BANNER
Engineering | Architecture | Surveying
Banner Associates, Inc. | 730 South St, Ste. 201
Rapid City, South Dakota 57701
Toll Free | 1.855.323.6342
www.bannerassociates.com

Contact Report

Date:	Friday - 5/15/15 9:00 a.m.
Contact:	Tim Schaal, PE – Water Rights Division (SD DENR)
Tel/Fax:	(605) 773-3151 (605) 773-6035 fax
Email:	Tim.Schaal@state.sd.us
Address:	PMB 2020 Water Rights Program
	523 East Capitol
	Pierre, SD 57501
Subject:	Custer West Dam – Regulatory Issues (Requested by D.LaFrance)
Project:	Embankment and Spillway Reconstruction, Custer, SD
	BAI. No. 22136.00.00
Conferees:	Tim Schaal, Sig Zvejnieks and Dave LaFrance (w/ Banner)

On this date,
Sig Zvejnieks and I discussed the pending Custer Dam/Embankment Project with Tim Schaal at DENR. We explained the City's desire to bring the embankment into compliance with the State's Water Right and Dam Regulations.

At the time of this call supplemental survey work had not yet been completed, and Banner was also awaiting the City's GIS information, so any discussion of water storage potential was based from very preliminary information (handed to Banner at time of first meeting).

The City's request and goal of reducing the regulatory dam storage was discussed, and their desire for Banner to consider 'digouts' as part of the design in order to make the lake 'deeper' and more suitable for fishing. Banner asked for Tim's opinion on how these would be viewed from a Dam Regulatory (not a water right) viewpoint.

Tim clarified that if any of the 'digouts' were situated at an elevation above the elevation of the downstream toe of the dam, then it should be counted as part of the Reservoir's Maximum Storage Capacity. Banner concurred.

Banner stated they received preliminary dam/reservoir information from the City, based on previous topographic surveys (By Buckhorn Surveying, Custer, SD), showing that the height of the current embankment is approx. 17-20 feet above the invert of the downstream channel.

As an approximation only, it was discussed that the apparent Max. Storage Capacity (assuming current top of dam elev. of 5354 ft. elevation) for existing conditions is nearly 100 acre-feet. Banner stated the goal they had been given was to reduce the maximum storage to less than 50 acre-feet, if possible.

The timing of a request to adjust (and increase if necessary) the allowable Water Rights (Conservation Capacity) storage from the existing 30 acre-feet allowance was also briefly discussed. Tim stated that it was likely that the request might need to go to the full State Water Board hearing for the granting of

that increase. To clarify: A New Water Rights permit would have to be requested according to current state rules, not just an amendment to the existing permit.

Banner's preliminary estimates indicate that the dam embankment would need to be lowered approximately 4-5 feet to reduce the overall storage capacity of the reservoir to something less than 50 ac-ft (to below the regulatory classification of a dam).

Tim stated that regardless of the proposed revisions or reductions to storage capacity, that he will view the installation as a high hazard dam/embankment until proven otherwise. This could include the need to perform an incremental damage assessment of the structures downstream, and include a dam breach analysis.

Sig stated his opinion that given the overall system flows (with 45.6 sq. miles of contributing drainage area per the FEMA 2012 Flood Insurance Study Report) that the size of the existing/proposed impoundment was quite small and the storage inconsequential to the larger flows that might come from upstream.

Based on a previous conversation Dave had with Tim regarding dam and/or embankment reinforcement, Tim had stated that hard armoring for an overtopping event should be planned. Dave confirmed during the call that it likely will need to be the entire embankment that would need to be hard armored, to accommodate a 50-100 year storm over-topping event, and still remain functional. The length of an emergency spillway (at 2 to 4 ft. depth) will likely encompass most of the embankment crest length. And Banner confirmed that any existing structures or platforms in front of the spillway area would need to be removed so as not to impair the performance of the spillway during a storm emergency.

Tim stated if the spillway encompasses most of the embankment, that the top of the dam could be viewed as the invert of the emergency spillway, for maximum storage capacity calculation purposes. He also asked about the disposition for the existing roadway and parking area on top of the dam, whether that would remain in the revised design. Banner said they had discussed with City Reps. the possibility of the roadway access being eliminated from across the top of the dam, with the future access to the Golf Course coming from Wazi Road instead. Tim stated that would be his preference and typical for other spillway embankments of this type.

