

ADDENDUM TO 1041 APPLICATION FOR
OLD DILLON RESERVOIR ENLARGEMENT

Response to Summit County Planning Department
Punch List Comments on the
Request for Level of Permit Determination Submittal

Planning Case File #09-105

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I. Introduction

This addendum accompanies the formal application for a Minor Permit under Section 10 of the Summit County Land Use and Development Code (Code) for the proposed Old Dillon Reservoir Enlargement. On November 25, 2009, the Planning Department responded to our request for a level of permit review; determining that the project did not qualify for a Finding of No Significant Impact nor was Major Permit review required. In accordance with the Code, the Planning Department required submission of a Minor Permit application for review. On December 16, 2009, the Planning Department provided a punch list of 11 items requesting additional information in the formal application for Minor Permit review. We also received the Planning Directors report on the level of permit review and coordinated with County staff in producing this addendum.

This response primarily follows the punch list items but we also reviewed the Planning Directors report and elaborated on issues based on this information in that report. For several of the issues we worked with the resource specialists and the design engineers, Tetra Tech, to provide responses.

II. Additional Information

The heading in italics is the punch list item from the Planning Department, or excerpts from the staff report.

Any state or federal agency approvals secured at the time of application (i.e., USFS's EA, State Engineer's Dam Safety Permit, Army Corps of Engineers 404 Permit, etc.) should be incorporated in the application submittal materials. If the approvals are not yet received/are in progress, then they will need to be appropriately conditioned as a part of the minor 1041 permit review.

We have included the Colorado State Engineer's Dam Safety Permit for the project. The US Forest Service received no comments during the comment period for the Environmental Assessment and we have provided them with all information needed to complete their permit process. A decision whether to issue the Special Use Permit to construct, operate, and maintain the enlarged reservoir on National Forest System Lands is pending. The Section 404 of the Clean Water Act is also pending, and the US Army Corps of Engineers (Corps) is waiting for the 401 Water Quality Certification from the Colorado Department of Public Health and Environment. We will provide the decisions from the Corps, the CDPHE and the US Forest Service. Based on coordination with both agencies we anticipate that both the Forest Service SUP and the 404 permit will be issued in early 2010.

The formal application for the 1041 permit needs to include further explanation of the emergency operations and the impacts to SLG in regard to brook trout fishery as well as input from the appropriate state and federal agencies. These recommendations will, in turn, be appropriately conditioned with triggers.

We believe the Environmental Assessment, the Aquatic Resources Technical Report prepared by Miller Ecological Consultants (Miller), and the Hydrology Report prepared by Resource Engineering adequately describe Emergency Operations, and the potential impacts to the brook trout fishery downstream of the diversion. We also included a description of the impacts in the submittal, maintain that description in this formal application; and our description further explains why the degree of impact described in Miller is not likely.

In summary, Normal Operation actually improves the aquatic ecosystem downstream of the diversion primarily due the cessation of winter diversions that occur under existing conditions. During Emergency Operations, due to the need for the Town of Dillon to provide municipal water to the community (domestic water for the residents and businesses in Dillon), the diversion could dewater Salt Lick Gulch immediately below the diversion point during the winter months. Miller used computer modeling to document the effects of various diversions on the fishery downstream of the diversion during both Normal and Emergency Operations. This modeling, known as Instream Flow Incremental Method (IFIM) and PHABSIM, uses surveyed cross-sections to predict the available habitat for trout at different flow levels in the stream. The available habitat is based on detailed studies of trout in literature, and rating curves based on those studies habitat and flow levels. IFIM and PHABSIM are the most widely used methods of assessing impacts to fisheries, and Mr. William Miller is a well respected fisheries biologist who has used these techniques to document potential impacts for numerous projects.

