Associated Environmental

TERMS OF REFERENCE AND WORK PLAN

H.S. Jansen & Sons Farms Ltd.

Pollution Abatement Order
File AMS#350091

July 2016

ISO 9001 and 14001 Certified | An Associated Engineering Company

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1 Introduction

Associated Environmental Consultants Inc. (Associated), with Ruth McDougall, P.Ag. and Doug McFarlane, CCA, were retained by H.S. Jansen & Sons Farms Ltd. to complete the Terms of Reference (TOR) and work plan for a comprehensive monitoring program and an Environmental Impact Assessment (EIA) for nitrates and other nitrogen compounds in the soil and groundwater. The focus of the comprehensive monitoring program and EIA is the H.S. Jansen & Sons Farms Ltd. dairy operation located at 5063 Knob Hill Road, Armstrong, BC. The requirements for the monitoring program and EIA are specified in the Pollution Abatement Order issued by the BC Ministry of Environment on May 12, 2016 (File AMS#350091).

1.1 QUALIFIED PROFESSIONALS

The following Qualified Professionals will complete the comprehensive monitoring program and the EIA. They are listed here with their qualifications as reference. Resumes can be provided on request.

1. **Marta Green, P.Geo.** of Associated will be responsible for the groundwater component. Through education and experience in consulting for the past 16 years, Marta's skillset includes physical hydrogeology (e.g., well testing – pumping tests and slug tests), water quality, contaminant hydrogeology, and regional hydrogeological studies.
2. **Hugh Hamilton, PhD., P.Ag.** of Associated will provide guidance on monitoring design and EIA methodology, and provide senior review of the reports. He has been practicing in environmental and agricultural consulting in BC since 1990. His areas of practice include soil and water conservation, water quality, land use, and environmental impact assessment.
3. **Ruth McDougall, M.Sc., P.Ag.** will contribute to the soil and nutrient management component of the EIA. Ruth is an acknowledged expert in BC in the characterization and recycling of organic residuals to agricultural land. She has expertise in soil fertility and nutrient cycling in agricultural systems, having started in this line of work in 1990. Ruth has been involved in writing provincial guidelines for residuals recycling, and has produced Land Application Plans for the application of many residuals to agricultural land as well as Environmental Farm Plans for livestock operations.
4. **Doug Macfarlane, CCA**, will contribute to the soil and nutrient management component. He is a Certified Crop Advisor registered with American Soil Society of Agronomy and has many years of experience in BC.
5. **Rod MacLean, P.Eng.**, with Associated will contribute to the civil and drainage management component. Rod is a senior engineer responsible for civil, municipal, and agricultural design services in the Okanagan, and has a long history of experience in addressing water supply conservation issues. Rod has completed a variety of irrigation and drainage assessments for both small farming operations and larger corporate facilities. He is currently the BC Director of the Canadian National Committee for Irrigation and Drainage (CANCID) and supports research across Canada.

1.2 BACKGROUND TO THE TERMS OF REFERENCE

Development of the TOR and work plan is intended to meet Requirement 1 of the Pollution Abatement Order (the Order) issued on May 12, 2016 by the Ministry of Environment (MOE) to H.S. Jansen & Sons Farms Ltd. The Order applies to the following area (the Lands):

- Parcel 13, Plan KAP4541B, District Lot 96, Kamloops Div. of Yale Land District, Except Plan KAP22943: Property identification 011-769-092; and
- Lands used from time to time for agricultural operations that are part of or associated with the agricultural operations of the above lands and are controlled by H.S. Jansen & Sons Farms Ltd.

Requirement 2 in the Order is to implement the monitoring program and to complete the EIA. The monitoring program and EIA will begin as soon as the TOR and work plan are approved by MOE.

The Order states that "the usefulness of the environment has been impaired due to the presence of nitrates in the groundwater as the presence of nitrates is causing the groundwater in the unconfined aquifer that lies in part underneath the Lands (commonly referred to Hullcar Aquifer 103) to be unfit for potable water for specific persons in the population." The Order stems from the Hullcar Aquifer Inter-Ministry Action Plan developed in March 2016, where one of the goals of the Action Plan is to determine as accurately as possible the sources of nitrate and potential for human health effects in the Hullcar Aquifer (MOE 2016). The TOR and work plan are intended to clearly identify the methods to meet this goal.

