



CENTRAL PEACE REGIONAL WATER SUPPLY SYSTEM PHASES 1 & 2

PROJECT OVERVIEW

August 07, 2024

ENGINEERING OVERVIEW

NOTE: Sections that include notable updates are highlighted in bold text.

1. Status of preliminary engineering includes the following:

- .1 ***The revised concept for the raw water pumping station wet well 27 m (90 ft) deep excavation shoring support is to incorporate a secant pile wall shoring system. With the extensive bracing requirements for a rectangular secant pile wall shoring configuration, the Geotechnical Engineering recommendation of a circular excavation and secant pile wall configuration has been adopted as the feasible approach. The secant pile wall ring on its own shall not be utilized for supporting additional loads within its interior. A separate concrete wet well structure will be cast inside of the secant pile wall shoring ring that will be capable of supporting the intermediate platform slab, and access stairway for the deep wet well chamber. A specialist GeoStructural Subconsultant is completing the design of the secant pile wall shoring support. The secant pile wall is being designed as a permanent structure to provide the long-term lateral support for the wet well deep excavation. An option to lower the ground elevation at the pumping station location was recently reviewed to allow for less depth for the wet well, however, it was determined that this option would not be feasible. The Geotechnical Team also reviewed the slope stability consequences corresponding to lowering the ground elevation at the site and have presented their findings in a separate technical memorandum. The GeoStructural Subconsultant is completing a detailed review to evaluate a sheet pile approach for the cofferdam to isolate the raw water intake within the Peace River. One of the alternatives involves a high sheet pile cofferdam around the intake structure location with a lower sheet pile cofferdam causeway that would connect the intake location to the shoreline. The other alternative being reviewed in detail involves a high sheet pile cofferdam around the intake structure location with another high sheet pile cofferdam at the river shoreline that would be used as a landing and staging area, and a lower trestle bridge structure would then be constructed that would connect the intake location to the shoreline cofferdam. The detailed evaluation between the two main alternatives is being finalized. Costs to complete geotechnical testing of the river bottom have been obtained from three contractors that include the barge services for geotechnical drilling of the river bottom on the open water. The geotechnical testing work has been scheduled to occur in mid-September 2024 subject to the river level remaining high enough to operate a barge during the upcoming filling of the upstream Site C Dam facility. The final regulatory approval for the river geotechnical work is anticipated from Transport Canada in August 2024 to complete the work under the Navigable Protection Act. With***

the River Engineer advising of the requirement for geotechnical erosion protection of the opposite bank of the river during the implementation of the cofferdam, the River Engineer was engaged to provide design services for the opposite bank protection and a draft design for rock trenches to protect the opposite bank gravel bar has been provided by the River Engineer. The regulatory requirements for the opposite bank erosion protection work are being clarified. The extent of opposite bank erosion protection may be impacted on whether the river intake cofferdam is connected via a low cofferdam to the shoreline versus being connected to the shoreline via trestle bridge. The additional regulatory approvals required for the riverbed drilling were applied for by the Geotechnical Team. The application for approval under the Water Act was submitted and permission was received from the Department of Fisheries and Oceans (DFO) related to the Federal approvals required for the river geotechnical testing. The Land Agent, Scott Land and Lease, was engaged to procure the required Temporary Field Authorization (TFA) for access on Crown lands for the river geotechnical work.

- .2 ***Related to the river geotechnical drilling investigation that is scheduled to be undertaken in September 2024, the County and representatives from MPE Engineering, met with the crane contractor at the Dunvegan boat launch on August 06, 2024, to review the deployment of the crane required to launch the barge from which the geotechnical drilling shall be conducted. Launching of the barge at the Dunvegan boat launch was determined to be feasible through the use of rig mats to level the crane on the steep slope of the boat launch. The County has offered to assist with coordinating the occupation of the boat launch with the local river boating association. The River Engineer has been engaged to provide review as to whether the river levels shall be sufficient for barge operation during the Site C Dam filling period that is scheduled to commence in late August or early September 2024. In addition to the geotechnical drilling that is scheduled, further river bottom investigation work is being considered with the potential usage of Multichannel Analysis of Surface Waves (MASW) seismic methods to obtain a more continuous subsurface profile at the river intake location.***
- .3 Support for the regulatory approval applications remains on-going for the Public Lands Act and Water Act Approvals. Prior to the Approvals being brought forward to their semi-finalized draft stage, the Project Team and Alberta Environment had held regular monthly meetings with the Department to facilitate the approval applications. Related to the Water Act Approval, in a May 2024 meeting between Saddle Hills County and Alberta Environment, the Water Act Approvals Engineer requested submission of the finalized raw water transfer pipeline alignment drawings in advance of the final landowner signoff, in order for the Department to proceed with finalization the Water Act Approval. Drafting of the amended drawing package for the pipeline alignment is being completed for the Water Act Approval submission of final documentation. Work was assigned to the project Environmental Subconsultants to delineate the wetland areas along the finalized version of the pipeline alignment as well as assess the alignment for other water body (creek) crossings, which are required for the Water Act Approval submissions. The information received from the Biologist Subconsultants has been updated on the pipeline plans and has been submitted to Alberta Environment in support of the Water Act licence application.

