Synapse Real Estate Corp
Synapse Data Center Power Plant Project
Proceeding 30732
Application 30732-A001

Synapse Real Estate Corp ("Synapse") Response to
Alberta Utilities Commission ("AUC") Information Request ("IR") No. 2

Synapse-AUC-2026JUL19-001

References: **Exhibit 30732-X1241, TP 31 - Noise Impact Assessment - Stage 2, PDF pages 56-58;**

Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF pages 65-66

Issue: **Final equipment and noise mitigation implementation**

Quotes: Exhibit 30732-X1241, PDF pages 56-58:
"**Appendix F: Noise Control Acoustic Specifications**

Summary
The table below lists the noise control items designed to bring the Olds Data Center in compliance with regulations for nighttime operations.

Table 5: Noise Control Recommendations – Nighttime

Item	Noise Source	Noise Control
1	Chillers	Install chillers with ≤ 85 dBA [A-weighted decibels] PWL [sound power level] per unit
2	ACC Discharge	Install discharge silencers on all ACCs with specifications below
3	Condenser Cooling Pumps Rooftop	Operate one (1) out of (3) units that are located on the rooftops of all power plant buildings
4	Plant -South-west Side	Upgrade and install ≥8 m high, highly absorbing (both sides assumed absorption coefficient 0.84) noise barriers as depicted on the figure below, see below for available industrial noise barrier specifications

…

The table below lists the noise control items designed to bring the Olds Data Center in compliance with regulations for the identified worst-case event assuming nighttime compliance is achieved by implementing the above noise control recommendations. [underline emphasis removed]

Extended Noise Control Recommendations - Worst-Case - Nighttime

Item	Noise Source	Noise Control
1	Emergency Back-up Generators Upgrade	Upgrade all emergency back-up generators to achieve 65 dBA @ 7m [metres] for single unit

Exhibit 30732-X1223.01, PDF pages 65-66:

"Confirmed. The NIA [noise impact assessment] concluded that implementation of the **four "Noise Control Recommendations – Nighttime" items** in Appendix F of the Project Noise Impact Assessment (NIA) (Exhibit 30732-X011, TP 31 – Noise Impact Assessment) is required to achieve compliance with the applicable Permissible Sound Levels (PSLs) at nearby receptors for nighttime operations. Accordingly, Synapse will implement **those four recommendations**, or equivalent measures demonstrated through detailed engineering to provide the same or improved acoustic performance, to ensure compliance with AUC Rule 012 [*Noise Control*]. This will be incorporated into the final facility design and reflected within the final NIA." [emphasis added]

Preamble: The NIA demonstrates compliance with Rule 012 following the implementation of specific noise control measures and assumptions regarding equipment performance; however, detailed engineering and procurement activities remain ongoing, and final equipment specifications have not yet been confirmed. The assessment therefore relies on representative or assumed sound power levels and mitigation measures that are to be incorporated at a later stage. Synapse has committed to implement the mitigation measures for the normal operation scenario.

Request:

a) Please describe the current status of equipment procurement and detailed engineering. In particular, confirm whether key equipment (e.g., turbines, chillers, generators) has been selected.

b) Please confirm that, in addition to the mitigation measures for the normal operation scenario, Synapse will implement the mitigation measures for the worst-case scenario.

   (i) Specifically, confirm that the emergency backup generators will achieve a maximum sound level of 65 dBA at seven metres for each unit, or equivalent or better acoustic performance, consistent with the assumptions in Appendix F of the NIA.

c) Please confirm that procurement and construction specifications will include acoustic performance requirements consistent with the modelling assumptions and all noise control measures identified in the NIA (e.g., maximum sound power levels, enclosure performance, barrier specifications), including vendor guarantees where applicable.

d) Please confirm that an updated NIA, based on the final project design and equipment specifications, will be filed prior to operation to validate compliance with Rule 012.

e) Please describe how the effectiveness of mitigation measures will be verified and maintained during operations, including any monitoring, testing, or corrective action processes.

Response:

a) Synapse has identified a preferred equipment supplier and preferred equipment configuration for the combustion gas turbogenerators ("**GTGs**"), steam turbogenerators ("**STGs**"), heat recovery steam generators ("**HRSGs**"), Air Cooled Condensers ("**ACCs**"), and diesel generator units. Commercial negotiations and final procurement activities remain ongoing. Synapse has also identified a shortlist of chiller suppliers and configurations that meet or improve upon the equipment-specific acoustic performance criteria used in the NIA, including the applicable maximum sound power level.

