REVIEW OF THE COST STATUS OF MAJOR TRANSMISSION PROJECTS IN ALBERTA

From The Transmission Facilities Cost Monitoring Committee

JUNE 2014 REPORT

Industry Abbreviations Found In This Report

Alberta Electric System Operator . . . . . (AESO)

Alberta Utilities Commission . . . . . (AUC)

AltaLink Management Ltd. . . . . (AltaLink)

ATCO Electric Ltd. . . . . (ATCO)

Critical Transmission Infrastructure . . . . . (CTI)

Direct Assign Capital Deferral Account . . . . . (DACDA)

Distribution Facility Owner . . . . . (DFO)

ENMAX Power Corp. . . . . (ENMAX)

EPCOR Distribution and Transmission Inc. . . . . (EDTI)

EPCOR Utilities Inc. . . . . (EPCOR)

Facility Application . . . . . (FA)

General Tariff Application . . . . . (GTA)

High Voltage Direct Current. . . . . (HVDC)

In-Service Date . . . . . (ISD)

Long-Term Plan . . . . . (LTP)

Needs Identification Document. . . . . (NID)

Proposal to Provide Service . . . . . (PPS)

Permit and Licence . . . . . (P&L)

TransAlta Corp. . . . . (TransAlta)

Transmission Facilities Cost Monitoring Committee. . . . . (TFCMC)

Transmission Facility Owner . . . . . (TFO)

Transportation Utility Corridor . . . . . (TUC)

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Message From the Chair

This is the seventh report from the Transmission Facilities Cost Monitoring Committee (TFCMC) to its stakeholders. The report provides a detailed and structured summary of the cost, scope and schedule information of the transmission projects monitored by the Committee on a monthly basis for the period of November 1, 2013 to April 30, 2014.

During this period, the Committee examined the progression of 15 major transmission projects, with the total cost of these projects estimated at just under $9.339 billion. A listing of the 15 projects can be found in Section 1 while details for these projects are contained in Appendices B and D.

Section 2 of this report contains several key observations made by the Committee while monitoring the progress of these transmission projects. The Committee received a presentation from the Alberta Electric System Operator (AESO) on their latest long-term planning outlook on Alberta's transmission development needs. Through its monitoring efforts, the Committee has noted, with encouragement, several examples of proactive initiatives by the Transmission Facility Owners (TFOs) that could result in positive cost-optimization benefits. Also during this report period, the AESO has initiated a working group to review transmission design criteria – the ISO Rule 502.2 Working Group – with the aim of optimizing the technical design of the facilities within the province's transmission grid.

The ENMAX No. 65 Substation and North Fort McMurray Transmission Development projects were completed during this reporting period. The two projects' authorized budgets were estimated at a cost of $38 million and $237 million at their Facility Application (FA) stage; the final cost for these projects was $45 million and $352 million, respectively.

Through the TFCMC's work in monitoring transmission project costs, the Committee has identified many opportunities to control costs. Since its inception, the Committee has made recommendations to take advantage of these opportunities. Section 3 provides an update on the status of all previous recommendations. The Committee is heartened by the proactive responses from the AESO and Alberta Energy. The AESO's continuing work in enhancing the benchmarking database and in strengthening Rule 9.1 in the areas of cost estimating and cost reporting are just some examples of their positive responses to the Committee's recommendations.

On February 24, 2014, the Canadian Federation of Independent Business submitted its resignation from the TFCMC in writing to the Minister of Energy. The Federation stated that their involvement in the Committee is no longer necessary because of the re-establishment of an independent regulatory review process in 2013 and the repeal of Bill 50. The Minister accepted the resignation with gratitude on April 3, 2014.

Thank you for your continuing support. The TFCMC's next report is scheduled for the spring of 2015. Your comments to improve the report will be much appreciated. Please email your comments to **TFCMC@gov.ab.ca**

Henry Yip
Chair, Transmission Facilities Cost Monitoring Committee

1. Transmission Projects Covered Under The TFCMC's Mandate

The TFCMC has the authority to review records relating to the cost, scope and schedule of transmission facility projects that are expected to cost more than $100 million. These projects include all lines and substations, which make up the transmission facilities required to transfer power between generators and loads.

Monitored Projects

The TFCMC monitored 15 projects valued at a total of just under $9.339 billion[1] (based solely on the current estimated costs noted in Appendix B of this report). During the period covered by this report, two of the projects – 922, ENMAX No. 65 Substation and 791, North Fort McMurray Transmission Development – were completed and this report is expected to conclude the Committee's work on these undertakings.

The monitored projects, in alphabetical order, are:

- **ALBERTA INDUSTRIAL HEARTLAND BULK TRANSMISSION DEVELOPMENT (HBTD);** PROJECT 629 – Construction of a double-circuit 500 kV transmission line, which will connect the Heartland region (northeast of Fort Saskatchewan) to existing 500 kV transmission facilities in the Edmonton area.
- **CENTRAL EAST AREA TRANSMISSION DEVELOPMENT (CETD);** PROJECT 811 – Transmission development in Wainwright, Lloydminster, Provost, Vegreville and Cold Lake.
- **CHRISTINA LAKE AREA 240 KV TRANSMISSION DEVELOPMENT (CHL);** PROJECT 1101 – To establish transmission facilities to serve new oilsands developments and enhance reliability to existing oilsands operations.
- **EAST CALGARY TRANSMISSION PROJECT AND ENMAX SHEPARD ENERGY CENTRE CONNECTION (ECTP);** PROJECT 719 – To serve growing demand for electricity in the Calgary and High River planning areas and to interconnect the ENMAX Shepard Energy Centre.
- **EDMONTON REGION 240 KV LINE UPGRADES (ERLU);** PROJECT 786 – Upgrading 240 kV lines in the Edmonton area; adding one 240 kV phase shifter at Dover substation.
- ***COMPLETED* ENMAX NO. 65 SUBSTATION (ESCS);** PROJECT 922 – New 240 kV substation in south Calgary and 138 kV development due to overloading in south Calgary.
- **FOOTHILLS AREA TRANSMISSION DEVELOPMENT (FATD) – EAST PROJECT;** PROJECT 1117 – To meet growing demand in South Calgary, High River and the surrounding area.
- **FORT MCMURRAY AREA TRANSMISSION BULK SYSTEM REINFORCEMENT (FMAC);** PROJECT 838 – Construction of 500 kV transmission lines from the Edmonton region to the Fort McMurray area.
- **HANNA REGION TRANSMISSION DEVELOPMENT (HATD);** PROJECT 812 – Transmission development in the Hanna, Sheerness and Battle River areas.
- ***COMPLETED* NORTH FORT MCMURRAY TRANSMISSION DEVELOPMENT (NFMD);** PROJECT 791 – Transmission development to relieve constraints and to serve forecast demand north of Fort McMurray.
- **NORTH SOUTH TRANSMISSION REINFORCEMENT (HVDC);** PROJECT 737 – Construction of two 500 kV HVDC transmission lines from the Edmonton area to the Calgary and south regions[2].
- **NORTHWEST (OF) FORT MCMURRAY TRANSMISSION DEVELOPMENT (NW FMM);** PROJECT 1180 – To provide service and connect future industrial customers in areas where there are no transmission facilities northwest of Fort McMurray.
- **RED DEER REGION TRANSMISSION DEVELOPMENT (RDTD);** PROJECT 813 – 240/138 kV transmission system reinforcements in the Red Deer area.

1 This figure does not include costs for Project 838 – Fort McMurray Area Transmission Bulk System Reinforcement (FMAC) – as this project falls under a competitive procurement process.

2 In late February 2012, this project received provincial government approval to proceed after previously being placed under review by the government.

- **SOUTH AND WEST OF EDMONTON TRANSMISSION DEVELOPMENT (SWEATR);** PROJECT 850 – Transmission system reinforcement to the 138 kV system south and west of the City of Edmonton.
- **SOUTHERN ALBERTA TRANSMISSION REINFORCEMENT (SATR);** PROJECT 787 – To accommodate wind generation in southern Alberta.

2. TFCMC Observations To Date

As the TFCMC moves forward with its mandate to review the cost of major transmission projects, it embarks on in-depth assessments of these undertakings (in the case of new projects)[3] or focuses on a more detailed analysis of existing ones and relevant issues based on the monthly reports[4] it receives.

This section describes some of the substantive observations made by the Committee during the six-month period covered by this report.

East Calgary Transmission Project & ENMAX Shepard Energy Centre Connection Cost Evolution

In reviewing the cost performance of Project 719, the East Calgary Transmission Project and the ENMAX Sheppard Energy Centre Connection, the Committee noted an overall cost increase of $20 million or about 15%, attributed primarily to factors such as changing market conditions and increasing labour costs. ENMAX kindly accepted the Committee's invitation and made a presentation at the TFCMC's February 2014 meeting, providing the Committee with a better understanding of the drivers behind the increases.

The majority of the cost increase was due to a delay in permit and licensing (P&L) pushing back an expected start date of April 2012 to November 2012, resulting in the need for winter construction work and in turn, an increase in civil costs and construction schedule compression.

Other factors that came into play included a higher than planned use of external special resources due to construction complexity and an unplanned need to replace two substation transformers, which were determined to be at their economic end of life (over 50 years) and considered unsafe to relocate during the development of the substation. ENMAX had provided four options and replacement was selected as the best option. Also, some transmission and substation material cost increases were incurred due to current market conditions.

The project is expected to be completed in June 2015.

AESO Long-Term Plan Update

Earlier in 2014, the Alberta System Electric Operator (AESO) provided the TFCMC with an update on its long-term planning for Alberta's transmission system. This newest plan identifies and discusses 37 transmission development projects as well as the corresponding cost impact.

The AESO prepares and maintains a transmission system plan (an LTP or Long-Term Plan) that anticipates system conditions and requirements as required by the Transmission Regulation (T-Reg.). The T-Reg. states that there is a need to prepare and maintain a transmission system plan, which anticipates, for at least the next 20 years, system conditions and requirements.

Additionally, this plan must consider that the transmission system is available in advance of need and provide unconstrained access to customers. These legislative provisions mean that the AESO must take a long-term view, adjusting for short-term changes, and focusing on directional system requirements to meet the long-term vision for electrical infrastructure in Alberta.

The T-Reg. directs the AESO to update the LTP periodically as required, but at least once every two years. Further, the T-Reg. directs the AESO to make the transmission system plans available to the public, and file copies with the Alberta Utilities Commission (AUC) as well as the Minister of Energy for information purposes.

3 New projects added to the TFCMC's purview receive an in-depth review in addition to being inserted into the Committee's month-to-month examination process.

4 The TFCMC continues to receive monthly reports from the AESO, which originate from the TFOs, on all projects valued at $100 million and over.

The AESO's 2013 Long-Term Plan, (2013 LTP), filed in January 2014, covers the 20-year period out to 2032. The 2013 LTP provides the latest comprehensive evaluation of the transmission grid, incorporating the most recent forecasts of load, generation and overall economic activity in Alberta. It also sets out a blueprint that identifies and recommends possible infrastructure solutions to address existing and anticipated constraints and/or limitations, defining what, where, when, and at what cost the transmission system needs to be expanded or reinforced.

The 2013 LTP incorporates the impacts of various policies, regulations and market components that are unique to Alberta, and identifies key AESO initiatives to ensure and sustain a fair, efficient and openly competitive (FEOC) market. In addition, when planned transmission infrastructure builds are deferred or delayed beyond established need dates, the 2013 LTP identifies required system operation protocols and market products or rules be implemented as short-term mitigation strategies to address these gaps and ensure continued system integrity and reliability.

Significant stakeholder engagement occurs throughout both the forecasting and transmission planning processes. Also, the Transmission Planning Team (the Team) has travelled extensively throughout each region in the province and met with local municipalities in an effort to understand their planning needs and longer-term challenges.

The 2013 LTP identifies and discusses 37 transmission development projects (the Projects). The 2013 LTP sets out estimated costs for the Projects for the short term, or out to 2017. Of these there are two main groupings:

- First, there are those projects that have received approval to proceed from the AUC. With regard to this group, the costs associated with these are approximately $7.5 billion (2013$).
- The second group of projects has not yet received AUC approval and will be subject to the full AUC regulatory two-stage review process. With regard to this second group, the estimated costs associated with these projects is approximately $4.1 billion (2013$).

The 2013 LTP also provides an update to the anticipated rate impact that the 2013 LTP project cost estimates will have on the delivered cost of power in Alberta (Rate Impact). All electricity consumers pay for transmission in proportion to their use of the transmission system.

The Rate Impact analysis of the 2013 LTP Project Cost Estimates indicates that:

- The transmission share of an average residential electricity bill will remain at about 20% over the next 20 year period, and
- The transmission share of an average large industrial electricity bill will vary between 25% and 40% over the same 20 year period, resulting primarily from variations in the cost of energy.

The 2013 LTP also identifies and discusses key supporting AESO initiatives undertaken since the filing of the 2012 LTP, focusing on the advancement made in the areas of process improvements; the Competitive Process; Montana Alberta Tie Line (MATL) integration and operation; Interties strategy; Transmission Congestion Management; continued grid operations excellence; addition of Western Electricity Coordinating Council (WECC) Reliability Coordinator Functions, and completion of the new Back-up Control Centre[5].

5 The Back-up Control Centre (BUCC) is an emergency facility in the event that the primary control centre (System Control Centre or SCC) is deemed inoperable. A new BUCC was required as a result of the AESO outgrowing its needs. The AESO's BUCC moved to a new location in September 2013.

ISO Rule 502.2 Review

The AESO has established a Technical Panel to review ISO Rule 502.2. This rule sets out the technical requirements for bulk transmission lines. The current rule became effective on January 1, 2012.

The Technical Panel is to provide the following recommendations to the AESO:

1. The Technical Panel will recommend modifications to the existing Rule 502.2.
2. The Technical Panel will provide recommendations to enhance conductor and line optimization.
3. The Technical Panel will review the AESO's latest regional transmission plans and, if appropriate, identify new towers that should be designed.
4. The Technical Panel will review upcoming transmission projects and, if appropriate, identify existing towers that should be redesigned.

The Utilities Consumer Advocate (UCA) has engaged Utilitech Consulting Inc. (Utilitech) to represent the UCA as well as several ratepayers groups on the Technical Panel. Utilitech's mandate is to ensure that the technical line design standards, conductor and line optimization process and tower designs strike an appropriate balance between the provision of reliable service and the cost of transmission service to consumers.

During the first half of 2014, the AESO provided two updates to the TFCMC on the progress of the Technical Panel. The Technical Panel expects to submit its recommendations regarding modifications to Rule 502.2 by September 30, 2014. If it is decided to design a new tower or redesign an existing tower, it would take approximately 18 months to complete the design and testing of the tower.

Proactive TFO Actions

The TFCMC has taken note of some Transmission Facility Owners' (TFOs) actions that appear to have resulted in significant cost savings and could potentially lead to further transmission cost optimization. Other projects may benefit from similar strategies and these initiatives are commendable.

ATCO Electric Transmission Line Crew Increases Competition and Lowers Cost

ATCO Electric (ATCO) made a presentation to the TFCMC on March 21, 2014 describing their development – recently – of their own Transmission Construction Line Crew. ATCO had observed that costs were increasing due to the restricted number of qualified firms bidding on their projects. Contractor availability was challenging as workloads across the province were increasing to respond to the substantial increase in transmission construction. In addition, the need for schedule flexibility was becoming more important due to project quantity, scope and external factors.

ATCO acquired the equipment and recruited qualified labour resources from across the country. To attract qualified people, ATCO developed a modified crew shift, offered competitive rates and benefits, more job security, and apprenticeship and training opportunities.

To date, some of the benefits of developing their own transmission construction crew includes the ability to level construction schedules across all seasons and conditions due to having year-round capacity as well as significant decreases in the costs per structure and elimination of the contractor's profit margin (since ATCO executes the work at cost). Other benefits include the ability to move in-house crews between projects as required, the ability to provide immediate assistance in emergency situations and the ability to undertake capital maintenance on existing infrastructure.

AltaLink Obtains Input Parameter Changes, Lowers AC Mitigation Pipeline Costs

In an AltaLink presentation to the TFCMC on May 30, 2014 the TFO discussed their efforts to mitigate costs related to the Alberta Industrial Heartland Bulk Transmission Development; Project 629. AltaLink explained that electric transmission lines operating in parallel with pipelines can induce currents in the pipeline, resulting in pipeline corrosion, unless the effect is mitigated. Induced currents in metallic objects near the transmission line can impact public safety, result in alternating current (AC) corrosion, coating stress and soil arcing. One approach to mitigate these impacts is to install Anodes.

Normally, AltaLink designs mitigation equipment to the full-rated capacity of the line and requires pipeline companies to do the same when they are designing their installations. AltaLink pursued an exception with the AESO for the Heartland project due to the high density of pipelines in parallel to the transmission line and the move of the transmission centre line closer to the pipelines. The AESO agreed to lower the design requirements from 3,000 MVA to 1,000 MVA per circuit for 10 years based on a 10-year line-loading forecast. As a result, a material portion of the pipeline mitigation cost was deferred.

Moving a Substation to Save Site Preparation Costs

AltaLink was unable to complete geotechnical investigations at the proposed Ipiatik substation location (part of the Christina Lake Area 240 kV Transmission Development; Project 1101) prior to the Proposal to Provide Service (PPS) or Facility Application (FA) filing due to Alberta Environment and Sustainable Resource Development (AESRD) restrictions.

Subsequent geotechnical investigation identified constructability concerns due to the soil condition in the originally proposed location[6]. Shifting the location of the Ipiatik substation by approximately 150 metres to the northeast will alleviate these constructability issues. Amendments are in process with the AUC and AESRD to relocate the substation to the newly proposed location.

Costs for site preparation of a substation in areas with unsuitable soil conditions can be substantial. The effort to move the Ipiatik substation should result in significantly lower site preparation costs.

Change Order Analysis

The AESO has revised the monthly reporting the TFCMC receives to include two additional columns in one of the reports, based on a TFCMC request concerning change proposals and their affect(s) on a particular project.

The first column will report on the total changes for each FA. The second will report on the total percentage of the Change Proposal in terms of the overall project. As per a TFCMC request, the AESO will also add additional information to this report to identify the stage the project is in and which TFO owns the FA.

Meanwhile, the AESO continues to monitor Change Proposals as per its change management practices and will notify the AUC under Section 25 (5) of the Transmission Regulation if the AESO has a concern on the costs of the project.

Observations On New Projects

No new transmission developments were added to the TFCMC's roster of monitored projects during the period covered by this report.

6 AltaLink December 2013 Progress Report, Christina Lake Area Development – IPIATIK, Unplanned/Emerging Issues, page 4.

Completed Projects

The following projects have been completed and are now in service. The AESO considers these projects as closed and they will no longer be reported on to the TFCMC. Where a project may have some work outstanding, the AESO will advise the TFCMC as necessary. Projects are listed alphabetically.

ENMAX No. 65 Substation (ESCS) – Project 922

The substation is required to improve capacity and reliability in response to both current and future demand for electricity in southeast Calgary. Components include:

- A new 240/138 kV substation comprising two 400 MVA 240-138 kV autotransformers;
- Four 240 kV circuit breakers, four 138 kV circuit breakers, and
- Approximately one kilometre of 138 kV and 240 kV transmission lines to interconnect into the existing system.

Final costs were received from both AltaLink and ENMAX and collectively were $45 million. This is $3-million higher than final forecasts.

North Fort McMurray Transmission Development (NFMD) – Project 791

The North Fort McMurray Transmission Development Project will relieve transmission constraints and serve forecast electrical demand as industrial load (oilsands) continues to grow in the area north of Fort McMurray. Components include:

- A 240 kV double-circuit line (one-side strung) from Kearl Lake to Salt Creek;
- The addition of the McLelland 240 kV switching station near Kearl Lake, and
- A 240 kV switching station at Black Fly.

The project was energized on December 12, 2013. The final costs for the project were $352 million, which was $5-million lower than the expected final cost.

3. Results to Date: Status of Previous TFCMC Recommendations

Six semi-annual reports containing 11 recommendations – all with the goal of enhancing the management of transmission costs in Alberta – have been previously released. Nine of these recommendations were directed to the Alberta Electric System Operator (AESO) and two have been made to Alberta Energy.

Instead of recommendations, the TFCMC's June 2013 report focused on a list of the Committee's Top 5 transmission priorities. This list was developed as Alberta Energy initiated a review of its transmission cost management policy and sought input from leaders in the electricity sector[7].

Recommendations to the Alberta Electric System Operator

The AESO has been proactive in its response to recommendations made by the Committee, adopting a majority of the TFCMC's recommendations. The TFCMC, as previously noted, is encouraged by this and the overall direction and response that the AESO has taken in regards to these recommendations.

Recommendations already implemented:

- **JUNE 2011 REPORT, RECOMMENDATION NUMBER 1:** That the AESO improve future NID estimates by including fully loaded costs – allowance for funds used during construction (AFUDC), escalation, engineering and supervision, and owners' cost;
- **JUNE 2011 REPORT, RECOMMENDATION NUMBER 2:** That the AESO improve the estimates in the AESO Long-Term Transmission Plan by employing third-party cost estimates or cost estimate verification as well as from benchmark data being compiled by AESO;
- **JUNE 2011 REPORT, RECOMMENDATION NUMBER 3:** That the AESO develop a transmission cost benchmarking competency and database;
- **JUNE 2011 REPORT, RECOMMENDATION NUMBER 4:** That the AESO enhance compliance of the material procurement provisions of Rule 9.1;
- **JUNE 2011 REPORT, RECOMMENDATION NUMBER 6:** Initiate a review process on the current framework for cost accountability;
- **DECEMBER 2012 REPORT, RECOMMENDATION NUMBER 1:** The AESO, with assistance from TFCMC consultants, undertake a case study concerning the cost changes for Project 671 – from the NID through to the PPS and the authorized budget – and this should include lessons learned from the Yellowhead project and lessons about reporting under ISO Rule 9.1 (Compliance Monitoring).

The remaining AESO recommendations

The AESO has expanded the following recommendation into the broader context of the TFCMC's earlier cost accountability recommendation. The AESO's goal is to coordinate with the Alberta Utilities Commission (AUC) on the development of a reporting protocol with respect to the treatment of transmission project costs.

- **DECEMBER 2011 REPORT, RECOMMENDATION NUMBER 2:** That for each Direct Assigned project, the AESO provide to the Alberta Utilities Commission a summary of the scope changes authorized by the AESO for that project including the following:
  - I. The AESO's assessment on whether each scope change was needed;
  - II. A summary of the alternatives available to meet each scope change;
  - III. The AESO's assessment on whether the alternative recommended by the TFO to address each needed scope change was the most appropriate alternative; and
  - IV. The AESO's assessment on whether the cost of each scope change as estimated by the TFO was reasonable.

7 To see the TFCMC's Top 5 Transmission Priorities in their entirety, please consult the TFCMC's June 2013 semi-annual report.

This information would form part of the AUC's consideration, under section 25(4) of the Transmission Regulation, in determining the TFO's prudence in managing the cost of the Direct Assigned project.

The AESO considers the following recommendation closed.

- **JUNE 2012 REPORT, RECOMMENDATION NUMBER 1:** That for each Direct Assigned Capital project estimated to cost in excess of $100 million[8] at the Needs Identification Document stage, the AESO will publish a cost benchmarking report at the time the Transmission Facility Owner files its Facility Application with the Alberta Utilities Commission for approval. To the extent that there are significant project cost changes between the Proposal to Provide Service stage and the TFO's application before the AUC for rate base approval, the AESO will update and publish its cost benchmark report.

The AESO notes that the AUC has not expressed any interest in receiving or using such a report. The AESO has established a protocol with the AUC for transfer of cost information when projects exceed the cost estimate threshold. The cost information includes reports gathered under AESO Rule 9.1 and if pertinent, AESO benchmarking analysis.

Further, the AESO has made the cost benchmarking report available to the public. Therefore any interested party may create their own benchmarking report, for example, if they are intervening in a TFO proceeding. Further, the AESO processes for cost estimate reviews include a benchmarking analysis. These processes have been shared with the AUC and the TFCMC.

In response to the following TFCMC recommendation, the AESO has modified its Change Proposal form to include language indicating that change order approvals do not affect the approved NID, including preferred technical alternative and the expected in-service date for the project, and do not indicate that the costs are prudent.

- **DECEMBER 2013 REPORT, RECOMMENDATION NUMBER 1:** The Committee recommends that the AESO take the necessary steps to change the relevant rules so that it is clear that it will only review change orders for scope and in-service date changes.

Subject to ongoing information sharing processes under development between the AESO and the AUC, the AESO will advise the AUC if a TFO's project cost estimates are of concern.

AESO Cost Accountability Recommendation: ISO Rule Section 9.1 Consultation Update

In May 2014, the AESO resumed its stakeholder consultation on Rule 9.1. It has also split the rule development into three streams.

The first will be in regards to rule 9.1.2 Cost Estimating, in which the AESO will be recommending adoption of an industry cost estimating standard and a new cost estimating template and subsequent rule changes. The second will be with regards to rule 9.1.5 Project Procurement, in which the AESO will issue a policy recommendation paper prior to drafting any revisions to existing rules. Lastly, concerning rule 9.1.3, Project Reporting, the AESO will be recommending changes to existing reporting practices; i.e., monthly reporting, various reporting and final cost reporting.

