre of freeboard beyond what is required to accommodate wave action from wind gusts.

[105] Based on the submissions, evidence, and the Amending Approval and associated documents, the berm and Brine Pond #4 meet or exceed the relevant guidelines and safety factors. The Board finds the Appellants have not met their onus of adducing sufficient evidence to prompt the Board to recommend changes to the structure of Brine Pond #4 and the associated berm.

2. Surface Water Assumptions and Designs

[106] In their Notice of Appeal, the Appellants raised concerns regarding the surface water flows and whether peak flow values, such as during spring runoff, were used to assess the adequacy of the surface water management plan for the facility. The Appellants did not provide any evidence to indicate the assumptions used by the Approval Holder in its calculation of flow rates and directions were inaccurate. The Approval Holder explained the onsite drainage patterns are consistent with the Appellants' evidence in that regard. The Board finds the Approval Holder provided more detailed descriptions of the surface flow patterns, and the Approval Holder used conventional procedures in its calculations.

[107] The Approval Holder has designed the surface water management plan using existing drainage ditches and gated culverts and has added additional ditches to improve the drainage over the site. The drainage ditches to accommodate Brine Pond #4 were designed to accommodate water flows from 1 in 25 year storm events. The gated culverts allow the Approval Holder to control releases from the site. These are measures that adequately mitigate risks from uncontrolled surface water flows.

[108] Systems are also in place to minimize the risk of uncontrolled surface water flows that might be caused by overtopping of the brine pond berms. Additional freeboard was built to accommodate wave action from the wind. The pond and berm are monitored and visually checked on an ongoing basis both through actual inspection and via closed circuit cameras.

[109] In his final arguments, counsel for the Appellants argued an appellant does not have to bring forward experts but can question the other parties' experts to raise doubt into the accuracy of their evidence. The Board acknowledges it can be difficult, if not impossible, for an appellant to collect data from the actual site of the project, unless permission is granted by the landowner or project proponent. However, this does not prevent appellants from getting data from their own property. In this appeal, the Appellants raised the issue of trees being affected by the contamination. The Approval Holder had data available to show the contamination had not reached the edge of its property adjacent to the area of the affected trees. The Appellants adduced no plausible evidence to show whether or not the contamination had in fact reached their property. It would not have been difficult to obtain the information and depending on the results, could have assisted the Appellants in their appeal. However, without data from the Appellants, the Board only has the data provided by the Approval Holder to assess, taking into consideration the responses provided by the Approval Holder during cross-examination by the Appellants and questioning by the Board.

[110] Based on the evidence provided and the Record, the Board finds the methods used in the surface water management plans are appropriate for the site. The surface water management plan as described by the Approval Holder should effectively control surface water from Brine Pond #4 as well as the facility site. The data provided by the Approval Holder supports surface water flow predictions, and the Board finds the Appellants failed to adduce sufficient evidence in their submissions or during cross-examination of the Approval Holder's witnesses to raise doubt regarding the data.

3. Monitoring Plans

[111] The Approval Holder acquired the site and facility in 2003, including the associated liabilities. The Approval Holder acknowledged it has a contamination issue resulting from leakage from the original brine storage pond. From the data provided, it appears to the Board the contamination plume is still confined within the Approval Holder's property. The site continues to be monitored to assess the movement of the plume and to ensure it has not migrated off-site. It was clear from the evidence and submissions provided by the Appellants the historic

contamination is their major concern, and they have significant apprehensions regarding Brine Pond #4 in that, if a leak occurs, it will worsen the existing contamination.

[112] The Appellants asked that additional monitoring be incorporated into the monitoring plans, specifically adding monitors in the sand lenses. The Approval Holder acknowledged flow through sand lenses is generally faster than in clay soils. The data provided by the Approval Holder shows there are sand lenses at the facility site and there are monitoring wells that are screened in the lenses. The data shows the sand lenses are not contiguous, so it is difficult to place monitors in all the sand lenses. Furthermore, the ground water flow is impeded to some extent because the sand lenses are not contiguous. Although the Appellants wanted more monitoring, there must also be a balance to ensure the data collected is valuable. Based on the data and the explanations provided at the Hearing and in the Record, the Board considers the monitoring programs are adequate. No credible evidence was provided by the Appellants to show there is a need to increase monitoring around Brine Pond #4 other than what currently is in place. As data are collected and analyzed, the Director can determine if additional monitoring wells are warranted. The Board also notes that such data will continue to be received on an annual basis by the Director, as has been the case since 2003.

