



Report Date: January 09, 2018

File: 108389

Report Number: 074069

Grace-Mar Farms Ltd.  
5094 Salmon River Road, Armstrong, BC

Dear Grace-Mar Farms Ltd.

**Re: Notice Letter, Pollution Abatement Order 108389, 5094 Salmon River Road, Armstrong, BC, Effluent**

On November 16, 2017, Ministry of Environment and Climate Change Strategy, Environmental Protection Division staff conducted an inspection of your facility, Grace-Mar Farms Ltd. located at 5094 Salmon River Road, Armstrong, BC with Pollution Abatement Order number 108389 under the *Environmental Management Act*. Ministry staff were accompanied on site by Jason Benjamin, Grace-Mar Farms Ltd.; Doug McFarlane, Emerald Bay Ag Services.

Inspection Details:

Requirement Description:	<p>5: Upon approval by the Director, implement the Action Plan referred to in section 4 in accordance with any amendments to the Action Plan required or approved by the Director, or any further directions of the Director.</p> <p>5 (4.i): ACTION PLAN - MANURE STORAGE</p> <p>1. To manage mortalities, compost the remains on a site that conforms with the Agriculture Waste Control Regulations (AWCR) (BC Reg. 131/92) and best practices. Ensure the compost facility is located on an impermeable base. The structure must be 30 meters from drinking water source, 30 meters from top of watercourse bank, and 4.5 meters from property boundary. It must not be located in low-lying areas. Leachate must not enter a watercourse or groundwater, and odour must be managed. Any leachate must be contained and diverted back to the compost pile (or collected and removed for treatment.). The nutrients in the finished compost will be accounted for in the NMP. An acceptable alternative option for manage mortalities is by hauling off site to an appropriate waste management facility (June 30, 2017)</p> <p>2. Repair the broken concrete wall of the primary liquid storage. See Figure 3-1 for a close-up of facilities. (June 30, 2017)</p> <p>3. Along the south boundary of the dry concrete pad, reinforce/repair concrete lock-blocks (June 30, 2017)</p> <p>4. Avoid temporary outside storage of manure except on the dry concrete pad. Any temporary field storage must be located on an impermeable base and must not be located in areas of having standing water, on saturated soil or on a low-lying area that is prone to flooding. It must be monitored and maintained to prevent the escape of leachate, solids, or particulate matter, and any precipitation flowing on the ground must be diverted away from the pile. Any leachate must be contained and diverted back to the compost pile or collected for treatment. (On-going)</p>
Details/Findings:	<p>Action Items 1 to 3 were previously assessed to have been implemented in IR59938.</p> <p>Action Item 4 - Grace-Mar Farms Ltd. has avoided any temporary outside storage of manure. Grace-Mar Farms Ltd. indicated that they have reduced the number of cows on-site from greater than 500 to approximately 150 at the time of the inspection to reduce the volume of manure being produced and ensure that manure storage only takes place on the solids pad, receiving pit and storage lagoon.</p>

Compliance:	In
Actions to be taken:	Continue to implement the Action Items and adhere to the schedule listed in the Action Plan.
Requirement Description:	<p>5: Upon approval by the Director, implement the Action Plan referred to in section 4 in accordance with any amendments to the Action Plan required or approved by the Director, or any further directions of the Director.</p> <p>5 (4.ii): ACTION PLAN - DRAINAGE AND IRRIGATION MANAGEMENT</p> <p>5. Complete regular manure storage and stormwater management system inspections, following the AWCR and Environmental Farm Plan Reference Guide as a check-list for on-going best practices. Document any issues and perform necessary repairs. Attach monthly inspections notes to the annual reports in 2018 and 2019.</p> <p>6. Develop a contingency plan to be implemented in the event of a spill or imminent spill. The contingency plan will include procedures and protocols to follow, and if the Farm has more agricultural waste than can be applied to fields as fertilizer or soil conditions, the contingency plan will also include stocking spill mitigation kits in the barn. Once the contingency plan is developed, train staff in spill response, documenting the training. Review contingency plan with staff twice per year. Contingency plan development and training: June 30, 2017 Contingency plan review: spring and fall 2017 and 2018</p> <p>7. Improve irrigation management by install two automated soil moisture stations in two fields. The stations will monitor soil moisture at 30 cm, 60 cm, and 90 cm depths below ground, as well as precipitation and air temperature. Installation by June 1, 2017, with regular monitoring of moisture data as needed throughout irrigation season. Data will be downloaded and will be included in the annual summary reports for two years.</p>
Details/Findings:	<p>Action Item 5 - Records were provided that show that monthly inspections of the manure storage and stormwater management systems are being conducted (GraceMar Farms June 30, 2017 Formal Summary Letter, dated June 30, 2017).</p> <p>Action Item 6 - A contingency plan in the event of a spill was developed and training was conducted on June 27, 2017. The contingency plan and a record of the training was submitted to ENV (GraceMar Farms June 30, 2017 Formal Summary Letter, dated June 30, 2017).</p> <p>Action Item 7 - Soil moisture monitors were installed in 101 Home Pivot field and 201 Reserve Pivot field to improve irrigation management (GraceMar Farms June 30, 2017 Formal Summary Letter, dated June 30, 2017). A record of irrigation applied is being maintained.</p>
Compliance:	In
Actions to be taken:	Continue to implement the Action Items and adhere to the schedule listed in the Action Plan.

