

MEMORANDUM

Date: June 19, 2012
To: Water Right File 37-8205
From: Michele Edl
Re: Proposed data submittal

Introduction

I have been asked to review of the request submitted by Lawson, Laski, Clark and Pogue, PLLC (representing the permit holder) in a letter dated May 30, 2012. The letter requests an extension of time to modify or supplement the proposed plan for mitigation of the evaporative losses attributable to Permit 37-8025.

The Department has received and accepted a Beneficial Use Report dated October 16, 2009 and its revision, dated December 30, 2009. The technical memo imbedded within that later document provided a mitigation plan methodology. A fully elaborated, mitigation plan proposal was received November 24, 2010. In it, evaporative losses were calculated based on reduced pond surface area and reduced pond temperatures, such that, mitigation by right 37-22128 was possible. The mitigation plan was acceptable to the Department and the resulting Amendment of Permit 37-8205 was processed.

That the mitigation plan does not appear to be acceptable to the permit holder is evidenced by May 30, 2012 letter from their legal representatives.

The letter requests time to develop data originating from a weather station which was put in place August 2011. Brockway Engineering, PLLC has installed a data collection weather station near the site of water use authorized by the Permit. The Department is being asked to allow additional time for data collection from that station. Presumably the data would be used to amend the mitigation currently required for the Permit.

This memo summarizes two areas of concern related to technical issues. Administrative issues will be addressed by other personnel.

Method

I have read the December 30, 2010 technical memo within which Brockway Engineering PLLC, introduced their methodology for estimating evaporation and the dependent calculation for estimating the mitigation required by the Permit.

I am acquainted with the typical parameters required by equation for calculating or estimating the evaporative losses from exposed water surfaces.

I am also acquainted with the typical parameters available from weather stations and I have reviewed the availability of weather data for stations in proximity to the authorized place-of-use.

I have re-acquainted myself with the statistical analysis that can be conducted and the analysis that can be instructional when applied to weather data.

Results

Weather station availability

From my review of established weather stations in Idaho, I find that there are no nearby stations which collect the data needed for a finely tuned calculation of evaporation. Hailey 3NNW (NWS station

#103942) is located approximately four miles east, as the crow flies, from the place-of-use. But like most stations in the National Weather Service's cooperative system, this station ~~is~~ does not provide wind and humidity parameters.

The Ohio Gulch RAWS station (NWS #10296) is located south of the East Fork of the Wood River, a few more miles further east and north. It's setting is elevation 6220 feet, in SWSE, Twp 3N, Rge18E, sec 9. (for data see: <http://www.raws.dri.edu/cgi-bin/rawMAIN.pl?idIOHI>) This station provides relevant data but is located in a more exposed site than the Deer Creek canyon site. Other existing stations are located further away and/or do not provide the data needed in a calculation of evaporation.

Data assurance

The Department knows very little about the weather station that Brockway Engineering has installed. They have not provided their weather station design for our evaluation. Brockway Engineering have provided quality products for their clients in the past, so I expect that this station will supply data which is reliable (repeatable results with subsequent measurements), unbiased (no systematic errors) and valid (measures the parameters that they are expecting to measure). But without design information, it is difficult to determine if the data provided will have the characteristics needed to evaluate annual evaporation losses. Before the Department considers accepting the results from this experimental weather station, we should be confident that the collected data meets the goal of high quality and provides the customary or standard attributes needed for a statistical comparison.

Statistical analysis

The basic types of statistical analysis include 1) confidence intervals, when trying to estimate a value or the difference between two values, 2) hypothesis testing, when trying to test a claim about one or two population values and 3) correlation and regression analysis, when trying to show if and/or how one variable can predict changes in another variable.

Trustworthy analysis, of any type, expects larger data sets than is being proposed for our review. One year or two years of data cannot provide meaningful information for application to a long-lived project. Although an interesting weather experiment, a sample size this small is not a good predictor of future weather conditions.

The target conditions used in the design of this project, (including the design weather used for the heating and the snow melting systems), are based on industry standards and are backed by decades of weather data. The Department's standards are not so different. The consumptive use associated with a water right is based on lengthy weather data sets. There is no sound way to compare an existing normalized, or standardized consumptive use to an evaporative loss computed from only one or two seasons. It is a comparison of apples to oranges and it is not meaningful.

That said; it may be possible to include information from this station after ten years of data have been collected. However, even then, the data would be conditioned by a weighting factor and compared with several long-term weather stations. If a trend can be found through that comparison, the data could be accepted for continued use and continued pairing with the same long-term stations, until a 30-year period of record is realized.

Conclusions/Recommendations

The Department has accepted the mitigation proposal submitted by Brockway Engineering PLLC on behalf of the permit holder. No additional decisions about the mitigation plan are needed.

The Department should be reluctant to accept the proposed one or two year weather sample. No meaningful comparison can be made between the proposed one or two-year sample data set and the long-term, climate-based, consumptive use associated with 37-22128.

The Department is required to evaluate injury to existing right holders. A project whose lifetime is expected to be 50+ years into the future, requires a mitigation plan with comparable predictability. Mitigation based on one or two years of data is insufficient to that task.