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Project: Inundation Mapping for Trout Creek Dam

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c/o Ms. Lindsay George, P.E.

CWCB funding source: Severance Tax Operational Fund

SCOPE OF WORK

Applegate Group, Inc. (Consultant), at the direction of Mr. V. Paul Moltz (Vendor), will perform a dam breach modeling study and flood inundation mapping for a dam within the Vendor's system. The study shall be in accordance with the latest Breach Guidelines published by the Colorado Dam Safety Branch. The dam breach level of analysis shall be the "Simple" method as defined in Table 1 of the Guidelines for both the breach modeling and flood inundation mapping. Flood routing models and inundation mapping shall be based on USGS 10-meter Digital Elevation Model (DEM) or best available topographic mapping.

The dam to be modeled is the Trout Creek Dam located at Trout Creek Reservoir. The inundation mapping for the dam will extend from the dam, down the outlet channel, Trout Creek, to the Arkansas River. The mapping will then follow the Arkansas River downstream to a point where the flood impacts are negligible.

The analysis will be split into two phases. Phase 1 will be a breach and inundation analysis for the existing dam and reservoir storage. Phase 2 will be a breach and inundation analysis for the proposed enlargement of the dam and reservoir.

The inundation limits shall be prepared in UTM coordinates (NAD 83, Zone 13 – meters) which shall be overlaid on base mapping that includes color aerial imagery (2011 or newer). The inundation map shall be printed in color on a minimum sheet size of 11"x 17". The inundation extents shall be clearly illustrated and include peak discharge estimates, peak flood wave arrival times, peak velocities and peak flood wave depths at critical locations. Roads, highways and critical infrastructure (schools, hospitals, fire stations, etc.) shall be annotated and any roads expected to be overtopped by the flood wave shall be identified. The map shall include a legend noting the dam, DAMID, north arrow and a graphic scale.

PROPOSED METHODOLOGY

The Consultant shall perform a clear day dam failure analysis of the dam and route the resulting outflow hydrographs downstream using HEC-RAS or FLO-2D. Breach parameters shall be determined using empirical equations in accordance with methodologies recommended by the Office of the State Engineer, Dam Safety Branch. Hydraulic parameters, including width of flow, depth of flow and velocity at critical locations shall be estimated using the Corps of Engineer's HEC-RAS or FLO-2D computer modeling software. A steady-state water surface profile resulting from peak flow rates at various

locations shall be generated. Topographic information for the floodplains shall be based on USGS 10-meter DEMs from the National Elevation Dataset (NED) elevation data.

It is anticipated that field surveys of critical bridges in the study reach will not be necessary and that existing LiDAR will be attained from the Colorado Geological Survey. Correspondence shall be with Mark Perry, P.E. of the Colorado Division of Water Resources to present preliminary dam breach parameters, water surface profile modeling, and inundation mapping and to determine if field measurements are necessary for critical bridges.

DELIVERABLES

The Vendor shall provide the CWCB the following: a final report for the inundation mapping analysis stamped by a licensed Colorado professional engineer; digital files of the inundation limits, maps and supporting spreadsheets; and hydraulic/hydrologic models.

SCHEDULE

Work may initiate on the date of the State's Purchase Order and delivery of the final product is due no later than June 30, 2014.

BUDGET

The estimated cost for completing the project is $16,460 based on Consultant's current rate schedule and projection of effort. The estimate is summarized in the attached Table. The Consultant shall invoice Vendor on a Time and Materials basis for services performed.

PAYMENT

The State shall pay Vendor up to $5,600 for Consultant's project related invoices following receipt of final deliverables. The Vendor is responsible for all expenses in excess of the State's contribution. Any overages or increases in project costs shall be the responsibility of the Vendor.

Estimated Project Cost Sharing:

Owner Match	$ 10,860
CWCB Grant	$ 5,600
TOTAL	$ 16,460

CWCB shall issue payment following receipt and processing of Vendor's Request for Payment submittal. CWCB will issue payment for 50% of the Project's total cost, not to exceed $5,600. The Request for Payment must include: a summary of Consultant's labor effort and direct costs in accordance with the attached estimate, copies of corresponding invoices from Consultant, and identification of any major issues with proposed or implemented corrective actions. All products, data, and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of project documentation prior to CWCB issue of payment.