DESCRIPTION OF FACILITY AND BACKGROUND INFORMATION

Elberta Valley Ag operates a dairy and wastewater treatment facility in Utah County, Utah. Elberta Valley Ag is situated on approximately 160 acres located 1 mile south of Elberta, Utah, in Section 20, T10S, R1W, and SLBM. As defined by Utah Administrative Code R317-6, a CAFO (concentrated animal feeding operation) dairy uses liquid waste handling systems and has more than the following numbers of confined animals: 1,500 slaughter and feeder cattle; or 1,050 mature dairy cattle, whether milked or dry cows. The dairy design maximum is 5,000 dairy cows. Dairy cows are milked three times a day using machine milkers. Milk is produced and transported off of the site for pasteurization and distribution. Raw materials consumed at the site include animal feed and water.

The cows are housed in covered barns with alleyways that are periodically flushed with water. The wastewater from cleaning the alleyways runs through a separator where the solids are removed. The liquid waste is placed in an aerated treatment pond. Manure is a by-product of the dairy operations and the solids are stored in a composting area for use as fertilizer.

The existing dairy started in 1978 as the Butler Stake Welfare Farm and initially had 200 dairy cows. From 1980 to 1993, liquid waste from the dairy was managed using two unlined ponds. In 1993, the dairy expanded to 700 dairy cows and the name was changed to Elberta Dairy. The two wastewater ponds were excavated and converted to a single pond, and two additional ponds were constructed. All three ponds were lined with polypropylene vinyl lining and have a combined storage capacity of 3.9 million gallons.

The current treatment lagoon system consists of five cells. When full, the five cells can contain up to 76.08 million gallons of partially treated “red” water mixed with manure from flushing free stall barns. The daily discharge volume from the treatment pond varies depending on the number of cows milking. Discharge wastewater from treatment pond cells is used for land application. A Comprehensive Nutrient Management Plan (CNMP) has been developed to minimize impact to ground water from farm operations by applying wastewater at the appropriate agronomic uptake rate.

SITE HYDROGEOLOGY

The dairy site is located in the Goshen Valley, with the East Tintic Mountains on the west and Long Ridge on the east. Goshen Valley is situated within the hydrologic Great Basin, referring to that portion of the Basin and Range Province with no hydraulic drainage to the sea. Sources of surface recharge include streams, irrigation canals, irrigation, precipitation, and ephemeral
runoff. Aquifer recharge in the Goshen valley is primarily from subsurface inflow from the consolidated rock of the surrounding mountains. Water Resources Investigation Report 93-4221 (USGS 1994, plate 5) indicates that the Elberta Valley Ag facility is in an aquifer recharge area that eventually discharges to Utah Lake. In this area of the valley, the vertical hydraulic gradient is downward and there are no confining layers to prevent shallow contamination from reaching the principal aquifer.

Ground water occurs under confined and unconfined conditions and generally moves from the recharge areas of the mountain fronts towards the Utah Lake discharge area. South of Elberta, a ground water depression in the unconfined aquifer level has been created by pumping approximately 5,500 acre-ft of ground water per year for agricultural uses.

Surface geologic mapping in the site area shows three Quaternary formations are present: alluvial deposits, Provo Formation, and lake bottom sediments. The finer grained lake bottom sediments are typically clays, silts, and sands. Subsurface sediments observed during drilling and installation of three site monitoring wells were predominantly sands, with a 20 to 30 foot thick section of silty clays near the ground surface.

WATER QUALITY AND GROUND WATER CLASSIFICATION

The Goshen Valley has a history of impacts that have affected ground water quality now measured in valley water supply wells. Seepage from irrigation canals, fertilized and irrigated land, and evaporation ponds have contributed to diminished ground water quality. Waters from the Burgin Mine in the East Tintic Mountains were transported 2 miles in a ditch system to evaporation ponds a mile northeast of the dairy in the 1960s. Background water quality is based on historical data from area irrigation water supply wells prior to original permit issuance and subsequent accelerated sampling of new compliance wells at the dairy. Water supply wells are screened over larger intervals of the basin aquifer(s) and are not always representative of the shallow aquifer. In the general area surrounding Elberta Valley Ag, ground water in the unconfined aquifer underlying the site and beyond is Class III Limited Use Ground Water. Although the total dissolved solids (TDS) concentrations in area wells are less than 3,000 mg/L (Class II), concentrations of contaminants such as nitrate and sulfate in excess of Utah Ground Water Quality Standards precludes its use as drinking water without substantial treatment and therefore make it a Class III ground water. Deeper aquifers are Class II Drinking Water Quality Ground Water.

