SPF WATER ENGINEERING

MEMORANDUM

DATE: February 26, 2015

TO: Tim Luke, IDWR Water Compliance Bureau

FROM: Bob Hardgrove, P.E.

CC: T.J. Budge
Peter Cooper, P.E.
SPF file (535.0110)

RE: IGWA's 3rd Mitigation Plan: Flow Measurements at Sandy Ponds and Aquifer Recharge Measurement, Response Memo to February 17, 2015 IDWR Staff Memorandum/comments regarding IGWA's 3rd Mitigation Plan

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The Idaho Ground Water Appropriators, Inc. (IGWA) is reviewing legal and technical options related to water management stemming from the Rangen Water Call. At the request of IGWA through its legal counsel, SPF Water Engineering (SPF) prepared a protocol for determining aquifer recharge occurring at Sandy Ponds in Gooding County, located approximately 1.3 miles south of the Curren Tunnel. The 60% design submittal was presented to legal counsel by memorandum dated July 28, 2014. A supplemental memorandum was presented to legal counsel on January 9, 2015 and described a revision to the original measurement approaches. On February 17, 2015, the Idaho Department of Water Resources (IDWR) delivered a Response Memo to the memoranda described above. This memorandum is being issued as a response to IDWR's comments.

SPF felt obligated to submit a formal written response with this memo. However, we feel we could easily come to terms on most of these items with a sit down meeting between the interested IDWR personnel and SPF. We request this meeting is set-up in the next couple of weeks, so resolution can be found quickly and the associated designs can start moving forward again.

1. Water Balance Equation for Recharge Calculation

IDWR agreed with the water balance equation described in the original SPF Memo for recharge volume calculation. SPF agrees with IDWR that IGWA should be responsible for compiling necessary data for use in the water balance equation for recharge. Our understanding is a number of other entities completing recharge activities fulfill similar requirements.

2. Measurement of Inflows to Sandy Ponds

IDWR had a number of concerns with the utilization of the existing NSCC weir for determining inflow into the Sandy Ponds.

1. Existing weir used as a check structure: Through discussions with Alan Hansten at NSCC and field observations, SPF agrees the weir structure is also used as a check structure for the small headgate directly upstream of the weir. The headgate delivers water to the Veenstra property downstream, which according to IDWR records is entitled to 0.12 cfs of waste water for irrigation. SPF agrees that the placement of check boards would invalidate weir measurements. To check the necessity of placing check boards in the structure, SPF completed field survey of the Veenstra delivery ditch and has determined sufficient slope from the headgate to the Veenstra place of use is available if the ditch were to be maintained (see attached Exhibit A showing the ditch profile). SPF has also determined that if the ditch were maintained, the current height setting of the weir blade is approximately 0.85 feet higher than that necessary to provide adequate head for the delivery and the use of check boards is not necessary.
2. Functionality concerns:
    a. Approach conditions: SPF's observations of the weir during times of operation indicated the weir pool was large enough with slow enough velocity that the approach flow condition concerns are not warranted, even with the bend upstream.
    b. Weir Blade: SPF recently observed the weir in the dry condition, and agrees that the weir blade needs repaired and adjusted to provide an accurate measurement.
3. NSCC prefers IGWA and NSCC maintain separate measuring devices: Discussions between SPF and NSCC indicated NSCC would be willing to share data obtained at the W-26 Lateral weir with IGWA. The IDWR Staff memo brought it to our attention that this may not be the case after Frank Erwin discussed this with NSCC. IGWA will continue to work with NSCC and will enter into an agreement with NSCC, if use of their measuring device is pursued. If an agreement with NSCC cannot be obtained to share their measurement data, IGWA will pursue the construction of a separate weir downstream of the existing.

3. Measurement of Pond 1 Outflows

IDWR had a number of concerns with the utilization of the existing check structure as the measurement for the Pond 1 Outflow.

1. Mr. Morris' new pump and pond: SPF recently became aware of the extents of Mr. Morris' new pump and pond downstream of the check structure. Recent field survey

completed by SPF shows that sufficient elevation exists such that the current maximum pond level will not cause the proposed weir to be submerged.