2 Terms of Reference

2.1 GOALS OF THE MONITORING PROGRAM AND EIA

The overall goal of the combined monitoring program and EIA is to determine whether the existing agricultural operations on the Lands are having an adverse effect on Hullcar Aquifer 103 and connected surface water by increasing the concentrations of nitrate-N and other nitrogen compounds to levels that are a hazard to human health (Requirement 2 of the Order). The TOR:

- Outlines the regulatory context for the monitoring program and EIA (Section 2.2)
- Defines the spatial and temporal boundaries of the EIA (Section 2.3)
- Defines the environmental receptor that is the focus of the assessment (Section 2.4); and
- Defines the basic steps that will be completed to design and implement the monitoring program and complete the EIA (Section 2.5).

The monitoring program and EIA are described in the work plan (Section 3).

2.2 REGULATORY CONTEXT

The Order is pursuant to section 83 of the *Environmental Management Act* (EMA; SBC 2003 c. 53), and manure management is subject to the *Agricultural Waste Control Regulation* (BC Reg. 131/92). Fundamentally, the EMA prohibits pollution, and the Order indicates that pollution in this case has been caused by the introduction of agricultural waste to the environment. With respect to groundwater and

surface water, a key indication that pollution has occurred is an exceedance of water quality guidelines or objectives; specifically, Health Canada's Guidelines for Canadian Drinking Water Quality (Health Canada 2013) for the Hullcar Aquifer.

Health Canada's Guidelines for Canadian Drinking Water Quality state that the maximum acceptable concentration of nitrate-N in drinking water is 10 mg/L (Health Canada 2013). Elevated nitrate consumption can lead to methaemoglobinemia, which is a blood disorder that affects the ability to transport and release oxygen throughout the body (Health Canada 2013). Its effects are most pronounced in infants, and as a result it is more commonly referred to as "blue-baby syndrome." There are also concerns that nitrate may impact thyroid gland function and be associated with cancer (Health Canada 2013). The maximum acceptable concentration of 10 mg/L nitrate-N is designed to protect the health of the most sensitive users, i.e., bottle-fed infants. However, Health Canada recommends that levels be kept as low as reasonably practicable (Health Canada 2013). The BC Approved Water Quality Guidelines also state a maximum acceptable concentration of nitrate-N in drinking water of 10 mg/L (MOE 2009).

Under the regulatory guidelines, the landowner is responsible for the nitrates contributed by its operation to soil, groundwater, and surface water. It is therefore important to know the concentrations of nitrates in the water as it enters the property (i.e., the levels of nitrates prior to the effect from the operations on the Lands).

We therefore will consider an adverse impact to be present if the agricultural operations from the Lands are causing groundwater to exceed the 10 mg/L guideline in wells installed in the Hullcar Aquifer 103. The EIA will also consider the additive effect of farm operations on the Lands to the total nitrogen load in the aquifer, which is likely contributed by activities on other properties located over the aquifer.

2.3 SPATIAL AND TEMPORAL BOUNDARIES OF THE EIA

H.S. Jansen & Sons operates a dairy farm with 960 milking cows. The operation includes several properties that H.S. Jansen & Sons own or rent. H.S. Jansen & Sons own four properties (Main Farm, Main Farm, Harold's Property, and Dixon Property), and rent six (Skelton, VanDursen, Jessie, Silvia, and Reime, and Fieldstone) (Figure 2-1).

The spatial extent of the study area is the lands identified in the Order, which overlie, or partly overlie, the Hullcar Aquifer 103. The spatial extent of the study is shown in yellow on Figure 2-1, and are referred to here as the Lands. The vertical extent is from the land surface to the bottom of the Hullcar Aquifer 103.

The Order is for pollution abatement (i.e., the ending, reduction, or lessening of something). Therefore, the objective of the EIA is to assess current agricultural practices and their potential to adversely affect groundwater. H.S. Jansen & Sons Farms Ltd. has been following a nutrient management plan since spring 2014. We will therefore examine records relevant to our assessment since that time. Accordingly, we define the temporal extent of the EIA study to be from March 2014 to present.

2.4 RECEPTOR

As stated in the Order, the specific substance causing pollution is agricultural waste, including manure and/or manure-laden effluent, from which nitrate is leaching into groundwater. The Order describes the presence of nitrates in the groundwater, which is causing the Hullcar Aquifer 103 to be unfit for potable water. We therefore will assess the impacts from nitrogen (all species) on drinking water wells installed in the Hullcar Aquifer 103. The drinking water wells in the Hullcar Aquifer 103, which is an unconfined aquifer, will be the "receptor."