Rule revisions and changes to AESO practices will be implemented from the end of 2014 to mid 2015.

8 According to Section 10 of Ministerial Order 64/2010, the mandate of the TFCMC is to review all Transmission Facility Projects forecast to cost in excess of $100 million. In a letter dated January 12, 2011, the Minister of Energy clarified that the starting point for the TFCMC when reviewing cost variances is the estimate in place when a project is approved by an Order in Council for Critical Transmission Infrastructure (CTI) projects, or, the estimate in place when the Needs Identification Document (NID) is approved by the Alberta Utilities Commission (AUC). The AESO, of course, is at liberty to file benchmarking cost reports with various stakeholders, including the AUC, in respect of projects below the $100-million threshold.

AESO Transmission Cost Accountability Recommendation: Reporting and Oversight Protocol

New legislation regarding Transmission Cost Management is expected to be tabled and approved by the Government of Alberta in the fall of 2014.

The AESO has begun participation in the Cost Oversight Management (COM) pilot with activities scheduled to commence early in the third quarter of this year.

In addition, the AESO and AUC will commence discussion on a reporting protocol for efficient sharing of project cost information.

AESO Transmission Cost Accountability Recommendation: Rule 9.1.2 Update

On June 26th, the Industrial Power Consumers Association of Alberta (IPCAA) attended the AESO's stakeholder consultation meeting on Rule 9.1.2 – Cost Estimating. The AESO is examining potential changes to the rule and stakeholders were invited to provide input. All Alberta TFOs participated, most with several representatives. IPCAA was the only ratepayer group in attendance.

Cost estimates are vital for the AESO for the following reasons:

- They are required under Section 25(1) of the Transmission Regulation;
- They are used to evaluate alternative transmission options;
- They provide transparency of cost information;
- They increase efficiency by reducing information requests between the AESO and the TFOs, and
- They provide cost predictability to the AESO and to ratepayers.

Cost Estimate Industry Standard

The AESO's plan is to ensure consistency by adopting an industry standard, the Association for the Advancement of Cost Engineering (AACE) Recommended Practice No. 56R-08, which is designed for the building and general construction industries. The AESO governance committee has already approved the adoption of AACE standards.

The following table provides the suggested AESO basis of the cost estimate framework:

AESO BASIS OF COST ESTIMATE FRAMEWORK							
ESTIMATE CLASS	LEVEL OF PROJECTION DEFINITION	END USAGE	INDUSTRY USAGE	ACCURACY RANGE	MAJOR DELIVERABLES	ESTIMATING METHOD	OUTSIDE THE RANGE
Class 5	0% to 2%	Screening or Feasibility	Long Term Plan Feasibility Assessment Screening Alternatives	-30%/+50%	Conceptual Layout Preliminary Project Approval Long Term Plan	Parametric, Judgement or Analogy	Re-screening or New Feasibility
Class 4	1% to 15%	Concept Study of Feasibility	Need Assessment Study Scope Preferred Option	-20%/+30%	Preliminary Functional Spec Single Line Diagrams Study Scope Project Plan	Parametric, Equipment Factored	Re-Evaluation of Alternatives
Class 3	10% to 40%	Design Development Budget Authorization	Proposal to Provide Service Facility Application Preferred Option	-15%/+20%	Final Functional Spec Siting & Routing Preliminary Engineering Approved Budget & Schedule	Semi Detailed Unit Costs	Change Management
Class 2	30% to 75%	Control or Bid/Tender	Post Permit & License Revised Budget (180 day PPS)	-10%/+15%	Completed Detailed Engineering Permits & Licenses GeoTech Vendor Negotiation Contracts	Detailed Unit Costs	Change Management
			Approved Cost Estimate (ACE)	0%			ACE Adjustment
Class 1	65 to 100%	Bid Tender	Fixed Price Contracts	-5%/+10%	Contract	Final Detailed Unit Costs	Contract Amendment

All stakeholders generally agreed with the adoption of the AACE standard. However, there was disagreement on the proposed cost estimate classification, project definition and accuracy bands.

For example, for system projects, the Order of Magnitude (OOM) estimate currently has an accuracy range of +/-50. Under the proposed AACE Recommended Practice No. 56R-08, this would change to a Class 5 estimate with an accuracy range of +50/-30%. The TFOs instead proposed using the generic AACE Practice No. 17R-97 with an accuracy range of +120/-60%. There was also considerable debate on the use of contingency and the AACE accuracy band as it relates to project definition.

Cost Estimate Template

The other key discussion item at the stakeholder session was the AESO's proposed cost estimate template. The purpose of the template is to standardize cost estimate reporting and enable the data to be inputted into the AESO's cost benchmarking database for all stages of the project life cycle from the NID cost estimates to final cost reporting. The TFCMC has applauded the AESO on the creation of this database and ratepayers have been supportive of maintaining and enhancing it.

The TFCMC reaffirms support for the AESO's cost benchmarking database, and encourages all TFOs to populate the AESO's standardized template and generally be supportive of the cost benchmarking efforts of the AESO.

The AESO intends to draft its Authoritative Document changes during the summer, consult with stakeholders during the fall, and file its final changes with the AUC in December.

AESO Transmission Cost Accountability Recommendation: TFCMC Input to the 9.1.5 Working Group

ISO Rule 9.1.5 addresses TFO project procurement practices. The AESO recently reinitiated its consultation on changes to ISO Rule 9.1.5. Since a large portion of the cost of transmission projects is competitively procured by the TFOs, the TFCMC expressed an interest in understanding how any proposed changes could contribute to minimizing transmission costs.

Todd Mohr of FTI Consulting provided the TFCMC with some recommended improvements to ISO Rule 9.1.5[9]. Following this input, combined with feedback from TFCMC members, Mr. Mohr also provided his recommended improvements to the AESO in a stakeholder session. Individual TFCMC members are free to provide input to the AESO on Rule 9.1.5 and refer to the FTI recommendations if, and where, appropriate.

AESO Cost Benchmarking Recommendation Update

In March 2013, the AESO published the first release of the Alberta transmission cost benchmarking document: AESO Position Paper – Reasonable Assessment of Transmission Cost Using Benchmarking Methodology (Benchmarking Document). It consists of a main paper and four appendices at the AESO's website (->Transmission- >Transmission Costs ->Cost Benchmarking).

In July 2013, the AESO published the links of several interactive dashboards for transmission cost benchmarking data and analysis on its website. Since then, the AESO has updated the interactive dashboards in December 2013 and will be updating it again in July 2014. There have been more than 5,000 independent visits to of those dashboards.

This most recent update, in July 2014, will have the following key changes:

- Adding two new dashboards for engineering related cost estimates, and
- The constant dollar base year will now be 2013.

Stakeholders are being encouraged to contact the AESO when dealing with significant data outliers as it will help to improve both data accuracy and the quality of the transmission benchmarking database and analysis.

This initiative is based on a recommendation from the TFCMC, in its June 2011 Semi Annual Report, to develop a cost benchmarking database that will enable the AESO to further assess the reasonableness of the costs proposed by TFOs in the NID and PPS stages of a transmission development project.

9 FTI Consulting – on retainer to the TFCMC via Bema Enterprises Ltd. – is routinely engaged worldwide in reviewing project costs and procurement practices of large multi-million and billion-dollar projects.

Recommendations to the Provincial Government

The TFCMC has directed two recommendations to the Alberta Energy through its semi-annual reports. One[10] of the two, Recommendation Number 5 in the June 2011 Report, was considered premature by the Department given the implementation of the other recommendations from the same semi-annual report.

The TFCMC made a second recommendation for the Department to consider. This one, Recommendation Number 1 in the December 2011 Report, reads as follows:

- That the Minister of Energy modify the Transmission Regulation to require TFOs to seek AESO authorization of CTI pre-construction expenditures incurred prior to AUC approval of the Facility Application.

The Minister, in a letter to the Committee, advised that Alberta Energy would consider this recommendation as it reviews potential amendments to the Transmission Regulation, and Alberta Energy has considered this recommendation as part of its review. Changes to the Transmission Regulation Amendments are forthcoming.

10 The recommendation reads: That for non Critical Transmission Infrastructure (CTI) projects, the Department of Energy consider legislative changes to require a second approval stage by the AUC if cost estimates exceed a pre-determined limit. The TFCMC recognizes the need to avoid unnecessary project delays due to factors outside the control of the TFOs.

4. TFCMC Conclusions and Recommendations

A look at some of the conclusions the TFCMC has reached during the period covered by this report.

Hanna & Cassils-Bowmanton-Whitla Cost Comparison

In the December 2013 TFCMC Report, it was noted that AltaLink's Cassils-Bowmanton-Whitla (CBW) project – a portion of Project 787, Southern Alberta Transmission Reinforcement (SATR) – appeared to have high costs; this resulted in a TFCMC decision to undertake a more detailed analysis, with assistance from the Alberta Electric System Operator (AESO). As ATCO Electric's (ATCO) Hanna Region Transmission Development, Project 812, was built in a part of Alberta with similar terrain, population densities, tower types and environmental challenges, it was decided to undertake a comparative study of the two projects.

Project Comparison

In terms of design comparisons between the CBW and the Hanna 240 kV transmission line projects:

- The same 240 kV tower design is being applied to the projects being compared.
- The SATR CBW projects (886, 887) and a portion of the Hanna project require the application of twin-1033 ACSR conductors but most of the Hanna project requires the application of lower-cost twin-795 ACSR conductors.
- The geographic terrain where the transmission lines are being constructed is similar, which could imply similar foundation and related construction costs between both projects. The application of screw-pile anchors appears to be a common practice.
- For the Hanna project, only one side of the double-circuit towers is being strung with conductor. For the CBW project, both sides of the towers are being strung.
- Since CBW represented the first application of the new tower design, the development costs for the new towers are included in the total CBW project cost.

Investigation

Based on the latest cost estimates for the two projects (the +/-10% estimates provided 180 days after Permit & Licence), the unit cost of the CBW project is approximately 26% higher than the unit cost of the Hanna project ($1.6 million per kilometre compared to $1.27 million per kilometre). However:

- The increase in cost of using twin-1033 conductor rather than twin-795 conductor is estimated to be approximately 2%.
- The increase in cost of stringing both sides of the double-circuit towers rather than just one-side is estimated to be approximately 5%.
- The average structure weight for the CBW project is about 25% higher than for the Hanna project. The key reason is that the CBW project is in a mixed loading area of Zone B and C, while the Hanna project is in the (lighter) loading area of Zone C only. The impact of a 25% heavier structure on project cost is not limited to the structure's material cost. A heavier structure requires bigger foundations, as well as higher labour costs for structure assembly, structure erection and structure foundation installation, which are the most significant portions of line facility cost.
- Transmission line cross-overs will also contribute to higher transmission costs. The Hanna project had 10 line crossings while the CBW project had seven line crossings.
- The Hanna projects by ATCO utilize a somewhat narrower right-of-way (minimum 50 metres) compared to the CBW lines, which use a 60-metre right-of-way. This may contribute towards some lower land costs, although this could not be confirmed from the supplied AESO information.

Conclusion

Based on the above analysis, the TFCMC concludes that after consideration of the differences in foundation type, conductor size, line configuration (two-sides strung versus one-side strung) and loading zones, the unit costs of the CBW and Hanna projects are comparable where data is readily available to the AESO.

Recommendations

The Committee has no additional recommendations at this point.

Appendix A: About The TFCMC

Origin And Composition Of The Transmission Facilities Cost Monitoring Committee

The Government of Alberta created the Transmission Facilities Cost Monitoring Committee (TFCMC) on July 31, 2010 through a Ministerial Order issued by the Honourable Ronald Liepert, then Minister of Energy, in order to make sure Albertans have the benefit of increased transparency on the cost of transmission projects.

According to the Ministerial Order, number 64/2010, the TFCMC can consist of up to 13 individuals as follows:

- the **Alberta Association of Municipal Districts and Counties** may appoint one member;
- the **Alberta Chambers of Commerce** may appoint one member;
- the **Alberta Direct Connect Consumers Association** may appoint one member;
- the **Alberta Federation of Rural Electrification Associations** may appoint one member;
- the **Alberta Urban Municipalities Association** may appoint one member;
- the **Consumers' Coalition of Alberta** may appoint one member;
- the **Canadian Federation of Independent Business** may appoint one member;
- the **Industrial Power Consumers Association of Alberta** may appoint one member;
- the **Independent Power Producers Society of Alberta** may appoint one member;
- the Minister may also appoint up to ***two independent members*** with technical, regulatory, transmission facility development or other experience that, in the opinion of the Minister, will benefit the Committee;
- the **Independent System Operator (**"Alberta Electric System Operator") shall appoint one member; and
- the **Office of the Utilities Consumer Advocate** shall appoint one member.

The TFCMC's Mandate

The TFCMC's mandate is to review records that relate to the cost, scope, schedule and variances of Alberta transmission facility projects forecast to cost in excess of $100 million. This may include more than one transmission facility, if it is a part of a contiguous transmission facility project. The Alberta Electric System Operator (AESO), a not-for-profit entity that is responsible for the safe, reliable and economic planning and operation of Alberta's transmission system (also known as the Alberta Interconnected Electric System) determines which transmission facilities are part of a transmission facility project.

In a letter dated January 12, 2011, the Minister of Energy clarified that the starting point for the TFCMC – when reviewing cost variances – is the estimate in place when a project is approved by an Order in Council for Critical Transmission Infrastructure (CTI) projects, or, the estimate in place when the Needs Identification Document (NID) is approved by the Alberta Utilities Commission (AUC). The TFCMC, therefore, does not review any of the projects from an initial prudence, need, technology choice or staging perspective.

The TFCMC cannot delay or slow the development of transmission facility projects.

In late June 2011, the Minister of Energy provided his support of a request from the TFCMC to explore and develop innovative approaches to cost recovery for new transmission facilities in Alberta. The TFCMC was asked to undertake this initiative on a priority basis, together with the Transmission Facility Owners (TFOs), the AESO and Alberta Energy. The findings of this initiative were submitted in April 2012 to the Assistant Deputy Minister, Electricity, Alternative Energy and Carbon Capture and Storage, for consideration and action.

The TFCMC's Members

The organizations and independents named in the Ministerial Order forming the TFCMC represent a cross-section of industry, consumer and business groups with ties to Alberta's electricity sector.

Organizations and independent members are listed alphabetically:

Alberta Association of Municipal Districts and Counties (AAMDC)

The AAMDC advocates on behalf of the province's 69 municipal districts and counties. The association assists its members in achieving strong, effective local government. Their representative on the TFCMC is **Dwight Oliver, a Past Director for AAMDC District 2.**

Alberta Chambers of Commerce (ACC)

The ACC is a federation of 126 Chambers of Commerce, which in turn represents more than 23,000 businesses. The ACC ensures its members' business interests are improved through the development and advocacy of policy to the provincial and federal governments. Their representative on the TFCMC is **Ken Kobly, ACC President & CEO.**

Alberta Direct Connect Consumers Association (ADC)

The ADC represents nine large industrial consumers who have facilities directly connected to the transmission system. The ADC members represent the key sectors of forestry, chemical and cement manufacturing. The aggregate electricity demand of the membership represents about 7% of the Alberta load. Their representative on the TFCMC is **Colette Chekerda, ADC Executive Director.**

Alberta Electric System Operator (AESO)

The AESO is a not-for-profit entity, is independent of any industry affiliations, and owns no transmission or market assets. It is responsible for the safe, reliable and economic planning and operation of the Alberta Interconnected Electric System. Their representative on the TFCMC is **Kelly Yagelniski, AESO's Director, Transmission Program Support.**

Alberta Federation of Rural Electrification Associations (AFREA)

The AFREA is a not-for-profit cooperative association representing member Rural Electrification Associations (REAs) who provide rural power services throughout Alberta. It is committed to promoting the economic welfare and value of its cooperative members by providing strong representation to government and industry stakeholders with one voice. Their representative on the TFCMC is **Dan Astner, AFREA President – 2014 Board of Directors.**

Alberta Urban Municipalities Association (AUMA)

The AUMA represents Alberta's 271 urban municipalities including cities, towns, villages, summer villages, and specialized municipalities. AUMA represents and advocates the interests of its members to the provincial and federal governments. Their representative on the TFCMC is **Andre Chabot, AUMA Director, Cities Over 500,000.**

Consumers' Coalition of Alberta (CCA)

The CCA is comprised of the Consumers' Association of Canada (Alberta Division) and the Alberta Council on Aging. The CCA, a coalition of two public interest groups, participates as a collective in public utility hearings to ensure rates, tolls and charges for residential customers are just and reasonable. Their representative on the TFCMC is **Azad Merani, CCA Consultant.**

Independent Power Producers Society of Alberta (IPPSA)

The IPPSA represents Alberta's power producers. IPPSA is a forum for dialogue among Alberta's power producers and a proponent of competition in Alberta's electricity market. Their representative on the TFCMC is **Evan Bahry, IPPSA's Executive Director.**

Industrial Power Consumers Association of Alberta (IPCAA)

The IPCAA is an organization representing large industrial customers, including such key sectors as oil & gas, forest products, petrochemicals and steel. Its mission is to take a leadership role in achieving a fair, open and efficient marketplace for electricity sales and service in Alberta. Their representative on the TFCMC is **Vittoria Bellissimo, IPCAA's Executive Director.**

Office of the Utilities Consumer Advocate (UCA)

The UCA is the voice of small consumers in Alberta's electricity and gas markets. The UCA advocates on behalf of Alberta's low-volume or smaller users of electricity and natural gas, those being residential, small business and farm utilities consumers, and helps them to make informed choices. As well, the UCA represents and protects their interests by participating in utility hearings and inquiries. The UCA representative on the TFCMC is **Wayne Taylor.**

TFCMC Independent Members:

Allen Snyder, of Winnipeg, brings a background and a wealth of knowledge in the electricity sector to the TFCMC. He held several key executive positions with Manitoba Hydro including Vice President of Transmission & Distribution, Power Supply and Corporate Services over the past 20 years. He also established a very successful Manitoba Hydro International with sales of software and services to more than 60 countries worldwide. Currently, he is Vice President of Energy Services for Wood West & Associates.

Henry Yip is a senior business executive with more than 30 years of broad business experience in Canada and the USA. He has held senior executive positions in large corporations and entrepreneurial business enterprises, and has advised governments in the area of city planning, strategy development, technology commercialization, international business collaboration and grant application approval. His current business interests include Executive Chair at Nirix Technology, and President of C'andcee Development. He is a past Chair of the Board at Edmonton Economic Development Corporation.

Former Members

Canadian Federation of Independent Business (CFIB)

The CFIB is an association representing small- and medium-sized businesses across Canada that takes direction from its more than 109,000 members, providing independent businesses a voice at all levels of government. The CFIB resigned in early 2014, stating it believes its involvement is no longer necessary due to the re-establishment of an independent regulatory review process and the repeal of Bill 50.

The Operations Of The TFCMC

The TFCMC meets monthly, alternating between the cities of Calgary and Edmonton. The primary purpose of the meetings is to review reports provided by AESO on the cost status of transmission projects that are within the Committee's purview. The first meeting took place in September 2010.

The TFCMC reviews the reasons for cost variances of all these projects. When appropriate, it retains external experts to prepare information requests (IRs) to the AESO and the Transmission Facility Owners (TFOs) for further illumination on the reasons for the variances.

Each calendar year, the TFCMC is required to provide at least two reports to the member organizations represented on the committee as well as at least one report to the Ministers of Energy and Service Alberta. The reports summarize the records it reviews and the status of the transmission facility projects.

The TFCMC strives for consensus in its decision-making process but a simple majority of those present at a meeting is the minimum threshold for agreement.

Independent member Henry Yip chairs the TFCMC. The TFCMC secretary is Laura Severs, engaged through Alberta Energy; she also serves as the Committee's technical writer.

The TFCMC will also form subcommittees from time to time to facilitate the workings of the Committee. There were two active subcommittees in operation during the period of this report:

- A standing subcommittee to monitor and approve expenditures incurred by the members of the TFCMC during the course of discharging its mandate. Evan Bahry chairs this subcommittee.
- The Information Request (IR) subcommittee. This group develops appropriate questions for the TFOs in order to get clarifications on information previously provided by the TFOs on the cost status of the various transmission projects. This subcommittee is supported by external expert advisors when required. Allen Snyder chairs this subcommittee.

Appendix B: The Transmission Projects At A Glance

Facility Applications for each project are sorted by the forecast or actual in-service date (ISD). The Facility Application number column in each project's initial chart is provided as an easy reference to its location on the accompanying map. Meanwhile, please note that some dates and items may have changed from previous TFCMC reports. New for this edition is a Project Risk listing in the Current Status section.

1. **ALBERTA INDUSTRIAL HEARTLAND BULK TRANSMISSION DEVELOPMENT (HBTD);** PROJECT 629 – Construction of a double-circuit 500 kV transmission line, which will connect the Heartland region (northeast of Fort Saskatchewan) to existing 500 kV transmission facilities in the Edmonton area.

THE PROJECT: The Alberta Industrial Heartland Bulk Transmission Development calls for the construction of a double-circuit 500 kV transmission line, which will connect the Heartland region (northeast of Fort Saskatchewan) to existing 500 kV transmission facilities on the south side of Edmonton. The project also includes the construction of a new Heartland substation in the Heartland region. This upgrade is to respond to the growing demand for power in this region. The Heartland project will form the foundation of electricity supply into northeast Alberta, will support oilsands development, local demand in the Heartland area, and strengthen the entire provincial network. The Industrial Heartland region includes parts of Sturgeon, Strathcona and Lamont counties.

THE COMPONENTS: A 500 kV AC double-circuit transmission line connecting the 500 kV system on the south side of Edmonton to the new Heartland 12S Substation (the 500 kV Line Project); a 240 kV/500 kV Heartland 12S Substation, located approximately 15 kilometres northeast of Edmonton in the Gibbons-Redwater region (the Heartland 12S Substation Project), and a 240 kV double-circuit transmission line connecting the existing 240 kV system in the area to the new Heartland 12S Substation (the 240 kV Line Project).

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
500 kV 1206L/1212L	1	Sixty-five kilometres of 500 kV double-circuit line from Ellerslie to Heartland substation	July 24, 2014
Heartland 12S Ellerslie 89S and 1054L/1061L	2	Heartland 500 kV substation and 22 kilometres of 240 kV lines to tie in the existing system	July 24, 2014

THE TRANSMISSION FACILITY OWNER(S): AltaLink Management Ltd.(AltaLink) and EPCOR Distribution & Transmission Inc.(EDTI).

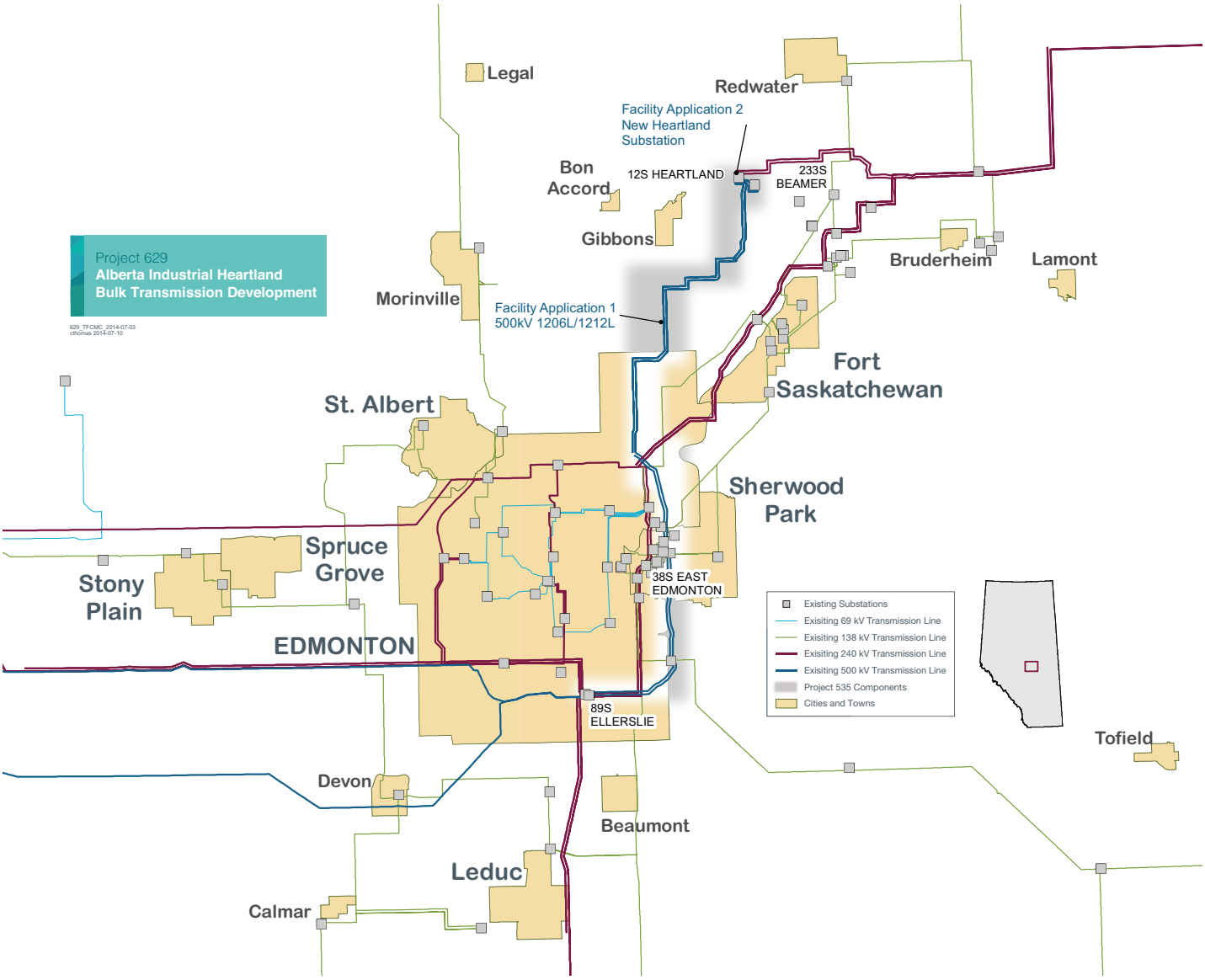
PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Alberta Industrial Heartland Bulk Transmission Development	**$613 Million** (2013$)	**$659 Million** (ISD$ with escalation)

CURRENT STATUS: The project was energized at 240 kV on December 28, 2013. The in-service date (ISD) for energization at 500 kV is scheduled for July 24, 2014. The reason for the delay of energization at 500 kV was a result of equipment issues.