2. Weir sizing: SPF will take into consideration IDWR's weir dimension recommendations when they complete final design.
3. Channel maintenance: SPF agrees that the channel in the area immediately up and downstream of the existing check structure needs cleaned and routinely maintained for proper weir performance.

With the understanding that the downstream pond will not submerge the proposed weir, SPF will proceed with their proposed approach for measuring outflows from Pond 1. This approach may be modified if direct measurement of the new Morris pump is required. SPF is currently not aware of any direction that requires this pump be independently measured.

4. Pond 2 Outflows to Sandy Pipe

The final approach for measurement of Pond 2 outflow may need to be modified if direct measurement of the three pumps from the Sandy pump vault is required. SPF is currently not aware of any direction that requires each property be independently measured. If IDWR requires the individual pumps have flow meters, an independent Pond 2 outflow measuring device would no longer be required. The Pond 2 outflow could be calculated by summing the individual pump flow with the flow over the proposed pump vault weir to the Curren Ditch.

If the individual pumps are not required to have flow meters, the Pond 2 weir structure is still a valid option to measure the Pond 2 Outflow. SPF will provide design information to IDWR for their review if this design progresses.

SPF made the statements regarding data transfer to IDWR based on multiple conversations and e-mails with IDWR staff during the preliminary design stage. As such, the design contemplated using hardware preferred by IDWR staff. If IDWR's preference is for IGWA to collect and store data directly, the brand of data collection and telemetry equipment may be modified to better coordinate with the equipment installed within the Magic Springs pump station. IGWA will be happy to provide collected data to IDWR on an annual basis.

5. Pond Evaporation

SPF will continue to pursue the approach of utilizing mean monthly evapotranspiration ("ET") data for use in the daily pond evaporation calculations completed by IGWA and understands IDWR may choose to use actual daily ET data during review of recharge calculations.

6. Discharge to Martin-Curren Ditch Data Collection Plan

SPF believes an accurate Curren Ditch flow measurement can be obtained at the pump vault using the weir blade approach outlined in SPF's memorandum. IDWR's recommendation to install a closed conduit flow meter at or near the end of the pipe discharging to the Curren Ditch would greatly increase the cost for the overall measurement project.

SPF believes the calculated method of determining pump discharge from the pump vault outlined in SPF's memo should be an acceptable method. If IDWR requires the individual pumps in the pump vault to have flow meters, the measurement approach outlined in the memorandum may be reconsidered, as stated in Section 4 above.

The requirement for the Morris-Crandlemire pipe entering the Sandy Vault to have a lockable valve seems to be something the WD36A watermaster will require as part of the Morris exchange agreement. It can be accommodated if it is ultimately a requirement.

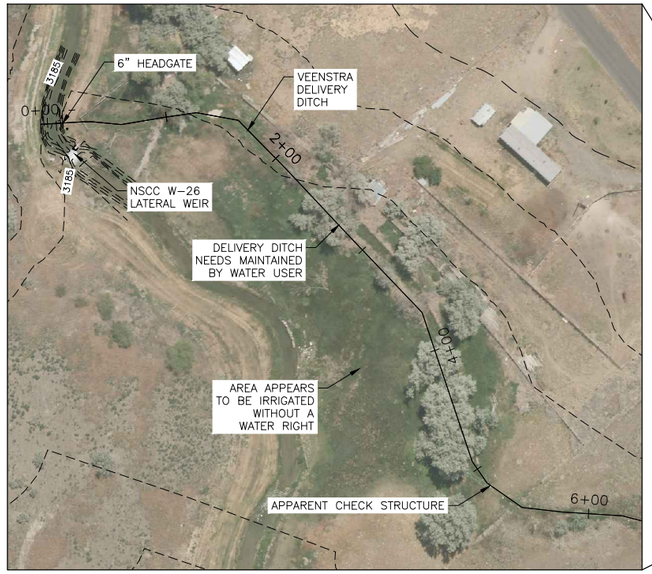
7. Ownership and O&M

As described above, SPF understood that IDWR's preference would be to own and operate the measurement equipment contemplated for this project. As such, the design contemplated hardware typically used by IDWR staff (Campbell Scientific). If IDWR's preference is for IGWA to collect and store data directly, the brand of data collection and telemetry equipment may be modified to better coordinate with the equipment installed within the Magic Springs pump station. Reasonable access to the measurement sites will be provided for Water District staff.

