DRAKE LANDING SOLAR COMMUNITY

Information Package and Decision

June 11, 2024

dlsc@atco.com / gas.atco.com/Drake

ATCO Okotoks

CONTENTS

Executive Summary.....Page 3

Assessment Background.....Page 4

System Issues.....Page 4

Alternatives.....Page 6

1. Do nothing / status quo
2. Decommission
3. Recommission
4. New District Energy System

Decision.....Page 7

Home Heating Conversion Options.....Page 7

Timeline.....Page 8

Questions and Answers.....Page 8

Service Agreement.....Page 11

Terms and Conditions.....Page 13

EXECUTIVE SUMMARY

Over its lifetime, the Drake Landing Solar Community (DLSC) inspired new ideas and proved what was possible for sustainable energy. Unprecedented in the world, the innovative project garnered support from industry, academia, and government – all while drawing attention and accolades worldwide. It also inspired new ideas for communities in Canada, China, the United States and several European countries.

Fulfilling over 90 per cent of each home's space heating requirements from solar energy, estimates show that each home produced about 5 tonnes fewer greenhouse gas (GHG) emissions per year than an average home, making them 30 per cent more efficient than conventional residential buildings of a similar age.

However, in recent years the district heat system has shown its age with critical components failing and affecting reliability – it is in fact, at the end of its life. Adding to this, it is increasing difficult to find replacement parts and the right technical expertise for maintenance and repairs. Therefore, the system is much less reliable and no longer working as intended. Natural gas backup boilers are now delivering most of the heat as components of the solar thermal, borehole thermal energy storage (BTES) and heat loop systems have deteriorated beyond financially feasible repair.

While significantly outlasting the project's initial four-year testing period and having provided almost 17 years of continuous performance analysis and knowledge, the mounting issues have led to an untenable funding model. Despite monthly access fees paid by residents, recent costs to run the system have ballooned, with annual losses of $42,000 to $62,000 – all covered by the Drake Landing Company (DLC). And despite extensive efforts to arrange for new grant funding, the DLC has been unable to secure additional dollars, making the path forward a clear choice – the Drake Landing Solar Community must be decommissioned.

Although the time has come to wind the project down, our sincere thanks go to the homeowners and residents who have been a part of this success story – none of which would have been possible without your unwavering belief in a better energy alternative.

Looking forward, the DLC has completed an assessment to determine the best pathway for the DLSC with a focus on residents' ability to access reliable energy and space heating. Four options were explored, and the **decommissioning option was chosen** as it is the most reliable and affordable option for residents.

Options

1. Do nothing
2. Decommission
3. Recommission
4. Install a new district energy system

ASSESSMENT BACKGROUND

In operation since 2007, the DLSC is a carefully designed 52-house subdivision that consists of a highly interconnected district heating system featuring 798 solar collectors mounted on garage roofs to collect and store energy underground during warmer months for later distribution during the winter.

After 17 years the system has reached the end of its service life. Numerous operational and maintenance issues have developed leading to system reliability concerns. As a result, operational decisions need to be made so that all the homes can maintain sufficient space heating.

The purpose of this assessment is to examine heat supply alternatives and provide a recommendation to residents. Each alternative is discussed with its associated risks and costs.

SYSTEM ISSUES

The primary issue is that the Drake Landing district energy system has continued to deteriorate and reached its end of life (see Table 1 for a detailed list of deficiencies). Therefore, the system can no longer be relied upon to effectively and reliably provide space heat to all 52 homes.

Until now, failures are fixed as they arise – but instances are increasing each year, both in probability and severity. As an example, in the winter of 2022, there was an incident with the controls system causing the delivery temperature in some homes to drop to 15 degrees Celsius. The issue was remedied before the temperatures dropped further, but this failure alerted us all to the fragile state of the system. As an interim measure, in 2023, redundancies were installed to allow for a backup boiler to be connected to the system that would provide additional heat if one of the existing boilers failed.