- .4 Following the meeting that occurred with the County and the River Engineer, Northwest Hydraulic Consultants (NHC) on January 25, 2024, to review the River Intake Assessment report previously completed by NHC and review options for alternatives to the recommended intake configuration, the River Engineer was engaged to proceed with a further review on the feasibility of the possible alternate intake configurations in detail. Some previous geotechnical information that was available for the river bottom conditions was provided to the River Engineer to assist with the River Intake Assessment and the completed assessment was received in April 2024. The intake options assessment concluded that alternative river intake concepts were feasible for a “bank style” intake, or “infiltration gallery style” intake, but all of these feasible concepts had varying pros and cons that required consideration. Following review of the risks and rewards, the County has elected to continue with the original “in-river style” intake at the original location in the river provided that additional grant funding is confirmed by the Province to cover the costs. The original intake concept would appear to have the least risks from structural ice issues, frazil ice issues, and sedimentation issues, during operation of the river intake. In the event that there may be a grant funding shortfall from the Province, the County would only then explore a compromise option for a bank style river intake. A cost proposal to undertake the bank style intake design was received from the River Engineer in May 2024, in such event that the County may elect to pursue this compromise alternative. The May 2024 design proposal for the bank style intake option has been accepted by the County and the River Engineer has been notified to proceed with the alternative detailed design for a bank style intake option.
2. **Raw Water Pumping Station Land Acquisition:** The transfer of land for the Raw Water Pumping Station subdivision parcel has been fully completed and the Land Title Certificate for the parcel is now in the name of Saddle Hills County. The TransAlta Utility Right of Way agreement for the pipeline portion across their lands has previously been registered at Land Titles. A meeting was arranged with TransAlta on March 05, 2024 to coordinate their requirements for use of the Working Area easement that the County had procured on the west side of the pumping facility land parcel. The meeting discussion with TransAlta involved topics that included operating on their site, tree clearing, use of the Working Area for surplus excavated material storage, landscape modifications, and gravel usage. A formal request was made to TransAlta to review the Working Area site modifications that were proposed by the County. An information package that summarizes the proposed usage of, and modifications to, the Working Area parcel was developed and was included with the formal request to TransAlta. This information package was forwarded to the County in April 2024 for review and the feedback from the County has been incorporated into a revised information package that was reviewed by the County in May 2024 prior to its submission to TransAlta. A follow up meeting with TransAlta occurred on July 18, 2024 to review the information package and the County’s proposed usage of the Working Area. TransAlta are presently reviewing the land use proposal for the Working Area easement.
3. **Public Lands Act Dispositions:** All three of the approved Public Lands Act Dispositions for the river intake, the Crown land occupation of the pipeline, and the crossing of the Dunvegan (Bronco) Creek have now been received from the Province. The overall map of the pipeline alignment identifying all of the wetlands and watercourse crossings will require adjustment and re-submission subject to the pipeline alignment changes that are now being completed following recent problems with procuring pipeline right of way agreements along the previous route revision. The Land Agent, Scott Land and Lease, was engaged to complete an application for a Temporary Field Authorization (TFA) for access on Crown lands to proceed with the summer geotechnical drilling on the river during open water conditions.

4. **Pipeline Alignment Land Agreements:** Landowner holdouts have impacted proceeding with previous pipeline route between TWP Road 795A and TWP Road 790. An alternate alignment (third alternate) for the pipeline that was re-routed to avoid holdout properties was determined and the required easements for the properties along the alignment have been secured by the Land Agent, with the final easement signoff obtained in late June 2024. A pipeline alignment adjustment was also implemented to avoid an abandoned oil company well on one of the easement agreement land parcels. The Owner of the abandoned well was contacted and the Design Team has coordinated the re-alignment of the pipeline with the abandoned well Owner. A working space agreement has been arranged for the property at the top of the Peace River valley hill for the steel pipe HDD work.