The network of compliance monitoring wells shall provide the ability to detect contamination in the shallow aquifer from the permitted facility. The compliance monitoring wells are screened in the shallow aquifer near the treatment ponds. Under the provisions of this permit, ground water contamination in the shallow aquifer would be a reason for the Permittee to take remedial action before deeper aquifers are affected. The dairy has installed three monitoring wells at the site to determine groundwater flow direction in the shallow aquifer. Following well development and water level measurements, it is determined that MW-1 is down gradient of the treatment pond cells, MW-3 is up gradient of the treatment pond cells, and MW-2 is cross-gradient and is not in an optimal location to detect seepage from the newer treatment pond cells. MW-2 will be used
to monitor the older dairy wastewater ponds. The Executive Secretary may require the Permittee to drill additional down gradient wells if MW-2 well location is determined to be ineffective.

At the dairy, monitoring wells have elevated levels of nitrate and Total Dissolved Solids (TDS). Levels of Total Nitrate/Nitrite (as N) 14 to 34 times higher than the Utah Ground Water Quality Standard of 10 mg/L have been detected in wells MW-2 and MW-3. Total Dissolved Solids in these wells are 3 to 5 times higher than the best water quality found in MW-1. These are the highest reported levels of nitrate found in the area. MW-3 is the up gradient well for the facility at this time, but ground water quality has been affected by historical operations of the Elberta Dairy. This well may not represent true background water conditions for the discharge permit. Down gradient well MW-1 is farthest away from existing operations that may have affected ground water and has the best water quality of all the three monitoring wells at the farm site. Because of existing impacts from the old dairy operations, this permit requires that the expanded dairy not cause any further degradation of aquifer quality beyond that existing at time of permit issuance. Corrective action to improve the localized excessive levels of TDS and nitrate in ground water may be required.

BASIS OF PERMIT ISSUANCE

The administration of the permit, to assure compliance with ground water protection regulations, is founded on the use of periodic monitoring well sampling to assess potential impacts to ground water quality from the treatment pond discharges. The determination of impacts from past and present day releases to ground water is a major concern for ground water management. Elberta Valley Ag has proposed to continue controlled land application of wastewater, and evaporation as approaches to reduce impacts to ground water. The Comprehensive Nutrient Management Plan is used to regulate discharge wastewater to agricultural fields at appropriate agronomic rates.

BASIS FOR SPECIFIC PERMIT CONDITIONS

Wastewater Application - Land application of Elberta Valley Ag wastewater will conform to the proper application rates and procedures outlined in the Comprehensive Nutrient Management Plan. This plan is Appendix A of the permit.

Ground Water Monitoring - The enforceable performance standard for this permit to achieve protection of ground water quality will be monitoring of ground water quality parameters listed in Table 1 of the permit. The minimum frequency of reporting will be semi-annually. Elberta Valley Ag will prepare and submit a Sampling and Analysis Plan. This plan, upon approval by the Executive Secretary, will become Appendix B of the permit. Compliance samples will be analyzed for contaminants found in dairy wastewater, including: nitrate+nitrite, chloride, and other parameters listed in Permit Table 1.

Operations and Maintenance - Elberta Valley Ag has an Owners and Operations Manual that describes inspection, maintenance, and operating procedures for treatment ponds, wastewater handling, and features not permitted-by-rule. This plan is Appendix C of the permit.
CORRECTIVE ACTION CLEAN UP

Utah Administrative Code (R317-6-6.15) requires applicants to submit a Contamination Investigation and Corrective Action Plan or other response measures to be taken to remedy any violation of ground water quality standards resulting from discharges occurring prior to issuance of a ground water discharge permit. Should future data indicate that ground water cleanup is needed, the permit has a compliance condition that allows the Executive Secretary to call for a Contamination Investigation and Corrective Action Plan to be submitted and made a part of this permit.