PROJECT RISKS

There is minimal operational risk associated with the final energization.


Project 629
Alberta Industrial Heartland
Bulk Transmission Development
629_TFCMC_2014-07-03
cthomas 2014-07-10
Legal
Redwater
Facility Application 2
New Heartland
Substation
Bon
Accord
12S HEARTLAND
233S
BEAMER
Gibbons
Bruderheim
Lamont
Morinville
Facility Application 1
500kV 1206L/1212L
Fort
Saskatchewan
St. Albert
Sherwood
Park
Spruce
Grove
Stony
Plain
38S EAST
EDMONTON
EDMONTON
89S
ELLERSLIE
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Tofield
Devon
Beaumont
Leduc
Calmar

2. **CENTRAL EAST AREA TRANSMISSION DEVELOPMENT (CETD);** PROJECT 811 – Transmission development in Wainwright, Lloydminster, Provost, Vegreville and Cold Lake.

THE PROJECT: To accommodate load and generation in central Alberta, additional substations and upgrades to existing facilities are required. The Alberta Electric System Operator (AESO) has outlined the need for the 138/144 kV augmentation and upgrade with two stages of implementation. The Central East project serves the dual purpose of meeting the growing demand for electricity for pipelines moving oilsands production, and the connection of more than 500 MW of proposed gas-fired generation and wind farms in the eastern region of Central Alberta. Aging infrastructure, overloads, and low voltages in the large area east of Edmonton, from Cold Lake in the Northeast region to Hardisty, compels the substantial rebuild of the 138 kV and 144 kV systems, and the decommissioning of aging 69 kV and 72 kV lines.

THE COMPONENTS[11]: Originally there were two stages to this project, however, Stage 2 has been cancelled and the current Needs Identification Document (NID) is being amended to address the cancellations. Additionally, a new project is being developed to address system constraints.

The major components for Stage 1 of the project are: a new 144/25 kV Watt Lake substation; the conversion of three existing 72/25 kV substations to 144/25 kV; a new 240 kV switching station in the Cold Lake area, energized at 144 kV initially; a new double-circuit 144 kV line from the existing Mahihkan 837S to the new switching station; a new 240 kV double-circuit line (one-side strung) from the new switching station to the existing Bonnyville 700S and initially energized at 144 kV; a new single-circuit line from the existing Wainwright 51S to the existing Edgerton 899S; a new 144 kV capacitor bank at Vermilion 710S; the addition of one 138/72 kV transformer at the existing Wainwright 51S; rebuild six existing 138 kV or 144 kV lines to increase capacity, and restore ratings of existing 144 kV lines by mitigating line clearances and discontinuing the use of existing 72 kV equipment at existing substations or lines.

Please note: Due to cancellations, Facility Application (FA) numbers 5, 6, 7, 8 and 12 have been reassigned to FAs that are being implemented.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Heisler Area Upgrades	7	Convert Heisler 764S from 72 kV to 144 kV; addition of 144/72/25 kV transformer from Vermilion 710S; new 144 kV single-circuit line from Heisler 764S to existing 7L701 and discontinue use of existing 6L05	July 27, 2013
Vermilion 710S Substation Upgrade	6	Addition of 144 kV–25 VAr capacitor bank; addition of a new 144/25 kV transformer; relocation of existing 144/72/25 kV transformer to Heisler 764S; discontinue use of existing 72 kV equipment at Vermilion 710S and discontinue use of 6L06 (Kitscoty 705S to Vermilion 710S)	September 15, 2013
St. Paul Area Upgrades – Watt Lake, 7LA92	3	New 144/25 kV Watt Lake and new 144 kV line from Watt Lake to existing 7L92	December 12, 2013
Cold Lake Area Reinforcements (Except Bonnyville to Bourque)	1	New 144 kV switching station (Bourque 970S); new 144 kV double-circuit line from existing Mahihkan 837S to new 144 kV switching station and rebuild existing 144 kV lines (7L87, 7L74 and 7L83)	January 30, 2014

11 Revisions have been made to the information in this project's Components chart. Changes on this project are due to the cancellation of Stage 2 and the new project being developed for that area. As such, please use this information going forward.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
St. Paul Area Upgrades – Whitby Lake	5	Rebuild St. Paul 707S from 72/25 kV to 144/25 kV substation; new 144 kV double-circuit line from St. Paul 707S to existing 7L70 creating an in/out configuration	June 25, 2014
Cold Lake Area Reinforcements – Bonnyville	2	New 240 kV double-circuit line (one-side strung) from new 144 kV switching station to existing Bonnyville 700S, initially energized at 144 kV	December 1, 2014
Kitscoty Area Upgrades	8	Convert Kitscoty 705S from 72 kV to 144 kV; addition of 144/72/25 kV transformer from Heisler 764S, new 144 kV double-circuit line from Kitscoty 705S to existing 7L14	December 31, 2014
St. Paul Area Upgrades – St. Paul 707S and 7L139/7L70	4	St. Paul 707S and 7L139/7L70 in/out	January 31, 2015
Line Clearance Mitigations	10, 11, 12	Restore ratings of existing 144 kV lines by mitigating line clearances	March 31, 2015
Wainwright Upgrades	13	25 km of single-circuit line from Wainwright 51S to 704L	Cancelled

THE TRANSMISSION FACILITY OWNER(S): AltaLink and ATCO Electric Ltd. (ATCO).

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Central East Area Transmission Development	**$246 Million** (2013$)	**$378 Million** (ISD$ with escalation for Stage 1)

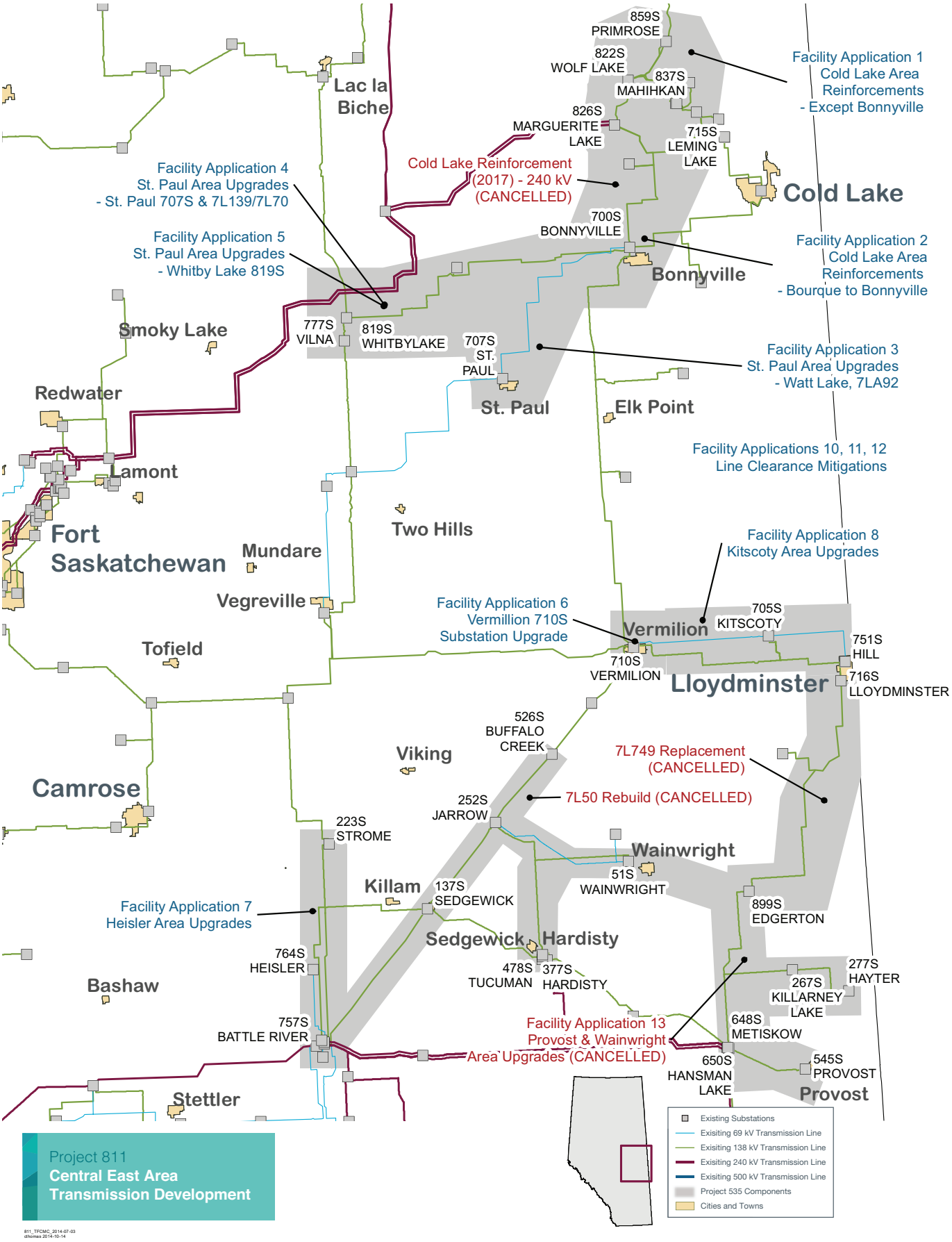
CURRENT STATUS: Most of ATCO's Stage 1 facilities are either in service or under construction. ATCO is preparing the FA for line 7L14 Clearance Mitigation.

AltaLink is preparing the FA for 138 kV line 408L to re-arrange the connection at Wainwright 51S.

Stage 2 has been cancelled. The AESO is preparing a NID amendment related to the cancelled facilities of Stage 1 and Stage 2 of the project.

PROJECT RISKS

Several facilities were put on hold and restarted after the completion of a Supplemental System Study, and the final cost of those facilities may increase due to cost escalation. Since the TFO is currently developing the Proposal to Provide Service (PPS) and the FA for those facilities, the cost impact is not known at this time.


859S
PRIMROSE
822S
WOLF LAKE
837S
MAHIHKAN
826S
MARGUERITE LAKE
715S
LEMING LAKE
Facility Application 1
Cold Lake Area
Reinforcements
- Except Bonnyville
Lac la Biche
Cold Lake Reinforcement
(2017) - 240 kV
(CANCELLED)
Cold Lake
Facility Application 4
St. Paul Area Upgrades
- St. Paul 707S & 7L139/7L70
700S
BONNYVILLE
Facility Application 5
St. Paul Area Upgrades
- Whitby Lake 819S
Facility Application 2
Cold Lake Area
Reinforcements
- Bourque to Bonnyville
Bonnyville
Smoky Lake
777S
VILNA
819S
WHITBYLAKE
707S
ST. PAUL
Facility Application 3
St. Paul Area Upgrades
- Watt Lake, 7LA92
Redwater
St. Paul
Elk Point
Facility Applications 10, 11, 12
Line Clearance Mitigations
Lamont
Fort Saskatchewan
Two Hills
Mundare
Facility Application 8
Kitscoty Area Upgrades
Vegreville
Facility Application 6
Vermillion 710S
Substation Upgrade
705S
KITSCOTY
Vermilion
751S
HILL
Tofield
710S
VERMILION
716S
LLOYDMINSTER
Lloydminster
526S
BUFFALO CREEK
Viking
7L749 Replacement
(CANCELLED)
Camrose
252S
JARROW
7L50 Rebuild (CANCELLED)
223S
STROME
Wainwright
51S
WAINWRIGHT
Killam
137S
SEDGEWICK
Facility Application 7
Heisler Area Upgrades
899S
EDGERTON
Sedgewick
Hardisty
764S
HEISLER
478S
TUCUMAN
377S
HARDISTY
277S
HAYTER
Bashaw
267S
KILLARNEY LAKE
757S
BATTLE RIVER
Facility Application 13
Provost & Wainwright
Area Upgrades (CANCELLED)
648S
METISKOW
650S
HANSMAN LAKE
545S
PROVOST
Provost
Stettler
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 811
Central East Area
Transmission Development
811_TFCMC_2014-07-03
dthomas 2014-10-14

3. **CHRISTINA LAKE AREA 240 KV TRANSMISSION DEVELOPMENT (CHL);** PROJECT 1101 – Reinforcing transmission facilities for oilsands developments and enhanced reliability to existing oilsands operations.

THE PROJECT:[12] Significant oilsands development, including Steam Assisted Gravity Drainage (SAGD) and pump station facilities, in the Christina Lake area, located approximately 140 km south of the City of Fort McMurray and 100 km to the northeast of Lac La Biche, is driving this development. This project would ensure the area's transmission network is reinforced to support current load and to ensure adequate capacity to connect customers in the near-and-long term. The Christina Lake plan will reinforce the existing 138 kV network in the southern part of the area through the development of two new 240/138 kV substations and will reinforce the 240 kV network by closing the loop from the new Black Spruce 154S substation to the existing Heart Lake A898S substation.

THE COMPONENTS: The AESO has proposed a transmission development plan for the area that includes developing a 240 kV looped transmission system, including three new 240 kV substations, approximately 100 km to 150 km of new 240 kV transmission line, and modifications and expansion of existing transmission substations in the area. The project consists of a new 240 kV switching station and a new 240/138 kV substation.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Black Spruce substation and 240 kV lines	1	Black Spruce substation and interconnecting 240 kV lines	July 10, 2013
Pike substation and 240 kV lines	2	Pike substation and interconnecting 240 kV lines to Black Spruce	June 30, 2014
Pike to Ipiatik to Heart Lake and 240 kV lines and modifications to Christina Lake 723S	3	New Ipiatik substation, new 240 kV line from Pike to Ipiatik to Heart Lake substation and modifications to Christina Lake 723S	June 30, 2015
Heart Lake expansion	4	Expand Heart Lake substation for the termination of 9L930 in/out and the new 240 kV line to Ipiatik	June 30, 2015

THE TRANSMISSION FACILITY OWNER(S): AltaLink and ATCO.

PROJECT COST:

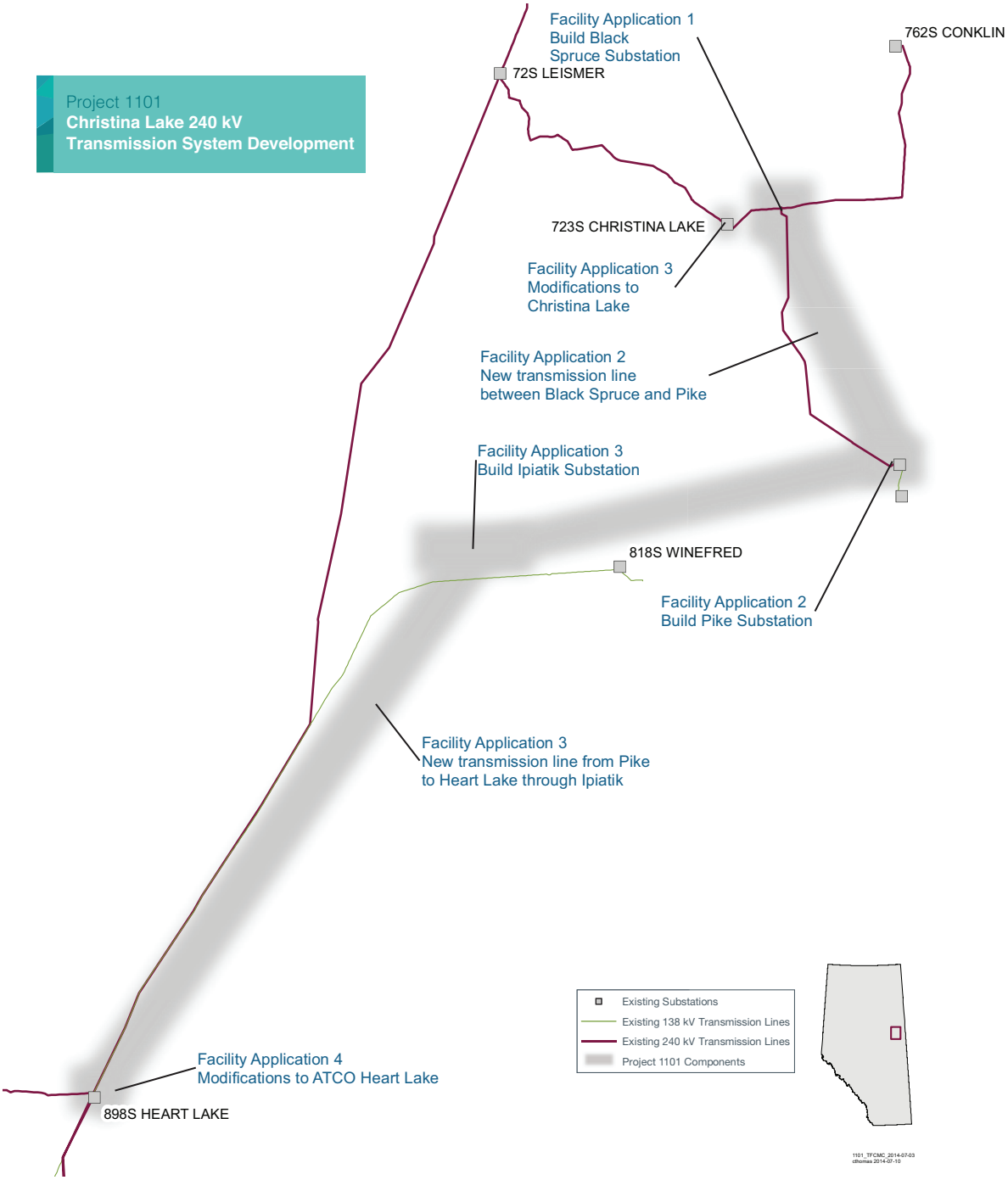
TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Christina Lake Area 240 kV Transmission Development	**$390 Million** (2013$)	**$463.4 Million** (ISD$ with escalation)

12 The Christina Lake Area 240 kV Transmission Development and the Heart Lake expansion project identified in the AESO's Long-term Transmission Plan (filed June 2012) were combined into one NID.

CURRENT STATUS: The NID was approved by the Alberta Utilities Commission (AUC) on April 24, 2012. The Black Spruce substation was energized on July 11, 2013. The Permit & License (P&L) for Pike was received on June 28, 2013 and was placed in-service on June 30, 2014. The P&L for the Ipiatik to Heart Lake development was received on November 1, 2013. This is under construction with an ISD of June 2015. The P&L for the Heart Lake development was received on January 6, 2014. This is under construction with an ISD of June 2015.

PROJECT RISKS

The later than anticipated approval of the P&L may delay the ISD date for Ipiatik to Heart Lake to early 2016. AltaLink is investigating the costs to meet the early 2016 ISD and is reviewing construction with Alberta Environment and Sustainable Resource Development about prolonging the construction season. Late freeze and early thaw could also impact construction activities due to very wet conditions.



4. **EAST CALGARY TRANSMISSION PROJECT AND THE ENMAX SHEPARD ENERGY CENTRE CONNECTION (ECTP);** PROJECT 719 – To serve growing demand for electricity in the Calgary and High River planning areas and to interconnect the ENMAX Shepard Energy Centre.

THE PROJECT: The East Calgary Transmission Project and the ENMAX Shepard Energy Centre Connection is required to serve growing demand for electricity in the Calgary and High River planning areas, enable future generation facilities to reliably connect to the system, and maintain system reliability. The project supports the connection of the ENMAX Shepard Energy Centre Connection, a new 850 MW combined-cycle generation facility via a new substation – ENMAX No. 25.

THE COMPONENTS: Modifications to existing East Calgary 5S and ENMAX No. 2 substations (including the addition of one 240/138 kV – 240/320/400 MVA transformer); a new 138 kV transmission line between ENMAX No. 23 and ENMAX No. 2; a new 138 kV transmission line between Janet 74S and ENMAX No. 23; modifications to the existing 240 kV double-circuit towers (to maintain the connection between Janet 74S and East Calgary 5S); removal of line terminations at East Calgary 5S and Janet 74S; new 240 kV double-circuit 240 kV transmission line (985L/1003L) from Janet 74S to ENMAX No. 25; addition of a 240 kV switching station (ENMAX No. 25) for connection to the transmission system and Shepard Energy Centre; addition of a second 240/138 kV – 240/320/400 MVA transformer at East Calgary 5S.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
East Calgary 240 kV and 138 kV transmission system upgrades and Shepard Energy Centre Connection (AltaLink Facility Application)	1	Rebuild East Calgary 5S substation; upgrade AltaLink-owned infrastructure to Janet 74S; build D/C 240 kV transmission line between Janet 74S and ENMAX No. 25 substations, replace existing transformer at East Calgary 5S	June 30, 2015
East Calgary 240 kV and 138 kV transmission system upgrades and Shepard Energy Centre Connection (ENMAX Facility Application)	2	Modifications to existing ENMAX No. 2 and No. 23 substations, addition of new ENMAX No. 25 substation; construct new 138 kV line between ENMAX No. 23 and Janet 74S substations	June 30, 2015

THE TRANSMISSION FACILITY OWNER(S): ENMAX Power Corp. (ENMAX) and AltaLink.

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
East Calgary Transmission Project and The Enmax Shepard Energy Centre Connection (ECTP)	***$921 Million**[13] (2013$) *entire FATD plan	***$153 Million** (includes escalation and AFUDC) *ECTP and Shepard Energy Centre PPS only

CURRENT STATUS: The Shepard Energy Centre interconnection and components of the East Calgary Transmission Project were energized in September 2013. Construction is ongoing for the remaining facilities of the transmission system upgrade and is scheduled to be completed by July 2015.

PROJECT RISKS

Construction challenges, due to brownfield development, may delay project completion. In addition, outage coordination with concurrent projects may impact project schedules.

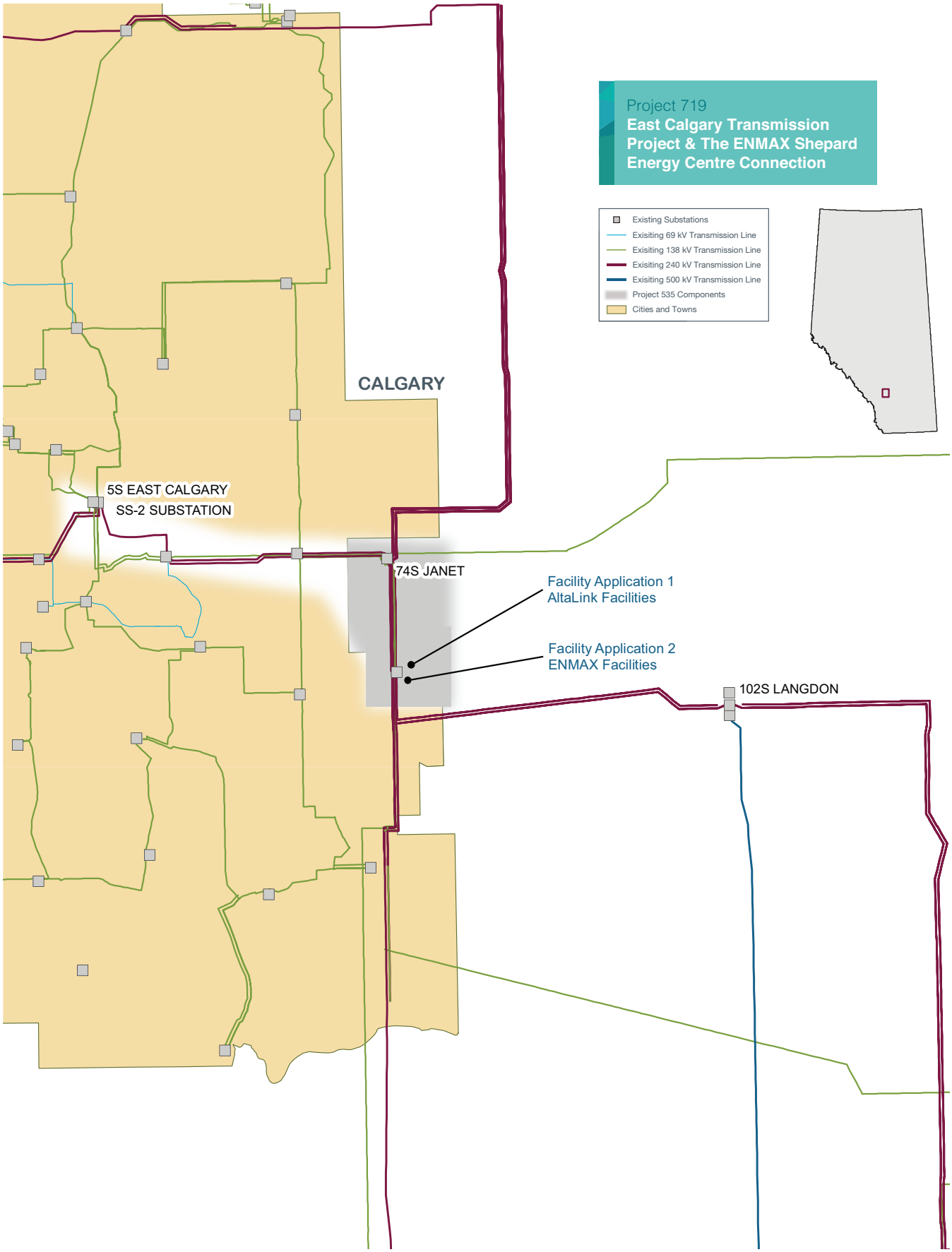
13 The AESO's Long-Term Transmission Plan identified the need for the Foothills Area Transmission Development. The East Calgary 240 kV and 138 kV transmission system upgrades are one of four components of the overall Foothills Area Transmission Development. The four components of the Foothills Area Transmission Development are:

a. East Calgary 240 kV and 138 kV transmission system upgrades and Shepard Energy Centre Connection;

b. Foothills Area Transmission Development – East Region;

c. Third 138 kV circuit from ENMAX No. 65 to existing ENMAX No. 54 and 41; and

d. Foothills Area Transmission Development - West Region


Project 719
East Calgary Transmission Project & The ENMAX Shepard Energy Centre Connection
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
CALGARY
5S EAST CALGARY
SS-2 SUBSTATION
74S JANET
Facility Application 1
AltaLink Facilities
Facility Application 2
ENMAX Facilities
102S LANGDON

5. **EDMONTON REGION 240 KV LINE UPGRADES (ERLU);** PROJECT 786 – Upgrading 240 kV lines in the Edmonton area; add one 240 kV phase shifter at Dover substation.