2.5 ENVIRONMENTAL ASSESSMENT PROCESS

The environmental assessment process will include the following tasks:

- Characterize the existing environmental conditions on the Lands and underlying aquifer; considering climate, soils, surficial geology, aquifer characteristics, and water quality. Existing environmental conditions characterization includes design and implementation of a monitoring program.
- Describe farm operations on the Lands, particularly manure and nutrient management.
- Assess the effects of farm operations on the environment, considering the magnitude, timing, duration, and reversibility of any adverse effects.
- Identify management practices or other mitigation measures to avoid or minimize the identified adverse effects. The EIA will include the recommended preliminary mitigation strategy, with the details to be developed later as part of the Action Plan.
- Determine if there are any residual effects that cannot be reasonable mitigated.
- Develop a monitoring program to assess the effectiveness of the mitigation measures.

The implementation of these tasks is described in the work plan (Section 3).

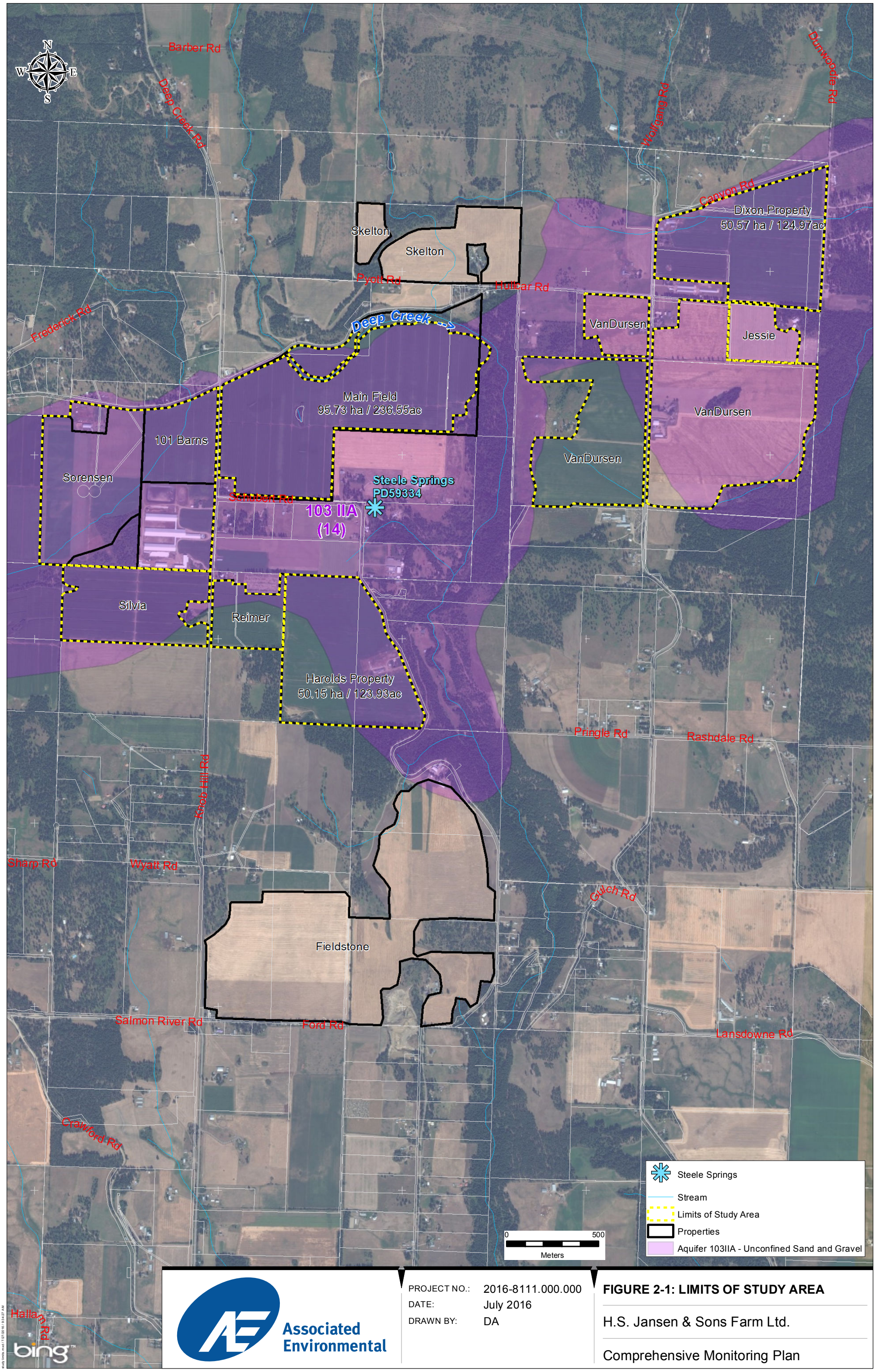

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FIGURE 2-1: LIMITS OF STUDY AREA

H.S. Jansen & Sons Farm Ltd.

