STATEMENT OF BASIS

GROUND WATER DISCHARGE PERMIT UGW010002

Mango II-Milford, LLC. – Skyline Complex Farms
Milford, Utah

January 2026

Introduction

The Division of Water Quality ("Division") under the authority of the Utah Ground Water Quality Protection Rules[1] (Ground Water Rules) issues ground water discharge permits to facilities that have the potential to discharge contaminants to ground water[2]. As defined by the Ground Water Rules, such facilities include agricultural operations.[3] The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Utah Administrative Code (Utah Admin. Code) R317-6-6(6.4)(A) are met.[4] Following this strategy, ground water is divided into classes based on its quality[5]; and higher-quality ground water is given greater protection[6] due to the greater potential for beneficial uses.

Under Utah Admin. Code R317-6, Mango II-Milford, LLC ("Mango II") has requested a renewal of the Ground Water Discharge Permit ("Permit") for the Skyline Farm Complex. The Division has developed permit conditions consistent with Utah Admin. Code R317-6 and appropriate to the nature of the operations, maintenance, best available technology[7] (BAT), and the hydrogeologic and climatic conditions of the site, to ensure that the operation will not contaminate ground water.

Basis for Permit Renewal

This Permit is being renewed in accordance with Utah Admin. Code R317-6-6(6.7). However, a permit may be terminated or a renewal denied if any one of the four items in Utah Admin. Code R317-6-6(6.8) applies:

A. Noncompliance by the permittee with any condition of the Permit where the permittee has failed to take appropriate action in a timely manner to remedy the Permit violation;

B. The permittee's failure in the application or during the Permit approval process to fully disclose all significant relevant facts at any time;

C. A determination that the permitted facility endangers human health or the environment and can only be regulated to acceptable levels by plan modification or termination; or

D. The permittee requests termination of the Permit.

[1] Utah Admin. Code R317-6
[2] https://lf-public.deq.utah.gov/WebLink/ElectronicFile.aspx?docid=618204%20&eqdocs=DWQ-2006-004002
[3] Utah Admin. Code R317-6-6(6.1)(A)
[4] Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August 1989
[5] Utah Admin. Code R317-6-6(3)
[6] Utah Admin. Code R317-6-6(4)
[7] Utah Admin. Code R317-6-6(1.3)

Purpose

The Division is renewing Mango II's Permit for the Skyline Farm Complex (UGW010002) for a five-year term. Mango II operates swine production facilities in Beaver County, southwest of Milford, Utah. Manure from each of the swine production facilities is drained into an associated anaerobic lagoon system for treatment and storage. The lagoon systems at the farm sites consist of one primary lagoon and one containment basin for evaporation. The primary lagoons and the containment basins are each compacted to at least 90 percent of maximum dry density and lined with a 40-mil high-density polyethylene (HDPE) flexible membrane liner (FML), or for 10 lagoons, clay. Table 1 below provides a summary of the permitted facilities associated with the Skyline Farm Complex.

Table 1: Summary of Facilities for the Mango II Ground Water Discharge Permit

Permit No.	Complex/County	Facility Type	Farm Nos.	Total Farm Sites
UGW010002	Skyline/Beaver	Sow Farms Nursery Farms Finisher Farms Boar Stud Facility	41101- 41108 41201- 41210 41301- 41323 49170	42

Hydrogeology

The Milford basin is located in southwestern Utah and encompasses a 3,004 km^2 area within the Basin and Range physiographic province. The mountain ranges adjacent to the basin, bounded by normal faults, have large coalescing alluvial fans extending into the valley. The principal water-yielding aquifer is a basin-fill aquifer. Sediments that make up the basin-fill aquifer are of late Tertiary to Quaternary age and consist of multiple discontinuous layers of silt, sand, and gravel separated by less permeable layers of clay and silt. The basin-fill deposits are at least 270 meters thick in the basin center and thin toward the margins (Van der Hoven, 2001).