The environmental and technical assessments submitted in support of the Application were developed using equipment data supplied by current preferred suppliers, or representative design parameters consistent with the preferred equipment configurations currently under evaluation. Final equipment selection will be confirmed prior to construction and included in Synapse's final project update

b) With respect to the emergency backup generators, two generator models are assessed in the NIA using assumptions to represent a potential emergency outage at the combined cycle plants. The 75dBA at 7m option produces on average more noise at the modelled receptors than the 65dBA at 7m option and, according to the modelled results, produces exceedances of PSLs as determined pursuant to Rule 012 at several residential receptors near the Project.

The emergency backup diesel generators are not part of the Project's normal power generation configuration and are not intended to supply the full data centre or power plant electrical load during extended operation. Their purpose is to protect sensitive physical property (GPU and CPU server hardware) and the sensitive intellectual property (IP) stored on that hardware.

As described in the NIA and Air Quality Assessment (Exhibit 3072-X0007, TP 25 – Air Quality Assessment v1.2) operation of the emergency diesel generators represents a temporary emergency condition only. In view of the thresholds in AUC Rule 012 and the Alberta Ambient Air Quality Objectives, in the event of an interruption to the natural gas supply requiring diesel generation that would exceed emission and/or noise limits >1% of a calendar year (87.6 hours), the facility would be safely shut down, unless otherwise permitted by regulatory authorities.

While 65dB at 7m generators are available, they are significantly more expensive and would materially reduce the funds available for a Community Benefits Program by tens of millions of dollars. Synapse notes that the units at issue are emergency backup generators only, expected to operate in the worst-case scenario in rare circumstances. Given this limited expected use, Synapse considers that the public benefit of directing additional funds to the Community Benefits Program outweighs the incremental noise mitigation that the 65 dB generator upgrade would achieve. Synapse recognizes, however, that this involves a balancing of competing public benefits and respectfully submits this information for the Commission's consideration.

Synapse will adhere to any conditions imposed by the Commission, including a condition requiring the use of 65 dB (at 7 m) generators, should the Commission determine the incremental noise mitigation from the quieter generators better serves the public interest. However, in these circumstances, Synapse's position is that approval of the Power Plant, including the 75dB at 7m generators, is in the public interest.

c) Confirmed. Major equipment suppliers and noise-control vendors will be required to provide certified acoustic performance data and contractual guarantees, where applicable, demonstrating that the supplied equipment and mitigation meet or improve upon the acoustic criteria used in the NIA. Compliance will be verified through vendor submittal review and, where practicable and appropriate, factory acceptance testing or other acoustic testing prior to shipment. Final installed performance will also be verified during commissioning, as addressed further in response to part (e).

d) Confirmed.

e) The effectiveness of the Project's noise mitigation measures will be verified during construction, commissioning and operation. Vendor-certified acoustic data and guarantees will be reviewed against the applicable procurement specifications, and factory or shop acoustic testing will be completed where practicable. During construction, Synapse will inspect the installation of acoustic enclosures, silencers, barriers, absorptive materials, vibration isolation, louvres, doors, seals and building penetrations to confirm consistency with the final design.

Following commissioning and once representative operating conditions have been established, sound measurements will be completed for significant noise sources and at the most affected receptor locations, or suitable representative monitoring locations, as appropriate. The results will be compared against the equipment performance requirements, the predictions in the NIA, and the applicable Rule 012 PSLs. Testing will include representative normal operation and, where reasonably practicable, the equipment combinations and operating conditions relevant to the modelled worst-case scenario.

Noise-control equipment and structures will be incorporated into the Project's preventive maintenance and inspection programs. Acoustic barriers, silencers, enclosures, absorptive materials, ventilation systems, seals, and other attenuation components will be periodically inspected and repaired or replaced where deterioration or damage could reduce their effectiveness. Material equipment replacements, facility modifications or operating changes that could affect acoustic performance will be reviewed against the updated NIA before implementation.

Synapse will document and investigate noise complaints and any identified deviation from expected acoustic performance. Corrective actions may include equipment maintenance or repair, replacement of damaged acoustic components, additional attenuation, adjustment of equipment operating practices or sequencing, or other engineered mitigation. Follow-up sound measurements may be completed where necessary to confirm that the corrective action has restored compliance.

Synapse-AUC-2026JUL19-002

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 2**

Issue: **Procurement and construction**

Quote: "Current indications from the preferred gas turbine supplier suggest that turbine delivery can occur as early as November 2026, subject to final procurement arrangements and permitting timelines."

Request:

(a) How long would it take for Synapse to procure all the gas turbines, steam turbines and diesel generators required for the full build of the project?

(b) How does the estimated procurement of the first gas turbine line up with permitting, construction and operation of the pipeline to supply the gas?