Other upgrades completed since 2021 include:

- Repairing the refractories on both backup boilers
- Multiple pump and building mechanical replacements
- New control computer and connectivity software

Continued issues have also been seen on the solar collection system; as a result, more sections of panels have been shut in. The system is now, at most, utilizing 20 per cent of the solar thermal panels with the rest of the heat being provided by the backup natural gas boilers.

Air handlers – a key component to effective heat distribution within the home – are also starting to fail, with a lack of manufacturer support for parts and maintenance.

Table 1: System Deficiencies

BTES	Energy Centre	Solar Collection	Home System
Issues starting in 2020 have progressively worsened	All boiler units are end of life – parts failures since 2022	Issues starting in 2017 and have progressively worsened	Air handlers concerns began in 2020, with a shortage of replacement parts.
Failure of borehole loop temperature-sensor sending units	Extensive corrosion and scaling within piping and storage tank.	Solar collection panels failing	Downstream delivery pipe system condition unknown
Underground sensors are inaccessible/irreplaceable due to access/location. Liquid quality and piping flow abilities are not known.	Hydronic delivery fluid requires flushing (replacing)	Garage foundations have shifted creating breaks in solar collector piping.	Some customer flow control valves failing
No longer able to verify thermal intake	Circulating pumps near end of life	Flexible bellows connecting each panel have been failing since 2010. Fitting was custom designed and sourcing a replacement has proven to be very difficult and costly.	Individual system control boards no longer available
	Control software/system needs upgrading	Solar panel trim-related failures creating a hazard	Original air handler hydronic coil unit no longer available
	Heat Exchangers near end of life		
	Difficulty obtaining critical parts		

ALTERNATIVES

Table 2: Alternatives at a glance

Do nothing / status quo	Decommission - CHOSEN PATH	Recommission	New District Energy system
Continue to operate system "as is". Maintain end-of-life system and repair failures as required. **Estimated annual cost: $150,000 for operating & maintenance** **Estimated increase to monthly access fees**: up to $240* from current $85** **To keep system operational; does not contribute to reserve fund 15 years from now.* **Risks** • System is no longer being operated as originally intended. Most of the heat is provided by central natural gas boilers. • Catastrophic failure of aging system may lead to no heat in homes. • Increasing O&M costs as system continues to age and deteriorate. Monthly access fees will need to increase to recover costs. ***Monthly fee Increases adds up to $2,884 annually – over double the cost of a conventional heating system.*	Install new space heating systems in all 52 homes (2 have converted already). Removal of solar thermal panels, the collection system, the abandonment of the heating loop, and the demolition and site remediation of the Energy Centre and BTES. **Capital cost: $2.2 million** **Risks** • Moving to a conventional system has higher GHG emissions than the original, intended system. • Perception that the District Energy system was a failure and a devaluation of resident's homes. • Significant resident disruption	Rebuild and update the DLSC with modern controls and systems. **Capital cost: $4.1 million plus $150,000 annually for operating & maintenance** **Estimated increase to monthly access fees: up to $240* from current $85** Expected lifespan: 15 years **Risks** • High capital cost with no funding • Cost of investment exceeds lifespan of new system • Significant resident disruption • Potential interim heating solution unknown **Monthly fee Increases adds up to $2,884 annually – over double the cost of a conventional heating system.*	Design, develop, and construct a new district energy system. **Estimated annual cost: $150,000 for operating & maintenance** **Estimated increase to monthly access fees: up to $240* from current $85** Expected lifespan: 15 years **Four choices considered:** 1. District electric heat pump with electric boiler, solar PV, natural gas backup boiler, and new in-home air handlers & high temperature heat loop **Capital cost: $12.1 million** 2. District electric heat pump with electric boiler, solar PV, natural gas backup boiler, and re-use original air handlers with high temperature heat loop **Capital cost: $9.6 million** 3. District electric heat pump with electric boiler, solar PV, natural gas backup boiler, a water source heat pump and new air handlers. **Capital cost: $13.4 million** 4. District hydrogen (H_2) production with electrolyzer, H_2 boiler, BTES, heat loop and new air handlers. **Capital cost: $11.3 million** **Risks (all four choices above)** • High capital cost with a potential for *partial* funding. • Investment costs exceed life of new system • Major community disruption • Decommissioning existing/ commissioning new system creates complications maintaining heat energy to homes during process. **Monthly fee increases adds up to $2,884/year – over double the cost of a conventional heating system.*

