

**Agri-Mark, Inc. d.b.a. Cabot Creamery  
Polished Permeate Spray Disposal System  
2019 Annual Inspection Report  
Indirect Discharge Permit # 9-0043**

**May 2019**

**Prepared for:**

**AGRI-MARK, INC. d.b.a. CABOT CREAMERY**

193 Home Farm Way  
Waitsfield, VT 05673

**Prepared by:**

**vhb**

100 State Street  
Montpelier, Vermont 05602



May 3, 2019

Mr. Bryan Harrington  
Indirect Discharge Section  
Drinking Water and Groundwater Protection Division  
1 National Life Drive, Main 2  
Montpelier, VT 05620-3521

Re: Agri-Mark, Inc. d.b.a. Cabot Creamery, Indirect Discharge Permit # 9-0043  
2019 Annual Inspection of Spray System  
vhb # 58312


Dear Mr. Harrington:

As required by Part I, Condition D5 (A) of the referenced permit we submit herewith the engineer's annual inspection report on behalf of Agri-Mark, Inc. The inspection was conducted on April 25 with Aaron Paige of Agri-Mark.

The spray disposal system is generally in good condition and is being well maintained. Should have any questions please feel free to contact me.

Sincerely,

THE JOHNSON COMPANY, INC.

By:   
Joel Behrsing, P.E.  
Senior Engineer

cc: Aaron Page; Agri-Mark, Inc. d.b.a. Cabot Creamery (via e-mail)

TABLE OF CONTENTS

1.0 INTRODUCTION ..... 1  
2.0 POLISHED PERMEATE SPRAY DISPOSAL SYSTEM DESCRIPTION ..... 1  
3.0 2019 ANNUAL INSPECTION ..... 1  
    3.1 POLISHED PERMEATE TRANSFER SYSTEM..... 1  
    3.2 POLISHED PERMEATE STORAGE LAGOONS..... 2  
    3.3 SPRAY IRRIGATION DISPOSAL SYSTEM..... 2  
4.0 RECOMMENDATIONS..... 3

## **1.0 INTRODUCTION**

Agri-Mark, Inc. (dba Cabot Creamery) land-applies dairy processing wastewater and washwater under the jurisdiction of the Indirect Discharge Rules in accord with Indirect Discharge Permit #9-0043. Part I of the permit contains conditions specific to the polished permeate spray disposal system. Condition D5 (A) of Part I requires that the spray disposal system be inspected annually during April by a Vermont Registered Professional Engineer and a report on the findings be submitted by July 1<sup>st</sup>.

On April 25, 2019, Joel Behrsing, P.E. of vhb (formerly the Johnson Company) performed the spray disposal system inspection. Mr. Behrsing was accompanied during the inspection by Mr. Aaron Page of Agri-Mark's Cabot Creamery. The system was found to be in good overall condition.

## **2.0 POLISHED PERMEATE SPRAY DISPOSAL SYSTEM DESCRIPTION**

The polished permeate is generated by a two-step reverse osmosis treatment of process wastewater. The polished permeate is transferred to one of three earthen storage lagoons. Polished permeate is also utilized for boiler make-up water and in the first step of the CIP (clean-in-place) process. A self-priming centrifugal pump draws from the lowest lagoon and pumps to a spray field valve pit. The three valves in the pit control flow to three different sets of spray-heads located in two spray-fields.

## **3.0 2019 ANNUAL INSPECTION**

The following report is presented in the order of the system process, i.e., beginning at the facility and ending at the spray fields.

### **3.1 POLISHED PERMEATE TRANSFER SYSTEM**

The polished permeate is either directed to one of two 30,000-gallon stainless steel vertical tanks (identified by Cabot as Silos #13 and #14) inside the facility or it is directed to the centrifugal transfer pump. The flow meter for the transfer pump was tested and calibrated in-place by manufacturers' technicians. Documentation of the calibration is attached.

An air/vacuum release valve on the transfer force main is housed in a concrete manhole with a cast iron cover. The manhole is in good condition. The valve, as observed from above, appears to be in good condition. The manhole appears to be set on free draining crushed stone and no standing water was observed. The manhole placard “Confined Space-Entry by Permit Only” was adjacent to the manhole.

The force main terminates at a concrete surge tank next to the lagoon valve pit. The surge tank riser was placarded with “Confined Space-Entry by Permit Only”. The surge tank discharges to the valve pit and has a vented overflow pipe that discharges to lagoon #1. The concrete valve pit and aluminum hatch are in good condition. Groundwater (2”-3" deep) covers the bottom of the valve pit to the elevation of the drain invert. The valves are labeled with plastic tags corresponding to the lagoon number that they discharge to. The valve pit was placarded with the warning “Confined Space-Entry by Permit Only”.

### **3.2 POLISHED PERMEATE STORAGE LAGOONS**

The polished permeate is stored in three earthen lagoons, with a reported combined capacity of approximately 6.1 million gallons. Staff gauges were in place in each lagoon. Monitor wells around the lagoons are enclosed in protective steel casings.