Comprehensive Monitoring Plan

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3 Work Plan

The work plan includes two phases:

- Development and implementation of a comprehensive monitoring program; and
- The EIA.

The comprehensive monitoring plan is designed to inform the EIA, and will form the basis for later monitoring to evaluate the effectiveness of the Action Plan. The work plan for the comprehensive monitoring program and EIA is described in Table 3-1.

The results of the EIA will provide the information necessary to develop the Action Plan, which is Requirement 3 in the Order. The Action Plan will detail the mitigation measures that will be taken to abate the environmental impacts identified in the EIA.

We understand the MOE will be retaining another environmental consulting firm to complete an assessment of the Hullcar Aquifer. We understand the MOE expects the two groups will work collaboratively to meet the objectives of each study. In general, tasks to be performed within lands owned or managed by H.S. Jansen are to be completed by H.S. Jansen, and tasks that need to be performed outside of the study area are to be completed by the Hullcar Aquifer Study team. We have noted in the Work Plan where collaboration is part of our plan.

Table 3-1
Proposed work plan

Phase	Task	Description
Phase 1: Comprehensive Monitoring Plan	**Task 1: Review background information**	a) Review nutrient management plan, groundwater monitoring records, soil and climate information for the farm, historic soil nutrient data where available, facility drawings, and groundwater movement and recharge information. b) Calculate average monthly potential evapotranspiration and irrigation demand using climate and soils data. c) Conduct a site visit and review farming practices with landowner to document: · Location of on-site wells in Hullcar Aquifer 103; · Location of fields receiving manure and fertilizer from farm operations; · Manure application rates; · Fields irrigated and irrigation rates and schedules; · Drainage management and manure transportation systems; and · Cropping practices including crop types and rotations. d) Review of a receptor survey to identify the nearest existing drinking water wells or springs. We have assumed that the receptor survey will be conducted by others as part of the Hullcar Aquifer Study.
	Task 2: Analyze and assess nitrogen management practices	a) Summarize sources of nitrates including but not limited to temporary and permanent manure storage areas, feeding areas, cultivated fields, and pastures. A detailed map showing features and facilities will be prepared. b) Describe farming operation including number of livestock, acres farmed over aquifer and elsewhere, crops grown, typical yields and nitrogen uptake by crops, manure handling and transportation systems (including details such as if the manure transportation system is primed during summer months), manure storage type and capacity, manure use by field, manure brought from off site, and chemical N fertilizer use. c) Calculate estimated annual nitrogen loading on land-base over aquifer (tabulated by field), based on nutrient use information from operator and the scientific literature. d) Assess influences of precipitation and irrigation practices on the movement of nitrogen from surface soils to groundwater, including schedule and crop type. e) Determine need for soil testing and soil sampling locations based on an understanding of the location and type of manure storage facilities on site, both field storage areas and permanent manure storage facilities, as well as nutrient receiving sites as deemed necessary based on the results of Task 1 and 2.
	Task 3: Log lithology, sample deep soils, and install monitoring wells	a) Determine locations of monitoring wells based on an understanding of the site and nutrient sources. A preliminary calculation of nutrient loading to the Field of Concern since cows were brought to the Main Farm estimates that the mass of over-application of nitrogen for years 2009-2012 was 24,000 kg per year, and for 2013 was (24,200 kg), 2010 (24,240kg), 2011 (24,240kg), 2012 (24,240kg), and 2013 was 16,480 kg. In 2014 and 2015 the nutrient applications were balanced with crop demands and in 2016 no nutrients were applied. A preliminary mass balance was calculated using the mass of over-applied N, an aquifer thickness of 12 m based on the Hullcar Hall observation well lithology, the area of the farmed area of the Field of Concern (84.3 ha); and assuming that the loading accumulates in the groundwater over this entire period (since 2006) before discharging. The preliminary mass balance results in an estimated nitrate concentration of over 30 mg/L. This does not account for dilution from recharge sources or migration of groundwater with advective flow, which would act to reduce the nitrate-N concentrations to the levels observed over the past year (to be confirmed during the EIA). However, based on these calculations, there is strong evidence to indicate that previous over-application of nutrients on the Field of Concern is the cause of the observed high concentration of nitrate-N in the aquifer. We will therefore focus our soil sampling and drilling program on the assessment of land applications of manure and other fertilizers, as opposed to minor leaks related to the facilities (note, however, that we will provide a detailed map of the facilities and features as part of Task 2, and a Professional Engineer will inspect the facilities. If, based on our site visit and inspection, leaks are detected, we will recommend the leaks be fixed. Monitoring wells will be positioned on fields where the review of the current nutrient management plans indicate an over-application of nutrients, to indicate existing groundwater conditions. b) Complete an underground utility locate. c) Conduct a drilling program: · Install up to 5 monitoring wells in Hullcar Aquifer 103 west of Deep Creek. Preliminary proposed locations are shown on Figure 3-1. These locations could change based on the findings of Tasks 1 and 2; however, the number of monitoring wells will not be reduced.