8. Final Design and IDWR Review

The July 28, 2014 memorandum described a concept at the 60% design level. It is common for concepts and designs to be refined as they progress to final design. It is SPF's intent to continue to work with IDWR as the design of the measurement devices moves forward. We anticipate submitting our final design to IDWR for their review, prior to any construction taking place.

EXHIBIT A
VEENSTRA DITCH PROFILE



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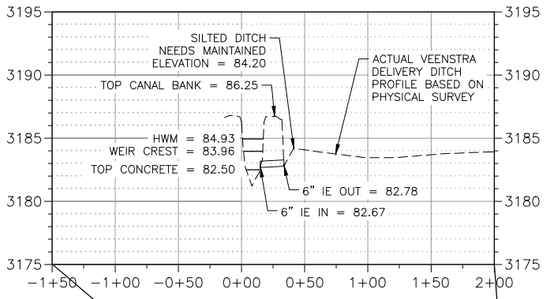

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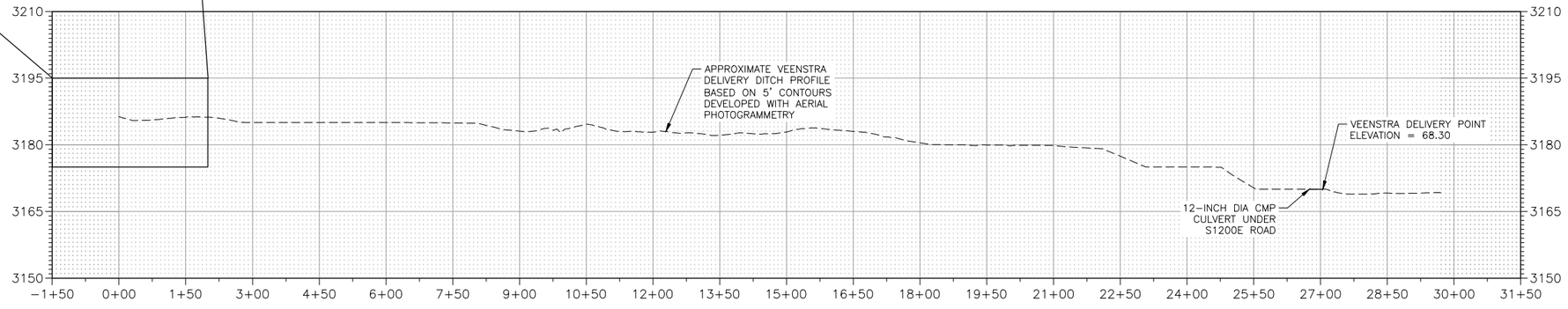

SPF WATER ENGINEERING
300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

SANDY PONDS MEASUREMENT PROJECT
IGWA

NSCC VEENSTRA DELIVERY DITCH PROFILE

PRELIMINARY DRAFT NOT FOR CONSTRUCTION

REVISIONS		
ITEM	DESCRIPTION	DATE
A	NSCC EXHIBIT	2/26/15

VERIFY SCALE
0 1/2 1
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.

PROJECT:	535.0170
DESIGNED:	PZC
DRAWN:	PZC
CHECKED:	RRH

EX-A

Path: S:\PROJECTS_thru_L_Projects_Projects\IGWA_535\0170_Magic Springs Tailwater\PROJECT\CAD\EXHIB Filename: 2015-02-09 NSCC ditch upstream of weir Plot date: Feb 26, 2015-10:31:03am CAD User: PCooper.
Xref Filename: | 5350150-XR-3DI AERIAL 5' BIG BOUNDARY | SPF-TITL-22X34 | 5350150-XR-SURVEY |