The force main drain valve at lagoon #3 appear in good condition. To facilitate testing of the spray system, the drain valve was not operated. No seeps were noted on the lagoon #3 exterior embankments. The embankment below the area was inspected and no seeps or other signs of piping were observed. Lagoon #2 is in good condition. Brush has been removed from the interior and exterior embankment. No seeps were noted on the lagoon #2 exterior embankments. Lagoon #1 also appears in good condition. No seeps were noted on the lagoon #1 exterior embankments.

### **3.3 SPRAY IRRIGATION DISPOSAL SYSTEM**

A wood frame pump house at the northwest corner of lagoon #3 houses the spray irrigation pump and appurtenances. The self-priming centrifugal pump draws the polished permeate from lagoon #3 through a suction hose with a screened end. The 50 HP pump was

recently rebuilt, including new belts, seals, shaft, bearings, and impeller. A surge relief valve, check valve and isolation gate valve are employed in the pump discharge piping. A leak from the check valve was noted. An electromagnetic type flow meter monitors the pump discharge rate and total gallons. This flow-meter was tested and calibrated in-place on April 22, 2019. Documentation of the calibration is attached.

The spray system force main terminates at the spray field valve pit. The valve pit is concrete with a weatherproof cover. The cover has been replaced. Downhill from the valve pit is the spray field drain valve which is in good condition. Each lateral of the spray field was walked. The spray fields have been mowed, are well vegetated and no erosion was noted. Some shallow ruts were noted uphill from the valve pit from vehicle travel associated with replacing the valve pit cover.

The spray disposal system was operated to inspect the spray heads. During the inspection it was observed that all sprinkler heads were in place (except for one in Field #1 A1) and all were operating properly except for sprinkler heads with poor or no spray patterns (Field #1 A4, B5 and C6; Field #2 A7 and B9; and Field #3 B2 on attached Figure 1).

#### **4.0 RECOMMENDATIONS**

1. Continue mowing and brush cutting activities on the storage lagoons and spray fields
2. Continue to maintain an operation log book for the spray irrigation pump system.
3. Install, replace or clean spray heads as needed for proper operation. Periodically observe the spray heads in operation and clean those noted to be improperly functioning.
4. Continue to cut back brush and trim trees around the spray fields.
5. Annually exercise the valves in spray field valve pit.
6. Replace or repair the leaking check valve at the spray system pump.

# SIEMENS MAGFLO® Verification Certificate

<b>Customer:</b>		<b>MAGFLO® Identification:</b>	
Name	<u>Cabot</u>	TAG No./Name	<u>0</u>
Address	<u></u>	Sensor Code No.	<u>7ME631</u>
	<u></u>	Sensor Serial No.	<u>544640H053</u>
	<u></u>	Transmitter Code No.	<u>7ME692</u>
Phone	<u></u>	Transmitter Serial No.	<u>133530U411</u>
Email	<u></u>	Location	<u></u>

<b>Results:</b>	<b>Verification file name or No.</b>	<b>File #7</b>
	<b>Transmitter</b>	<u>Passed</u>
	<b>Sensor Insulation</b>	<u>Passed</u>
	<b>Magnetic Circuit</b>	<u>Passed</u>

Velocity	Current Output			Frequency Output		
	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.806mA	0.75%	0.500kHz	0.499kHz	-0.23%
1.0m/s	5.600mA	5.609mA	0.58%	1.000kHz	1.001kHz	0.06%
3.0m/s	8.800mA	8.819mA	0.39%	3.000kHz	3.006kHz	0.21%

Current Output 4-20mA                      Frequency Output 0-10kHz

<b>Transmitter Settings:</b>		
<b>Basic</b>	Qmax.	<u>250.000 US G /min</u>
	Flow Direction	<u>Positive</u>
	Low flow Cut-off	<u>1.50%</u>
	Empty Pipe	<u>OFF</u>
<b>Output</b>	Current Output	<u>ON (4-20mA)</u>
	Time Constant	<u>5.0 Sec.</u>
	Relay Output	<u>Error Level</u>
	Digital Output	<u>OFF</u>
	Frequency Range	<u>N/A</u>
	Time Constant	<u>N/A</u>
	Volume/pulse	<u>0.0 US G/p</u>
	Pulse width	<u>0.066 sec.</u>
	Pulse polarity	<u>Positiv</u>
	Totalizer 1 value before test	<u>15276298.95606389 US G</u>
	Totalizer 1 value after test	<u>15276305.14759637 US G</u>
	Totalizer 2 value before test	<u>504258.17315719 US G</u>
	Totalizer 2 value after test	<u>504258.20540467 US G</u>
	Operating time in days	<u>2216</u>

<b>Sensor Details: Permeate to Ponds</b>	
Size	<u>DN 100 4 IN</u>
Cal. Factor	<u>8.31173897</u>
Correction Factor	<u>1.0</u>
Excitation Freq.	<u>6.25Hz</u>

<b>Vericator Details (083F5061)</b>	
Serial No.	<u>000714N089</u>
Device No.	<u>94135</u>
Software Version	<u>1.40</u>
PC-Software Version	<u>5.01</u>
Cal. date	<u>2018.12.17</u>
ReCal. date	<u>2019.12.17</u>

<b>Comments</b>

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters. Verification is traceable to National and International Standards.

Date and signature

2019.04.25

MPL