Phase	Task	Description
		· A hydrogeologist will log each borehole and design each monitoring well installation, and will be onsite to direct drilling. · Advance the borehole using solid stem augers to collect continuous soil samples for logging to the top of the uppermost silt/clay layer below the water table. If the borehole does not stay open, conduct continuous sampling using hollow stem with split spoons. · In three boreholes (two on Field of Concern and one on the field labelled as 101Barns on Figure 3-1), collect deep soil samples in the unsaturated zone to assess whether or not the best management practices being followed since 2014 are resulting in acceptable nitrate (as N) concentrations in the unsaturated zone. A method for determining aqueous nitrate concentrations in soil is described by Rudolph et al. (2015)[1] and Bekeris (2007)[2]. The method involves analyzing for soil moisture concentrations and bulk soil nitrate concentrations and using a calculation to determine the aqueous nitrate concentrations. These methodologies will be followed during this program, and comprise of the following steps: In three boreholes (two on Field of Concern and one on 101Barns), collect deep soil samples in the unsaturated zone: collect one soil sample from the 30 to 60 cm depth, one sample from the 60 to 100 cm depth, and one sample every 60 cm of depth below that until reaching the groundwater table. Every discrete soil sample will be a minimum of 15 cm long. Once samples are taken, they are to be bagged in an air tight Ziploc bag with the air removed. Samples will be placed on ice and shipped to the lab for analysis of soil moisture, nitrate-N, ammonium-N and total N. The results are presented as concentration of nitrate-N in pore water in mg/L. · Collect representative soils samples from the aquifer for grain size analysis. · Install wells into the uppermost water bearing sand unit, using hollow stem casing, 5 cm (2-inch) diameter PVC screen, and an artificial filter pack inserted into the annulus to the required depths around the screened sections; use 10/20 sand or similar. · Seal the sections with bentonite from 0.6 m above the screened section up to 0.6 m below ground surface, to meet or exceed the BC *Ground Water Protection Regulation*. · Affix well plate identifiers to each new monitoring well and any existing wells that will be used as part of the monitoring program (if not already present). · Install 2 m long screens at the bottom of the approximately 3 m thick aquifer. This is based on the understanding that there are many well logs available for the area; however, most provide little detail on the lithology of the Hullcar Aquifer 103. The most detailed well log is from well tag number 104830 at 5081 Schubert Road. It was drilled in 2011 by JR Drilling and describes the static water level at 12 m, and a moist layer between 13 and 24 m (end of log) as loose fine and medium sand. This is the most detailed description of the aquifer material in the Hullcar Aquifer 103. Therefore, the depth of the majority of the wells will be up to 16 m. If actual geological conditions are found to be different during the fieldwork, we will complete screens no longer than 2 m at the coarsest section of the uppermost unconfined aquifer. A multi-level well (with up to two 2m long screens) will be considered, if the aquifer is thicker than 10 m. d) Survey the top of casing and ground surface of each new monitoring well and existing well(s) that will be used as part of the monitoring plan, with an accuracy of +/- 2 cm.
	Task 4: Conduct groundwater sampling and aquifer parameter tests	a) Develop each new monitoring well until purge water is clear using either a submersible pump or Waterra™ tubing with a foot valve and surge block, depending on geologic conditions. Purge water will be used as irrigation water on the same field it was captured from. b) Measure groundwater level (if available) for each well after well completion and once the well has been left for one day to stabilize. This work will be coordinated with the Hullcar Aquifer study team to get as many water levels in the area as possible during one round. We have assumed that at least one well to the southeast of the Field of Concern will be monitored by the Study team and we will rely on that data. c) Perform slug tests or short pumping tests (up to 4 hours) in three wells to estimate hydraulic conductivity of the aquifer. Measure the recovering water levels with an electronic water level meter inserted into the well for the duration of the test. Pumped water will be used as irrigation water on the same field it was captured from. d) Analyze grain size of six representative soil samples. e) Sample groundwater in new monitoring well samples on west side of Deep Creek and from four existing wells on the east side of Deep Creek (Figure 3-1). Collect groundwater samples using low flow sampling techniques and a submersible pump. Conduct purging until consistent (stabilized) field-measured chemistry (e.g., electrical conductivity, pH, and temperature) is observed. Collect samples as per the British Columbia Field Sampling Manual (MWLAP 2013). f) Complete laboratory analysis of the water samples collected. Courier samples to an analytical laboratory for analysis of routine potability, dissolved metals, ammonia, nitrate, nitrite, total Kjeldahl nitrogen (TKN), organic nitrogen, and total nitrogen.
	Task 5: Analyse hydrogeological and groundwater quality data	a) Estimate hydraulic conductivity two ways: 1) by the Hazen equation or similar using grain size results, and 2) by processing the aquifer testing results using Aquatesolv or similar aquifer testing software. b) Calculate groundwater flow direction, and estimate groundwater travel time across the Study Area. This will be a collaboration with the Hullcar Aquifer Study team. c) Upload all water quality results directly from the laboratory to Wireless Water™ Database Management Services, and then tabulate and compare results with the Guidelines for Canadian Drinking Water Quality (Health Canada 2014). Results will also be uploaded to EMS. We have assumed that location numbers for the EMS database will be provided to us by MOE once we provide a list of well plate identifiers and UTM coordinates that will be sampled to MOE.