DECISION

After thorough investigation, the Drake Landing Company has chosen to proceed with the **Decommission scenario** as it is the most reliable, cost-effective option for the 52 residents. ATCO and the Town of Okotoks will work with each homeowner to educate, support, and ensure a smooth transition.

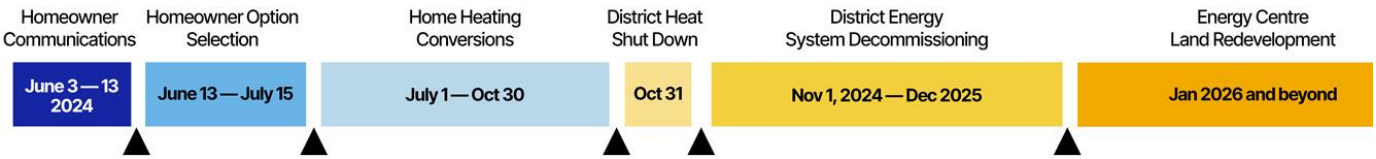
HOME HEATING CONVERSION OPTIONS

Options A, B, and C below cover the associated costs to dismantle and remove the air handler in each home.

Table 3: Heating conversion options for homeowners

OPTION A (Base Option) **Natural Gas Furnace Installation**	**OPTION B** **Combination natural gas furnace + hot water installation**	**OPTION C** **Hybrid heating (electric heat pump and natural gas furnace)**	**OPTION D** **Cash in kind. Homeowner chooses their own solution**
Cost to homeowner: None ($0) **Full cost of this Option will be covered by the Drake Landing Company**	**Cost to homeowner: $4,975** **This Option carries an additional charge to cover the higher priced equipment and additional work required for the new configuration.**	**Cost to homeowner: $7,385** **This Option carries an additional charge to cover the higher priced equipment and additional work required for the new configuration.**	**Cash in kind: $7,600** **Homeowners choose their own solution.**
Overview • Removal of air handler unit followed by installation of a standard 2 stage 96% efficient natural gas forced-air furnace. • Choices of furnaces: ○ Lennox Elite® Gas Furnace (10-year warranty) ○ Daikin Gas Furnace (12-year warranty)	**Overview** • Removal of air handler and natural gas hot water units*, followed by installation of Gradient Thermal 2-in-1 combined natural gas furnace + tankless hot water heater. • Furnace: ○ Gradient syncFURNACE Tankless™ (10-year warranty) **Solar hot water system can potentially be utilized if still operational.*	**Overview** • Removal of air handler unit followed by installation of electric heat pump for space heat/cooling. • Furnace: ○ Daikin FIT Heat Pump paired with Daikin furnace (12-year warranty)	**Overview** • No conversion work is done by Drake Landing Company (final disconnection from the system only). • Homeowner agrees to complete work to convert their home by October 31, 2024.

TIMELINE



QUESTIONS & ANSWERS

Where can I go for more information?

A dedicated webpage has been launched by ATCO that will be updated as time goes on. You can visit the page at gas.atco.com/Drake or send us an email at dlsc@atco.com.

I have extra homeowners' insurance to cover the replacement value of equipment and infrastructure that's tied to my property. Am I free to cancel this coverage now that we know the wider system will be dismantled anyway?

Though not mandated, many Drake Landing Solar Community homeowners have additional insurance coverage to cover the replacement value of the components tied to their individual homes. While it's up to each homeowner to decide when to cancel this coverage, the decommissioning of the Drake Landing Solar Community is a certainty. Additionally, it's the very *lack* of suitable replacement parts on the market that has contributed to this decision.

I pay $85 plus GST monthly to access the system. When will this fee be cancelled?

