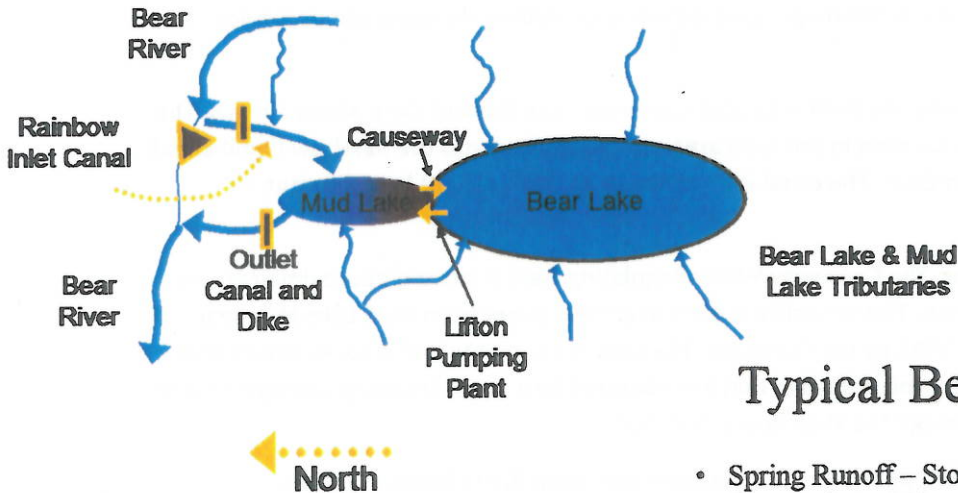


## LIFTON FACT SHEET

- Constructed in the 1909-1918 period.
- Primary purposes are irrigation and flood control; power is an incidental purpose
- Stewart Dam is a concrete and steel structure that is 200' long and 75' wide with 6 radial gates that are 25' wide and 16' high.
- Rainbow Dam is a concrete and steel structure that is 100' long, 42' wide and 15' high supported on pilings. There are 5 regulating bays with stop logs and two bays with electric motor operated slide gates.
- The Rainbow Inlet Canal is 150' wide and 22,300' (4.2 mi) long. Maximum historical flow capacity is 4,700 cfs.
- The Causeway Water Regulating Dam is a concrete and steel structure that is 57' long and 24' wide. There are 5 concrete gates that are operated by a single traveling carriage electric hoist.
- The Outlet Canal is 150' wide and 74,615' (14 mi) long. Historical maximum flow capacity is 3,080 cfs.
- Outlet Water Regulating Dam (Paris Dike) is a concrete and steel structure that is 89' long and 30' wide. There are 7 concrete gates that are operated with 7 individual electric motors. Maximum capacity through the structure is 5,000 cfs. (It was rebuilt in 1996.)
- Lifton Pump Station houses 5 electric pumps each rated at 750 hp with maximum total flow capacity of about 1,600 cfs. The pumps have recently been upgraded. Units 1 and 5 received new impellers and Units 2, 3 and 4 have been rehabilitated. The cost to date is \$5.8 million dollars.
- Maximum one-year elevation gain of Bear Lake was 11.5 feet was in 2011.
- Low elevation of Bear Lake is 5902.0 feet (reached in 1935); maximum is 5923.65 feet (reached multiple times, most recent near-full was in 1986 at 5923.61 feet).



## Typical Bear Lake Operations

- Spring Runoff – Store all water possible
- Late Spring – When downstream demand exceeds reach gain below (dry) Outlet Canal, stop putting water on Bear Lake and allow Bear River inflow from upstream to pass downstream. Typically passed through Mud Lake and not past Stewart Dam
- Summer – Pump Bear Lake storage water
- July 1 – West Fork Canal prairie right ends, small increase in Rainbow Canal flow
- Fall – evaluate need to evacuate flood control storage
- Winter – store or release for flood control. Releases must be steady and unchanging due to downstream icing concerns.



## LIFTON

The Lifton Complex is located 4 miles east of St. Charles, Idaho, on the north shore of Bear Lake. The complex consists of several water regulating structures, water conveyance canals and the Lifton Pump Station. These facilities were constructed in the 1909-1918 period. All of these facilities are owned and operated by the Company. The purpose of these facilities is to divert water from above Bear Lake and store it in Bear Lake during the winter and spring runoff periods, then release it from Bear Lake to meet downstream irrigation contractual requirements when required by the irrigators. The system is also managed to meet flood control requirements below Bear Lake.