THE PROJECT: More than 4,000 MW of baseload generation that serves as the main source of electricity for the majority of the province is situated near Wabamun Lake in the Edmonton region. This generation supports central and south Alberta loads, northwest regional loads, Edmonton area loads and major industrial loads located in the Fort Saskatchewan area. There are major thermal overloads of transmission facilities throughout the Edmonton region. The 138 kV transmission paths from Wabamun to North Calder and East Edmonton to Nisku, and from East Edmonton to the Fort Saskatchewan area are weak during peak load conditions, and voltage violations occur in those two areas due to weak system support.

THE COMPONENTS: The 240 kV transmission system developments in the area include a rebuild of some sections of the existing transmission line, an increase in capacity of the lines by replacing conductors, the reconfiguration of the system, building new lines and the installation of a special protection scheme for multiple contingencies to ensure system reliability in the area. Additionally, a 240 kV phase-shifter transformer will be installed at Livock 939S in the Fort McMurray area.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
AltaLink 908L, 909L Restring	5	Restring four km of 908L and 909L outside Sundance 310P substation (first four km of the lines); 908L is renumbered to 1045L	March 20, 2011
EPCOR Jasper, Petrolia	6	Upgrade bus work and protections	June 14, 2011
EPCOR 1044EL, 1045EL	3	Restring approximately 24 km of existing 904L at Jasper 805S – in/out line section; renumber EPCOR's portion of the line to 1044EL (going to Petrolia 816S) and 1045EL (going to Sundance 310P)	February 29, 2012
ATCO Phase Shifter	7	Add 600 MVA phase shifting transformer at Livock 939S	August 20, 2013
AltaLink Rebuild 240 kV 904L (1043L) TransAlta 902L, 1043L Re-terminate 909L at Sundance	1, 2, 3, 8	Delegate the work to AltaLink for re-termination of the existing 240 kV 909L at Sundance 310P (Ellerslie 89S to Sundance 310P); rebuild approximately 50 km of the existing 240 kV line 904L between Jackfish Lake west of Edmonton and Petrolia 816S; salvage the existing 240 kV structures, conductor and hardware; build a new section of approximately 12 km of 240 kV line utilizing double-circuit structures with one-side strung to connect Keephills 320P substation to the rebuild of 904L – renumbered to 1043L (Keephills 320P to Petrolia 816S)	January 30, 2015
AltaLink 902L	4	Restring eight km of 902L at each line end; Wabamun 19S and Sundance 310P substations	January 30, 2015

THE TRANSMISSION FACILITY OWNER(S): AltaLink, EDTI and ATCO.

PROJECT COST:

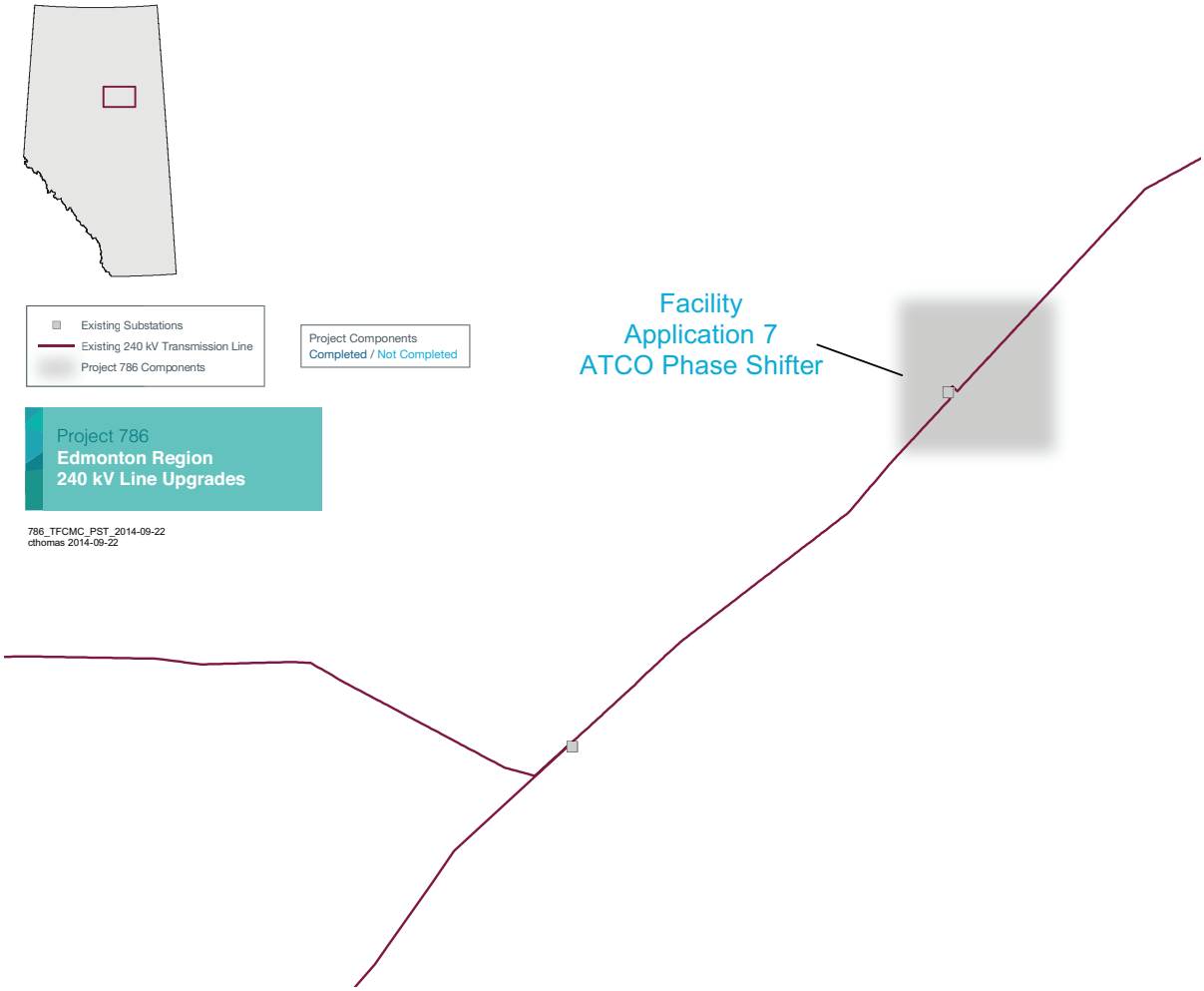
TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Edmonton Region 240 kV Line Upgrades	**$182 Million** (2013$)	**$178 Million** (ISD$ with escalation)

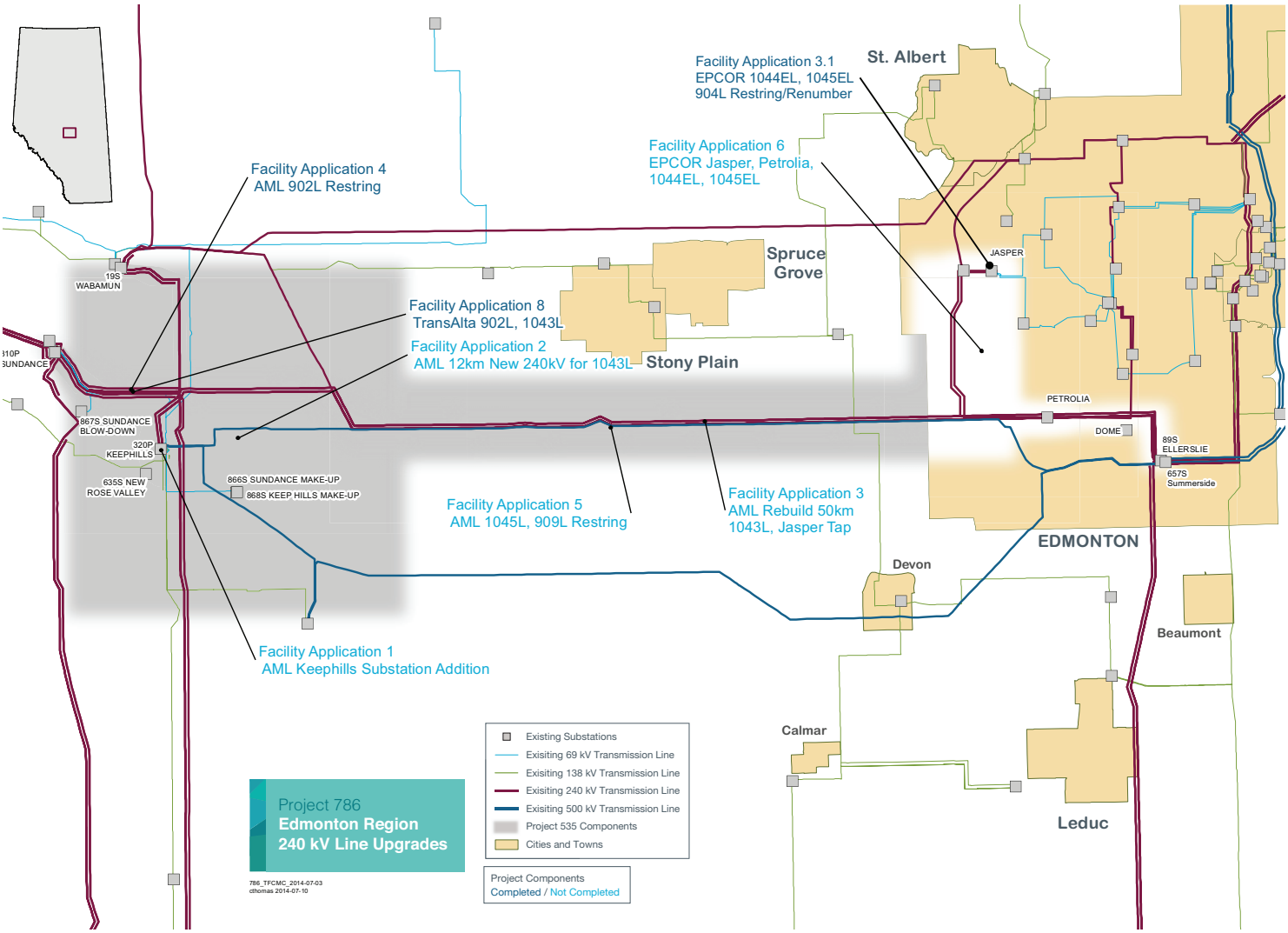
CURRENT STATUS: All aspects of this project, with the exception of 1043L, are in service.

The construction required to complete a small portion of the 1043L transmission line has been delayed due to land access issues. An in-service date for the 1043L transmission line and re-termination of 909L cannot be determined at this time.

PROJECT RISKS

The 1043L ISD: it is unknown when negotiations between the landowner and TransAlta will be complete.




Facility Application 3.1
EPCOR 1044EL, 1045EL
904L Restring/Renumber
St. Albert
Facility Application 6
EPCOR Jasper, Petrolia,
1044EL, 1045EL
Facility Application 4
AML 902L Restring
Spruce Grove
JASPER
19S
WABAMUN
Facility Application 8
TransAlta 902L, 1043L
Facility Application 2
AML 12km New 240kV for 1043L
Stony Plain
867S SUNDANCE
BLOW-DOWN
320P
KEEPHILLS
635S NEW
ROSE VALLEY
866S SUNDANCE MAKE-UP
868S KEEP HILLS MAKE-UP
PETROLIA
DOME
89S
ELLERSLIE
657S
Summerside
Facility Application 5
AML 1045L, 909L Restring
Facility Application 3
AML Rebuild 50km
1043L, Jasper Tap
EDMONTON
Devon
Beaumont
Facility Application 1
AML Keephills Substation Addition
Calmar
Leduc
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project Components
Completed / Not Completed
Project 786
Edmonton Region
240 kV Line Upgrades
786_TFCMC_2014-07-03
cthomas 2014-07-10

6. ***COMPLETED* ENMAX NO. 65 SUBSTATION (ESCS);** PROJECT 922 – New 240 kV substation in south Calgary and 138 kV developments due to overloading in south Calgary.

THE PROJECT [14]: This project was originally listed as Critical Transmission Infrastructure (CTI) in the AESO 2012 Long-Term Transmission Plan. The then proposed development included a new 240/138 kV substation, to be called ENMAX No. 65 substation (located east of 88 Street SE, Calgary, and north of Highway 22X), a short double-circuit 138 kV transmission line that ties into an existing 138 kV transmission line and a double-circuit 240 kV transmission line from existing 911L to connect into the existing transmission system. The substation is required to improve capacity and reliability in response to both current and future demand for electricity in southeast Calgary.

THE COMPONENTS: The development includes a new 240/138 kV substation comprising two 400 MVA 240-138 kV autotransformers; four 240 kV circuit breakers; four 138 kV circuit breakers, and approximately one km of 138 kV and 240 kV transmission lines to interconnect into the existing system.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
New 240/138 kV Substation (named ENMAX SS 65)	1	New ENMAX No. 65 Substation and about one km of 138 kV transmission line to connect the new substation to the existing transmission system	September 30, 2013
ENMAX No. 65 Substation interconnection 2	2	Addition of double-circuit line from existing 911L to create an in/out configuration into the new ENMAX No. 65 Substation	September 30, 2013

THE TRANSMISSION FACILITY OWNER(S): ENMAX and AltaLink.

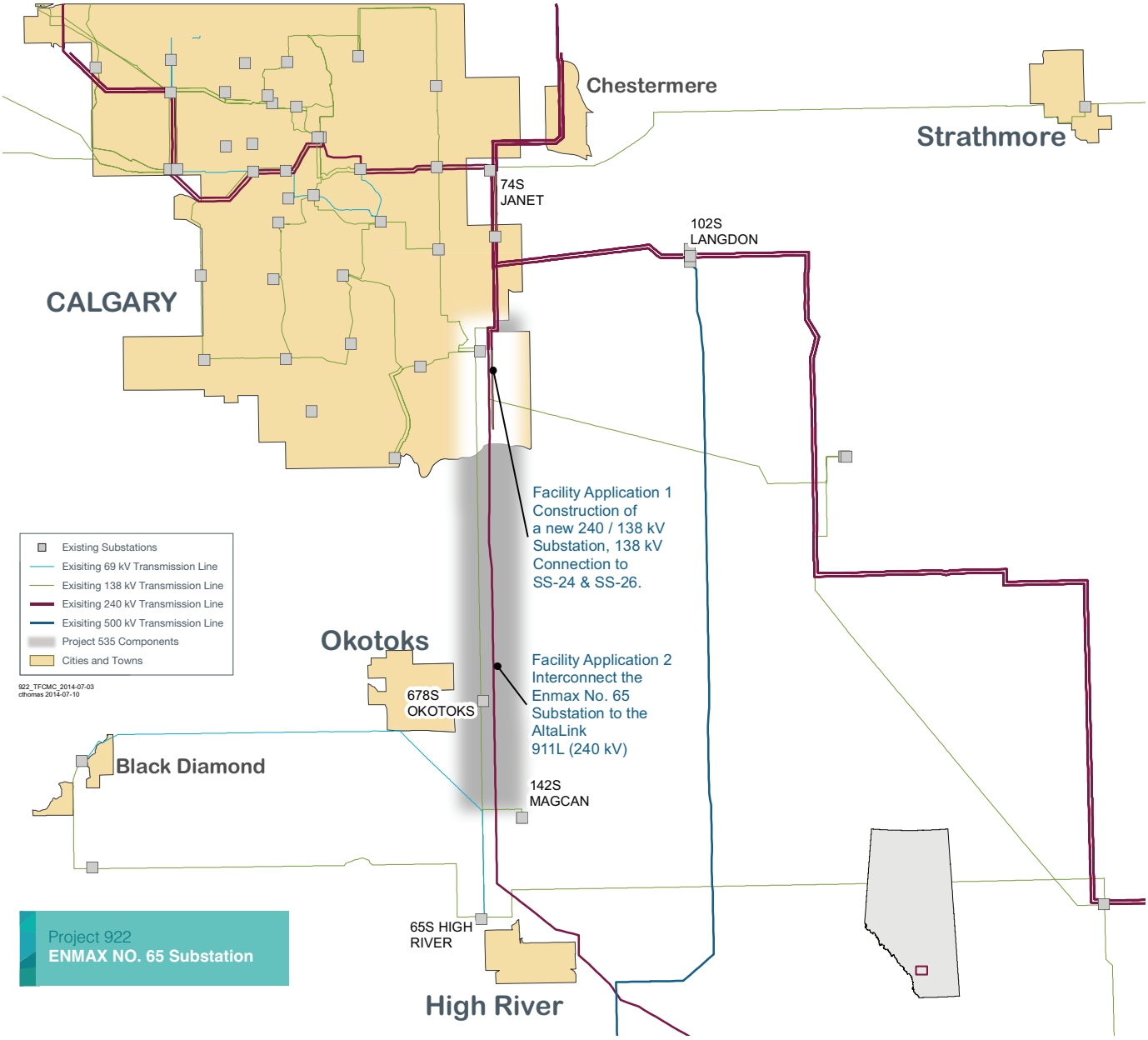
PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
ENMAX No. 65 Substation	**Not Applicable**	**$45 Million**

CURRENT STATUS: Construction on the project started in April 2012 and it was energized on September 30, 2013.

Final cost reports have been received from both AltaLink and ENMAX. A revised cost report is expected shortly from AltaLink.

14 The TFCMC has monitored Project 922, ENMAX No. 65 Substation. While the current value of the project is below the $100-million TFCMC threshold, the original project initially came in above the threshold, which is why the Committee kept it on its list of monitored projects.


Chestermere
Strathmore
74S
JANET
102S
LANGDON
CALGARY
Facility Application 1
Construction of
a new 240 / 138 kV
Substation, 138 kV
Connection to
SS-24 & SS-26.
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
922_TFCMC_2014-07-03
cthomas 2014-07-10
Okotoks
678S
OKOTOKS
Facility Application 2
Interconnect the
Enmax No. 65
Substation to the
AltaLink
911L (240 kV)
Black Diamond
142S
MAGCAN
65S HIGH
RIVER
High River
Project 922
ENMAX NO. 65 Substation

7. **FOOTHILLS AREA TRANSMISSION DEVELOPMENT (FATD) – EAST PROJECT;** PROJECT 1117 – To meet growing demand in South Calgary, High River and the surrounding area.

THE PROJECT: The FATD East development will ensure the transmission system will serve growing electricity demand in Calgary, High River, and the surrounding areas, enable new generation facilities to connect, and maintain system reliability. It will also facilitate wind generation development within adjacent areas and mitigate thermal overloads and voltage violations.

THE COMPONENTS: The project has both a 240 kV and 138 kV scope.

The 240 kV scope consists of building a new 240/138 kV substation designated Foothills 237S; adding a new 240 kV double-circuit line from the proposed Foothills 237S substation to ENMAX SS-65; a new 240 kV double-circuit line from the existing Langdon 102S to the existing the Janet 74S; a new 240 kV double-circuit line from Langdon 102S to East Calgary 5S using a combination of existing lines; a 240 kV double-circuit line between the ENMAX SS-65 substation to the new ENMAX SS-25 substation, and the de-energization of sections of existing transmission lines.

The 138 kV scope consists of a new 138 kV single-circuit line from the proposed Foothills 237S to the existing Okotoks 678S; a new 138 kV single-circuit line from Foothills 237S to the existing High River 65S; a 138 kV single-circuit line from Okotoks 678S to Carseland 525S, and the de-energization of transmission lines and modifications to lines in the area.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
North Foothills Transmission Project	1	Construction of Foothills 235S 240/138 kV switching station, and construction of approximately 52 km of double-circuit 240 kV transmission line from Foothills 237S to ENMAX SS-65	May 25, 2015
ENMAX No.25 substation 240 kV line additions and ENMAX No.65 substation 240 kV line additions	2	Interconnection of two new AltaLink 240 kV transmission lines at ENMAX SS-25, and termination of three new AltaLink 240 kV transmission lines at ENMAX SS-65	May 25, 2015
Langdon to Janet Project	3, 4	Construction of approximately 18 km of double-circuit 240 kV transmission line from Langdon 102S to Janet 74S; expansion of Janet 74S substation; removal of terminations at Janet 74S resulting in two new circuits terminals at East Calgary 5S and Crossing 511S, and salvage of approximately six km of 240 kV transmission line from Janet 74S to ENMAX SS-25	May 25, 2015
Foothills 138 kV Project	5	Addition of two 240/138 kV transformers at Foothills 237S; construction of approximately 14 km of double-circuit 138 kV transmission line from Foothills 237S to High River 65S; rebuild of approximately seven km of existing transmission line to 678S, and salvage of approximately 30 km of existing line from Janet 74S to Okotoks 678S	October 1, 2015

THE TRANSMISSION FACILITY OWNER(S): AltaLink and ENMAX.

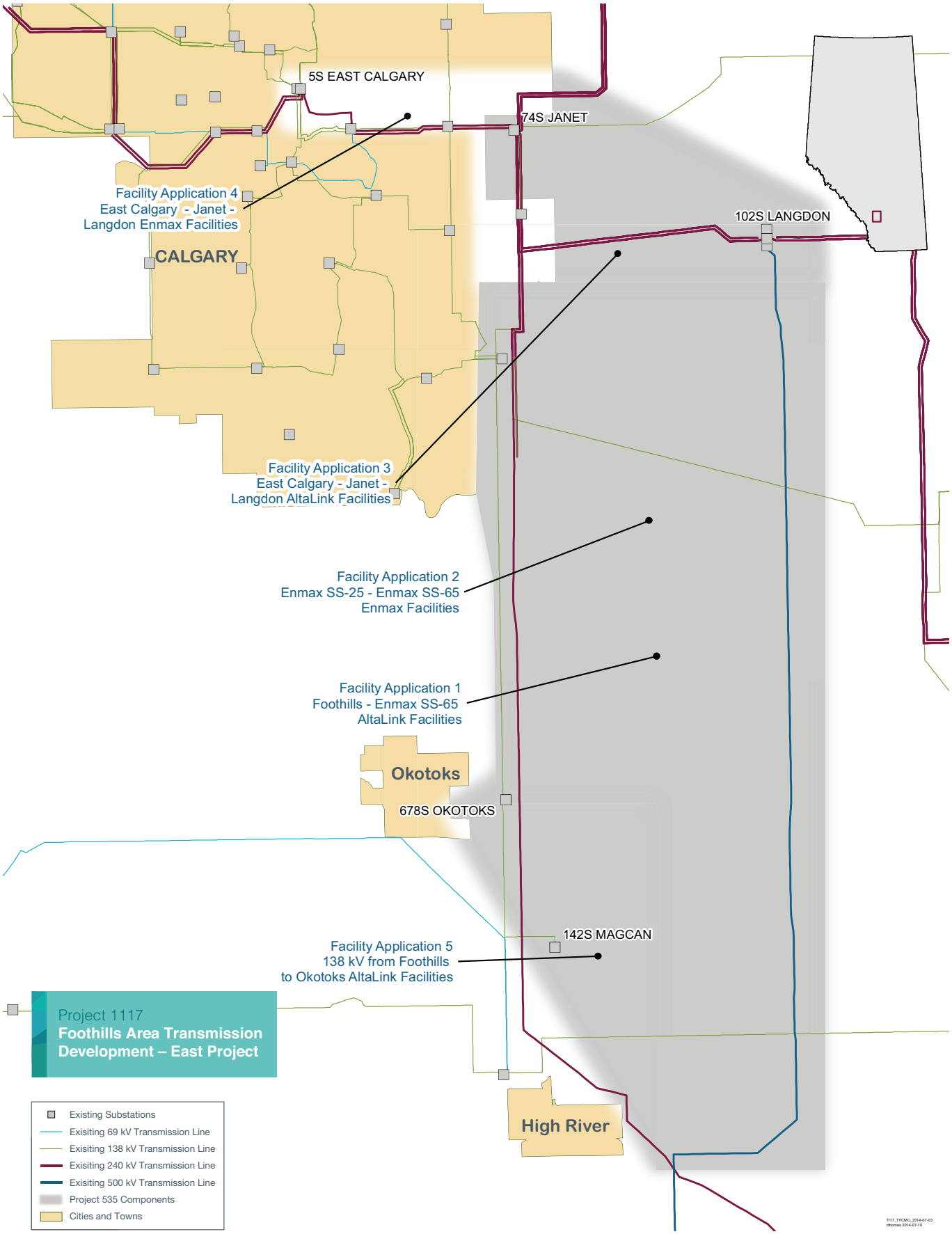
PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Foothills Area Transmission Development – East Project	***$921 Million** (2013$) *entire FATD plan	***$434 Million** (ISD$ with escalation *FATD East

CURRENT STATUS: The AUC approved the NID on October 7, 2013 and the FAs in October 2013. Construction started in fall 2013. The project is expected to be completed by October 2015.