5. **Environmental Assessments - Terrestrial:** The draft of the Biophysical Assessment report was completed by the Terrestrial Biologist, Fiera Biological Consulting in July 2023 following the field surveys that were completed at the end of May 2023. Valuation of the wetland compensation costs for the Regional Water Treatment Plant site have been confirmed by the Terrestrial Biologist (in consultation with the Province), with the submission of their Biophysical Assessment draft report. As one of the key takeaways from the draft report, Fiera has recommended to try as much as possible to retain the C-value treed wetland area located in the north central area of the project site due to its environmental significance. Fiera is providing support for any of the supplemental environmental information requests raised by the Water Act Approval application review and Public Lands Act Approval application review for the project. This includes providing the wetland boundaries along the pipeline alignment (and any potentially revised alignment sections) requested by Alberta Environment at a previous meeting. Fiera has also provided any follow up disposition support for the Key Wildlife and Biodiversity Zone along the steel pipe HDD installation route up the Peace River valley hill. Coordination to facilitate winter construction for the steel pipe installation on the hill that respect the hard dates for the Restricted Activity Periods (RAP) will require support from Fiera to negotiate the period for the construction RAP window stipulated by Alberta Environment. A meeting was requested in July 2024 with Alberta Environment to review the implications of carrying out work within the Key Wildlife and Biodiversity Zone during the RAP. Fiera shall provide support during the (as yet to be scheduled) meeting with Alberta Environment. The County had engaged with a local contractor about removal of trees at the river location of the Raw Water Transfer Station in advance of the restricted activity period for nesting migratory song birds. However, the tree clearing work shall be deferred until after the RAP for the migratory songbirds which will be after the month of August. Prior to proceeding with tree clearing at that location, Fiera was requested to provide recommendations on the requirement for any environmental sweeps that may be required for any other wildlife on the property. Most recently Fiera Biological was engaged in late-May 2024 to complete a wetlands assessment along the finalized version of the raw water transfer pipeline route as required by Alberta Environment for the Water Act Approval submission information for the finalized pipeline alignment. The wetlands information for the finalized pipeline alignment was received in June 2024 and the information is being incorporated onto the pipeline drawings.

6. **Environmental Assessments - Aquatic:** The Fish and Habitat environmental assessment report completed by the original Aquatic Biologist, Mainstream Aquatics, was the primary supporting documentation for the Provincial Water Act Approval as well as the Federal DFO application. The Principal Biologist for Mainstream Aquatics retired as of July 31, 2022. The new supporting Aquatic Biological Subconsultant for the project for subsequent work is Ridge Environmental Planning Ltd. Ridge Environmental Planning completed a field review in June 2023 of the proposed wastewater outfall discharge location at the Regional Water Treatment Plant location. The Fish and Habitat environmental assessment report for the wastewater outfall at the Regional Water Treatment Plant site was received from Ridge Environmental Planning in August 2023. Further engagement of the Aquatic Biologist will be required in the future to meet the requirements of the response letter received from DFO in July 2023 related to their review of the project approval application. An environmental monitoring scope of services plan has been provided by Ridge Environmental Planning for the aquatic environmental monitoring of the work that will be required by the Regulatory Authorities during the implementation of the cofferdam in the River at the intake location. The services of the Aquatic Biologist would also be required to support the regulatory applications that would be required for the proposed geotechnical drilling within the riverbed necessary for the cofferdam design work. Most recently Ridge Environmental Planning was engaged in early June 2024 to complete an aquatic assessment of any creek crossings along the finalized version of the raw water transfer pipeline route as required by Alberta Environment for the Water Act Approval submission information for the finalized pipeline alignment. The creek crossing information for the finalized pipeline alignment was received in June 2024 and the information is being incorporated onto the pipeline drawings. Delineation of the top of bank limits for each of the identified creek crossings is required to be defined by a Legal Surveyor that shall be engaged by the County to complete the top of bank surveys.