[1] Rudolph, D.L., Devlin, J.F., Bekeris, L. 2015. Challenges and a strategy for agricultural BMP monitoring and remediation of nitrate contamination in unconsolidated aquifers. Groundwater Monitoring & Remediation. Vol. 35 No. 1 PP. 97-109.
[2] Bekeris, L. 2007. Field-scale evaluation of enhanced agricultural management practices using a novel unsaturated zone nitrate mass load approach. Masters Thesis. Waterloo, Ontario, Canada

Phase	Task	Description
	Task 6: Conduct additional soil sampling after crop harvest	a) Sample all fields that received manure during 2016 at three depths – 0-15 cm, 15-30 cm and 30-60 cm. Subdivide fields into sampling areas based on crop, soil type and topography. Submit one composite sample composed of a minimum of 10 sub-samples for each depth and sampling area. Conduct soil sampling within 2 weeks of final crop harvest for 2016. Submit samples for laboratory analysis and assess results. b) Submit samples for laboratory analysis of nitrate, ammonium, organic matter, and TKN[3]. c) Identify fields that had elevated nitrate levels at the end of the growing season and develop a management strategy for nutrient application on those fields as part of the Action Plan, if required (See Task 9).
Phase 2: Environmental Impact Assessment and Reporting	**Task 7: Conduct EIA**	a) Refine the identification of receptors and the spatial extent of the study area or limits of monitoring. b) Calculate descriptive statistics (average, median, min, max, standard deviation, count) for the water quality and soil data collected at all monitoring locations. c) Determine if current (since 2014) agricultural operations on the Lands cause nitrate-N concentrations in the aquifer to exceed water quality guidelines in the vicinity of the nutrient applications. d) Assess the difference in concentrations of nitrogen species between upgradient and downgradient locations. Where there are sufficient data, determine if differences between monitoring locations or areas are statistically significant. f) Determine the potential for cumulative effects on nitrogen in groundwater from nearby properties in addition to the Lands.
	Task 8: Draft comprehensive monitoring and EIA report	Compile the results of the comprehensive monitoring program and EIA into a draft technical report that will be submitted to MOE for review. The monitoring program section will describe tasks completed, methods applied, and results obtained, including the following results: 1. Farm nitrogen balance and nitrogen loading practices; and soil sampling program, if completed. 2. Drilling and aquifer testing, including well lithological logs and a site plan showing well locations and groundwater flow direction. 3. Groundwater sampling g) Based on the technical assessment, the report will determine the likelihood that current farm practices are causing pollution, on their own or in combination with activities on other properties. The report will include the laboratory reports from the sampling programs in an appendix, and will include photographs, maps, and charts.
	Task 9: Finalize comprehensive monitoring and EIA report	h) The report will be finalized after receiving comments from MOE on the draft report. The details of action items for abatement/mitigation will not be included in the current scope. This will be a separate task identified as the Action Plan in the Order, with a different schedule, and would be completed if an adverse effect on groundwater from the current farm practices is identified by the EIA. However, the report will provide a preliminary identification of pollution prevention strategies (actions) that would be put in place based on the EIA findings.