PROJECT RISKS

Outage coordination with concurrent projects may impact project schedules.


5S EAST CALGARY
74S JANET
102S LANGDON
Facility Application 4
East Calgary - Janet -
Langdon Enmax Facilities
CALGARY
Facility Application 3
East Calgary - Janet -
Langdon AltaLink Facilities
Facility Application 2
Enmax SS-25 - Enmax SS-65
Enmax Facilities
Facility Application 1
Foothills - Enmax SS-65
AltaLink Facilities
Okotoks
678S OKOTOKS
142S MAGCAN
Facility Application 5
138 kV from Foothills
to Okotoks AltaLink Facilities
High River
Project 1117
Foothills Area Transmission
Development – East Project
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns

8. **FORT MCMURRAY AREA TRANSMISSION BULK SYSTEM REINFORCEMENT (FMAC);** PROJECT 838 – Construction of 500 kV transmission lines from the Edmonton area to the Fort McMurray area.

THE PROJECT: The Fort McMurray area transmission project is to serve load from the expected growth of the oilsands industry in the northeastern part of the province and will see the construction of two 500 kV transmission lines from the Edmonton area to the Fort McMurray area.

THE COMPONENTS: The major components for Stage 1 of the project (West 500 kV Line) are: approximately 500 km of 500 kV single-circuit transmission line from Thickwood Hills 951S to Sunnybrook 510S; a 500 kV substation switchyard at Thickwood Hills 951S to terminate the north end of the West 500 kV line; modifications to the Sunnybrook 510S substation to terminate the south end of the West 500 kV line, and a 500/240 kV 1200 MVA transformer bank at Thickwood Hills 951S.

The major components for Stage 2 of the project (East 500 kV Line) are: approximately 400 km of 500 kV single-circuit transmission line from Thickwood Hills 951S to Heartland 12S; modifications to the Thickwood Hills 951S substation to terminate the north end of the East 500 kV line; modifications to the Heartland 12S substation to terminate the south end of the East 500 kV line, and a second 500/240 kV 1200 MVA transformer bank at Thickwood Hills 951S.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Fort McMurray Area Bulk System Development Stage 1 – West Line	1	One 500 kV transmission line will be constructed from a new substation at Thickwood Hills to the Genesee area, referred to as the West 500 kV line	2019
Fort McMurray Area Bulk System Development Stage 2 – East Line	2	A second 500 kV transmission line will be constructed from a new substation at Thickwood Hills to the Heartland area, referred to as the East 500 kV line	2021

THE TRANSMISSION FACILITY OWNER(S): The TFO(s) will be determined through the Competitive Process.

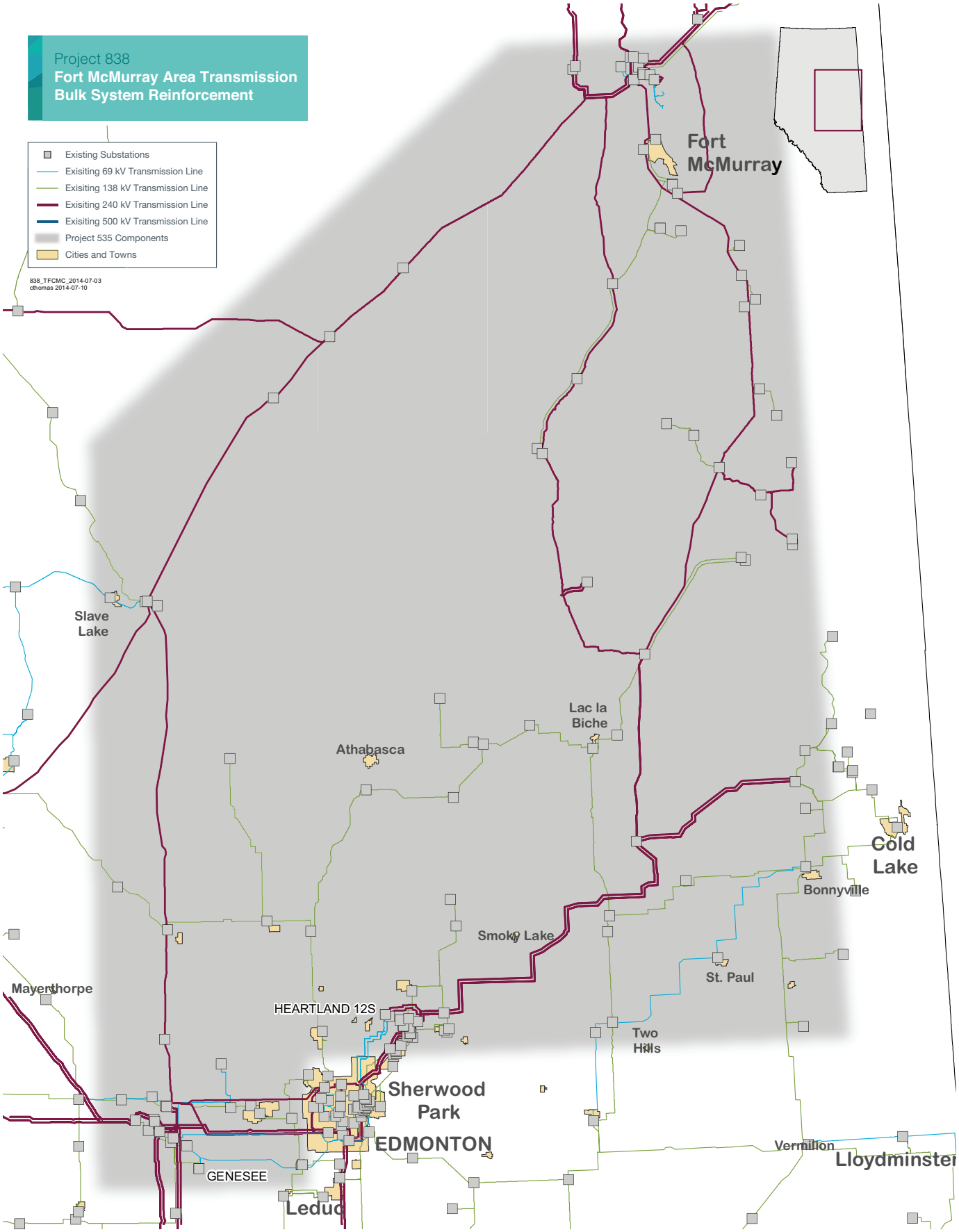
PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Fort McMurray Area Transmission Bulk System Reinforcement	**$1.796 Billion** (2013$) **Stage 1: $1.796 Billion** (2013$) **Stage 2: To Be Determined**	Not Available

CURRENT STATUS: The Request for Proposal (RFP) process began in January 2014, with five Request for Qualifications (RFQ) respondents shortlisted. The AESO will select a winning proponent in December 2014. The target in-service date for Stage 1–West Line is May 2019.

PROJECT RISKS

The ISD may be delayed beyond May 2019 for the West 500 kV Line due to external factors such as regulatory process, weather, construction activities in muskeg, land rights or access, incumbent TFOs and stakeholders. Mitigation would be to meet with the successful proponent and develop joint mitigation plans.


Project 838
Fort McMurray Area Transmission Bulk System Reinforcement
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
838_TFCMC_2014-07-03
cthomas 2014-07-10
Fort McMurray
Slave Lake
Lac la Biche
Athabasca
Cold Lake
Bonnyville
Smoky Lake
St. Paul
Mayerthorpe
HEARTLAND 12S
Two Hills
Sherwood Park
EDMONTON
Vermilion
Lloydminster
GENESEE
Leduc

9. **HANNA REGION TRANSMISSION DEVELOPMENT (HATD);** PROJECT 812 – Transmission development in the Hanna, Sheerness and Battle River areas.

THE PROJECT: Transmission reinforcement in the Hanna region (East Central Alberta) will allow for the connection of up to 700 MW of wind power and serve demand of about 970 MW, largely driven by industrial development in the area. The AESO's system studies indicate that the key drivers for the project are to provide transmission capacity to meet growth (load and generation), improve the reliability of the transmission system and alleviate transmission constraints that can result in generation curtailment in the region.

THE COMPONENTS: There are two stages of transmission development for the project.

The major components for Stage 1 of the project are: a new 240/144 kV substation near Hardisty with a 240 kV double-circuit line connecting the new substation to the 240 kV line between Cordel and Hansman Lake, and a 138 kV double-circuit line connecting the new substation to the existing Tucuman 478S; a 240 kV double-circuit line from Anderson to a new 240 kV switching station south of Anderson 801S; a 240 kV double-circuit transmission line (one-side strung) from the new 240 kV switching station to existing Hansman Lake 605S and two new 240/144 kV substations near Oyen and Monitor; addition of -100/+200 VAr static var compensators at existing Hansman Lake 650S and new Lanfine 959S substations; a double-circuit 240 kV line (one-side strung) west from the new 240 kV switching station to a new 240/144 kV substation near the Hand Hills area, and various local area 138 kV or 144 kV enhancements.

The major components for Stage 2 of the project are: string conductor on the open side of the 240 kV lines from the 240 kV switching station south of Anderson 801S to Hansman Lake 650S; string conductor on the open side of the 240 kV line west from the 240 kV switching station south of Anderson 801S to the new 240/144 kV station in the Hand Hills area; addition of a second 240/144 kV transformer at source substations near Oyen, Monitor and Hand Hills; the addition of -100/+200 VAr static var compensator, and various local area 138 kV and 144 kV enhancements.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Battle River 757S Capacitor Bank addition	2	Battle River 757S–72 kV Capacitor Bank addition; 144 kV circuit breaker and substation alterations	October 3, 2011
Youngstown 772S Capacitor Bank addition	1	Youngstown 772S–Capacitor Bank addition; 144 kV breaker and communication tower	October 6, 2011
144 kV Capacitor Bank and Circuit Breaker additions at Three Hills substation 770S	13	Three Hills 770S 144 kV Capacitor Bank addition; 144 kV circuit breaker and substation alterations	December 13, 2011
Rowley 768S–Michichi–Three Hills 144 kV DC Line 7L25	18	Expansion and rebuild of existing Rowley 768S substation; construction of about 13 km of new 144 kV double-circuit transmission line designated as 7L25 and 7L137 and alterations at existing substations	June 1, 2012
Hardisty 377S substation Capacitor Bank	21	138 kV Capacitor Bank addition at Hardisty 377S substation and other associated work	June 28, 2012
Hansman Lake 650S substation SVC addition	22	Addition of a -100/+200 VAr SVC at Hansman Lake 650S	October 5, 2012

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Heatburg 948S–Three Hills–Nevis 144 kV D/C Line 7L16/7L159	17	New 144/25 kV Heatburg 948S substation; new double-circuit 144 kV transmission line from Heatburg 948S to existing 7L16; modification of 7L16 to create an in/out configuration to Heatburg 948S and alterations at existing substations	January 25, 2013
Oakland 946S 240 kV S/S combined with Anderson–Oakland line	7	New double-circuit 240 kV transmission line (designated as 9L70/9L97) from Anderson 801S to Oakland 946S, Oakland 946S substation and related alterations	March 25, 2013
Stettler 769S–Nevis 768S 144 kV S/C Line 7L143	19	New single-circuit 144 kV transmission line from Nevis 766S to Stettler 769S; alterations to Nevis 766S and alterations to Stettler 769S	April 21, 2013
Coyote Lake 963S 240 kV S/S combined with Oakland–Coyote line	9	New 240/144 kV Coyote Lake 963S; new 240 kV double-circuit transmission line (one-side strung) designated as 9L29 from Oakland 949S to Coyote Lake 963S and alteration to Oakland 946S	May 17, 2013
New Lanfine 240/144 kV substation	3	New 240/144 kV substation designated Lanfine 959S	May 20, 2013
Oakland–Lanfine 240 kV S/C line 9L924	8	New double-circuit 240 kV transmission line (one-side strung) designated 9L24, from Oakland 946S to Lanfine 959S and alterations to Oakland 946S	May 21, 2013
Pemukan 932S 240 kV substation	11	New 240/144 kV substation designated Pemukan 932S	June 1, 2013
New Lanfine-Pemukan 240 kV S/C Line 9L46	12	New double-circuit 240 kV transmission line (one-side strung) designated 9L46, from Pemukan 932S to Lanfine 959S and alterations to Lanfine 959S	June 1, 2013
Relocate 7L98 Oyen 767S–Lanfine 959S	6	Decommission and salvage of transmission line 7L98 and 7LA98	June 1, 2013
Relocate 7L79 line from Monitor 774S–Pemukan 932S	16	Re-termination of existing 7L70 from Monitor 774S to Pemukan 932S and alterations to Pemukan 932S	June 12, 2013
Pemukan 932S–Monitor 774S 144 kV S/C Line 7L127	15	Double-circuit 144 kV line (one-side energized) from Pemukan 932S to Monitor 774S	June 15, 2013
Coyote Lake 963S–Michichi Creek 802S 144 kV SC Line 7L128	10	New single-circuit transmission line designated as 7L128 from Michichi Creek 802S to Coyote Lake 963S and alterations to existing Michichi Creek 802S	July 12, 2013

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Lanfine-Oyen 144 kV S/C Line 7L132	5	Double-circuit 144 kV line (one-side energized) from Lanfine 959S to Oyen 767S	July 15, 2013
Hansman Lake-Pemukan 240 kV S/C Line 9L966	14	New double-circuit 240 kV transmission line (one-side strung) designated 9L966, from Pemukan 932S to AltaLink's service territory and alterations to Pemukan 932S	August 21, 2013
New 240 kV line 966L from Pemukan 932S–Hansman Lake 650S	23	New double-circuit 240 kV transmission line (one-side strung) designated 966L, from Hansman Lake 650S to ATCO's service territory and alterations to Hansman Lake 650S	August 21, 2013
Nilrem 574S combined with D/C 240 kV 953L – 1047L and Tucuman 478S combined with D/C 138 kV 679L – 680L	20	New 240/138 kV Nilrem 574S; new 240 kV double-circuit transmission line (designated as 953L/1047L) from connection point on existing 240 kV line 953L to Nilrem 574S; alteration to existing 953L; new 139 kV double-circuit transmission line (679L/680L) from Tucuman 478S to Nilrem 574S and alterations to existing Tucuman 478S	August 30, 2013
New 240 kV line 1060L from Ware Junction 132S–West Brooks 28S	24	New single-circuit 240 kV transmission line (designated 1053L) from Ware Junction 132S to Cassils 324S; alterations to Ware Junction 132S and alteration to Cassils 324S	November 29, 2013
Lanfine 959S 200 VAr SVC	4	Addition of a -100/+200 VAr SVC at Lanfine 959S	July 26, 2014

THE TRANSMISSION FACILITY OWNER(S): AltaLink and ATCO.

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Hanna Region Transmission Development	**$909 Million** (2013$)	**$969 Million** (ISD$ with escalation)

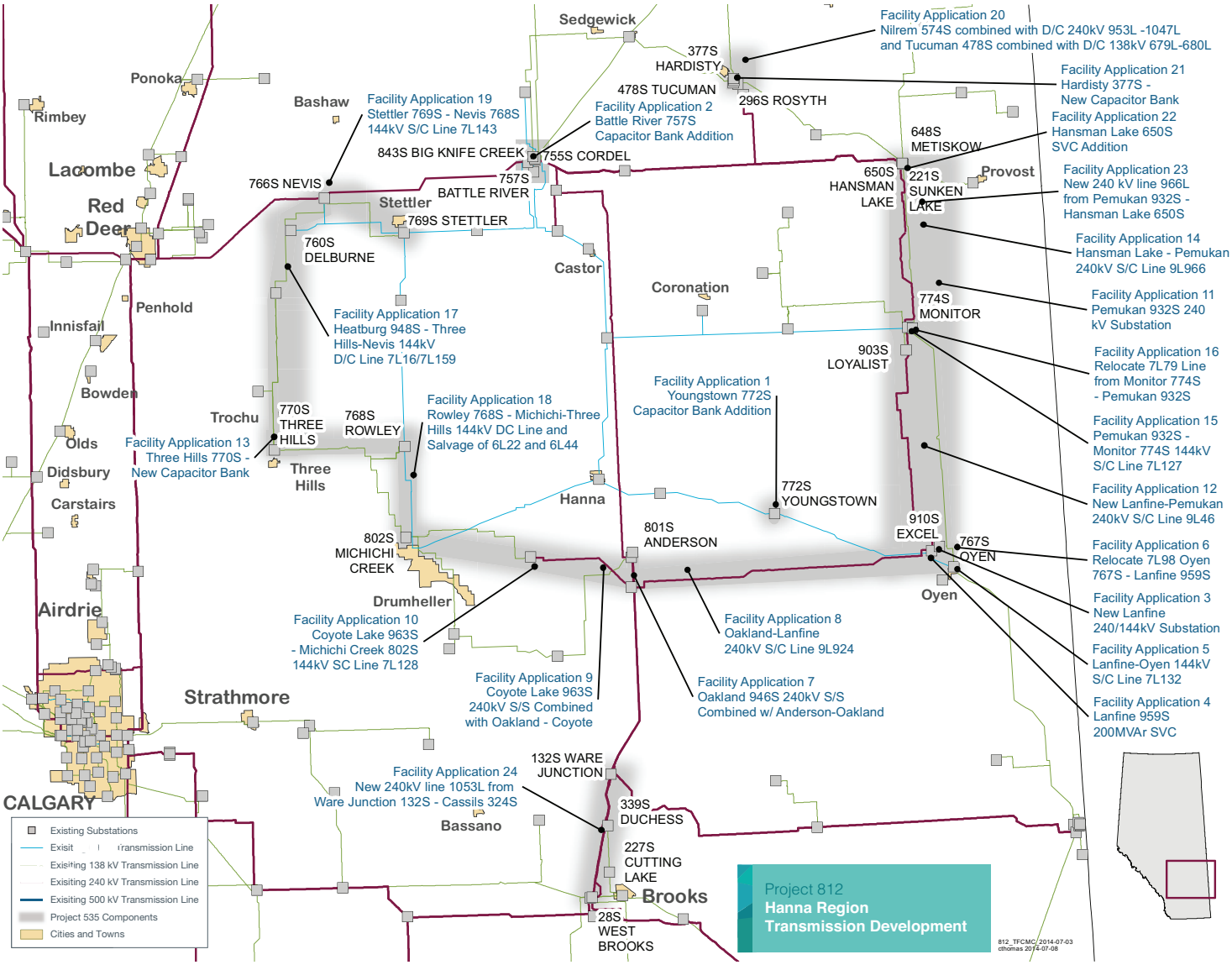
CURRENT STATUS: All FAs related to Stage 1 of the project have been completed, with the exception of the Lanfine Static VAr Compensator (SVC). The ISD for the Lanfine SVC has been delayed from May 30, 2014 to July 26, 2014.

Change Proposals (CPs) totaling $28.4 million were submitted and approved by the AESO as of April 2014. Since the original 2009/2010 PPS estimates, increases in costs were due to schedule delays, increased right-of-way (ROW) scope and changes in labour market conditions.

The AESO has initiated Phase 2 of the Hanna project; the NID identifies that this development is required by 2017. Hanna Region Transmission Development Phase 2 is reported via Project 1113. The project was kicked off with AltaLink and ATCO Electric on March 26, 2014. A draft functional specification (FS) was distributed to TFOs on May 26, 2014. A revised draft FS was distributed to team on June 30th. Final FS and directions will be distributed in August 2014.

PROJECT RISKS

The Lanfine SVC energization has had some contracting issues, which impacted the ISD of May 30, 2014. The new ISD is July 26, 2014, but that is at risk as well.


Sedgewick
Facility Application 20
Nilrem 574S combined with D/C 240kV 953L -1047L
and Tucuman 478S combined with D/C 138kV 679L-680L
377S
HARDISTY
Facility Application 21
Hardisty 377S -
New Capacitor Bank
478S TUCUMAN
296S ROSYTH
Facility Application 2
Battle River 757S
Capacitor Bank Addition
Facility Application 22
Hansman Lake 650S
SVC Addition
648S
METISKOW
Ponoka
Rimbey
Bashaw
Facility Application 19
Stettler 769S - Nevis 768S
144kV S/C Line 7L143
843S BIG KNIFE CREEK
755S CORDEL
Lacombe
Red
Deer
766S NEVIS
757S
BATTLE RIVER
Stettler
769S STETTLER
650S
HANSMAN
LAKE
221S
SUNKEN
LAKE
Provost
Facility Application 23
New 240 kV line 966L
from Pemukan 932S -
Hansman Lake 650S
760S
DELBURNE
Castor
Coronation
Facility Application 14
Hansman Lake - Pemukan
240kV S/C Line 9L966
Penhold
Innisfail
Facility Application 17
Heatburg 948S - Three
Hills-Nevis 144kV
D/C Line 7L16/7L159
774S
MONITOR
Facility Application 11
Pemukan 932S 240
kV Substation
903S
LOYALIST
Facility Application 16
Relocate 7L79 Line
from Monitor 774S
- Pemukan 932S
Bowden
Facility Application 1
Youngstown 772S
Capacitor Bank Addition
Trochu
770S
THREE
HILLS
768S
ROWLEY
Facility Application 18
Rowley 768S - Michichi-Three
Hills 144kV DC Line and
Salvage of 6L22 and 6L44
Facility Application 15
Pemukan 932S -
Monitor 774S 144kV
S/C Line 7L127
Olds
Facility Application 13
Three Hills 770S -
New Capacitor Bank
Didsbury
Three
Hills
Hanna
772S
YOUNGSTOWN
Facility Application 12
New Lanfine-Pemukan
240kV S/C Line 9L46
Carstairs
910S
EXCEL
801S
ANDERSON
767S
OYEN
Facility Application 6
Relocate 7L98 Oyen
767S - Lanfine 959S
802S
MICHICHI
CREEK
Oyen
Drumheller
Airdrie
Facility Application 3
New Lanfine
240/144kV Substation
Facility Application 10
Coyote Lake 963S
- Michichi Creek 802S
144kV SC Line 7L128
Facility Application 8
Oakland-Lanfine
240kV S/C Line 9L924
Facility Application 5
Lanfine-Oyen 144kV
S/C Line 7L132
Strathmore
Facility Application 9
Coyote Lake 963S
240kV S/S Combined
with Oakland - Coyote
Facility Application 7
Oakland 946S 240kV S/S
Combined w/ Anderson-Oakland
Facility Application 4
Lanfine 959S
200MVAr SVC
132S WARE
JUNCTION
Facility Application 24
New 240kV line 1053L from
Ware Junction 132S - Cassils 324S
CALGARY
339S
DUCHESS
Bassano
227S
CUTTING
LAKE
Brooks
28S
WEST
BROOKS
Existing Substations
Exisit Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 812
Hanna Region
Transmission Development
812_TFCMC_2014-07-03
cthomas 2014-07-08

10. ***COMPLETED* NORTH FORT MCMURRAY TRANSMISSION DEVELOPMENT (NFMD);** PROJECT 791 – Transmission development north of Fort McMurray.

THE PROJECT: The North Fort McMurray Transmission Development Project is to relieve transmission constraints and to serve forecast electrical demand as industrial load (oilsands) continues to grow in the area north of Fort McMurray.

THE COMPONENTS: The project called for a 240 kV double-circuit line (one-side strung) from Kearl Lake to Salt Creek, the addition of the McLelland 240 kV switching station near Kearl Lake, and a 240 kV switching station at Black Fly.