[113] The surface water and groundwater monitoring plans for Brine Pond #4 have been incorporated into the monitoring plans for the entire area. This appears to be a reasonable approach in order to understand what effects, if any, Brine Pond #4 will have on the site. At the time of the application, the Approval Holder had 50 groundwater monitoring wells, including five wells around the perimeter of the location of Brine Pond #4. As a result of the concerns expressed by the Appellants that any leaks would exacerbate the existing contamination onsite, the Approval Holder installed three additional wells, two on the east or down gradient side and one deeper well on the west side of Brine Pond #4. The Board commends the Approval Holder for adding these additional wells. The information provided will assist the Approval Holder in designing its monitoring plans for the existing ponds as well as any future ponds. It may also provide additional data on groundwater sources for Alberta Environment and should provide additional comfort to the Appellants that any potential leak will be intercepted and dealt with

quickly. Since these wells may provide additional information on groundwater in the area and early detection of any leaks, should any occur, the Board recommends these three wells, including the two on the east side and the deeper well on the west side of Brine Pond #4, be incorporated into the Amending Approval as a monitoring requirement. When the original Approval is renewed in 2016, the Director can review the data collected from these monitoring wells and determine whether they should remain in place.

[114] The Approval Holder and Director argued the Board cannot consider the historic contamination in this appeal. The Board agrees to the extent that it cannot reconsider the original Approval, but it can assess the impacts as they relate to the operation of Brine Pond #4. It is clear from the evidence provided by the Approval Holder that Brine Pond #4 is inextricably linked to the other operations on the site. The Approval Holder described the brine operations at the site as “integrated,” and the Board agrees with this description. Brine Pond #4 will be used to store brine while the other ponds are being repaired or when the other ponds have reached their maximum storage capacity. If Brine Pond #4 reaches its capacity, then brine will be stored in the other ponds. It is this integrated approach to operations that links Brine Pond #4 to the rest of the facility. It was also clear the monitoring programs for Brine Pond #4 have been incorporated into the monitoring plans for the entire site.

[115] Since the Approval Holder acquired the site in 2003, it has been working with Alberta Environment to determine the best possible process to deal with the contamination. The Board commends the efforts being taken by the Approval Holder to accept its liabilities with respect to the contamination and for taking the steps to deal with it. From the evidence presented, it appears the Approval Holder is in the process of preparing a remediation plan for the Director’s review. It is not clear how far into the process the Approval Holder has progressed. One of the questions raised by the Appellants is why the Approval Holder is allowed to expand without having to remediate the contamination on the site first. This is an understandable concern. The Approval Holder stated it intends to build a fifth pond in the future. It seems reasonable and environmentally responsible that, before either further expansion is undertaken or the original Approval, as amended, is renewed, a remediation plan that is acceptable to the Director should be designed to deal with the historic contamination. The

design and content of any remediation plan will be determined by the Approval Holder taking into consideration the advice of its consultants and subject to the approval of the Director. The Board appreciates it may take years to complete the remediation work, but the actual remediation process should start as soon as possible. Therefore, the Board recommends the Amending Approval be varied to include a condition that a remediation plan that is ready to be implemented be provided to the Director prior to the submission of either an application by the Approval Holder for any further expansion of its facilities or the submission of the renewal application of the existing Approval, which the Board notes expires in 2016.⁹ The Board understands the Approval Holder wishes to commence remedial action as soon as possible and encourages this be done regardless of upcoming approval renewal deadlines. The Director will continue to receive the groundwater monitoring well data annually. If the Director finds the data indicate a concern regarding the brine contamination, the Board considers it appropriate for the Director to require the Approval Holder to implement the remediation plan sooner.

[116] In making this recommendation, the Board specifically notes that it is not within its purview to suggest or prescribe the terms of any such remediation plan, and given the issues as framed for this Hearing, it would not be appropriate to do so. However, the Board finds that, given the evidence before it and the concessions offered by the Approval Holder in closing, it would not be inappropriate if the terms of the Amending Approval were amended so as to create a positive obligation on the Approval Holder to continue with its plans to develop and submit a comprehensive remediation plan as part of its overall obligations for the site and its operations thereon.

[117] The Approval Holder acknowledged it has responsibilities to the environment, and it took pride in its environmental stewardship. The Board commends the efforts being taken by the Approval Holder and considers it prudent to continue on this path.