Ground Water Quality

Ground Water Class and Protection Levels Based on ground water quality data from historical site-specific monitoring wells, the ground water quality beneath farm sites ranges from Class 1A Pristine Ground Water to Class IV saline Ground Water. Compliance limits for each farm site are summarized in Appendix A of Permit UGW010002.

As required in Part I.E.5.c of the Permit, a background monitoring program has been completed by the Permittee to collect data for calculating well-specific background ground water quality statistics. This includes background ground water concentrations for total dissolved solids, chloride, bicarbonate, nitrate + nitrite as nitrogen, and pH, all of which have been defined for the purposes of determining the applicable Ground Water Protection Levels. Most wells have more than a 10-year monitoring history. The Division evaluated Ground Water Protection Levels for all farms as part of the permit renewal process.

Class I Protection Levels. In accordance with Utah Admin. Code R317-6-6(4.2), Class I ground water will be protected to the extent feasible from degradation due to facilities that discharge or would probably discharge to ground water. Class I protection levels are established in accordance with Utah Admin. Code R317-6-6(4.2)(B).

Class II Protection Levels. In accordance with Utah Admin. Code R317-6-6(4.5), Class II ground water will be protected for use as drinking water or other similar beneficial use with conventional treatment prior to use. Class II protection levels are established in accordance with the criteria in Utah Admin. Code R317-6-6(4.5)(B).

Class III Protection Levels. In accordance with Utah Admin. Code R317-6-4.6, Class III ground water will be protected as a potential source of drinking water after substantial treatment, and as a source of water for industry and agriculture. Class III protection levels are established in accordance with the criteria in Utah Admin. Code R317-6-4.6B.

Class IV Protection Levels. In accordance with Utah Admin. Code R317-6-4.5, protection levels for Class IV ground water will be established to protect human health and the environment.

Long-term ground water elevation monitoring indicates a steady decline in the water table elevation over the last several years. Some monitoring wells with less water available in their screened interval may purge to dry conditions, which can affect the quality of the water sample. The Permittee is currently assessing the overall ground water conditions and any potential changes that may be needed to the ground water monitoring network to ensure adequate coverage.

Compliance Monitoring Program

A ground water monitoring well system has been installed at each of the lagoon systems to establish the ground water gradient at each farm site and to monitor the ground water quality both upgradient and downgradient in the uppermost water-bearing zone under the lagoons. Ground water is sampled and analyzed semi-annually for the term of the Permit. The following key leakage parameters were selected for compliance monitoring based on their high concentrations in the process water compared to concentrations in shallow ground water:

- Bicarbonate
- Nitrate+ nitrite as N
- Chloride
- Total Dissolved Solids

Field parameters collected for each ground water sampling event include pH, specific conductance, and temperature. This list of ground water monitoring parameters may be updated in the most recently revised and approved version of the Mango II *Sampling and Analysis Plan* .

Regulatory decisions made as a result of ground water monitoring must consider the background variability of ground water quality at the sites. Mango II will not be required to take corrective action if it can be verified that changes in ground water quality are a result of other factors not related to their operations.

Best Available Technology (BAT)

The administration of this Permit is founded on the use of best available treatment technology, in accordance with the requirements of Utah Admin. Code R317-6-6(1.3).

These farm sites each have at least one primary lagoon and a containment basin for evaporation. Primary lagoons and containment basins are compacted to a minimum of 90 percent maximum dry density (ASTM D698) and lined with a 40-mil synthetic high-density polyethylene (HDPE) FML. The coefficient of permeability for 40-mil HDPE is 2.7×10^{-13} cm/sec (Haxo and Lahey, 1988). The constructed depth and maximum operating depth of the primary and containment basins at each farm site are included in the construction permits and construction permit applications.