This fee will stop as soon as you are disconnected from the system and your final bill will be a pro-rated sum for the days used that month.

I've already switched my home to a natural gas furnace. Will I be reimbursed for my costs?

Homeowners that have already converted their heating system will be reimbursed $7,600 – the same amount being offered as the Option D cash-in-kind payment. We will reach out to you to provide additional details soon.

QUESTIONS and ANSWERS continued...

Will I need a permit to have a natural gas forced-air furnace installed? Who will be responsible for securing the permit?

The installer will pull the permit as part of installing the forced-air furnace in your home.

I'm leaning towards Option B or C but have a finished basement. Does this mean my costs will be higher than a home with a more accessible space?

No. The Drake Landing Company has an agreement with the contractor for a set rate on Options A, B, and C, respectively. As a result, there will be no surprise costs – what is being offered to homeowners up front IS the only cost to convert your home.

However, work to convert homes with finished basements may take longer than those with a more accessible space.

I chose this system because my environmental footprint is important to me. What will happen to the component parts as Drake Landing is dismantled? Will it end up in a landfill?

Where possible, the components will be recycled, although due to the types of equipment much of it is not directly usable in other applications.

What if you can't transition everyone in time for the winter season?

The Drake Landing Company is aiming to have all homes off the district system and converted to alternate heating by October 31, 2024, with full system decommissioning completed by the end of 2025.

As individual households are disconnected from the system, heat outputs may be redistributed to support those remaining. It is important to note that this configuration does not mean that the system could remain viable if there were fewer homes tied to it, as the overall maintenance costs and lack of suitable parts will continue to be a problem. Rather, if unforeseen issues prevent all homes from being transitioned in time for the cold weather, the system should still function well enough to support the remaining homes.

I know that I need to book an initial assessment prior to the actual heating conversion of my home. How long will this take and who do I contact to make the appointment?

The assessment of your home will take 30 minutes or less. We will reach out to all residents shortly to provide directions on the booking process.

QUESTIONS and ANSWERS continued...

How long will it take to complete the conversion?

We will provide you with an estimated time to complete the work once we've assessed your home. Many factors are at play to determine the length of time required for each conversion. This includes the individual option you select for your home as well as our ability to access the space (e.g., a finished basement will take longer to complete than an unfinished open space).

I'm not happy with any of the three options available to transition my home's space and hot water heating. Are there any other options available? Can you just pay me out and I'll find my own contractor to do the work?

There are elements of the conversion that the Drake Landing Company needs to complete for the proper disconnection and transition of the system. However, homeowners have additional flexibility in Option D to select their own installer and type of heating.

What will happen to the land that the Energy Centre currently sits on?

The Energy Centre land and the adjacent greenspace containing the underground borehole thermal energy storage occupies about 0.75 acres. The land is currently zoned as Traditional Neighbourhood (TN). The primary intent of property zoned as TN is to provide a variety of primarily detached or side by side housing options. It is likely that once the Energy Centre has been removed that the land would be posted for sale. Some of the land will require subdivision, leaving some parkland space and allow for the continuation of the pathway system and construction of new homes.

DISTRICT HEATING SYSTEM END OF SERVICE AGREEMENT (DRAKE LANDING COMPANY)

DISTRICT HEATING SYSTEM END OF SERVICE AGREEMENT – DRAKE LANDING COMPANY ("Company")

Date: _____

BASIC TERMS

Property information

Homeowner name (the "**Homeowner**")	
Address of property (the "**Property**")	
Site ID	
Homeowner mailing address (**if different than Property address**)	
Homeowner email address	
Homeowner phone number	

Homeowner Selection (mark with an X the selected option)

Option No.	Description	Choices	Selection (X)
#1	Installation of high efficiency forced air gas furnace (at no cost to the Homeowner).	o Lennox Elite® Gas Furnace (10-year warranty); **or** o Daikin Gas Furnace (12-year warranty)	
#2	Installation of Gradient syncFURNACE (heat and hot water combination system) for an additional cost to the Homeowner of $4,975, payable directly to the Installation Contractor (an "**Additional Cost**").	o Gradient syncFURNACE Tankless™ (10-year warranty)	
#3	Installation of Daikin heat pump and DiaikinA furnace for an Additional Cost to the Homeowner of $7,385 payable directly to the Installation Contractor.	o Daikin FIT Heat Pump with Daikin Gas Furnace (12-year warranty)	
#4	Payment in lieu of $7,600.00 ("**Payment in Lieu**").		