**Stewart Dam:** The Stewart Dam is located on the Bear River approximately 5 miles south of Montpelier, Idaho. Stewart Dam allows for the diversion of the Bear River water into the Rainbow Inlet Canal for conveyance into the Mud Lake/Bear Lake facilities. The dam is a concrete and steel structure that is 200' long and 75' wide with 6 radial gates that are 25' wide and 16' high. The gates are operated by Project personnel using manual coffer chain hoists. These gates are kept closed at all times unless flows exceed 5,000 cfs, as measured at the Company's Rainbow gauge station located one mile downstream. A flow in excess of 5,000 cfs has occurred only once in the entire operating history of the dam.

**Rainbow Dam:** The Rainbow Dam is located approximately 800 feet downstream from Stewart Dam in the Rainbow canal. The dam provides the head to allow West Fork Canal Company to divert water from the Rainbow Canal into their canal. The dam is a concrete and steel structure that is 100' long, 42' wide and 15' high supported on pilings. There are 5 regulating bays with stop logs and two bays with electric motor operated slide gates.

**Rainbow Inlet Canal:** The Rainbow Inlet Canal conveys Bear River flows from the Stewart Dam into Mud Lake. In Mud Lake, the Rainbow Canal merges with the Outlet Canal where the flow is either conveyed into Bear Lake or downstream to the Bear River. The canal is 150' wide and 22,300' (4.2 mi) long. Maximum flow capacity is 4,700 cfs. A stream gauging station is located on the canal about 2 miles downstream from Stewart Dam.

**Dingle Canal:** The Dingle Canal Diversion Dam is located upstream from Stewart Dam about 4 miles. The canal provides irrigation water to farmers in the local area prior to flowing into the Rainbow Canal about 2 miles downstream from Stewart Dam. The canal is 8' wide and 24,600' (4.7 mi) long. Current maximum flow capacity is 50 cfs.

**Causeway Water Regulating Dam:** The Causeway Water Regulating Dam is located approximately one mile east of the Lifton Pump Station. This structure is used to convey water from Mud Lake into Bear Lake for storage. It was rebuilt in 1995 by the Company. The dam is a concrete and steel structure that is 57' long and 24' wide. There are 5 concrete gates that are operated by a single traveling carriage electric hoist. Maximum flow capacity through the structure is 5,500 cfs.

**Bear Lake Outlet Canal:** The Outlet Canal is located between the Lifton Pump Station and the confluence with the Bear River downstream from the Outlet Water Regulating Dam. The canal is 150' wide and 74,615' (14 mi) long. Historical maximum flow capacity is 3,080 cfs.

**Outlet Water Regulating Dam (Paris Dike):** The Outlet Water regulating Dam is located at the north end of Mud Lake. It was rebuilt in 1996. The dam is a concrete and steel structure that is 89' long and 30'