The lagoon system is sized to accept up to 1.8 cubic feet of volume per live animal weight (LAW) in the primary lagoon for sow, finisher, and boar stud farms (2.3 cubic feet for nursery farms) and provide enough

surface area for evaporation of water in the containment basin. The primary lagoons at each farm site are designed to operate as anaerobic waste treatment lagoons in which liquid and solid swine waste flushed from the pits under the animal containment barns is digested primarily by anaerobic bacteria in the treatment volume of the lagoon and sludge accumulates in the underlying sludge volume. These design specifications require the establishment and maintenance of a properly balanced bacterial population, which is realized through the proper operation, and management of the anaerobic lagoons. Proper operation and management of anaerobic lagoons will also optimize volatile solids digestion and prevent excessive sludge build up extending the effective life of the lagoon before sludge removal is required. Only wastes from the hog-raising operations may be treated in the lagoons. The design, operational, and contingency requirements detailed above represent Best Available Technology since the implementation of these requirements is expected to be protective of ground water resources in the area surrounding the facility.

Currently Mango II has 20 farm sites in operation for this permit, and each site has at least one primary lagoon where manure solids are collected. It may be necessary to remove accumulated solids from the bottom of each primary lagoon at the farm sites so that treatment zones are maintained. Sludge storage volume is engineered for approximately 20 years of accumulation. Sludge accumulation is measured and reported. Mango II has implemented a program to remove the solids from the lagoons and dry the manure on a drying pad constructed near the lagoon. The manure is a nutrient source, and the drying of the manure will allow the nutrients to be sold and applied to local cropland at agronomic rates. Drying pad construction will follow the engineering design approved by a licensed Professional Engineer with the Division.

Potential Impacts to Ground Water

Leakage from liners can cause degradation of the ground water at the permitted sites. Potential impacts to ground water can be minimized by employing best available technology and discharge minimization technology for the lagoons. BAT performance monitoring, treatment technology, and compliance monitoring wells are used to ensure that the facility is operated in accordance with design specifications and will also ensure that any early indications of facility problems will be detected.

Liner replacements in the primary lagoon have been made at farms 41108, 41317, 41319, and 41320; these lagoons previously had clay liners. Based on hydrogeological tests to determine the rate of groundwater velocity in the Skyline area, improvements in ground water quality measured at downgradient monitoring wells require several years following repairs. These farms are considered compliant even though a monitoring well may have analytical results exceeding a compliance limit for that farm. Statistical trend analyses are used for an appropriate period of time that allows for a natural decrease in elevated target parameters. If no decrease is observed, further Corrective Action may be warranted.

A Source Assessment investigation has been completed at farm 41108, and farm 41319. Monitoring parameter trends are required at these farms during the permit term. If further degradation of ground water from probable failure of BAT is observed, additional source assessment or corrective action may be required.

Major Permit Changes

1. Major ion sampling was included in previous permit cycles to better characterize the concentrations of sulfate, sodium, potassium, magnesium, and calcium at the Blue Mountain Farm Complex. This additional sampling requirement has been removed from the current Permit, as sufficient background data has now been collected.

2. The Permittee is now required to calculate and report the hydraulic gradient and direction for each farm system that contains a confirmed out-of-compliance upgradient monitoring well covered

under this Permit. Hydraulic gradient and flow direction will be provided in each semi-annual monitoring report as necessary.

Compliance Schedule

1. *Source Assessment and Contamination Studies* – Mango II has submitted *Source and Contamination Study* plans for out-of-compliance monitoring wells at the Skyline Farm Complex. These plans address the following Farm Systems and downgradient monitoring wells that have exceeded Ground Water Protection Levels for consecutive sampling events:

    a) Farm System 41103: downgradient monitoring well 41103MD5 has exceeded its ground water protection level for chloride and Total Dissolved Solids (TDS) for consecutive sampling events.

    b) Farm System 41108: downgradient monitoring well 41108MD2 has exceeded its ground water protection level for chloride, TDS, and bicarbonate for consecutive sampling events. Downgradient Monitoring well 411808 MD3 has exceeded its ground water protection level for chloride and TDS for consecutive sampling events.