Within this 1041 application, I explain why the impacts predicted by the models would not likely be as severe as predicted. Miller can only use the hydrology models provided by Resource Engineering. Those models developed a hydrograph at the diversion based on historic recorded data, and adjacent watersheds where gages are present. The model predicts that if Emergency Operations remove 100% of the flow at the diversion in the late winter, the brook trout and macroinvertebrate populations would suffer a 100% loss between the diversion and the Old Dillon Reservoir Return Channel (approximately 0.90 mile). While this is likely true for a distance downstream of the diversion, what Miller could not model was the groundwater input to the stream and the beaver ponds present within that 0.9 mile reach as we did not have sufficient data. Resource Engineering attempted to sample flow in the reach during the winter but only had one valid data point. During that winter sampling in 2007/2008, we observed that the existing diversion was removing 100% of the flow, and there is an extant brook trout population in the 0.9 mile reach. Winter diversions we observed were the typical conditions as Dillon attempted to keep the fishery in Old Dillon Reservoir viable during the winter. Obviously, groundwater input within this 0.9 mile reach sustains a fishery as fish and macroinvertebrate populations were present despite many years of a 100% diversion during the winter.

The project includes mitigation measures to protect the fishery which are minimum flows to be maintained in the creek for Normal and Emergency Operations, and specific water conservation measures to be employed by the Town of Dillon when, and if, Emergency Operations are required. These mitigation measures were developed in conjunction with the US Forest Service aquatic biologist and hydrologist. We believe these mitigation measures are adequately described in both the main body of this submittal, the Environmental Assessment, the 404 Application (Appendix D), and both the Hydrology Report (Appendix A) and Aquatic Resources Report (Appendix H). However they were not listed separately and are listed below as they appear in the aforementioned documents. The US Forest Service and the US Army Corps of Engineers will condition approval of the project requiring adherence to these mitigation measures to protect the aquatic environment.

Mitigation Measures to Protect the Aquatic Environment

Normal Operations

Under Normal Operations, during the spring reservoir fill period of April, May and June a minimum flow of 0.5 cfs would be maintained in Salt Lick Gulch downstream of the diversion.

Under Normal Operations, if the full water right of 421.14 AF has not been diverted by late June, and diversions continue into the summer and fall; a minimum flow of 1 cfs would be maintained for July, August, September, October and November.

Under Normal Operations, no diversions would occur in December, January, February and March.

Emergency Operations

If direct flow diversions cause Salt Lick Gulch to drop below 1.0 cfs during the months of July through September, the Town of Dillon would implement a water conservation plan designed to effectively reduce its irrigation demand by 30%. This may be achieved, for instance, by applying an even/odd watering schedule, eliminating park and open space irrigation, limiting the number of days that irrigation water can be applied, or other measures as determined by the Town.

If at any time during the year direct flow diversions under emergency operations cause Salt Lick Gulch to flow below the minimum flow target of 0.5 cfs, the Town of Dillon would reduce its water needs by using a more restrictive conservation plan that reduces irrigation demand to approximately 10% of the normal irrigation requirements. However, the Town may use alternative sources of water supply and water rights as available to supplement its irrigation needs during this period.

The Town of Dillon would deliver its Old Dillon Reservoir water, previously accrued when water was available for storage, during the winter months to supplement the Town's direct flow demand.

Although not included in the bullet list, the staff report included the following concern on the impacts to the fishery:

However, the application materials do not provide any information as to what would occur if the populations of brook trout and macro-invertebrates is diminished or eliminated. The formal application should go into detail as to the actions proposed if monitoring determines that the populations are found to be declining as a result of the winter diversions.

There is a conceptual plan for restocking this reach with transplants from upstream of the diversion if the fish do not naturally recolonize the affected reach. Although we believe populations upstream of the diversion will naturally move into unoccupied habitats, the applicants commit to transplanting fish from upstream of the diversion to the downstream reach if they do not colonize the reach naturally. The brook trout populations in Salt Lick Gulch and Ryan Gulch upstream are high, and a relocation of fish from those populations is proposed in the event fish do not repopulate the affected reach after Emergency Operations cease. Macroinvertebrate populations will rapidly colonize the affected reach; therefore, there is no plan to transplant macroinvertebrates. Approval from the Colorado Division of Wildlife would be necessary, and the applicant would coordinate with CDOW on the techniques used and number of fish to be transplanted.

The formal application needs to quantify the amount of wetlands and wetland setbacks areas proposed to be disturb as well as the amount of mitigation for each category being proposed. A supplemental table and corresponding graphic representation should accompany the formal application.

The formal application also needs to clearly state as to whether there will be any wetland setback disturbance mitigation and if so, what the ratio of the mitigation will be compared to the amount of wetland setback disturbed through the proposed project.