A primary outlet structure was briefly discussed, to handle the more frequent 2 to 10 year storms without going over the emergency spillway. This would likely be in the form of a Precast drop structure with top hat safety/trash rack and outlet pipe or CIP concrete notch type outlet cut thru the emergency spillway. The former option would have the added benefit of allowing the lake to be drained in the future to allow for occasional dredging and/or excavation of collected silts and sediment at the base of the dam.

Tim stated that he would like to see preliminary layouts and the existing versus proposed Area/Capacity Curves for the project, before he could make a judgment whether to support a request for a revised (higher capacity) water right permit for the project.

Notes Prepared By: D.A.LaFrance, PE

BANNER
Engineering | Architecture | Surveying
Banner Associates, Inc. | 730 South St, Ste. 201
Rapid City, South Dakota 57701
Toll Free | 1.855.323.6342
www.bannerassociates.com

Contact Report

Date:	Thursday - 6/11/15 9:30 a.m.
Contact:	Tim Schaal, PE – Water Rights Division (SD DENR)
Tel/Fax:	(605) 773-3151 (605) 773-6035 fax
Email:	Tim.Schaal@state.sd.us
Address:	PMB 2020 Water Rights Program
	523 East Capitol
	Pierre, SD 57501
Subject:	Custer West Dam – Regulatory Issues Follow-Up (Requested by the City and Banner)
Project:	Embankment and Spillway Replacement, Custer, SD
	BAI. No. 22136.00.00
Conferees:	Tim Schaal, Sig Zvejnieks and Dave LaFrance (w/ Banner)-
	Earlier Meeting included City Reps. (6/10/15)

On this date,
Sig Zvejnieks, PE and Dave LaFrance, PE discussed the City of Custer's pending Custer Dam/Embankment Upgrade Project with Tim Schaal, PE at DENR. Banner had requested that Mr. Schaal provide clarification from the State's standpoint on what the repercussion's would be to the City if the City chose a 'Do Nothing' alternative.

Mr. Schaal clarified that if the City chooses to keep the current embankment to allow its use as a road access only, they can do so, but it cannot remain in its current condition and/or be allowed to impound any water behind it. He said the State's only requirement in this case, at a minimum, would be to require the City to replace and upgrade the existing failing pipe conduit under the existing road with a larger capacity size (Banner's suggestion is for at least a 10 year or larger storm event). This approach would be a possible alternate way to avoid having the current facility become registered and listed as a High Hazard Dam on the State's Official Dam Inventory List. Note: In earlier communications, Mr. Schaal confirmed that it was his opinion that it is a High Hazard (Category 1) Dam in its current configuration, for the primary reason that it is located immediately upstream of a populated area. However, as he noted also, it currently is not listed on the State's Inventory Listing for reasons unknown. The implication he made was that this oversight needs to be corrected as soon as possible, because the dam even now has the capacity to impound water behind it (as Banner confirmed recently during a small storm event in early June). Banner's initial findings do concur with Mr. Schaal's statements, and as reported to City representatives previously, that in its current configuration, the current impoundment is in excess of the regulatory threshold definition of 50 acre-feet, confirming that it is a "Dam" by definition as it is nearly 120 acre-feet in maximum storage capacity.

In addition, the City requested that we clarify the following with Mr. Schaal: How much review time would he need to review the Proposed Design Plans. He stated he could provide review comments on the Revised Embankment Design Basis (Report) and Associated Plans within 2-3 weeks after submittal. Banner responded that they will attempt to provide this submittal soon (likely the week of June 15), for SD DENR Review and Approval.

Previous day meeting (6/10 at 9 a.m.), Banner Reps. (Sig Zvejnieks and Dave LaFrance) and City Representatives Bob Morrison, Scott Simianer, and Mayor Gary Lipp, met with Tim Schaal at the existing 'Dam' Site. Steve Price (GC management) joined the conversation about half way through.

S. Zvejnieks asked Mr. Schaal for clarification on whether the State would have jurisdiction if the regulatory (maximum storage) capacity was lowered to less than 50 acre – feet. Mr. Schaal stated the State would no longer have jurisdiction as far as it being labeled a 'Dam', if the new work was to proceed as discussed. Note: The State still retains jurisdiction from a 'Water Rights' standpoint, regardless, and will require Submittal of Plans to determine if a permit is required or not for any changes proposed.