    c) Farm System 41206: downgradient monitoring well 41206MD2 exceeded its ground water protection level for chloride and TDS for consecutive sampling events.

    d) Farm System 41301: downgradient monitoring well 41301MD3 exceeded its ground water protection level for nitrate + nitrite for consecutive sampling events.

    e) Farm System 41308: downgradient monitoring well 41308MD3 exceeded its ground water protection level for TDS for consecutive sampling events.

    f) Farm System 41313: downgradient monitoring well 41313MD3 exceeded its ground water protection level for chloride and TDS for consecutive sampling events.

    g) Farm System 41316: downgradient monitoring well 41316MD exceeded its ground water protection level for nitrate + nitrite for consecutive sampling events.

    h) Farm System 41317: downgradient monitoring well 41317MD2 exceeded its ground water protection level for nitrate + nitrite, chloride, TDS, and bicarbonate consecutive sampling events. Additionally, downgradient monitoring well 41317MD3 exceeded its ground water protection level for chloride and TDS for consecutive sampling events.

    i) Farm System 41320: downgradient monitoring well 41320MD5 exceeded its ground water protection level for nitrate + nitrite and TDS consecutive sampling events.

    j) Farm System 49170: downgradient monitoring well 49170MD3 exceeded its ground water protection level for nitrate + nitrite and chloride for consecutive sampling events.

Mango II is required to complete the approved *Source Assessment and Contamination Study* plan for each out-of-compliance Farm System according to the agreed upon schedule.

Permit Appendix Documents

Applicable Mango II appendix documents for this permit include:

APPENDIX A	Farm and Monitoring Well Protection Level Summary
APPENDIX B	Monitoring Well Locations
APPENDIX C	Construction Details for Primary and Secondary Lagoons
APPENDIX D	Sampling and Analysis Plan
APPENDIX E	Anaerobic Lagoon Systems Operation and Maintenance Manual
APPENDIX F	Spill Prevention and Response Manual
APPENDIX G	Sludge Disposal and Farm Closure Plan
APPENDIX H	Nutrient Management Plan for Land Application

References:

ASAE, 1999. American National Standards Institute/American Society of Agricultural Engineers (ANSI/ASAE) Engineering Practice EP403.3 Jul99, *Design of Anaerobic Lagoons for Animal Waste Management* pp 6. Retrieved on January 30, 2019 from http://agrienvarchive.ca/bioenergy/download/anaerobic_lagoons_asae_ep403.3.pdf

ASAE, 2012. American National Standards Institute/American Society of Agricultural Engineers (ANSI/ASAE) Engineering Practice EP379.5 APR2012, *Management of Manure Odors* pp 7. Retrieved on January 30, 2019, from https://elibrary.asabe.org/azdez.asp?JID=2&AID=41359&CID=s2000&T=2

Haxo, H.E., and Lahey, T.P., 1988. Transport of Dissolved Organics from Dilute Aqueous Solutions Through Flexible Membrane Liners, Hazardous Waste and Hazardous Materials, 1988, 5, 275-294.

Miller, R. and Major, J., 2013. Lagoon Startup and Maintenance for Optimal Livestock Waste Treatment. Utah State Cooperative Extension: Logan, UT. Retrieved on January 30, 2019, from https://extension.usu.edu/agwastemanagement/ou-files/pdfs/Lagoon_Startup_and_Maintenance_2013.pdf

NRCS, 2009. Chapter 13 Operation, Maintenance, and Safety In L. Owens, S. Self, W. Pierce (Eds.), *Part 651 Agricultural Waste Management Field Handbook* (p. 57). Washington D.C.. Retrieved on January 30, 2019, from https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch13.pdf

Van der Hoven, S.J. 2001. Determination of Groundwater Transport Rates, Annual Recharge, and Sources of Microbial Contamination in the Milford Basin, Utah. Department of Geography-Geology, Illinois State University