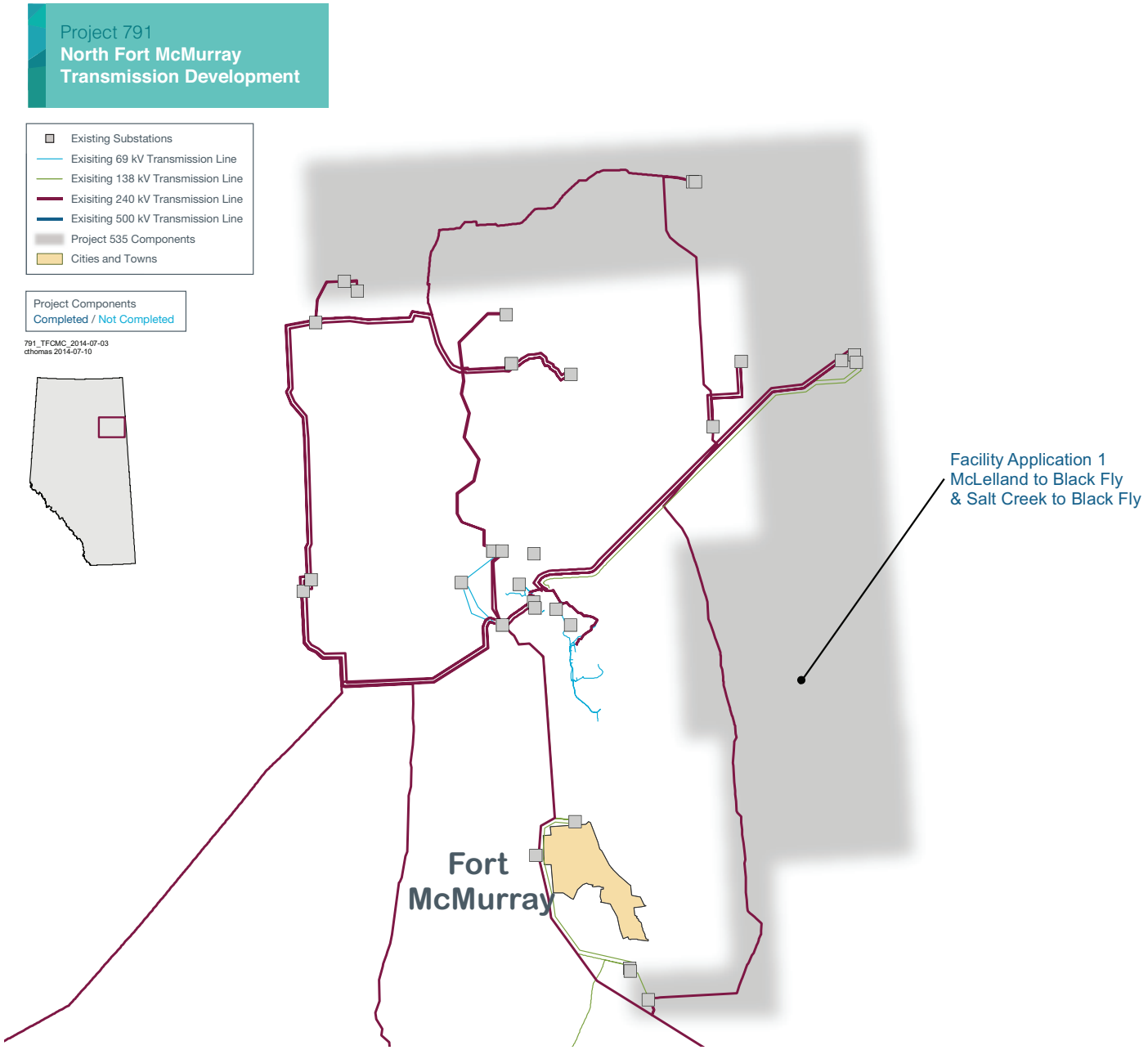
FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
North Fort McMurray Transmission Development	1	Double-circuit 240 kV line (one-side strung) from Kearl Lake to Salt Creek; addition of the McLelland 240 kV switching station near Kearl Lake, and a 240 kV switching station at Black Fly	December 11, 2013

THE TRANSMISSION FACILITY OWNER(S): ATCO.

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
North Fort McMurray Transmission Development	**Not Applicable**	**$352.3 Million**

CURRENT STATUS: The final cost report was received on June 3, 2014. The final cost was $5-million lower than the forecasted final cost.


Project 791
North Fort McMurray
Transmission Development
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project Components
Completed / Not Completed
791_TFCMC_2014-07-03
cthomas 2014-07-10
Fort
McMurray
Facility Application 1
McLelland to Black Fly
& Salt Creek to Black Fly

11. NORTH SOUTH TRANSMISSION REINFORCEMENT (HVDC); PROJECT 737 – Construction of two 500 kV HVDC transmission lines from the Edmonton area to the Calgary and south regions.

THE PROJECT: The North South Transmission Reinforcement is to address increased demand in southern and central Alberta, mitigate issues with reliability, maximize efficiency, accommodate long-term growth and lead generation decisions. The project calls for two high-capacity lines between Edmonton and Calgary to reinforce the backbone of the grid and replace aging 240 kV lines. One line will be located on the west centre portion of the province, connecting to the existing Wabamun Lake hub west of Edmonton to the Calgary area hub near Langdon. The second line will be located on the east side of the province connecting the Heartland hub northeast of Edmonton to a southern hub in the Brooks area.

THE COMPONENTS: The two new lines will use 500 kV high-voltage direct current (HVDC) technology and will be built to transfer up to 1000 MW of power each. Each line and converter station can be upgradable to 2000 MW at a future date. For each line, two HVDC converter stations will be required, one at the source and one at the destination point, to convert AC power to DC and DC to AC.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Eastern Alberta Transmission Line Project Facility Application – AltaLink	3	Application to construct and operate an interface for the EATL Converter Stations	December 15, 2014
Eastern Alberta Transmission Line Project Facility Application – ATCO	1	Application to construct and operate a high-voltage DC line from Heartland to West Brook	April 22, 2015
Western Alberta Transmission Line Project Facility Application – AltaLink	2	Application to construct and operate a high-voltage DC line from Genesee to Langdon	April 22, 2015

THE TRANSMISSION FACILITY OWNER(S): AltaLink is the designated TFO to build the Western Alberta Transmission Line (WATL) and ATCO is the designated TFO to build the Eastern Alberta Transmission Line (EATL).

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
North South Transmission Reinforcement – EATL	**$1.665 Billion** (2013$)	**$1.90 Billion** (ISD$ with escalation)
North South Transmission Reinforcement – WATL	**$1.499 Billion** (2013$)	**$1.669 Billion** (ISD$ with escalation)

CURRENT STATUS: Based upon the most recent monthly TFO reports, EATL is about 55% complete and WATL is about 65% complete. In May 2014, ATCO advised that the ISD of December 2014 is not achievable and will provide an update in late August 2014. AltaLink is reporting that WATL is on schedule to meet the ISD of April 2015. Further, the AESO project deliverables (i.e., area studies, operation procedures, training, EMS upgrades) are on track.

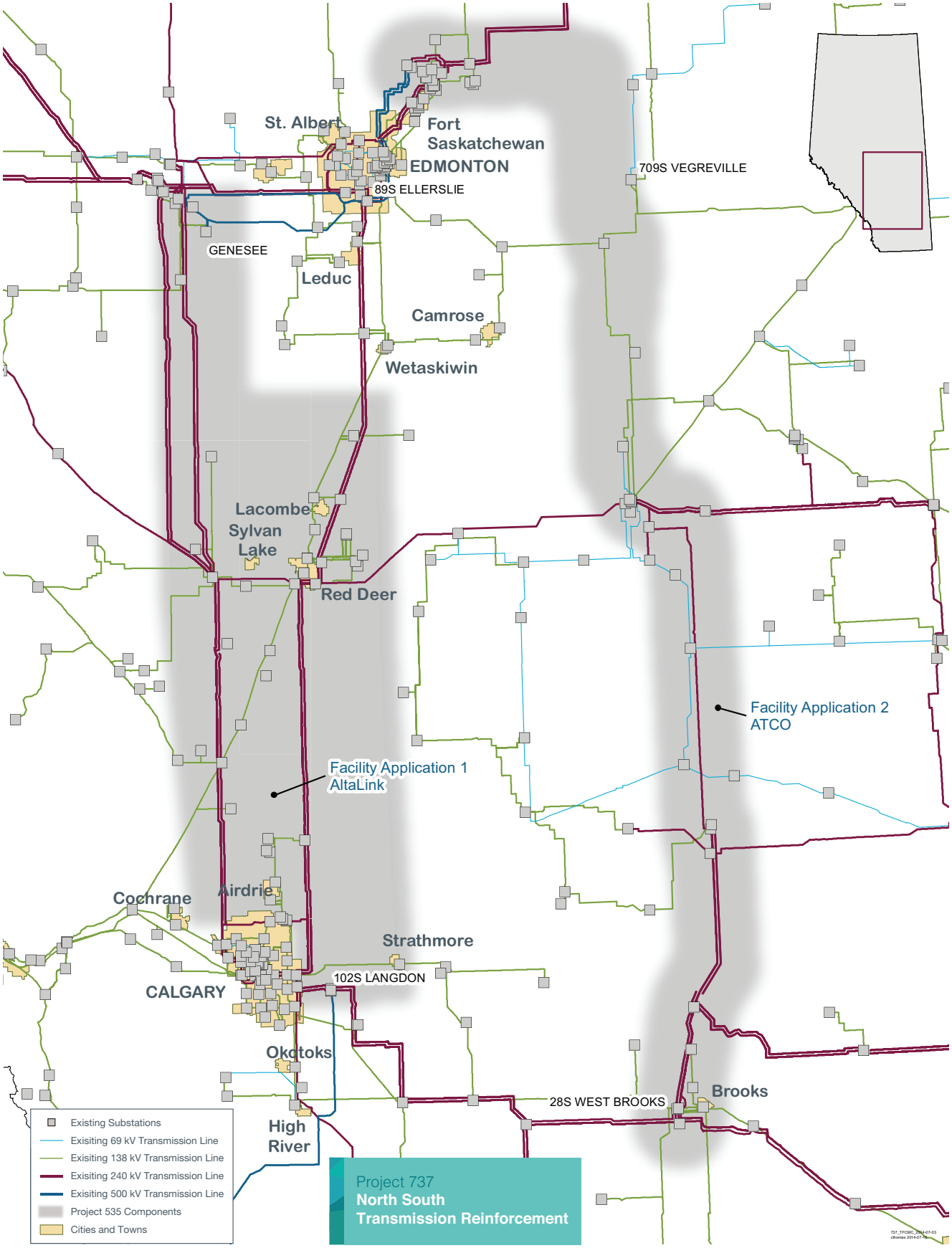
The forecast project cost for EATL is $1.90 billion, which is a net increase of $256.9 million from the original PPS estimate. The net increase is a result of the AESO's approval of nine EATL change proposals from ATCO (4) and AltaLink (5).

The current authorized budget for WATL is $1.669 billion, which is a net increase of $249 million from the original PPS estimate. The net increase is a result of the AESO approval of six WATL change proposals from AltaLink and EPCOR.

PROJECT RISKS

The EATL ISD of December 2014 is no longer achievable, thus, the project cost may increase depending upon the magnitude of the delay.

There are several risks related to construction outages and project interdependencies with other projects (i.e., FATD, Project 1117; ECTP, Project 719; SATR, Project 787) that are being managed and mitigated by the project team.


St. Albert
Fort Saskatchewan
EDMONTON
89S ELLERSLIE
709S VEGREVILLE
GENESEE
Leduc
Camrose
Wetaskiwin
Lacombe
Sylvan Lake
Red Deer
Facility Application 2
ATCO
Facility Application 1
AltaLink
Cochrane
Airdrie
Strathmore
102S LANGDON
CALGARY
Okotoks
28S WEST BROOKS
Brooks
High River
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 737
North South
Transmission Reinforcement

12. NORTHWEST (OF) FORT MCMURRAY TRANSMISSION DEVELOPMENT (NW FMM); PROJECT 1180 – To provide service and connect future industrial customers in areas where there are no transmission facilities northwest of Fort McMurray.

THE PROJECT: The Northwest (of) Fort McMurray 240 kV Transmission Development includes a 240 kV-looped system extending west from existing transmission facilities between the Dover 888S and Joslyn 849S substations, including the addition of two new 240 kV substations. This expansion of the transmission system will serve developing (electricity intensive) industrial growth as oilsands extraction facilities and related industrial developments are proceeding into areas where there are currently no transmission facilities to provide service, and connect future industrial customers.

THE COMPONENTS: Major components include a new 240 kV switching substation (Birchwood Creek 960S-NW FMM South); existing 9L57 line in/out at Birchwood Creek 960S; a new 240 kV switching station (Ells River 2079S-NW FMM North); 9L08 Joslyn to Dover line in/out at Ells River 2079S (approximately 50 km of 240 kV double-circuit line, designated as 9L08/9L76); approximately 80 km of 240 kV single-circuit line (9L95), between Ells River 2079S and Birchwood Creek 960S.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Birchwood Creek substation and 9L57 in/out	1	Birchwood Creek: new 240 kV switching substation; existing 9L57 line in/out at Birchwood Creek	December 1, 2014
Ells River substation, 9L76 and 9L08, in/out 240 kV double-circuit line from existing 9L08 to Ells River substation	2	9L08, Joslyn to Dover line in/out at Ells River (approximately 50 km of 240 kV double-circuit line)	April 1, 2016
Ells River to Birchwood Creek Line 9L95, 240 kV line between Ells River and Birchwood Creek	3	Approximately 80 km of 240 kV double-circuit line, one-side strung between Ells River and Birchwood Creek	December 1, 2016

THE TRANSMISSION FACILITY OWNER(S): ATCO.

PROJECT COST:

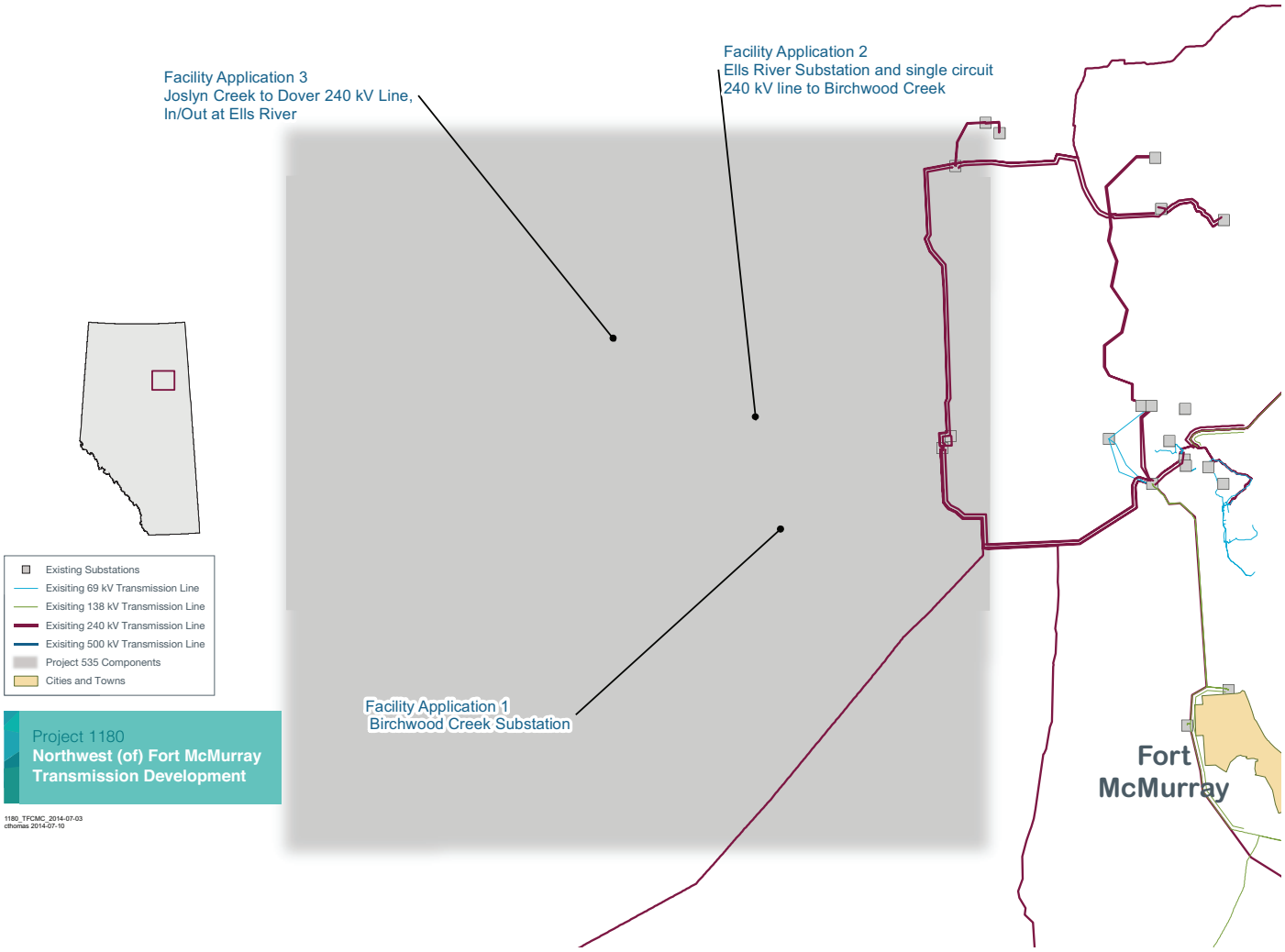
TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Northwest (of) Fort McMurray Transmission Development	**$343 Million** (2013$)[15]	**$343 Million** (ISD$ with escalation)

CURRENT STATUS: The project will be developed in three stages. The P&L for Stage 1, Birchwood Creek, was received on January 8, 2014. This is under construction with an ISD of December 1, 2014. The FA for the Ells River stage is expected to be filed in the third quarter of 2014 and the FA for 9L95 in the first quarter of 2015.

PROJECT RISKS

ATCO is in negotiations with First Nations on line routing for Ells River/9L08/9L76. This could delay filing the Ells River FA and may lead to a hearing.

15 Referenced as the "240 kV double-circuit line from Livock to Joslyn Creek" in the Long-Term Transmission Plan filed in June 2012.


Facility Application 3
Joslyn Creek to Dover 240 kV Line,
In/Out at Ells River
Facility Application 2
Ells River Substation and single circuit
240 kV line to Birchwood Creek
Facility Application 1
Birchwood Creek Substation
Fort
McMurray
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 1180
Northwest (of) Fort McMurray
Transmission Development
1180_TFCMC_2014-07-03
cthomas 2014-07-10

13. **RED DEER REGION TRANSMISSION DEVELOPMENT (RDTD);** PROJECT 813 – 240/138 kV transmission system reinforcements in the Red Deer area.

THE PROJECT: Growing demand from industrial, commercial, farming, and residential, along with existing constraints on the system, have created the need to strengthen the transmission system in the Red Deer region.

THE COMPONENTS[16]: There are two stages of transmission development for the project.

The major components for Stage 1 of the project are: building new 240/138 kV substations near Didsbury, Ponoka and Innisfail; upgrading substations near Benalto and West Lacombe; adding approximately 150 km of new and rebuilt transmission line, and salvaging more than 100 km of existing transmission line.

The only component left for Stage 2 of the project is building a third 138 kV line from Gaetz to Joffre.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Red Deer Area Transmission Development Stage 1 – Brownfields	1	Split 768L and 778L; 240/138 kV transformer at Benalto 17S; Capacitor Banks at Joffre 535S, Prentiss 276S and Ellis 332S	November 28, 2013
Red Deer Area Transmission Development Stage 2 – Rebuild 166L	4	Rebuild 166L from Didsbury 152S to Harmattan 256S	June 26, 2015
Red Deer Area Transmission Development Stage 1 – Rebuilds and Greenfields	2	Rebuild 80L from S. Red Deer 194S to N. Red Deer 217S; rebuild 80L from S. Red Deer 194S to Red Deer 63S; rebuild 755L from Red Deer 63S to Piper Creek 247S to Joffre 535S, and rebuild 717L from Red Deer 63S to Benalto 17S; New Johnston 240/138 kV substation and new transmission lines; 138 kV line from NE Lacombe 212S to Ellis 322S; new Wolf Creek 240/138 kV substation and new transmission lines; new Hazelwood 240/138 kV substation and new transmission lines	September 21, 2015
Red Deer Area Transmission Development Stage I – Salvage	5	Salvage 80L from Ponoka 331S to West Lacombe 958S; salvage 80L from Red Deer 63S to Innisfail 214S to Olds 55S; salvage 716L from Wetaskiwin 40S to Ponoka 331S	January 25, 2016
Red Deer Area Transmission Development Stage II – 2017 Facilities	6	Component energizations	November 10, 2017

TRANSMISSION FACILITY OWNER(S): AltaLink.

16 Additional revisions have been made to the information in this project's Components chart (FA's numbers two and three have been combined into FA 2), on top of those noted in the December 2013 TFCMC Report. As such, please use this information going forward.

PROJECT COST:

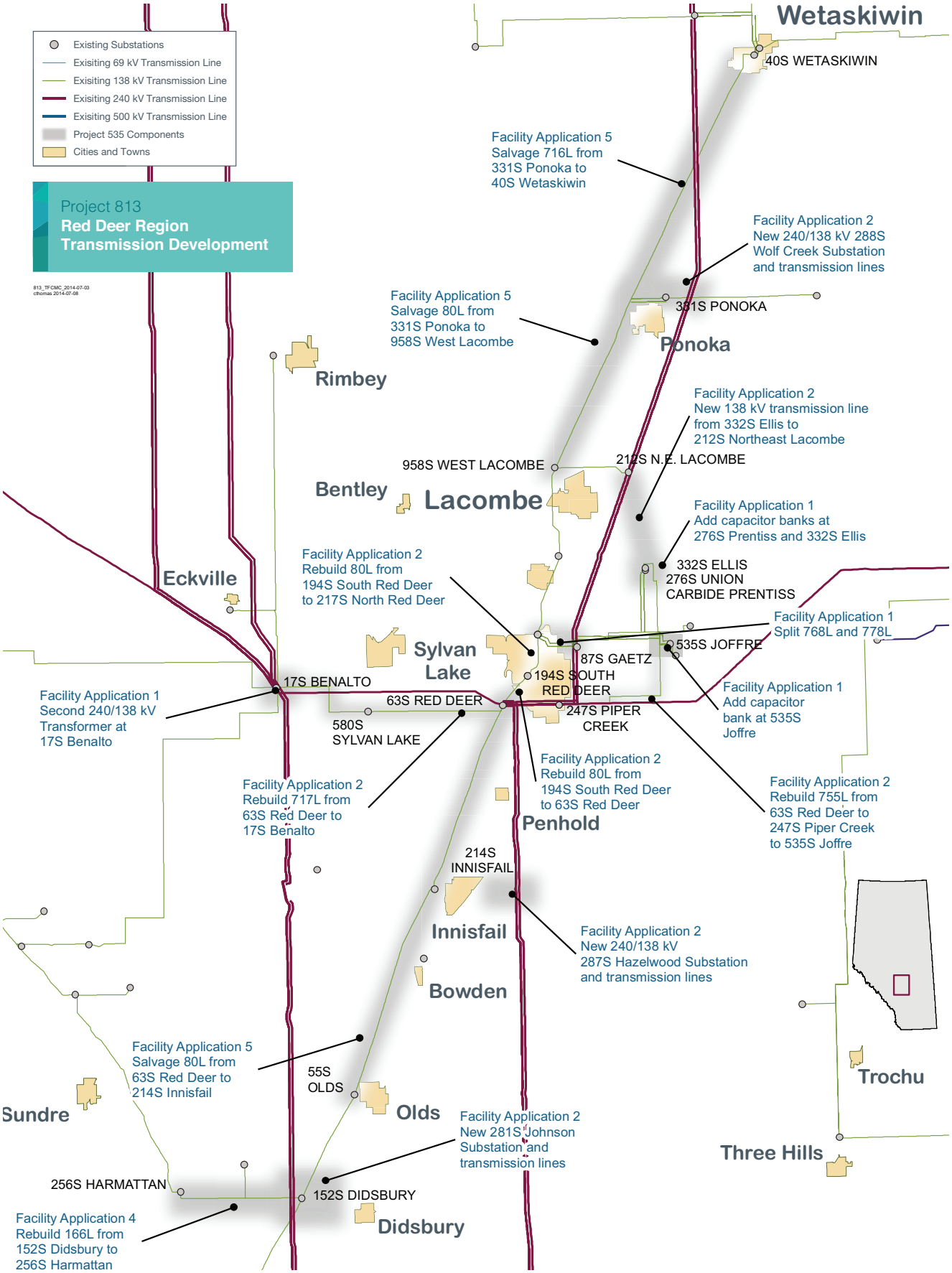
TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Red Deer Region Transmission Development	**$329 Million** (2013$)	**$361 Million** (ISD$ with escalation)

CURRENT STATUS: AltaLink filed FAs for Brownfields on September 26, 2011 and received approval on September 27, 2012. AltaLink filed FA Rebuilds and FA Greenfields in June 2013. A FA hearing was conducted in March 2014 for the FA Rebuilds and Greenfields. An AUC decision on all components is expected in late summer 2014.

Stage 2 development related to the rebuild of 166L will be advanced to 2015 to facilitate the connection of a generation facility in the Harmattan area. Following P&L approval of the FA Rebuilds and FA Greenfields, a NID amendment will be submitted to the AUC by the AESO in late summer 2014, along with AltaLink's filing their updated FA.