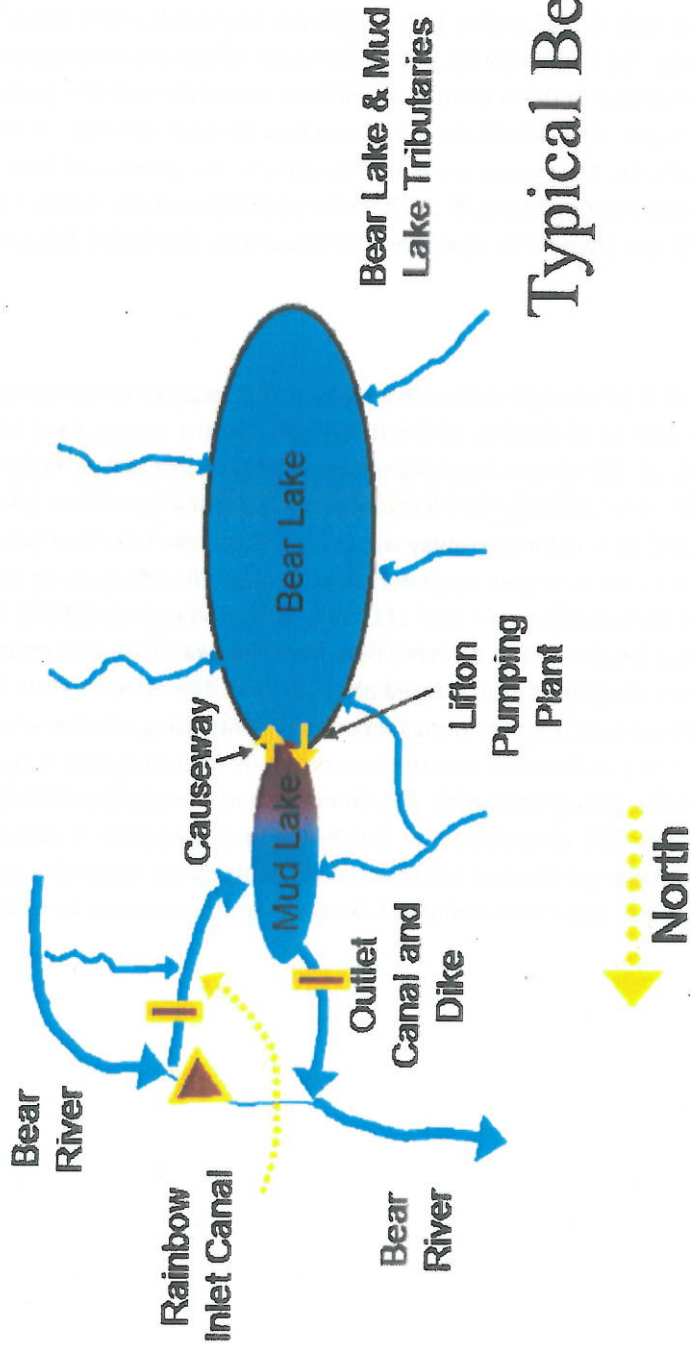


wide. There are 7 concrete gates that are operated with 7 individual electric motors. Maximum capacity through the structure is 5,000 cfs.

**Lifton Water Conveyance System:** Water flowing from the Bear River above Bear Lake is diverted at Stewart Dam into the Rainbow Inlet Canal. At Stewart Dam, all of the gates are kept closed and all water is diverted under normal operating conditions. The original Bear River channel below Stewart Dam is dewatered except for leakage that is approximately 5-7 cfs. The only time that the gates would be opened at Stewart would be if inflows exceeded 5,000 cfs. Flooding may occur in the downstream channel if flows exceed 200 cfs. The entire flow of the Bear River is diverted and conveyed through Mud Lake to be stored in Bear Lake or for bypass back to the Bear River via the Bear Lake Outlet Canal. From the Mud Lake complex, water enters Bear Lake through the Causeway Diversion via gravity flow. If necessary, water can also enter Bear Lake through the two sluiceways in the Lifton Pump Station. All of the spring runoff is normally stored in Bear Lake unless the lake is full which would result in spring runoff being bypassed back into the Bear River via the Outlet Canal. When it is necessary to release water from Bear Lake, either for irrigation or flood control, it will be released through the pump station sluiceways if Bear Lake elevation is higher than Mud Lake via gravity flow through the station. If the elevation in Bear Lake is lower than Mud Lake, the pumps are placed in-service. The amount of flow out of the lake will be determined by downstream irrigator needs or channel capacities and the number of pumps will be selected accordingly. Water then flows down the Outlet Canal to the Outlet Dike and back into the Bear River channel.

#### **Lifton Pump Station**

The Lifton Pump Station is a two story concrete structure. It is located on the north shore of Bear Lake approximately 4 miles east of St. Charles, Idaho. It houses 5 electric pumps each rated at 750 hp with maximum flow capacity of 420 cfs or a total capacity of 2,100 cfs. *The pumps have recently been upgraded. Units 1 and 5 received new impellers and Units 2, 3 and 4 have been rehabilitated. The cost to date is 5.8 million dollars.* The 5 pumps convey water from Bear Lake into Mud Lake only. Water can only pass from Mud Lake into Bear Lake by gravity flow through the Lifton sluice gates or through the Causeway Structure located about 1 mile east of Lifton. Flows and lake elevations in the Bear Lake area are monitored at several locations. The diverted flow from the Bear River upstream from Bear Lake is monitored at a Company gauging station located about 2 miles downstream from the dam in the Rainbow Inlet Canal. This gauge is a continuous recording facility using a battery/solar panel electrical system. It contains a Campbell Scientific electronic continuous recording data logger. Communications is accomplished via radio-frequency telemetry. The monitoring of the outflow from Bear Lake regulating dam occurs approximately 600' downstream of the Outlet Canal structure. It uses the same type of equipment. In addition there are Stevens continuous recording charts located in the Pump station which provides level monitoring of Bear Lake and Mud Lake on a continuous basis in addition to daily manual readings.



# Typical Bear Lake Operations