The discrepancy in the amount of wetland setback area being disturbed by the proposed project (8.3 acres versus 6.5 acres) needs to be addressed in the formal application.

The following paragraph is an excerpt from the staff report on wetlands:

The application indicates that the applicants propose to replace the proposed wetland and wetland setbacks disturbed by the proposed project at a 1:1 ratio (1.34 acres disturbed replaced by 1.34 acres of newly created wetlands) and as such, would comply with Subsection 7105.03.D of the Code. However, the application does not provide the specific details as to how this amount is arrived at. The formal application will need to fully document the amount of wetlands and wetland setbacks to be disturbed in the proposed project and clarify the amount of mitigation for each type of disturbance in order for the Review Authority to determine if the proposed project is in conformance with Subsection 7105.03D of the Code.

Wetlands: The ODR project will impact 1.34 acre of wetlands as described in the submittal for level of permit determination. The project impacts 1.21 acres directly from reservoir expansion, pipelines and the new diversion. The project indirectly impacts 0.13 acre of wetlands of the ODR outlet channel through dewatering. The original submittal also describes the need for each impact and a discussion of why those impacts could not be avoided. Appendix C of that submittal included the 404 permit application and respective figures depicting impacts to wetlands and waters. The Environmental Assessment provided to the County includes two figures depicting the locations of those impacts. All of this information is included in the main body of this submittal. We have attached additional figures (Sheets 1-3) created for this addendum to depict wetlands and wetland setbacks as well as the impacts to both resources. We have included a table of wetland impacts (page 6).

Wetland Setbacks: There is no discrepancy in the acreage of wetland setback impacts in the original submittal for level of permit review. On page 19, we state that 8.3 acres of wetland setback are associated with wetlands in the project area, and that the project would disturb 6.5 acres of that wetland setback.

We explained where those impacts occurred and where the setback was not disturbed. The attached figures depict the wetland setbacks (Sheet 1), the wetland setback impacts (Sheet 2 and 3). Areas where the wetland setbacks are not impacted are also shown on Sheets 2 and 3.

We revised the totals as we realized additional areas of setback would not be disturbed (these revisions are included in the main body of this submittal as well). The project area contains 7.75 acres of wetland setback (note we do not include the setback of the wetland system downstream of the Dillon Ditch diversion in this total as this system is not impacted). The project would impact 5.81 acres of wetland setbacks: at the diversion, the north side of the Dillon Ditch west of the interstate, the entire Dillon Ditch east of the interstate, and around Old Dillon Reservoir. The wetland setbacks are not disturbed on the south side of the Dillon Ditch west of the interstate and for a large portion of the ODR outlet channel.

We do not propose wetland setback disturbance mitigation for the reasons explained in the application (Page 19).

Table 1. Wetland Impacts (acres) from the ODR Enlargement Project

Impact type/ Wetland type	Dam	Reservoir Expansion	Dillon Ditch to pipeline	Diversion Structure	Temp. Impacts At Diversion	Construction Access	Indirect Impacts from Dewatering
Dillon Ditch South	0.02		0.08				
Dillon Ditch North			0.46				
Outlet Channel	0.03						0.13
Lacustrine wetlands at ODR	0.18	0.25					
Riverine/ slope wetlands Salt Lick Gulch				0.18	0.05	0.01	
Permanent Impact by Impact type	0.23	0.25	0.54	0.18		0.01	
Total Direct Permanent Impact	1.21						
Total Permanent Impact (including indirect impacts)	1.34						

The formal application of the 1014 permit should provide further explanation of how the project will be complying with the standards listed in Section 7103.01.B of the Code which states:

*“ B. **Containment of Stream:** If a stream or intermittent stream is involved, the stream is completely contained during construction from 50 feet upstream of any site disturbance to 50 feet downstream of any site disturbance. For streams and intermittent streams, the conveyance shall be sized for a minimum flow with a ten percent (10%) chance of occurrence. The conveyance shall be installed prior to any construction and shall be removed only when permission is granted by the Engineering Department.”*

This item is addressed in the December 21, 2009 letter from Tetra Tech to Mr. Ray Tenney of the Colorado River District, Item 6 (attached).

The formal 1041 permit application needs to provide a better explanation as to why the applicants believe there are no groundwater quality impacts involved in the proposed project.