Requirement Description:	<p>5: Upon approval by the Director, implement the Action Plan referred to in section 4 in accordance with any amendments to the Action Plan required or approved by the Director, or any further directions of the Director.</p> <p>5 (4.iii): ACTION PLAN - AGRONOMICALLY CORRECT NUTRIENT ADDITIONS</p> <p>8. continue to engage a Professional Agrologist to prepare an annual Nutrient Management Plan (NMP) based on current cropping information and soil test results. The definition of the NMP is per the March 1, 2017 amended Order. Grace-Mar Farms plans to improve irrigation efficiency. WT94334, on of two irrigation wells used by Grace-Mar Farms, was sampled as part of the EIA, and the nitrate-N concentration was 0.010, and total N was 0.552 mg/L. Based on this data, at least one irrigation well does not have nitrogen-laden water. Nevertheless, sample both irrigation wells and consider the concentration of nitrogen species in irrigation water when developing the NMP. Annually for two years. The NMP will be included in the annual reports.</p> <p>9. Base nutrient applications in manure and chemical fertilizer on recommendations in NMP as per the March 1, 2017 amended Order. Annually for two years. The NMP will be included in the annual reports.</p> <p>10. Do not apply any organic or inorganic fertilizer to FIELD 102 until fall residual nitrate levels decline to below the Ministry of Agriculture target levels (BC EFP Reference Guide). Alternatively, if the field is planted to corn in 2017, use the pre-side dress nitrate test (PSNT) to determine if additional nitrogen is required. Only apply manure or fertilizer if the PSNT indicates inadequate nitrogen to meet crop needs. Re-assess soil nitrate levels to 90 cm in fall 2017 to determine if the field is in balance. Fall 2017. The NMP will be included in the annual reports.</p> <p>11. Do not apply manure to annually copped land after September 1. Apply manure on perennial crops only from September 1 to October 31 as per BC EFP Reference Guide recommendations. Apply 50% or less of annual nitrogen requirements in manure on perennial crops in September and October. If this is not achievable, increase manure storage capacity or put more land into perennial crops. Records to be kept on application rates of nutrients and irrigation rates. Irrigation rates will be estimated by recording irrigation applications (length of application and field), and conversion to flow rates from nozzle size and measured pressure). Records to be included in annual summary report. Fall 2017. The NMP and irrigation rates will be included in the annual reports.</p>
Details/Findings:	<p>Action Item 8 - A Nutrient Management Plan was prepared by a Professional Agrologist (Ruth McDougall, MSc, PAg) (Grace-Mar Farms Ltd Nutrient Management Plan 2017, dated May 2017). The Nutrient Management Plan was based on the cropping information and soil test results. The Nutrient Management Plan considered the concentration of nitrogen species in the irrigation water. The Nutrient Management Plan was provided with the June 30 Annual Summary Letter.</p> <p>Action Item 9 - The Nutrient Management Plan recommended agronomically correct application rates for manure application and these rates were adhered to and records were maintained.</p> <p>Action Item 10 - No organic or inorganic fertilizer was applied to Field 102.</p> <p>Action Item 11 - No manure was applied to annually cropped land after September 1. Grace-Mar Farms Ltd. indicated that they intended to apply manure on perennial crops after September 1; however, AGRI suggested that they not do so in 2017.</p>
Compliance:	In
Actions to be taken:	Continue to implement the Action Items and adhere to the schedule listed in the Action Plan.