⁹ In previous decisions, the Board has recommended adding conditions to an approval requiring the approval holder to submit plans to the Director or complete specific work prior to applying for a renewal of the approval. See: *Kievit et al. v. Director, Approvals, Southern Region, Regional Services, Alberta Environment re: Lafarge Canada Inc.* (27 May 2002) Appeal Nos. 01-097, 098 & 101-R (A.E.A.B.).

III. RECOMMENDATIONS

[118] The Board recommends the Amending Approval be varied. The Board recommends the three wells the Approval Holder added to its monitoring program in response to the Appellants' concerns, including the two on the east side and the one deeper well on the west side of Brine Pond #4, be incorporated into the Amending Approval as a monitoring requirement.

[119] In addition, the Board recommends a clause be added to the Amending Approval requiring the Approval Holder to provide to the Director a remediation plan that is ready for implementation for the brine contamination on the site. This remediation plan is to be provided prior to submitting the application to renew the Approval in 2016 or prior to any application for the expansion of its existing facilities. The Board considers it appropriate that, if the Director finds on reviewing the annual groundwater monitoring well data submitted by the Approval Holder there is an issue arising regarding the brine contamination, the Director consider requiring the Approval Holder to implement the remediation plan sooner.

[120] 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. Mr. Keith Wilson, Wilson Law Office, on behalf of Mr. Harvey and Ms. Elaine Visscher and Henryk Farms Ltd.;
2. Ms. Shannon Keehn, Alberta Justice, on behalf of the Director, Northern Region, Environmental Management, Alberta Environment; and
3. Ms. JoAnn Jamieson, Twyman Jamieson LLP, on behalf of Provident Energy Ltd.

[121] None of the Parties reserved their right to apply for costs and, therefore, the Board will not be accepting costs applications in this matter.

Dated on July 22, 2011, at Edmonton, Alberta.

“original signed by”

Eric McAvity, Q.C.

Panel Chair

“original signed by”

Nick Tywoniuk

Board Member



ALBERTA
ENVIRONMENT

*Office of the Minister
MLA, Medicine Hat*

**Ministerial Order
33/2011**

Environmental Protection and Enhancement Act

R.S.A. 2000, c. E-12

**Order Respecting Environmental Appeals Board
Appeal No. 10-011**

I, Rob Renner, Minister of Environment, 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 No. 10-011.

Dated at the City of Edmonton, in the Province of Alberta, this 11 day of August, 2011.

“original signed by”

Rob Renner
Minister

Appendix

Order Respecting Environmental Appeals Board Appeal No. 10-011

With respect to the decision of the Director, Northern Region, Environmental Management, Alberta Environment (the “Director”), to issue Amending Approval No. 9995-02-01 (the “Amending Approval”) under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12, to Provident Energy Ltd. (the “approval holder”), I, Rob Renner, Minister of Environment, order that the Amending Approval is varied as follows:

1. In section 6 of the Amending Approval delete the phrase “**SECTION 4.6: GROUNDWATER**”.*
2. In section 6 of the Amending Approval add the following immediately after condition 4.6.11:

“4.6.12 The Groundwater Monitoring Program shall include the two groundwater monitoring wells on the east side of Brine Pond #4 and the one deeper groundwater monitoring well on the west side of Brine Pond #4 identified by the approval holder in Environmental Appeals Board Appeal No. 10-011. (See: *Visscher v. Director, Northern Region, Environmental Management, Alberta Environment*, re: *Provident Energy Ltd.* (22 July 2011), Appeal No. 10-011-R (A.E.A.B.).)”
3. In section 7 of the Amending Approval add the following immediately after condition 4.7.13:

“**BRINE REMEDIATION PLAN**

4.7.14 The approval holder shall submit a Brine Remediation Plan to the Director on the earlier of:

 - (a) 120 days before the filing of an application for the renewal of the approval;
 - (b) 120 days before the filing of an application for an amendment to the approval to expand the plant, including but not limited to expanding the brine ponds; or
 - (c) a date specified by the Director in writing if, in the Director’s opinion, groundwater monitoring well data indicate a concern with brine contamination at the plant that is not adequately being addressed.

4.7.15 The Brine Remediation Plan shall: (a) address all brine contamination on the plant, including but not limited to the historical brine contamination and the contamination plume that has been detected at the plant, and (b) be ready to be immediately implemented upon being authorized by the Director.

* This amendment corrects a clerical error in the Amending Approval. The heading “**SECTION 4.6: GROUNDWATER**” already appears in the Approval that is being amended.

- 4.7.16 If the Brine Remediation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.
- 4.7.17 The approval holder shall implement the Brine Remediation Plan as authorized by the Director in writing.”