DISTRICT HEATING SYSTEM END OF SERVICE AGREEMENT continued...

Contractor information

Decommissioning Project Manager (the "**Decommissioning PM**")*: **Decommissioning to be undertaken by designated contractors.*	ATCO Gas & Pipelines Ltd.
Installation Contractor (the "**Installation Contractor**") selected, if applicable:	

Critical dates

Contractor installation date for Options #1-3	
Decommissioning PM will coordinate the disconnect of the District Heating System infrastructure at Property (**"District Heating System Disconnection Date"**)	
Homeowner selected termination of district heating services by Company (the **"Termination Date"**)	
Ultimate Termination of district heating services by Company (**"Ultimate Termination Date"**)	December 1, 2024

Subject to the terms and conditions attached hereto and incorporate by reference.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed as of the day and year first above written at the Town of Okotoks, in the Province of Alberta.

Homeowner Signature
Written Name:

Drake Landing Company

Per:
Authorized Representative

TERMS & CONDITIONS to the District Heating End of Service Agreement

NOW, THEREFORE, in consideration of the premises and for other good and valuable consideration given to each Party hereto, the receipt of which is hereby acknowledged, the Parties agree as follows:

1. Interpretation.

1.1. Any reference to "**this Agreement**" or "**the Contract**" is reference to this District Heating System End of Service Agreement and its Terms and Conditions, as entered into between the Homeowner and the Company on the date first written above.

1.2. In this Agreement, the Homeowner and the Company shall be collectively referred to as the "**Parties**", and individually as a "**Party**".

1.3. This Agreement is effective as of the date first written above.

1.4. The headings in this Agreement are for convenience only and shall not affect its interpretation.

1.5. The "Basic Terms" contained on the first page are hereby incorporated herein by reference as if fully set forth herein. Unless otherwise defined herein, the definitions contained in the Basic Terms shall apply.

1.6. All references in this Agreement to "dollars" or "$" are to Canadian dollars, unless otherwise stated.

1.7. Where the singular form of a word is used in this Agreement, it shall include the plural as the context so requires, and vice versa.

2. Agreement to Terminate.

2.1. Notwithstanding any provision of any agreement to provide the District Heating System or utility services, or any services whatsoever, to the Homeowner by the Company, the Parties hereby acknowledge and agree that as of the earlier of the Termination Date or Ultimate Termination Date:

(a) the District Heating System, or any other services provided by the Company shall automatically terminate in all respects (without any further action on the part of any Party hereto) and any agreement between the Parties to provide the said District Heating System or services of any kind or nature shall be of no further force or effect;

(b) without limiting the generality of the foregoing, the Company shall have no liability for the provision of the District Heating System, utility services, services generally, utility infrastructure or general infrastructure of any kind to the Property as of the earlier of the Termination Date or Ultimate Termination Date; and

(c) any requirement for notice with respect to the termination of the District Heating System or services or infrastructure of any kind is hereby expressly waived.

3. Payment terms

3.1. Option #2 or #3. The Homeowner shall pay any Additional Cost directly to the Installation Contractor upon receipt of the Installation Contractor's invoice. The Company shall have no liability for payment to the Installation Contractor of the Additional Cost.

3.2. Option #4: The Company shall pay the Payment in Lieu within fifteen (15) days of the date of this Agreement. Upon payment of the Payment in Lieu, the Homeowner shall have no further rights to Options #1, #2 or #3.

