

Request to Modify  
401 Water Quality Certification No.: SPK 2013-00240  
and  
USACE 404 Permit No.: SPK 2013-00240

Submitted to  
Utah Division of Water Quality  
U.S. Army Corps of Engineers  
on Behalf of  
Ferron Canal and Reservoir Company

By  
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## PURPOSE

The purpose of this document is to request that the 401 Water Quality Certification with Conditions and the USACE 404 Permit, both numbered SPK 2013-00240 be modified based upon data collected and the experience gained during the three-day spillway/dredge operation at Millsite Dam in 2015.

## NEED

The current permits allow for passing dredged sediment over the spillway at Millsite Dam if (1) water is freely passing over the spillway and (2) the turbidity of the water and sediment mix going over the spillway is within 10 NTUs of the Ferron Creek inflow to the reservoir, and the dissolved oxygen (D.O) of the spillway/dredged material does is not less than 3 ppm. For other conditions, please see the 401 Water Quality Certification.

Data collected during 2015 indicate that by the time the reservoir fills to the level of the spillway that about 80% of the annual sediment load has already entered the reservoir. It will be impossible to pass the annual incoming sediment load downstream under the current NTU requirement.

## PROPOSED CHANGE IN OPERATIONS

It is proposed that we

- Monitor water and sediment inflow to the reservoir until water begins to pass over the spillway, then
- Calculate the average sediment concentration in the ***inflow*** for that period of time, then
- Dredge and spill as long as there is flow over the spillway at the ***average sediment concentration of the inflow***. The outflow concentration will be averaged over a 24-hour period for this purpose.

It was thought that there was ‘hysteresis’ in the collected sediment concentration data – that is, that for a given discharge on the rising limb of the inflow hydrograph, the sediment concentration was higher than for the same discharge on the falling limb of the hydrograph. But due to the relatively small number of sediment samples collected by the US Geological Survey, such a trend cannot be detected. It is for this reason that the change in operations is as described above.

Using the data collected during 2015,

1. Inflow to Millisite reservoir began in earnest on about April 29, 2015 at 00:00 hours.

2. Spill began on about June 01 at 00:00 hours.
3. Between the beginning of runoff and the beginning of spill,
  - a. There was an inflow of about 8533 acre-ft of water
  - b. The average sediment concentration was about 560 mg/L or 560 ppm
  - c. There was inflow of sediment of about 9.56 AF
4. If we were able to achieve an average concentration in the outflow of 560 ppm
  - a. There would be about 7 AF of sediment leaving the reservoir during the observed period of spill.
  - b. That's about 75% of the inflow

If this change is requested, (1) there will be higher concentrations of sediment passing downstream than during the three-day trial operation in 2015, (2) instantaneous sediment concentrations in the outflow may sometimes exceed those in the inflow, and (3) the timing of sediment releases will not match the pattern of incoming sediment loads to the reservoir.

#### POTENTIAL DOWNSTREAM IMPACTS

The potential downstream impacts of this requested change are the same as those identified in the Final Mitigation and Monitoring Plan submitted in 2015. The primary impacts described there include (1) potential deposition of sediments in Ferron Creek downstream from Millsite Dam, (2) a reduction in the DO of the waters in Ferron Creek downstream from Millsite Dam, and (3) the potential for clogging gravel substrate with fine sediments which would reduce the number and diversity of macroinvertebrates on the streambed.

The attached letter from the Utah Division of Water Resources focuses on potential impacts to the downstream aquatic habitat including fisheries if the requested change in operation is permitted. We will comply with their revised requirement for DO, namely that DO levels cannot drop below 5 ppm for any three consecutive days and cannot drop below 3 ppm under any circumstances. Such occurrences would result in a cessation of dredging until DO levels rose above the minima.

## CHANGES TO MITIGATION AND MONITORING PLAN AND WATER QUALITY AND 404 PERMITS

### Mitigation and Monitoring Plan

- Matching the incoming and outgoing average NTU levels on a daily basis would not be performed. Instead, the concentration of the outflow would be such that it matches the average concentration of the inflow between the inception of runoff and the inception of spill. Since it is impossible to maintain the outflow concentration exactly the same at all times, the real time monitoring would be used to match the average concentration on a daily basis.

### 401 Water Quality Certification

- Condition 3 will be changed to read, "During the dredge and spill operation the sediment concentration in the outflow will match as closely as possible the average sediment concentration in the inflow calculated from the beginning of runoff to the inception of spill. This comparison will be done on a daily basis. . If the outgoing sediment concentration on a daily basis exceeds the average incoming sediment concentration, dredging operations will be adjusted to bring the concentration into conformity.

### 404 Permit

There are no apparent changes to the 404 permit.