[3] Analyses for these variables also enable the calculation of total N and organic N.

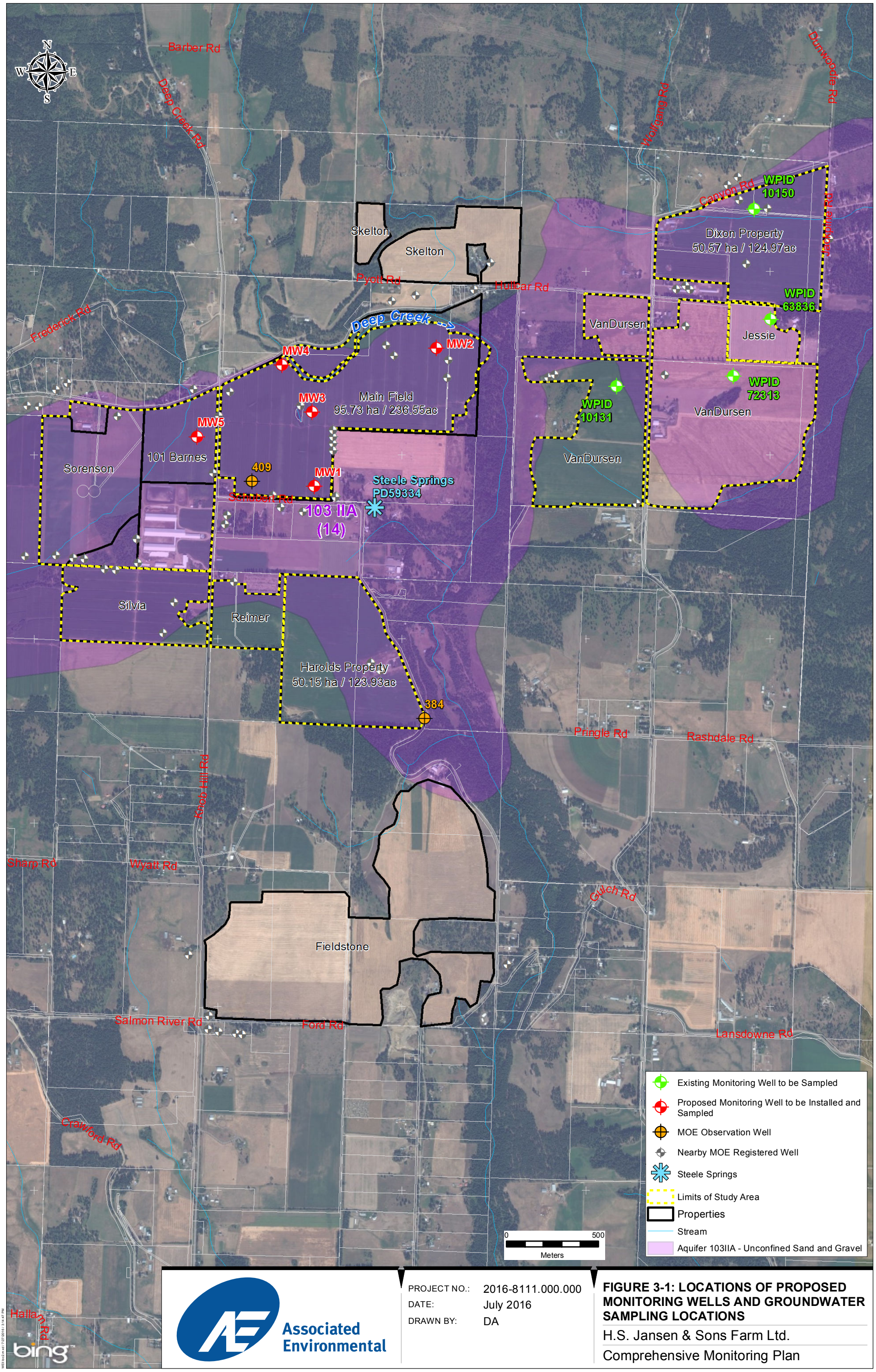

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FIGURE 3-1: LOCATIONS OF PROPOSED MONITORING WELLS AND GROUNDWATER SAMPLING LOCATIONS

H.S. Jansen & Sons Farm Ltd.