7. **River Engineering:** The Hydraulic Subconsultant for the River Intake, Northwest Hydraulic Consultants (NHC), continues to provide engineering support related to the intake and pumping station design. The submitted report by the Hydraulic Subconsultant comprises a major document in support of the application package for the Water Act Approval, and NHC has assisted to provide some of the supplemental information that has been requested by Alberta Environment in the follow ups to the original application submission. NHC has also provided the support and hydraulic modeling for the increased size coffer dam footprint in the event of using rock and earth fill materials for the temporary coffer dam for the river intake. From their hydraulic modeling of the cofferdam impact on the River flow, NHC has identified issues with erosion of the gravel bar located on the opposite bank of the River, that will require erosion protection during the implementation period for the cofferdam when the width of the River shall be restricted by the cofferdam. To address this opposite bank erosion issue, NHC has been engaged for the design of an erosion protection system for the opposite bank gravel bar, as well as assist with any required approvals for completing the opposite bank erosion protection work. The draft of the proposed opposite bank erosion protection design concept has been received from NHC which consists of implementing rock trenches across the gravel bar that are perpendicular to the River and filled with large diameter rock (800 mm diameter size). NHC is also assisting with cost estimates for this erosion protection work. NHC has recently provided more specific analysis for the River level information during the summer cofferdam implementation period as well as the ice affected water levels for winter cofferdam impacts. NHC has also been engaged for any River Engineering scope of work that will be required to implement geotechnical testing and drilling within the Peace River. A meeting between the County and the River Engineer occurred on January 25, 2024 to further review and revisit the option of utilizing a “bank style river intake” (that was dismissed as an option by the River Engineer in their recommendation report), instead of the “in-river style intake” that was proposed by the River Engineer for the project. The River Engineer was requested by the County to further review alternatives for the river intake configuration. The River Engineer completed the additional feasibility review in April 2024 and the assessment concluded that the other options for either a “bank style” intake or an “infiltration gallery style” intake were also potentially feasible for this project. However, the alternative river intake concepts had both pros and cons that required serious consideration in order to proceed with these alternatives. The original concept for the “in-river style” intake appears to be the least risk option from the standpoint of ice jam accumulations, frazil ice effects, and sediment build up, at the intake location. As a backup plan, the River Engineer was requested in May 2024 to provide a detailed proposal to undertake the design of a “bank style” intake in the event of a grant funding shortfall that may require the County to seek cost savings with an alternate river intake compromise. The scope proposal received from the River Engineer has been accepted by the County in June 2024 and the River Engineer has been notified to proceed with the alternative design for a bank style river intake. NHC has also recently been engaged in August 2024 to complete a review of the river water levels during the filling of the Site C Dam to determine whether the river levels shall be sufficient to support operation of a barge from which geotechnical drilling is tentatively scheduled to be undertaken in September 2024 (pending results of the River Engineering review of the minimum water levels).

8. **Water Act Approval Applications:** *The Water Act applications for the Approval to Construct for the River Intake systems and the Water Diversion licence for withdrawal of water from the Peace River were previously submitted and are in review by Alberta Environment. Updated draft versions of both the Water Act Approval and the Water Diversion licence were received from Alberta Environment in May 2023 that included some of the final revisions discussed at the previous monthly meeting. The received semi-final draft documents were reviewed at our meeting with the Department in May 2023 and were close to being finalized. The Project Team's most recent meeting with Alberta Environment occurred on June 12, 2023. Alberta Environment was sent a copy of the finalized revised geotechnical report for the raw water pumping station and cofferdam that was requested for the Approval application. The DFO Acknowledgement Letter received in July 2023 for the project has also been forwarded to Alberta Environment as well as the Historical Resources Act Approval that was received in August 2023 from Alberta Culture. The balance of information required for finalization of the Water Act Approval is the final route alignment of the raw water transfer pipeline following signoff from all of the affected landowners along the pipeline route. At a meeting between the County and Alberta Environment in May 2024, the Water Act Approvals Engineer requested that the County submit the finalized routing drawings for the raw water transfer pipeline even if the final landowner signoff agreements for the pipeline were not yet fully endorsed. The revised design drawing information for the proposed final pipeline alignment has been drafted and submitted to Alberta Environment in July 2024 to support finalization of the Water Act Approval for the project. The project environmental subconsultant for terrestrial biology, Fiera Biological Consulting, was engaged to provide a wetlands assessment along the adjusted version of the finalized pipeline alignment and delineate the wetland areas crossed by the pipeline as required for the Water Act Approval. The project environmental subconsultant for aquatic biology, Ridge Environmental Planning, was similarly engaged to provide a water body assessment along the adjusted version of the finalized pipeline alignment to identify and assess any creeks crossed by the pipeline. The information for the wetlands and creek crossings has been received and has been incorporated onto the finalized pipeline alignment drawings. The official top of bank boundaries for each of the identified creek crossings is required to be delineated and surveyed by a Legal Surveyor. The County shall engage their Surveyor to complete this work. A Water Act Approval application for the summer geotechnical test hole drilling in the river has been submitted and approved for the additional testing required for the structural cofferdam alternative. An application for a Temporary Field Authorization for Public Lands access for the river geotechnical drilling was submitted to the Province by the Land Agent and subsequently approved.*