PROJECT RISKS

The FA hearing has pushed construction for these developments into late 2014. All ISDs have shifted. In addition many of the change proposals received are related to detailed engineering planning, which have identified additional scope and costs that were not included in the PPS.


Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 813
Red Deer Region
Transmission Development
Wetaskiwin
40S WETASKIWIN
Facility Application 5
Salvage 716L from
331S Ponoka to
40S Wetaskiwin
Facility Application 2
New 240/138 kV 288S
Wolf Creek Substation
and transmission lines
331S PONOKA
Facility Application 5
Salvage 80L from
331S Ponoka to
958S West Lacombe
Ponoka
Rimbey
Facility Application 2
New 138 kV transmission line
from 332S Ellis to
212S Northeast Lacombe
958S WEST LACOMBE
212S N.E. LACOMBE
Bentley
Lacombe
Facility Application 1
Add capacitor banks at
276S Prentiss and 332S Ellis
Facility Application 2
Rebuild 80L from
194S South Red Deer
to 217S North Red Deer
332S ELLIS
276S UNION
CARBIDE PRENTISS
Eckville
Facility Application 1
Split 768L and 778L
Sylvan
Lake
535S JOFFRE
87S GAETZ
17S BENALTO
194S SOUTH
RED DEER
Facility Application 1
Second 240/138 kV
Transformer at
17S Benalto
63S RED DEER
247S PIPER
CREEK
Facility Application 1
Add capacitor
bank at 535S
Joffre
580S
SYLVAN LAKE
Facility Application 2
Rebuild 80L from
194S South Red Deer
to 63S Red Deer
Facility Application 2
Rebuild 717L from
63S Red Deer to
17S Benalto
Facility Application 2
Rebuild 755L from
63S Red Deer to
247S Piper Creek
to 535S Joffre
Penhold
214S
INNISFAIL
Innisfail
Facility Application 2
New 240/138 kV
287S Hazelwood Substation
and transmission lines
Bowden
Facility Application 5
Salvage 80L from
63S Red Deer to
214S Innisfail
55S
OLDS
Trochu
Sundre
Olds
Facility Application 2
New 281S Johnson
Substation and
transmission lines
Three Hills
256S HARMATTAN
152S DIDSBURY
Facility Application 4
Rebuild 166L from
152S Didsbury to
256S Harmattan
Didsbury

14. SOUTH AND WEST OF EDMONTON TRANSMISSION DEVELOPMENT (SWEATR); PROJECT 850 – Transmission system reinforcement to the 138 kV system south and west of the City of Edmonton.

THE PROJECT: In preparation of the South and West Edmonton Plan, the AESO considered the specific needs and timing of existing and future transmission facilities in the South and West Edmonton area. There is insufficient transmission capacity in the South and West Edmonton area and transmission developments are required to provide the needed capacity to meet future load growth.

The South and West Edmonton Transmission Development will add two new 240/138 kV substations, one south of the town of Stony Plain and one close to the Nisku 149S substation; reconfigure the 138 kV network in the vicinity of the Cooking Lake 522S substation; rebuild portions of the 138 kV transmission lines, and modify existing substations in the area. These developments are expected to be in service by the first quarter of 2017.

THE COMPONENTS: The list for the South and West of Edmonton Transmission System Development is as follows: a new 240/138 kV Harry Smith substation; a new Saunders Lake substation; a new 138 kV line from 780L to Cooking Lake and reconfiguration; one 138 kV 27 MVAr capacitor bank at Leduc 325S; existing 138 kV lines reconfiguration.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
New Capacitor Bank at Leduc 325S	5	One 138 kV 27 MVAr capacitor bank at Leduc 325S	December 10, 2015
Re-terminate 914L at Saunders Lake and up-rate 910L, 914L and 723L	4	Operate 133L line from Wabamun 19S to 234L tap normally open (operating condition)	December 22, 2015
New 138 kV line from 780L to Cooking Lake and reconfiguration	3	Two new 138 kV circuits, 780L to Cooking Lake 522S, augmentation of Cooking Lake 522S Substation (upgrades existing bus, addition of circuit breakers with isolating switches)	March 10, 2016
New Saunders Lake Substation	2	New Saunders Lake 289S substation including two 240/138 kV 400 MVA transformers, modifications to Nisku 149S, Wetaskiwin 40S and Ellerslie 89S, four 240 kV lines, two 138 kV lines, and rebuild 780L and 858L between Nisku and Saunders Lake	December 22, 2016
New Harry Smith Substation	1	New 240/138kV Harry Smith 367S substation including two 240/138 kV 400 MVA transformers, modifications to Acheson 305S, Stony Plain 434S and Keephills 320P substations, and two new 240 kV lines and three new 138 kV lines	January 3, 2017

THE TRANSMISSION FACILITY OWNER(S): AltaLink.

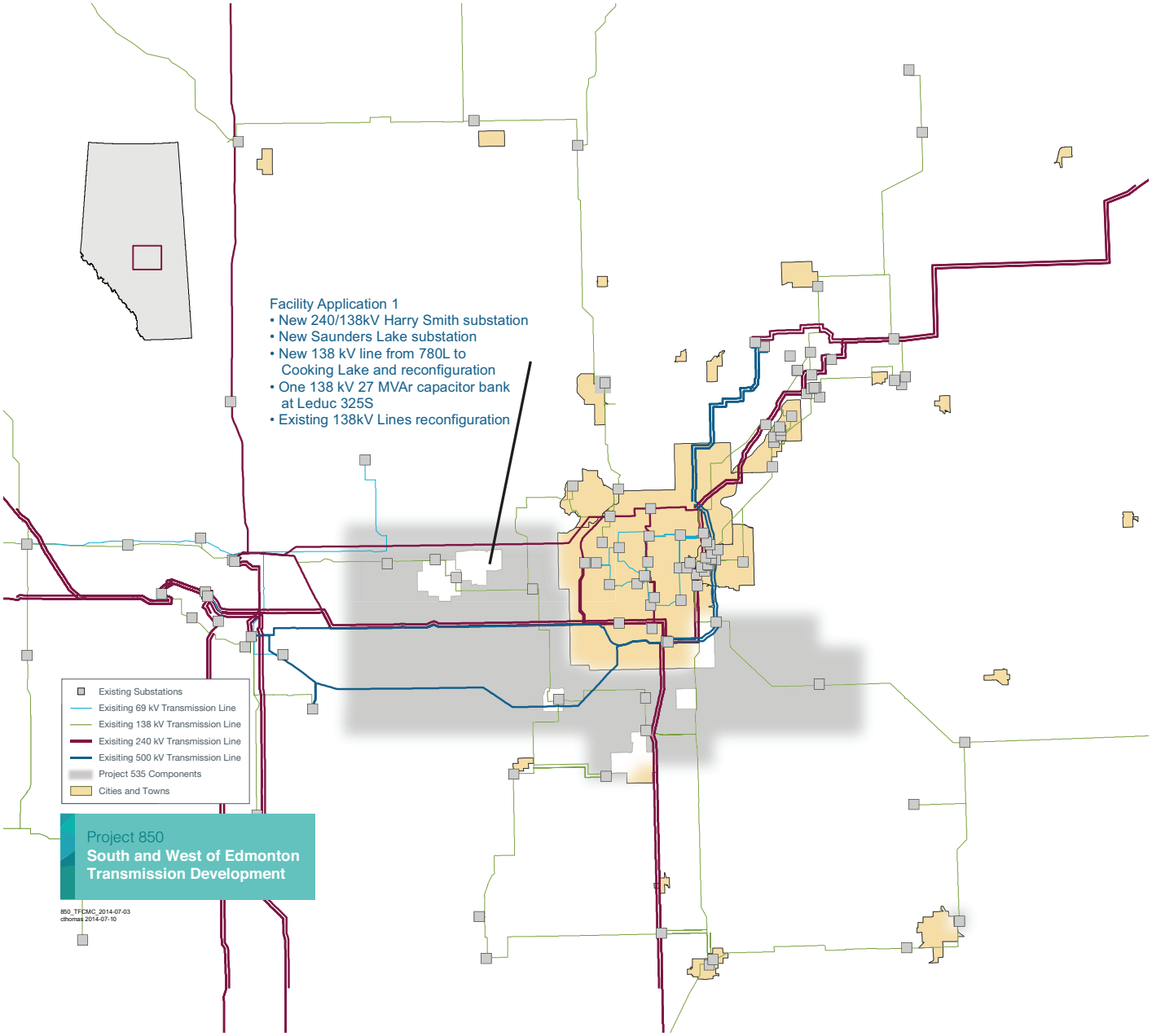
PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
South and West of Edmonton Transmission Development	**$194 Million** (2013$)	**$172 Million** (ISD$ with escalation)

CURRENT STATUS: The AESO filed the NID on December 14, 2012. The NID was approved on May 5, 2014. AltaLink is preparing the PPS and the FA.

PROJECT RISKS

The delay in completion of 1043L construction in the Edmonton Region 240 kV Line Upgrades (Project 786) will impact the Harry Smith 367S ISD planned for 2016. AltaLink is assessing the feasibility of changing the connection point to 1043L to a location outside the disputed landowner's property boundary.


Facility Application 1
• New 240/138kV Harry Smith substation
• New Saunders Lake substation
• New 138 kV line from 780L to Cooking Lake and reconfiguration
• One 138 kV 27 MVAr capacitor bank at Leduc 325S
• Existing 138kV Lines reconfiguration
Existing Substations
Exisiting 69 kV Transmission Line
Exisiting 138 kV Transmission Line
Exisiting 240 kV Transmission Line
Exisiting 500 kV Transmission Line
Project 535 Components
Cities and Towns
Project 850
South and West of Edmonton Transmission Development
850_TFCMC_2014-07-03
cthomas 2014-07-10

15. SOUTHERN ALBERTA TRANSMISSION REINFORCEMENT (SATR); PROJECT 787 – To accommodate wind generation in southern Alberta.

THE PROJECT: The existing capacity of the transmission system in southern Alberta is insufficient to provide adequate system access for the interconnection of additional wind-powered generation. Additional substations and upgrades to existing facilities are required. The AESO has outlined the need for a 240 kV AC looped system with three stages of implementation.

THE COMPONENTS[17]: The project includes three stages of development.

Stage 1: To reinforce the 240 kV system in the Fort MacLeod and the Brooks–Medicine Hat corridor.

Stage 2: To reinforce the 240 kV and 138 kV systems in the Glenwood, Lethbridge, Blackie and City of Medicine Hat areas, including a 240 kV system loop connection to the 500 kV Langdon–Cranbrook line.

Stage 3: Interconnect the Ware Junction–Langdon area via a 240 kV line.

FACILITY APPLICATION NAME	FACILITY APPLICATION NUMBER	FACILITY APPLICATION DESCRIPTION	FORECAST OR ACTUAL IN-SERVICE DATE
Milo Junction Switching Station	2	Build a switching station at Milo Junction	November 1, 2011
PST Addition at Russell 632S	3	Phase shifting transformer and new Russell substation	April 25, 2012
Ware Junction substation upgrade	13	933L line in/out at Ware Junction	October 4, 2013
Cassils to East Medicine Hat	4	240 kV lines from Cassils to new Bowmanton	November 27, 2013
East Medicine Hat to Whitla 240 kV Transmission Line	5	240 kV lines from Bowmanton to new Whitla	March 25, 2014
Medicine Hat Area 138 kV Line Development	6	138 kV system upgrades in the Medicine Hat area	May 22, 2015
911L Line Replacement	1	Build new 240 kV lines from Foothills substation to Windy Flats substation	September 22, 2015
Cypress Reactive Power Addition	12	Reactive power addition at Cypress substation	October 1, 2015
Blackie Area 138 kV upgrade	11	138 kV system upgrade in the Blackie area	April 30, 2016
Etzikom Coulee S/S and 240 kV Line to Picture Butte S/S	8	240 kV line from Etzikom Coulee to Picture Butte (formerly called MATL) substation	May 1, 2017
Castle Rock Ridge to Chapel Rock 240 kV line	7	240 kV Line from Goose Lake to new Chapel Rock 500 kV substation	July 29, 2017
240 kV Line from Etzikom Coulee to Goose Lake	9	240 kV line from new Journault substation to Goose Lake substation	March 31, 2018
Etzikom Coulee S/S to Whitla 240 kV Line	10	240 kV line from Journault to Whitla substation	January 1, 2020

THE TRANSMISSION FACILITY OWNER(S): AltaLink.

17 Revisions have been made to the information in this project's Components chart. As such, please use this information going forward.

PROJECT COST:

TRANSMISSION PROJECT	AESO LONG-TERM TRANSMISSION PLAN (FILED JANUARY 2014) ESTIMATED COST	CURRENT ESTIMATED COST
Southern Alberta Transmission Reinforcement	**$2.493 Billion** (2013$)	**$1.259 Billion** (ISD$ with escalation)[18]

CURRENT STATUS: All Stage 1 FAs are energized except for 911L Replacement, which is under construction with an ISD of September 2015.

With regards to Stage 2, one FA been energized, one other has received AUC approval and five new applications are currently being prepared by the TFO, AltaLink.

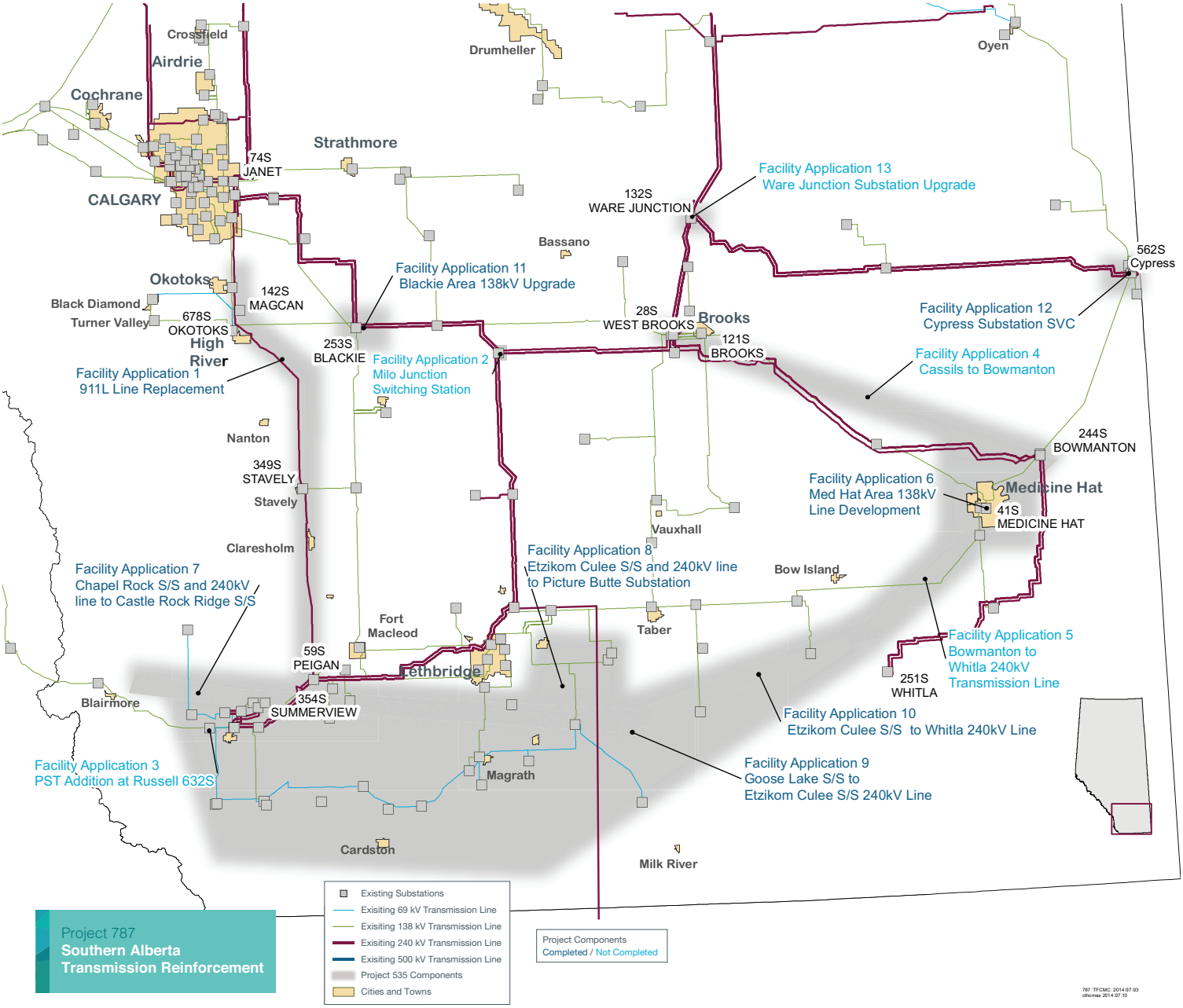
The AESO submitted a NID amendment to cancel the SATR Stage 3 on December 13, 2013. This NID amendment was approved on April 9, 2014.

PROJECT RISKS

Medicine Hat 138 kV Reconfiguration: The FA and NID amendments on this project are causing schedule delays, which pose a risk to the ISD.

240 kV Picture Butte to Journault and 240 kV Goose Lake to Journault: Project delays due to the need for additional engineering studies have caused a risk to the ISD. The AESO is waiting for AltaLink's line optimization report, which is expected by late August 2014.

18 For Facility Applications 7 to 12, the AESO has not yet received PPS estimates from the TFO. As such, these costs are not included in the PPS estimate total of $1.259 billion.



Project 787
Southern Alberta Transmission Reinforcement

Appendix C: Previously Monitored Projects

Since the TFCMC began its deliberations, the Committee has monitored a total of 18 different transmission projects. To date, five of the projects have been completed and for the purpose of TFCMC reporting are considered closed. Those undertakings, and their final costs, are below. Projects are listed alphabetically.

- **ENMAX NO. 65 SUBSTATION (ESCS);** PROJECT 922 – **NEW 240 KV SUBSTATION IN SOUTH CALGARY AND 138 KV DEVELOPMENT DUE TO OVERLOADING IN SOUTH CALGARY.**

  Final Project Cost: $45 million | AESO 2012 LTP Estimated Cost: $37 million | Removed from monitoring: TFCMC June 2014 Report

- **NORTH FORT MCMURRAY TRANSMISSION DEVELOPMENT (NFMD);** PROJECT 791 – **TRANSMISSION DEVELOPMENT TO RELIEVE CONSTRAINTS AND TO SERVE FORECAST DEMAND NORTH OF FORT MCMURRAY.**

  Final Project Cost: $352.3 million | AESO 2012 LTP Estimated Cost: $197 million | Removed from monitoring: TFCMC June 2014 Report

- **NORTHWEST TRANSMISSION DEVELOPMENT (NWTD);** PROJECT 535 – **TRANSMISSION EXPANSION AND ENHANCEMENT IN NORTHWEST ALBERTA.**

  Final Project Cost: $583 million | AESO 2012 LTP Estimated Cost: Not Estimated[19] | Removed from monitoring: TFCMC December 2013 Report

- **SOUTHERN ALBERTA TRANSMISSION DEVELOPMENT (SATD);** PROJECT 416 – **TRANSMISSION DEVELOPMENT IN GOOSE LAKE-PEIGAN AND NORTH LETHBRIDGE REGION.**

  Final Project Cost: $238 million | AESO 2011 LTP Estimated Cost: $91 million | Removed from monitoring: TFCMC June 2013 Report

- **YELLOWHEAD AREA TRANSMISSION DEVELOPMENT (YATD);** PROJECT 671 – **TO SERVE INCREASED ELECTRICITY DEMAND, REPLACE AGING INFRASTRUCTURE AND IMPROVE RELIABILITY IN THE DRAYTON VALLEY, HINTON, EDSON AND ALBERTA BEACH AREAS.**

  Final Project Cost: $141 million[20] | AESO 2012 LTP Estimated Cost: $123 million | Removed from monitoring: TFCMC December 2013 Report

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19 In the June 2011 TFCMC Report it was reported that the need for this project was recognized in March 2006 and the need approval was granted in August 2006 with the total project scope envisioned at $262 million. However, due to project scope changes, the value increased to $463 million. In the December 2011 TFCMC Report, the PPS estimated cost was $508 million (ISD$ with escalation but that did not include project 603, the Arcenciel synchronous condenser).

20 The estimated final cost of this project was $148 million, as noted in the December 2013 TFCMC Report – at that time, final costs were not available. The actual final cost came in at $140,652,893.

Appendix D: TFCMC Working Documents

The TFCMC receives reports and cost summary updates, on a monthly basis, in order to better understand the costs and changes associated with the transmission projects it monitors. In this part of the report, samples of the cost summary updates are included to provide readers with a better insight as to the type of material the TFCMC studies.

The cost summaries on the following pages are just a portion of the individual documents, which also include detailed information on authorized cost changes and cost estimate changes from the Needs Identification Document (NID) phase to the Proposal to Provide Service (PPS) stage.

As the documents on the following pages are an example, or working documents, of just some of the material the TFCMC reviews, there could be cost discrepancies between Appendices B and D on a particular project. Please refer to Appendix B for the most recent and accurate estimated cost figures.

Project Cost Reporting for TFCMC, Project 629: Alberta Industrial Heartland Bulk Transmission Development (HBTD); April 2014 Meeting

Project: 629 Cost Summary for [Alberta Industrial Heartland Bulk Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
629	Alberta Industrial Heartland Bulk Transmission Development	CTI	2009-12-09	0.00M	580.69M	78.77M	659.46M

Project 629 Details by FA

Group	FA_...	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
629, 1,2	2	Heartland 12S Ellerslie 89S and 1054L/1061L (Formerly P1066)	2010-09-27	2011-11-01	2014-07-31			
	1	500kV 1206L/1212L (Formerly P629)	2010-09-27	2011-11-01	2014-07-31	580,689,359	78,773,175	659,462,534

Comments

The difference between the TFO February monthly report and the TFCMC report is the recently rejected CP10:
- CP10-Cost increases due to 500kV line recontracting, helicopter incidence, wet weather & landowner conflict; ~$56.7M.

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Project Cost Reporting for TFCMC, Project 719: ENMAX Shepard Energy Centre (ECTP); April 2014 Meeting

Project: 719 Cost Summary for [ENMAX Shepard Energy Centre] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
719	ENMAX Shepard Energy Centre	2011-05-10	2012-11-01	132.61M	136.32M	16.94M	153.26M

Project 719 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
719, 1	1	FA1 - AltaLink Facilities	2011-06-27	2012-11-08		70,771,000	7,634,309	78,405,309
719, 2	2	FA2 - Enmax Facilities	2011-06-10	2012-11-08		65,551,448	9,305,754	74,857,202

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Project Cost Reporting for TFCMC, Project 737: North South Transmission Reinforcement (HVDC); April 2014 Meeting

Project: 737 Cost Summary for [North South Transmission Reinforcement] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
737	North South Transmission Reinforcement	CTI	2009-12-09	0.00M	3,058.41M	471.91M	3,530.32M

Project 737 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
737, 1	1	Facility Application 1 - ATCO East DC Facilities (Currently known to TFO as P961)	2011-03-29	2012-11-15	2014-12-15	1,598,755,000	203,690,619	1,802,445,619
737, 2	2	Facility Application 2 - AltaLink West DC Facilities (Currently known to TFO as P962)	2011-03-01	2012-12-06	2015-06-19	1,420,185,653	248,655,366	1,668,841,019
737, 3	3	Facility Application 3 - AltaLink East DC Facilities (Currently known to TFO as P961)	2011-05-01	2012-11-15	2014-12-15	39,351,473	19,677,282	59,028,755
737, 4	4	Facility Application 4 - EPCOR East DC Facilities (Currently known to TFO as P961)	2011-03-30	2012-11-15		119,921	-113,757	6,164

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Comments

1) Project Schedule:
a) EATL - forecasted in-service date (ISD) is December 2014; construction is underway.
b) WATL - forecasted ISD is April 22, 2015; construction is underway.
2) Project Costs:
a) EATL project: ATCO's forecast is $1,802M.
b) EATL proje

change_type

Project Cost Reporting for TFCMC, Project 786: Edmonton Region 240 kV Line Upgrades (ERLU); April 2014 Meeting

Project: 786 Cost Summary for [Edmonton Region 240kV Line Upgrades] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
786	Edmonton Region 240kV Line Upgrades	2008-08-26	2009-02-24	125.41M	155.03M	23.31M	178.34M

Project 786 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
786, 1,2,4,5	5	AML 908L, 909L Restring (Formerly P1058)	2009-09-13	2010-02-10	2011-03-20			
	4	AML 902L Restring & 909L Retermination (Formerly P1057)	2011-08-05	2012-10-31	2015-01-30			
	2	AML Rebuild 240kV 904L (1043L)	2010-07-28	2011-08-12	2015-01-30			
	1	AML Keephills Substation Addition (Formerly P953)	2009-11-06	2010-03-19	2010-07-31	101,345,374	12,660,253	114,005,627
786, 3	3	EPCOR 1044EL, 1045EL (Formerly P955)	2010-10-15	2011-08-12	2012-02-29	7,968,955	0	7,968,955
786, 6	6	Epoch Jasper, Petrolia (Formerly P955)	2010-04-15	2010-06-16	2011-06-14	4,548,195	2,650,550	7,198,745
786, 7	7	ATCO Phase Shifter (Formerly P957)	2009-09-14	2010-03-25	2013-08-20	31,515,000	7,999,971	39,514,971
786, 8	8	TransAlta 902L, 1043L (Formerly P959)	2011-08-05	2012-10-31	2015-01-30	9,653,299	0	9,653,299

Comments

FA 2, 4 and 8 are all associated with 1043L. The work on 1043L is delayed because of land access negotiations. EPCOR change request for $52.5 thousand based on delay of 1043L.