Comprehensive Monitoring Plan

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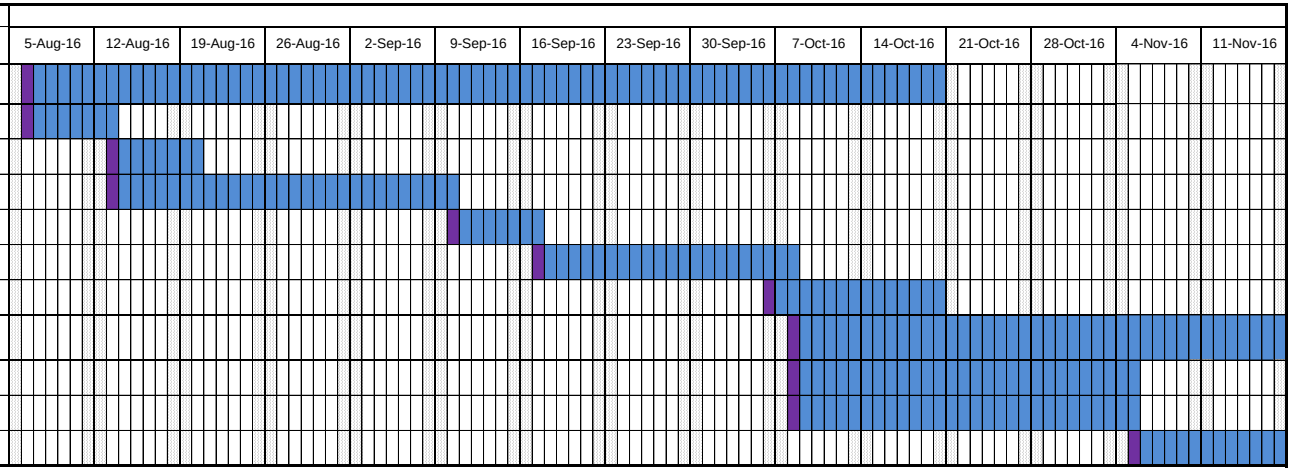
4 Schedule

Requirement 2, the completion of the comprehensive monitoring program and EIA are requested to be by August 1, 2016. This proposed schedule will be very difficult to meet because of the need to mobilize well drillers *after* the approval of the plan by MOE, then to submit and analyse laboratory results. Assuming the TOR is approved by MOE by August 1, 2016, Associated proposes to revise the schedule to submit the draft report of the monitoring plan and EIA on October 31, 2016. The proposed schedule is provided in Table 4-1.

Table 4-1
Proposed project schedule

ID	Task	Days	Start	End
		108	**1-Aug-16**	**17-Nov-16**
Phase 1 - Comprehensive Monitoring Program			**1-Aug-16**	**15-Oct-16**
1	Review background information	7	1-Aug-16	8-Aug-16
2	Analyse nitrogen management	7	8-Aug-16	15-Aug-16
3	Drill monitoring wells and conduct deep soil sampling	28	8-Aug-16	5-Sep-16
4	Conduct groundwater sampling and aquifer parameter tests	7	5-Sep-16	12-Sep-16
5	Analyse the hydrogeological data, soil and groundwater quality data	21	12-Sep-16	3-Oct-16
6	Conduct additional pre-harvest soil sampling	14	1-Oct-16	15-Oct-16
Phase 2 - Environmental Impact Assessment and Reporting			**3-Oct-16**	**17-Nov-16**
7	Conduct EIA	28	3-Oct-16	31-Oct-16
8	Draft Comprehensive Monitoring and EIA report	28	3-Oct-16	31-Oct-16
9	Final Comprehensive Monitoring and EIA report	17	31-Oct-16	17-Nov-16



Closure

This report was prepared for H.S. Jansen & Sons Farms Ltd. and outlines the TOR and work plan for the comprehensive monitoring program and EIA.

The services provided by Associated Environmental Consultants Inc. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Environmental Consultants Inc.

Marta Green, P.Geo.
Senior Hydrogeologist

Hugh Hamilton, Ph.D., P.Ag.
Senior Scientist

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