4. Liability terms

4.1. In the event the Homeowner selects Options #1, #2 or #3, the Homeowner hereby acknowledges the following:

4.1.1. that they have been provided with a list containing multiple independent contractors from which they can select their Installation Contractor, and that they have chosen their Installation Contractor based on their own needs and preferences;

4.1.2. that the Company makes no representation or warranty of any kind as to the suitability of the Installation Contractor or its sub-contractors, employees, agents or assigns, or the materials employed by the Installation Contractor for the completion of their work and the Homeowner has had the opportunity to make due inquiry as to the suitability of their chosen Installation Contractor and has chosen their Installation Contractor without undue influence or pressure from the Company;

4.1.3. that the Homeowner retains full liability for the payment of the Installation Contractor and the Company shall have no liability for the performance of any contract between the Homeowner and the Installation Contractor, including but not limited to, any action commenced against the Homeowner by the Installation Contractor or any liens which may be registered against the title of the Property by the Installation Contractor for the non-payment of its invoices; and,

4.1.4. the Company shall not be liable for any loss or damage of any kind suffered by the Homeowner which arises after the District Heating System Disconnection Date or as a result of the work performed by the Installation Contractor or arising out of the presence at the Property of the Installation Contractor or its sub-contractors, employees, agents or assigns, and the Homeowner hereby releases the Company from any and all manner of actions, causes of action, suits, proceedings, debts, dues, profits, expenses, contracts, damages, claims, demands and liabilities whatsoever, in law, statute or equity, which the Homeowner may have at any time after the District Heating System Disconnection Date, and without limiting the generality of the foregoing, the Homeowner agrees that following the District Heating System Disconnection Date the Company shall have no liability to the Homeowner for the provision of the District Heating System, utility services or utility infrastructure to the Property.

4.2. THE HOMEOWNER ACKNOWLEDGES, COVENANTS AND AGREES, ON ITS OWN BEHALF AND ON BEHALF OF ITS HEIRS, EXECUTORS, ADMINISTRATORS, ASSIGNS, SUCCESSORS IN TITLE (AND IF IT"S A CORPORATION OR OTHER ENTITY ITS SUCCESSORS, ASSIGNS, PREDECESSORS, SUBSIDIARIES, PARENTS, AFFILIATED AND ASSOCIATED CORPORATIONS AND ENTITIES, AND THEIR RESPECTIVE INSURERS, OFFICERS, DIRECTORS, SERVANTS, AGENTS, EMPLOYEES, SUCCESSORS AND ASSIGNS) DOES HEREBY REMISE, RELEASE AND FOREVER DISCHARGE THE COMPANY AND ANY OF AND THEIR RESPECTIVE INSURERS, OFFICERS, DIRECTORS, SERVANTS, SHAREHOLDERS, AGENTS, EMPLOYEES, SUCCESSORS AND ASSIGNS, AS THE CASE MAY BE, FROM ANY AND ALL MANNER OF ACTIONS, CAUSE AND CAUSES OF ACTION, CONTRACTS (WHETHER EXPRESSED OR IMPLIED), CLAIMS, DEMANDS, DAMAGES, LOSS, INJURY, SUITS, DEBTS, SUMS OF MONEY, INDEMNITY, EXPENSES, INTEREST, COSTS AND CLAIMS OF ANY KIND AND EVERY KIND AND NATURE WHATSOEVER, AT LAW OR IN EQUITY OR STATUTORY, WHICH THE HOMEOWNER EVER HAD OR NOW HAS OR WHICH IT CAN, SHALL OR MAY HEREAFTER HAVE BY REASON OF ANY CAUSE, MATTER OR THING WITH RESPECT TO FACTS NOW EXISTING WITH RESPECT TO ANY ALLEGATIONS MADE OR WHICH COULD HAVE BEEN ASSERTED IN RELATION TO THE PROPERTY, PROVISIONS OF THE DISTRICT HEATING SYSTEM, UTILITY SERVICES, SERVICES GENERALLY, UTILITY INFRASTRUCTURE OR INFRASTRUCTURE GENERALLY BY THE COMPANY, THE DECOMMISSIONING AND REMOVAL THEREOF FROM THE PROPERTY; OPTIONS #1, #2, #3 AND PAYMENT IN LIEU, AND ANY AND ALL MATTERS RELATED THERETO, WHETHER DIRECTLY OR INDIRECTLY.