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Project Cost Reporting for TFCMC, Project 787: Southern Alberta Transmission Reinforcement (SATR); April 2014 Meeting

Project: 787 Cost Summary for [Southern Alberta Transmission Reinforcement] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
787	Southern Alberta Transmission Reinforcement	2008-12-30	2009-09-17	3,442.90M	1,374.16M	(122.74M)	1,251.42M

Project 787 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
787,	9	Goose Lake S/S to Etzikom Coulee S/S 240kV Line (Formerly P1036)	2014-05-30	2015-08-31	2018-03-31			
	8	Etzikom Coulee S/S and 240kV line to Picture Butte S/S (Formerly P1035)	2014-07-15	2015-07-15	2017-05-01			
	7	Castle Rock Ridge to Chapel Rock 240 kV Line (Formerly P1034)	2014-09-30	2015-10-31	2017-07-29			
	12	Reactive Power Addition to Cypress 562S (Formerly P1039)	2014-09-08	2015-01-30	2015-10-01			
	11	Blackie Area 138kV Upgrade (Formerly P1038)	2014-05-23	2014-12-16	2015-12-30			
	10	Etzikom Coulee S/S to Whitla 240kV Line (Formerly P1037)	2014-07-14	2015-07-14	2017-05-01			
787, 1	1	911L Line Replacement (Formerly P882)	2012-09-25	2013-11-11	2015-09-22	440,171,000	-29,580,802	410,590,198
787, 2	2	Milo Junction Switching Station (Formerly P883)	2009-12-21	2010-08-05	2011-11-01	29,700,000	472,331	30,172,331
787, 3	3	PST Addition at Russell 632S (Formerly P884)	2010-08-27	2011-01-12	2012-04-25	17,207,000	-80,600	17,126,400
787, 4	4	Cassils to Bowmanton (Formerly P886)	2010-07-27	2011-06-08	2013-11-27	407,909,000	-48,026,198	359,882,802
787, 5	5	Bowmanton to Whitla 240kV Transmission Line (Formerly P887)	2010-07-27	2011-06-08	2014-03-25	352,754,000	-41,769,162	310,984,838
787, 6	6	Med Hat Area 138kV Line Development (Formerly P888)	2012-12-03	2013-10-18	2015-05-22	120,287,000	-4,226,014	116,060,986
787, 13	13	Ware Junction Substation Upgrade (Formerly P1040)	2011-04-05	2012-02-06	2013-10-04	6,134,000	473,000	6,607,000

Comments

787-Energization 11 : Updated Facility Application dates from AltaLink
787-Energization 12 : Updated Facility Application dates from AltaLink

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Project Cost Reporting for TFCMC, Project 811: Central East Area Transmission Development (CETD); April 2014 Meeting

Project: 811 Cost Summary for [Central East Area Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
811	Central East Area Transmission Development	2010-05-17	2011-02-10	431.00M	277.59M	100.24M	377.83M

Project 811 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
811,	40	FA 40 - Cold Lake Reinforcement (2017) - 240kV	2015-10-20	2016-05-03	2017-12-04			
	13	FA 13 - New 408L line from Jarrow to Wainwright (AltaLink)	2014-12-10	2015-08-19	2016-05-25			
811, 1,2	2	FA 2 - Bonnyville 700S and 7L146	2012-04-27	2013-07-02	2014-12-01			
	1	FA 1 - Cold Lake Area 144 kV Reinforcements	2012-03-07	2012-12-11	2014-01-30	141,083,000	54,832,643	195,915,643
811, 3,4,5	5	FA 5 - St. Paul Area Upgrades - Whitby Lake 819S 144kV CB Addition	2011-12-23	2012-04-20	2014-06-30			
	4	FA 4 - St. Paul Area Upgrades - St. Paul 707S and 7L139/7L70 in/out	2012-07-12	2013-12-20	2015-01-31			
	3	FA 3 - St. Paul Area Upgrades - Watt Lake 956S	2011-12-23	2013-03-27	2013-12-12	50,847,000	27,798,068	78,645,068
811, 6	6	FA 6 - Vermillion 710S Substation Upgrade	2011-10-24	2012-05-16	2013-09-15	6,697,000	2,923,014	9,620,014
811, 7,8	8	FA 8 - Kitscoty Area Upgrades	2012-06-13	2013-01-02	2014-12-15			
	7	FA 7 - Heisler Area Upgrades	2011-12-23	2012-02-27	2013-07-27	31,478,000	14,689,015	46,167,015
811, 10,11,12	12	FA 12 - 7L53/7L117 Line Clearance Mitigation	2012-09-11	2012-10-01	2015-02-28			
	11	FA 11 - 7L14 Line Clearance Mitigation	2013-12-31	2014-04-30	2015-03-31			
	10	FA 10 - 7L701 Line Clearance Mitigation	2011-10-24	2012-02-27	2012-07-18	13,283,000	0	13,283,000
811, 99	99	FA 99 - 7L749 Replacement (Cancelled pending AUC amendment)	Null	Null		34,201,000	0	34,201,000

Comments

FA#4 - St Paul Developments AUC P&L Decision December 20, 2013. ATCO issued change request CR-022 requesting new ISD Jan 31, 2015. CR-022 Approved by AESO.
FA#12 Line Clearance Mitigation 7L53 - TFO negotiating with stakeholder. Construction on hold.
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Project Cost Reporting for TFCMC, Project 812: Hanna Region Transmission Development (HATD); April 2014 Meeting

Project: 812 Cost Summary for [Hanna Region Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
812	Hanna Region Transmission Development	2009-08-14	2010-04-29	983.00M	940.89M	28.43M	969.32M

Project 812 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
812, 1	1	Youngstown 772S Capacitor bank addition (Formerly..	2010-08-09	2010-11-15	2011-10-06	6,289,000	-357,491	5,931,509
812, 2	2	Battle River 757S Capacitor Bank addition (Formerly..	2010-08-09	2010-08-27	2011-10-03	3,002,000	-170,645	2,831,355
812, 3	3	New Lanfine 240/144kV substation (Formerly P979)	2010-12-21	2012-05-08	2013-05-20	38,745,000	-2,202,414	36,542,586
812, 4	4	Lanfine 959S 200MVAr SVC (Formerly P980)	2011-03-04	2012-05-08	2014-05-30	39,360,000	-2,237,373	37,122,627
812, 5	5	Lanfine-Oyen 144kV S/C Line 7L132 (Formerly P982)	2011-03-21	2012-05-08	2013-07-15	15,623,000	-888,071	14,734,929
812, 6	6	Relocate 7L98 Oyen 767S - Lanfine 959S (Formerly ..	2011-03-21	2011-12-22	2013-06-01	12,770,000	-725,896	12,044,104
812, 7	7	Oakland 946S 240kV S/S combined with Anderson-..	2010-11-25	2012-05-08	2013-03-25	45,467,000	-1,717,758	43,749,242
812, 8	8	Oakland-Lanfine 240kV S/C Line 9L924 (Formerly P..	2010-12-21	2012-05-08	2013-05-21	119,927,000	-3,047,041	116,879,959
812, 9	9	Coyote Lake 963S 240kV S/S combined with Oaklan..	2011-02-07	2012-05-08	2013-05-17	77,799,000	-4,422,394	73,376,606
812, 10	10	Coyote Lake 963S - Michichi Creek 802S 144kV SC ..	2011-04-08	2012-05-08	2013-07-12	39,251,000	-2,231,177	37,019,823
812, 11	11	Pemukan 932S 240 kV Substation (Formerly P1001)	2011-01-24	2012-05-08	2013-06-01	32,490,000	-1,846,856	30,643,144
812, 12	12	New Lanfine-Pemukan 240kV S/C Line 9L46 (Forme..	2011-03-03	2012-05-08	2013-06-01	97,239,000	-5,147,438	92,091,562
812, 13,18	18	Rowley 768S - Michichi-Three Hills 144kV DC Line 7..	2010-11-15	2011-05-17	2012-06-01			
	13	Facility Application 13 - 144kV Capacitor Bank and C..	2010-10-08	2010-12-23	2011-12-13	27,037,000	-1,536,887	25,500,113
812, 14	14	Hansman Lake - Pemukan 240kV S/C Line 9L966 (F..	2011-01-24	2012-05-08	2013-08-21	67,685,000	-339,475	67,345,525
812, 15	15	Pemukan 932S - Monitor 774S 144kV S/C Line 7L12..	2011-01-24	2012-05-08	2013-06-15	14,311,000	-813,492	13,497,508
812, 16	16	Relocate 7L79 line from Monitor 774S - Pemukan 93..	2011-01-24	2012-05-08	2013-06-12	10,259,000	-583,161	9,675,839
812, 17	17	Heatburg 948S - Three Hills-Nevis 144kV D/C Line 7..	2012-02-13	2012-06-13	2013-01-25	14,843,000	-843,733	13,999,267
812, 19	19	Stettler 769S - Nevis 768S 144kV S/C Line 7L143 (F..	2011-06-03	2011-12-20	2013-04-21	41,285,000	-2,346,798	38,938,202
812, 20,21	21	Hardisty 377S Substation Capacitor Bank (Formerly ..	2010-11-29	2011-05-03	2012-06-28			
	20	Nilrem 574S combined with D/C 240kV 953L -1047L ..	2010-11-12	2011-11-10	2013-08-30	76,496,000	12,843,737	89,339,737
812, 22,23	23	New 240 kV line 966L from Pemukan 932S -Hansma..	2010-12-06	2012-05-08	2013-08-21			
	22	Hansman Lake 650S Substation Static VAR Compe..	2010-11-29	2011-04-27	2012-10-05	82,356,000	16,532,121	98,888,121
812, 24	24	New 240kV line 1053L from Ware Junction 132S-Ca..	2011-04-05	2012-02-06	2013-11-29	78,657,000	30,515,246	109,172,246

Comments

- Only 1 more energization for the Hanna region left to complete: Energization 4 - Lanfine 959S 200MVAr SVC-CP received for energization on May 30, 2014.

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Project Cost Reporting for TFCMC, Project 813: Red Deer Region Transmission Development (RDTD); April 2014 Meeting

Project: 813 Cost Summary for [Red Deer Area Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
813	Red Deer Area Transmission Development	2011-07-20	2012-04-10	222.80M	337.50M	19.08M	356.59M

Project 813 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
813,	6	RDATD Stage II 2017 Facilities	2016-10-27	2017-05-11	2017-11-09			
	5	RDATD Facility Application 5 - Salvage	2013-12-16	2015-01-12	2015-07-13			
	4	RDATD Facility Application 4 - 166L Rebuild	2014-05-28	2014-08-28	2015-06-26			
813, 1	1	RDATD Facility Application 1 - Brownfields	2011-09-26	2012-09-27	2013-11-28	20,720,000	10,957,330	31,677,330
813, 2	2	RDATD Facility Application 2 - Rebuilds & Greenfields	2013-06-18	2014-06-27	2015-09-21	316,784,000	8,124,990	324,908,990

Comments

- FA#2 was combined as one submission to the AUC for Line Rebuilds and Greenfields. For future TFO reports, the current FA#2 and FA#3 costs will be combined into one FA#2. New FA#3 will be Salvage costs.
- FA#4 filing of FA has been delayed by AESO - expe

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Project Cost Reporting for TFCMC, Project 850: South and West of Edmonton Transmission Development (SWEATR); April 2014 Meeting

Project: 850 Cost Summary for [South and West of Edmonton Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
850	South and West of Edmonton Transmission Development	2012-12-14	2014-06-05	172.17M	0.00M	0.00M	0.00M

Project 850 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
850,	5	Facility Application 5 - New Capacitor Bank at Leduc 325S	2014-10-30	2015-04-16	2015-12-10			
	4	Facility Application 4 - Re-terminate 914L at Saunders Lake & Up-rate 910L, 914L & 723L	2014-07-22	2015-04-28	2015-12-22			
	3	Facility Application 3 - New 138kV Line from 780L to Cooking Lake and Reconfiguration	2014-07-17	2015-04-23	2016-03-10			
	2	Facility Application 2 - New Saunders Lake 240/138kV Substation Development	2014-07-24	2015-04-30	2016-12-22			
	1	Facility Application 1 - Harry Smith Sub	2014-07-04	2015-04-10	2016-12-02			

Comments

The AESO filed NID Application 1609123 with the AUC on December 14, 2012. The NID is being reviewed by the AUC with expected approval by June 2014. AUC NID hearing completed on March 3, 2014; awaiting AUC NID approval.

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Project Cost Reporting for TFCMC, Project 1101: Christina Lake Area Development (CHL); April 2014 Meeting

Project: 1101 Cost Summary for [Christina Lake Area Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
1101	Christina Lake Area Development	2011-10-20	2012-04-24	406.61M	418.89M	32.45M	451.34M

Project 1101 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
1101, 1	1	Facility Application 1 - CHL1 Black Spruce 154S	2012-07-23	2012-12-24	2013-07-10	19,959,000	11,771,000	31,730,000
1101, 2	2	Facility Application 2 - Black Spruce 154S to Pike 170S	2013-01-18	2013-06-28	2014-07-01	116,147,209	6,151,075	122,298,284
1101, 3	3	Facility Application 3 - Pike 170S to Ipiatik Lake 167S	2013-03-28	2013-11-01	2015-06-30	256,736,261	14,525,220	271,261,481
1101, 4	4	Facility Application 4 - ATCO Heart Lake 898S	2013-10-10	2014-01-06	2015-06-30	26,045,923	0	26,045,923

Comments

All projects have P&L.

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Project Cost Reporting for TFCMC, Project 1117: Foothills Area Transmission Development – East Calgary Development (FATD); April 2014 Meeting

Project: 1117 Cost Summary for [FATD - East Calgary Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
1117	FATD - East Calgary Development	2012-07-05	2013-10-07	0.00M	443.45M	(26.15M)	417.31M

Project 1117 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
1117, 1	1	Facility Application 1 - North Foothills Transmission Project - AltaLink Facilities	2012-07-13	2013-10-07	2015-05-25	247,937,000	-15,988,221	231,948,779
1117, 2	2	Facility Application 2 - Enmax SS-65 and SS-25 Additions - Enmax Facilities	2012-07-13	2013-10-07	2015-05-25	4,293,228	0	4,293,228
1117, 3	3	Facility Application 3 - Langdon to Janet - AltaLink Facilities	2012-07-16	2013-10-07	2014-09-15	81,976,000	-5,427,169	76,548,831
1117, 4	4	Facility Application 4 - Janet to Langdon - Enmax Facilities (By AltaLink)	2012-07-13	2013-10-07	2015-05-25	22,661,000	0	22,661,000
1117, 5	5	Facility Application 5 - Foothills 138kV - AltaLink Facilities	2012-07-16	2013-10-07	2015-10-01	86,587,000	-4,732,395	81,854,605

Comments

Construction in progress.
Change proposal for Janet substation modifications ($5.9 million) and Janet additions ($4.7 million) under AESO review.

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Project Cost Reporting for TFCMC, Project 1180: Northwest (of) Fort McMurray Transmission Development (NW FMM); April 2014 Meeting

Project: 1180 Cost Summary for [NW Ft McMurray Transmission Development] Refreshed @ 4/11/2014 2:23:10 PM

Project_N	NID name	NID Filing Date	NID Approval Date	NID Estimated Cost	PPS Estimated Cost	Authorized Cost Change	Authorized Budget'
1180	NW Ft McMurray Transmission Development	2011-11-10	2012-06-19	366.29M	35.60M	0.00M	35.60M

Project 1180 Details by FA

Group	FA_..	FA name	Facility Application Filing Date	Facility Application Approval Date	Overall Facility ISD	PPS Estimated Cost	Authorized Cost Changes	Authorized Budget
1180,	3	Facility Application 3 - 9L95	2015-03-10	2015-08-25	2016-12-01			
	2	Facility Application 2 - Ells River/9L08/9L76	2014-08-29	2015-02-12	2016-04-01			
1180, 1	1	Facility Application 1 - Birchwood Creek	2013-10-31	2014-01-08	2014-12-01	35,600,042	0	35,600,042

Comments

Project will proceed as 3 subprojects. Birchwood Creek, Ells River/9L08 and 9L95.
Birchwood Creek P"L received Jan 8/2014. ATCO preparing new PPS for Ells River and 9L95

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Appendix E: Transmission Facility Owners Responses

Under the TFCMC's mandate, the Committee shall allow Transmission Facility Owners (TFOs) to review and provide written comments on any report produced that references a TFO or a project a TFO is developing. The following responses were received in regards to the June 2014 Report.

ALTALINK | 2611– 3rd Avenue SE, Calgary, Alberta T2A 7W7 | www.altalink.ca

September 19, 2014

Henry Yip
Transmission Cost Monitoring Committee
Email:hcyip@telus.net

Subject: 7th Semi Annual Transmission Cost Monitoring Committee Report

Henry,

Thank you for the opportunity to review the TFCMC's seventh semi-annual Transmission Cost Monitoring Committee Report. AltaLink continues to be supportive of reviewing project progress with the TFCMC in order to provide customer associations more visibility to project costs.

Given that the report covers the period November 1, 2013 to April 30, 2014, we would like to note some important developments which have occurred on a few projects since this timeframe:

- Heartland (Project 629)
  - the Heartland project was energized at 500 kV in July 2014
- Red Deer (Project 813)
  - The AUC approval of all components except 423L was received in July 2014. The alternate route was approved for the Hazelwood component. 423L was adjourned by the AUC and will be filed in a separate facility application in the fall of 2014.
- Southern Alberta Transmission Reinforcement (Project 787)
  - The AESO has advised the construction trigger for the Etzikom Coulee to Whitla have not been met and as such AltaLink is not pursing any activity on this project.
- North South Transmission Reinforcement (Project 737)
  - The delay in the EATL project to 2015 will also impact the outage planning and the ISD for the Red Deer Project (Project 813)

Thanks you again for the opportunity to comment on the report.

Regards,

Johanne Picard-Thompson
SVP Projects, AltaLink

.cc Jerry Mossing, VP AESO

Transmission Facility Owners Responses

2000 – 10423 101 St NW, Edmonton, AB
T5H 0E8 Canada
epcor.com

September 19, 2014

Henry Yip, Chair
Transmission Facilities Cost Monitoring Committee
Email: hcyip@telus.net

Dear Mr. Yip:

RE: TFCMC June 2014 Report

EDTI appreciates the opportunity to comment on the June 2014 Report from the Transmission Facilities Cost Monitoring Committee ("TFCMC" or the "Committee"). EDTI remains supportive of the Committee and its efforts to understand Alberta transmission infrastructure projects and the various factors that can impact the cost, scope and schedule of these projects.

EDTI has reviewed the report with specific attention to Section 3 – Results to Date: Status of Previous TFCMC Recommendations, and in particular the subsection describing updates of the Rule 9.1 Working Group. EDTI is a member of the Rule 9.1 Working Group and wishes to elaborate on some of the Working Group discussions included as part of this Report.

The subsection titled "AESO Transmission Cost Accountability Recommendation: Rule 9.1.2 Update" states that there was disagreement between the AESO and TFOs in which Association for the Advancement of Cost Engineering ("AACE") Recommended Practice to adopt. The AACE Recommended Practice No. 56R-08, cited in the report as having been proposed by the AESO, is an addendum to the generic AACE Recommended Practice 17R-97. Recommended Practice 17R-97 was the primary cost estimating Recommended Practice that was discussed by the Working Group in 2012 and 2013 prior to being placed on hold while the Department of Energy consulted with industry to enact amendments to the *Transmission Regulation*. Addendum 56R-08 states that it is intended for projects that are "repetitive and repeatable", as well as for building (vertical) construction. It states that it is not intended for horizontal infrastructure, which would include transmission lines. For those reasons many Working Group members did not support the adoption of addendum 56R-08.

For clarity, with respect to the accuracy range of cost estimates, EDTI notes that the degree of accuracy depends on the information available at the time the estimate is completed, and in particular the level of project definition in each case. For repetitive and repeatable vertical construction projects with known soil conditions, estimates will have a narrower accuracy range than unique transmission line or underground cable (horizontal) projects with unknown soil conditions.

EDTI shares the TFCMC's concern that the Industrial Power Consumers Association of Alberta ("IPCAA") was the only ratepayer group in attendance on the June 26th Rule 9.1 Working Group meeting. The Alberta Direct Connect Consumers Association ("ADC") is also a member of the Working Group but did not attend the June 26 meeting. In August 2012, the AESO invited stakeholders interested in participating in the Working Group to become members in the Working Group, with limited response. EDTI believes that Industry Working Groups can be most effective only with the full participation of TFOs, the AESO and

Transmission Facility Owners Responses

stakeholder groups, and remains hopeful that stakeholder groups will participate more fully as the Rule 9.1 Working Group continues its work.

If you have any questions about EDTI's comments, please do not hesitate to contact me at 780.441.7111.

Regards,

Jay Baraniecki
Director, EDTI Regulatory Affairs

Transmission Facility Owners Responses

ATCO Electric

September 24, 2014

Henry Yip
Chair
Transmission Facilities Cost Monitoring Committee
1701 TD Tower
10088 – 102 Avenue
Edmonton, AB T5J 2Z1

Dear Sir:

Subject: Review of the Cost Status of Major Transmission Projects in Alberta – June 2014 Report

Thank you for the opportunity to review and comment on the Transmission Facilities Cost Monitoring Committee's (TFCMC) seventh report dated June 2014.

ATCO Electric (ATCO) remains committed to cooperating with all interested parties and working on a collaborative basis to help the TFCMC achieve its mandated objectives. ATCO is, however, concerned with some of the comments contained in the following sections of the report:

- **Section 3: Results to Date: Status of Previous TFCMC Recommendations: AESO Transmission Cost Accountability Recommendation: Rule 9.1.2 Update (p.14-15)**

  "The AESO's plan is to ensure consistency by adopting an industry standard, the Association for the Advancement of Cost Engineering (AACE) Recommended Practice No. 56R-08, which is designed for the building and general construction industries. The AESO governance committee has already approved the adoption of AACE standards.
  …
  For example, for system projects, the Order of Magnitude (OOM) estimate currently has an accuracy range of +/-50. Under the proposed AACE Recommended Practice No. 56R-08, this would change to a Class 5 estimate with an accuracy range of +50/-30%. The TFOs instead proposed using the generic AACE Practice No. 17R-97 with an accuracy range of +120/-60%."

Further to the TFCMC's comments above, ATCO Electric wishes to clarify that AACE Practice No. 17R-97 (as recommended by the TFOs) is the core practice, whereas AACE Practice No. 56R-08 (as proposed by the AESO) is merely an addendum to that practice. While Practice No. 56R-08 (the addendum) is indeed "designed for the building and general construction industries", it is important to note that the addendum also specifically states that it "does not address cost estimate classification in . . . transportation (horizontal) infrastructure"[1] , and therefore ATCO Electric does not consider the addendum to be an appropriate basis for transmission line projects.

[1] AACE International Recommended Practice No. 56R-08 (Rev. December 5, 2012), p. 2

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Transmission Facility Owners Responses

ATCO Electric

- **Section 3: Results to Date: Status of Previous TFCMC Recommendations: AESO Transmission Cost Accountability Recommendation: TFCMC Input to the 9.1.5 Working Group (p.15-16)**

> *"Todd Mohr of FTI Consulting provided the TFCMC with some recommended improvements to ISO Rule 9.1.5. Following this input, combined with feedback from TFCMC members, Mr. Mohr also provided his recommended improvements to the AESO in a stakeholder session. Individual TFCMC members are free to provide input to the AESO on Rule 9.1.5 and refer to the FTI recommendations if, and where, appropriate."*

ATCO Electric notes that at the stakeholder session where Mr. Mohr of FTI Consulting presented his recommendations, not all parties agreed that the proposed amendments are "improvements". Instead, the proposed amendments raise issues that are yet to be resolved, such as blurred jurisdictional roles between the AESO and the AUC.

In addition, there were concerns raised during Mr. Mohr's presentation that he was not able to fully address in his recommendations, such as proposed rules that would limit bulk tendering. These proposed rules would reduce the number of vendors interested in bidding, resulting in potential lost opportunities for bulk pricing.

ATCO Electric supports and intends to actively participate in further stakeholder consultations with respect to any amendments to Rule 9.1.5, including the consultation process for the AESO's upcoming policy recommendation paper.

- **Section 3: Results to Date: Status of Previous TFCMC Recommendations: Rule 9.1 Working Group**

ATCO Electric has observed that there has been limited involvement from intervener groups over the course of the Rule 9.1 Working Group. In order to maximize the value of the Group's work, comments or concerns from intervener groups should be raised and addressed during the Working Group meetings and not brought forward after recommendations have been made and implemented.

Please contact me directly at 780-420-7434 if you have any questions or require any clarification to the comments included herein.

Yours sincerely,
ATCO Electric

Dennis A. DeChamplain, C.A.
Senior Vice President, Finance and Regulatory

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JUNE 2014 REPORT

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ISBN 978-1-4601-2222-8