9. **Historical Resources Act Approval Application:** The Historical Resources Act Approval for the project was received in August 2023 from the Provincial Regulator, Alberta Culture for the River intake facilities and the original raw water transfer pipeline alignment. A further application may be required now that the final revision to the pipeline route has been confirmed by the corresponding landowner signoffs. Historical Resources Impact Assessment (HRIA) stipulated by the Province was previously completed by the Archaeological Subconsultant, Circle CRM, for the original pipeline route, and their report submitted to the Provincial Regulator.
10. **Navigable Protection Act Application:** *The Notice of Works application for Navigable Waters previously submitted to Transport Canada for the river intake structure was approved (December 06, 2022) for the original temporary coffer dam during the construction and the permanent river intake. Subsequent notification was provided to Transport Canada for the potential increased footprint of the coffer dam to allow for rock and earth fill coffer dam construction, which has now been reviewed and accepted by the Department. An additional application was submitted in June 2024 for the geotechnical drilling work that will occur in the river from a barge. Public notification advertising of the river drilling activity has been undertaken by the County in July 2024 as required by Transport Canada. The Transport Canada approval for the river geotechnical drilling is anticipated to be issued in August 2024 provided there are not any issues related to Indigenous Consultations.*
11. **Steel Pipe Contract for Peace River Valley Hill:** *The HDD Specialist Subconsultant, Blue Fox Engineering, continues to be involved with the steel pipe installation contract as the contract was put out for tender in early June 2023. Blue Fox provided engineering support for the steel pipe HDD tender documents including pre-tender cost estimates, and has provided support for evaluation of tender submissions, and shall provide resident services during construction review. At the tender close on July 18, 2023, four bids were received, and the bid submissions were reviewed in detail by Blue Fox Engineering to ensure that all submissions were evaluated on an equal (apples-to-apples) basis. The bid submission amounts were significantly higher than previous estimates and exceed the cost estimates from the 2018 project grant application amount by far more than double. The County did not award the contract in 2023 and provided direction for review of scope to seek potential cost reductions, however, there was still interest from the bidders to proceed with the work. The updated project budget for 2024 now allows the County to proceed with this work. Factoring into consideration the scheduling window to meet the environmental Restricted Activity Periods along this portion of the pipeline, the time period to proceed with the work for the 2024 season could proceed as updated bidder costs and materials availability are being confirmed. One of the final material confirmations relates to the steel pipe coating products that have been proposed by the low bidder. The information on the pipe coatings is being reviewed for County recommendation. If the updated information can be favourably confirmed to the satisfaction of the County, the construction of the pipeline could potentially proceed in the fall season of 2024. Blue Fox Engineering has also provided a proposal to look after the drilling fluid waste management for the wastewater generated by the HDD pipe installation up the valley hill, which is being reviewed.*

12. **Project Budget:** An updated preliminary opinion of probable costs for the project was developed and shared with the County. The estimated costs had increased significantly since the 2018 Pre-Design Report and the County made a request to the Province for additional grant funding under the Water for Life program to make up the projected cost difference. The County had follow up meetings related to the grant request with representatives from the Province and had presented a cash flow projection to the Province that provided a schedule of expenditures over the course of the next three years as it relates to grant funding. The County met with the Province again in March 2024 and again in April 2024, and ultimately received formal response from the Province this June 2024 that confirmed additional grant amounts for the upcoming year.

NEXT STEPS

13. Complete the preliminary engineering and continue with the detailed design for the project including the drafting of revised plan and profile drawings for the pipeline (for Alberta Environment Water Act Approval), continue to hold meetings with Alberta Environment for the project and the approval submissions, proceed with geotechnical test hole drilling of the river bottom (and potentially MASW seismic investigation) for the structural cofferdam alternatives, coordination with the Transport Canada for the river geotechnical test hole drilling Navigable Protection Act Approval, continue with the river intake and pumping station design, and also wet well installation design, and excavation shoring design with the geotechnical group, follow up on TransAlta requirements for use of the Working Area easement on their property, incorporate design requirements and corresponding approval requirements for the erosion protection of the opposite bank during implementation of the temporary cofferdam, finalize access roadway design down to the cofferdam at river's edge, finalization of cofferdam concept, continue with Federal and Provincial regulatory approvals, proceed with the steel pipe HDD contract extending out of the River valley, provide responses to Public Lands Act and Water Act applications supplemental information requests from Alberta Environment as they are requested, confirm with Archaeological Subconsultant the Historical Resources Assessment Approval for final pipeline route, coordination with ATCO for the power servicing to the Raw Water Pumping Station, proceed with tree clearing at the Raw Water Transfer Station site, seek Provincial support for the balance of grant funding for project ultimate completion.

Haj Oshiki, P.Eng.