This item is addressed in the December 21, 2009 letter from Tetra Tech to Mr. Ray Tenney of the Colorado River District, Item 7 (attached).

The application notes that the fishery in ODR is supported by CDOW stocking of trout. Proposed reservoir operations would affect the fishery through draw downs to exercise the water rights. It is not known if CDOW will continue to stock the reservoir, and different management program may be required under the future reservoir operations. This question should be addressed and included in the formal submittal as a part of the recreational uses criteria discussion.

We addressed this issue to the degree that we can at this point in time. We cannot determine what the CDOW will decide as far as continued stocking as the CDOW will make that decision at a later date when they observe reservoir operations.

The formal application will need to discuss in detail the construction, operation and maintenance of the proposed project as well as any potential hazardous materials associated with the construction, operations and maintenance of the expanded reservoir. The formal application will also need to address spill prevention/response plans, waste minimization techniques, and plans for compliance with state and federal requirements for transporting, handling, storing, and disposing of any hazardous materials.

The original submittal and the main body of the formal application include a detailed description of each element of the project construction and operations (Section III, pages 2-6). Tetra Tech has provided additional information on this issue including spill prevention and maintenance in their December 21, 2009 letter attached, Item 9. We also provided a copy (paper and digital) of the final design plans prepared by Tetra Tech.

The formal application needs to provide a better demonstration of the proposals to mitigate the visual impacts of the increased dam faces as well as the proposed grading located in the northeast quadrant of the dam site where the construction access road will connect to the dam site. Granted, the scale of the visual simulations and the preliminary grading plans probably precluded showing these features. However, if an appropriate demonstration of the proposed mitigation measures can be provided, they may help address the concerns about potential visual impacts.

In an effort to address the Design and Visual Resources of the 1040 application process, the proponent was tasked with performing simulations of the proposed expansion of the Old Dillon Reservoir. A total of 11 simulations (six for the USFS and five for the County Planning Department) were performed that depicted existing, baseline and proposed conditions on the ODR project area. Existing conditions were unmodified photographs taken from the specified observer locations showing conditions as they existed on the ground at the date the photos were taken. A true future baseline condition was created simulating the additional clearing that will occur within the field of view of the photograph as prescribed by the Dillon Reservoir Forest Health and Fuels (DRFHF) project (as approved by the USFS); these simulations excluded any construction activities that will result from implementation of the ODR expansion. Lastly, the proposed condition simulations depicted implementation of the ODR expansion on top of this future baseline condition.

The simulations were performed at two separate times for both USFS and Summit County. The USFS simulations were completed in December 2008 and performed from six observer locations chosen by the Forest Landscape Architect, while the Summit County simulations were completed in August 2009 and performed from five observer locations within the Town of Silverthorne and the Town of Dillon, as requested by the County Planning staff. All locations are identified in the attached figure.

We include a description of the process for a better understanding of how the simulations were modeled.

Software

The simulation results were achieved using ESRI's ArcGIS, 3D Nature's Visual Nature Studio, and Adobe Photoshop software. ArcGIS is a GIS industry standard software suite that allows for creation and editing of spatial data, spatial analyses and mapping production. Visual Nature Studio is a premier 3D modeling software package that works seamlessly with spatial data to produce photo-realistic scenes that accurately depict the supplied geospatial data. Adobe Photoshop is an industry standard program for image editing and production.

Modeling Process

The first step to the modeling process was to inspect all acquired data for errors and inaccuracies in ArcGIS. Once these were identified and resolved, a dataset depicting existing vegetation stands was created via interpretation of the Summit County 2005 NAIP aerial imagery – this is the “existing condition.” The existing vegetation stand data was then modified to include forested clearing as prescribed by the DRFHF project to produce a baseline vegetation dataset to use for modeling purposes – this is the “baseline condition.” Following completion of the vegetation datasets, the proposed surface was created by merging existing ground contours with the proposed grading plans acquired from Tetra Tech to produce a final proposed surface dataset – “proposed.”