5. Indemnification

5.1. Despite anything to the contrary in this Agreement, the Homeowner will indemnify the Company and save them harmless from all loss (including loss of any amount payable by the Homeowner under this Agreement, claims, actions, damages, liability and expenses in connection with loss of life, personal injury, damage to property or any other loss or injury arising from this Agreement, including legal fees on a solicitor and their own client full indemnity basis, except if such loss, injury or damage was the result of an act or omission on the part of the Company or those for whom it is responsible at law.

6. General Terms.

6.1. The Homeowner agrees to be bound by the terms of this Agreement.

6.2. The Homeowner represents and warrants to the Company that it has the legal authority to bind all individuals having

any right of ownership to the Property, or any right in law or in equity to decision-making relating thereto, to the terms of this Agreement, and it further represents and warrants that it has made all of those individuals aware of the contents of this Agreement and that those individuals have jointly and severally agreed with the Homeowner to be bound by the terms hereof.

6.3. Neither Party may assign its interest in this Agreement without first obtaining the other's consent, such consent not to be unreasonably withheld or delayed.

6.4. Time shall be of the essence in this Agreement.

6.5. The waiver by either Party of the strict performance of any term of this Agreement shall not constitute a waiver of such term in the future or any other term of this Agreement.

6.6. If the Termination Date or any other date pursuant to this Agreement falls on a weekend or statutory holiday, then such date shall be postponed and extended to the next business day. All times specified in this Agreement shall be Mountain Standard Time.

6.7. If a court of competent jurisdiction finds that any term of this Agreement is unenforceable, that term shall be severed, and the remainder of this Agreement shall survive and be of full force and effect.

6.8. This Agreement shall be interpreted according to the laws of the Province of Alberta and the Parties attorn to the jurisdiction of the courts of the Province of Alberta.

6.9. This Agreement and the documents referenced herein constitutes the entire agreement between the Parties with respect to the matters set out herein. There are no collateral warranties, representations or conditions.

6.10. This Agreement may only be amended with the written agreement of both Parties.

6.11. Those terms which are specified in this Agreement to survive the closing of the transaction, and any other terms which by their nature are intended to survive the closing of the transaction, shall continue in force, and shall not merge.

6.12. This Agreement shall be binding upon and enure to the benefit of the Parties and their successors and permitted assignees.

6.13. The Parties agree to execute such further documents as may reasonably be required to carry out the transaction contemplated in this Agreement.

6.14. The rights and remedies under this Agreement are cumulative and are in addition to and not in substitution for any other rights and remedies available at law or in equity.

6.15. No Party is liable or responsible to the other Party, nor is deemed to have defaulted under or breached this Agreement, for any failure or delay in fulfilling or performing any term of this Agreement (except for any obligations to make payments to the other Party hereunder), when and to the extent such failure or delay is caused by or results from acts beyond the affected Party's reasonable control, including, without limitation (each, a "**Force Majeure Event**"): (a) acts of God; (b) flood, fire, earthquake, tsunami or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot or other civil unrest; (d) government order or law; (e) actions, embargoes or blockades in effect on or after the date of this Agreement; (f) action by any governmental authority; (g) national or regional emergency; (h) strikes, labour stoppages or slowdowns or other industrial disturbances; and (i) shortage of adequate power or transportation facilities. The Party suffering a Force Majeure Event shall give notice to the other Party, stating the period of time the occurrence is expected to continue and will use diligent efforts to end the failure or delay and ensure the effects of such Force Majeure Event are minimized.

6.16. This Agreement may be executed in counterpart and transmitted by email or other form of electronic means and the reproduction of any signature in counterpart and by email or other form of electronic means will be treated as though such reproduction was an executed original signature.