Requirement Description:	<p>5: Upon approval by the Director, implement the Action Plan referred to in section 4 in accordance with any amendments to the Action Plan required or approved by the Director, or any further directions of the Director.</p> <p>5 (4.iv): ACTION PLAN - MEASURES TO PREVENT MANURE APPLICATION IN SENSITIVE AREAS  12. Do not apply manure in these setback areas, as a minimum, as per the Order: 3.5 m from property boundaries; 3.5 m from the high-water mark of a watercourse; 3.5 m [from] any industrial wells; 30 m from any drinking water supply wells. On-going.</p>
Details/Findings:	Action Item 12 - No manure was applied within the setbacks listed in the Order.
Compliance:	In
Actions to be taken:	Continue to implement the Action Items and adhere to the schedule listed in the Action Plan.
Requirement Description:	<p>5: Upon approval by the Director, implement the Action Plan referred to in section 4 in accordance with any amendments to the Action Plan required or approved by the Director, or any further directions of the Director.</p> <p>5 (4.v): ACTION PLAN - MONITORING  13. Conduct post-harvest soil monitoring to 90 cm depth after final harvest on each field (part of nutrient management planning). Fall 2017 (within 2 weeks of final crop harvest)  14. Sample groundwater from MW1, MW2, MW3S, MW3D, WT94334, WT94335, WT48878, WT42426, AND Floyd's Swamp (Figure 3-2). Analyze for nitrate-N, nitrite-N, ammonia, TKN, total N, and chloride, low detection level phosphorus. March and November in 2017 and then re-assess frequency.  15. Install a pore water sampling lysimeter (drain gauge) below the root zone near MW3S in Field 101 (Figure 3-2). sample the water after recharge events (e.g. spring melt and, or heavy rainfall events) and analyse for nitrate-N, nitrite-N, ammonia-N, TKN, and total N. A minimum of three times in 2017 and then re-assess frequency.</p>

Details/Findings:	<p>Action Item 13 - Grace-Mar Farms Ltd. participated in the Post-Harvest Nitrate Testing to determine nitrogen levels in the soil after the crop harvest to allow adjustment in nutrient applications the following year.</p> <p>Action Item 14 - Groundwater samples were collected from MW1, MW2, MW3S, MW3D, WT94334, WT94335, WT48878, WT42426, and Floyd's Swamp and analyzed for nitrate-N, nitrate-N, ammonia, TKN, total nitrogen, chloride, and low detection level phosphorus on May 24, 2017 (Grace-Mar Farms Spring 2017 Water Sampling Results Ministry of Environment File No. 350101 - Action Plan Item #14, dated June 29, 2017). Grace-Mar Farms Ltd. indicated that the required November 2017 groundwater sampling was conducted on November 14 and 15, 2017.</p> <p>Action Item 15 - A porewater sampling lysimeter was installed near MW3S in Field 101 in June 2017. Grace-Mar Farms Ltd. indicated that it has not been possible to collect any samples yet because a sufficient volume of porewater has not been available for sampling. A significant rain event did occur on November 14, 2017; however, sufficient porewater is still not available. Grace-Mar Farms Ltd. indicated that they intend to sample when additional precipitation events occur and sufficient porewater is available for sampling.</p>
Compliance:	In
Actions to be taken:	Continue to implement the Action Items and adhere to the schedule listed in the Action Plan.

The final version of the Action Plan was submitted on April 7, 2017 (Grace-Mar Farms Ltd. Action Plan: AMS#35010 (UA Hullcar Aquifer), dated March 2017). The Action Plan listed 15 Action Items. An amendment to the Action Plan modifying Action Item 14 was approved on May 23, 2017 (Ministry of Environment Amendment of the Action Plan for Grace-Mar Farm Ltd. pursuant to Pollution Abatement Order #108389, dated May 23, 2017).

Compliance History:

- 2017-07-18 IR59938 - Warning
- 2017-03-29 IR51040 - Administrative Monetary Penalty Referral
- 2017-03-13 IR48771 - Investigation Referral
- 2016-02-10 IR25608 - Warning

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

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

Yours truly,

Colin Meldrum  
Environmental Protection Officer

cc:

**Attachments:**

**Deliver via:**  
Email:  Fax:  Mail:   
Registered Mail:  Hand Delivery:

**Ministry of Environment  
and Climate Change  
Strategy**

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It is also important to note that this inspection record does not necessarily reflect each requirement or condition of the authorization therefore compliance is noted only for the requirements or conditions listed in the inspection record.