After all spatial data was completed and prepared in ArcGIS; the data was then exported to Visual Nature Studio. Two separate models were created; the first contained all baseline conditions data and utilized the USGS 10-meter DEM as the underlying surface data; the second model contained all proposed grading activities and limits of disturbance and utilized the proposed surface dataset to depict the resulting topography. Both models contained the baseline vegetation dataset to populate all vegetation within the model environments. Vegetation species, heights, and distribution patterns were determined via field observation, aerial interpretation and the USFS Region 2 vegetation dataset. All of the vegetation information was compiled and used to create an accurate depiction of the vegetative stands within the model that would accurately depict field conditions upon full implementation of the DRFHF prescribed clearing activities. With all elements of the models completed to depict baseline and proposed field conditions, the lighting was then corrected to reflect solar illumination as it existed on the dates and times the individual photos were taken.

Two scenes were exported from the models for each observer location; the first depicting baseline conditions; the second depicting proposed conditions. The scenes were exported from Visual Nature Studio with the same camera settings as used in the field when taking the individual observer photographs.

The last step in the simulation process was compositing the baseline and proposed conditions scenes from Visual Nature Studio with the existing conditions photographs in Photoshop. The baseline conditions simulations were created first by overlaying the baseline scene on the existing conditions photographs. Due to the variations between actual surface topography and the more generalized topography produced from the USGS 10-meter DEM, the simulated scenes

required minor shifting and distorting to match the actual surface topography as closely as possible. All areas within the scene that represented existing conditions were then erased, leaving all areas where baseline simulations had occurred on top of the existing conditions photograph. The final step involved blending the simulated scene with the photograph via edge treatments and color balancing to produce a final simulated image of the baseline conditions.

The proposed condition simulations were created in a similar manner utilizing the final baseline simulated images. Due to the variations between the proposed surface data, USGS 10-meter DEM and the actual surface topography, the simulated proposed conditions scenes were shifted and distorted using the same parameters as applied to the baseline conditions scenes. All areas within the scene outside of the limits of disturbance were then erased, leaving only the proposed reservoir expansion on top of the baseline conditions image. The proposed conditions scene and baseline image were then blended via edge treatments and color balancing to produce a final simulated image of the proposed conditions. The simulations draw from existing vegetation and colors; the USFS has prescribed seed mixes for this project and the revegetation plan will necessarily include this information. The proposed conditions show one year after construction to emulate the “worst-case” scenario, with the realization that the visual condition will continue to improve with each successive year as the forest regenerates.

The construction access road in the northeast quadrant of the project would be visible on Observer Location 4 – Summit County Simulation; however, several existing lodgepole pines within the Wildernest Subdivision block the view. Those trees will not likely last very long, but were not part of the DRFHF project and thus not removed in the model. Figures 3-14 and 3-15 in the Old Dillon Reservoir Enlargement EA, which was included in the original submittal, would depict this road realignment; however, those simulations were created with the first grading plan provided by Tetra Tech. The road realignment was not included on the first grading plans, thus the realignment is not portrayed on Figures 3-14 and 3-15.

The road realignment will require a cut and create a visual scar on Lake Hill. That scar would not be visible from Observer Location 4 until the above referenced trees in the Wildernest subdivision either fall or are removed. The scar may be visible from other points within Wildernest that were not modeled. Visual simulation exercises of this nature cannot depict the subject project’s visual impacts from every possible location. Although a road scar would be visible, we do not believe it would rise to the level of a significant impact due the existing development on Lake Hill including existing road scars.

While the mitigation measures may not be readily apparent on the simulations, the simulations do portray those measures; and, in fact one of the reasons the simulations do not show a significant visual impact is the inclusion of the mitigation measures in those simulations. The Tetra Tech Design Plans provided with the original submittal show details of the dam. The mitigation measures include: variations or undulations in the face of the dam (the profile) to blend the structure into the landscape, boulders along the toe and edges of the dams, and revegetation with native grasses and forbs. The State Engineer’s Office would not allow undulations in the dam crest for obvious safety reasons.

The formal application also needs to address the actual construction site. This can be accomplished as a part of the 1041 permit application as a temporary use for the construction site area. The formal application would need to include any construction yard with storage of construction materials, storage trailers, equipment stored on-site, stockpiles of materials, etc.; construction office trailers and construction employee vehicle parking areas.

This item is addressed in the December 21, 2009 letter from Tetra Tech to Mr. Ray Tenney of the Colorado River District, Item 11 (attached). Refer to the Tetra Tech Design Plans provided with the original submittal, Sheets B109 and C110.