D. LaFrance stated that given the necessary shift in embankment location (due to recently discovered substandard existing embankment soil conditions, via soil test results provided by American Engineering Testing during their May 2015 Exploration; the proposed lowering of the existing dam top (by 5 to 6 feet); and the proposed filling in of some portions of the existing reservoir impoundment area (specifically to promote widening of Fairway (Hole) #9), then the embankment capacity could be reduced from the previously reported 52.6 Ac-Ft. (6-3-15) to a value less than 50 Ac-Ft. which Banner will demonstrate via an updated final plans (and design report) submittal.

Mr. Schaal confirmed that the State will then need to make a final 'determination' that the City's proposed plans are, or are not, a 'Dam'. Either way the City chooses, whether to alter the pipe and leave the embankment in place, or (re-)construct it completely, he stated it is required that DENR review any proposed final embankment plans/elevations and area/capacity curves which would verify and confirm to the State's Water Rights Division that the proposed reduced storage capacity limits and thresholds (for both the Water Rights Permit maximum allowable of 30 ac-ft., and the Regulatory Threshold for classification as a dam (at 50 ac-ft.)), are being met. Upon completion of the State's review, he would be in a position to document and provide a letter of determination for the proposed changes, and this without a delay or need to wait for the next hearing of the State Water Board to address pending permitting application requests. By the two options stated above, the 'Dam' in its current state would not remain, as it would no longer be a 'dam' by state definitions, and consequently would also not end up being added to the State's Dam Inventory List.

At the City's direction, Banner was requested to provide revised plans and send to the SD DENR as soon as possible, showing both a reduced water impoundment volume and dam configuration (with lowered height and volume restrictions) that meets both the current conservation storage (water right) permit limit of 30 ac-ft., and also stays under the 'maximum storage capacity' regulatory threshold which otherwise would classify the facility as a Dam, as noted above. Banner was advised that subsequently, the secondary approval process would then come via the Custer City Council, once a State Determination Letter had been received.

Banner Reps. stated that for the Design Memo (Report), they would utilize the published and publically available 2012 FEMA Flood Study (100 year storm frequency) numbers as the basis for the new spillway and outlet works sizing, with corrections noted for the reduced drainage basin area size.

Bob Morrison requested that Banner include a rough construction cost, if the City chose an option to totally reconstruct the current embankment and build it to its current configuration and height, in such a way to meet all state requirements for a "Dam" Classification, and co-incidentally still allow for passenger vehicles to traverse over the dam crest. D.LaFrance said he could provide a rough estimate.

Notes Taken By: D. LaFrance, PE

BANNER
Engineering | Architecture | Surveying
Banner Associates, Inc. | 2201 Jackson Blvd., Ste 200
Rapid City, South Dakota 57702
Toll Free | 1.855.323.6342
www.bannerassociates.com

Contact Report

Date:	Thursday - 7/16/15 9:30 a.m.
Contact:	Tim Schaal, PE – Water Rights Division (SD DENR)
Tel/Fax:	(605) 773-3151 (605) 773-6035 fax
Email:	Tim.Schaal@state.sd.us
Address:	PMB 2020 Water Rights Program
	523 East Capitol
	Pierre, SD 57501
Subject:	Custer West Dam – Regulatory Issues Follow-Up (Requested by the City)
Project:	Embankment and Spillway Replacement, Custer, SD
	BAI. No. 22136.00.00
Conferees:	Tim Schaal, and Dave LaFrance (w/ Banner)

On this date,
Dave LaFrance, PE discussed the City of Custer's request to provide clarification from the State's standpoint on how the volume of water stored in 'dig outs' would count against the City's current water rights permit limit of 30 acre-feet, for the volume of any new water stored below the existing bottom of the stream channel.

Mr. Schaal clarified that if the City desires to go with 'dig-outs' at the previous upstream location of the West Dam Reservoir, then this is the clarifying direction that should be followed, and this would preclude allowing any water to be stored behind the existing embankment/road grade:

A "Pass-Thru" channel is required to allow low stream flows to pass downstream unimpeded at all times", (similar to previous discussions with Rex Harris). Existing downstream water rights holders must be able to retain their water right access at all times to the water from the channel at low flow. Only High water (side channel type) storage detention cells would therefore be allowed.

The City's current 30 Ac-Ft existing water right permit limit will apply to any side channel 'dig outs', unless more storage capacity is desired/needed with the new design, whereby a new permit would be required.

Notes Taken By: D. LaFrance, PE