Response:

(a) While final procurement contracts have not yet been executed, Synapse has identified preferred suppliers and a preferred equipment configuration for the gas turbines, steam turbines, and diesel generators, and confirms that suitable equipment is currently available in the market. Synapse is not yet in a position to provide a definitive procurement timeline because entering into binding procurement commitments depends on securing a confirmed Project schedule, which in turn depends on AUC approval. Equipment suppliers require certainty as to Project timing and financing before delivery and commercial terms can be finalized. Final equipment selection and an updated procurement schedule will be confirmed prior to construction and included in Synapse's final Project update. However, Synapse notes delivery of major equipment is not required in order to commence work on the Project.

(b) Delivery of the first gas turbine is not required to complete permitting or commence construction of the pipeline to supply gas for the Project. Pipeline construction is anticipated to commence after the required AUC approvals have been obtained. Synapse will coordinate with the Alberta Energy Regulator ("**AER**") through its future pipeline operating partner in connection with the design and permitting of the pipeline infrastructure.

Synapse-AUC-2026JUL19-003

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 6**

Issue: **Project siting**

Quote: "The Town of Olds and Synapse engaged in discussions regarding a potential 1GW [gigawatt] data center with attached 1.4GW natural gas power plant in December of 2025. The North East Area Structure Plan was identified as the preferred location within the Town of Olds because its ILD [Light Industrial District] zoning allows for data center development as a discretionary use."

Request:

(a) Did Synapse consider other potential locations for the project, specifically ones farther away from population centres?

(b) If yes, why was the current proposed location selected over the other option(s)?

Response:

(a) As part of its site-selection process in November and December 2025, Synapse considered multiple potential locations in Rocky View County, Mountain View County and Ponoka County, including locations farther from established population centres. Synapse contacted municipal council members, administration and/or economic development representatives in the jurisdiction to assess items such as land-use compatibility, municipal support and development feasibility.

Synapse also considered municipal concerns regarding the preservation of higher-quality agricultural land and the development of large industrial projects in rural agricultural areas. Rocky View County was no longer an option after its council rejected a proposed Area Structure Plan for a large data centre technology park in September 2025. The preservation of high quality agricultural land has been expressed as an important item for counties as part of our conversations.

(b) The proposed Town of Olds location was selected because it provided the strongest overall balance of land-use compatibility, infrastructure availability, access to skilled workforce and minimized disturbance to agricultural land. The site is located within the North-East Area Structure Plan, where the applicable Light Industrial District zoning contemplates data centre development as a discretionary use

Synapse-AUC-2026JUL19-004

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF pages 14, 16 and 17**

Issue: **Real-world examples**

Quote: PDF page 14:

"10 substantially identical data centers and power plants are expected to be built as part of the Project. An example rendering is provided in Exhibit 30732-X0013 with a site plan showing the location of all buildings."

Preamble: Synapse provided updated renderings of the project on PDF pages 16 and 17 in Exhibit 30732-X1223.01 of the modular design with integrated gas power plants and an open-air mechanical yard.

Request: Please provide real-world examples of data centres of a similar size, modular design and an open-air mechanical yard.

Response: Specific site examples of existing data centres that employ comparable design and configuration are not available given that detailed design attributes, such as noise and emissions, vary depending on the requirements of the local authority having jurisdiction as well as the local climate conditions in which they are built. Synapse has designed its facility to fully comply with local regulatory requirements in the proposed location, and other data centres are not generally analogous.

However, there are common elements across data center design including modular design and open-air mechanical equipment yards.

Several real-world projects employ the modular design and exterior open-air mechanical yards.

Technology companies that have data centres that apply modular design and use open-air mechanical yards include:

- Google
- Meta
- Microsoft
- Amazon

These technology companies own or operate in data centres of a similar size to the proposed Project.

Synapse-AUC-2026JUL19-005

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF pages 19 and 21**

Issue: **Diesel generators**

Quotes: PDF page 19:

"… in the event of an interruption to the natural gas supply requiring diesel generation that would exceed emission and/or noise limits >1% of a calendar year (87.6 hours), the facility would be safely shut down, unless otherwise permitted by regulatory authorities."

PDF page 21:

"All mechanical and electrical systems in the data center are monitored by a centralized building monitoring system. Emergency runtime hours for each unit will be recorded, and alarm will be set to ensure they do not exceed allowed site runtime limits."

Preamble: It may be possible that a mix of diesel generation and gas generation is used to power the data centre and this mix does not result in an exceedance of noise or emissions limits.

Request:

(a) Given that it is possible that diesel generation is used that does not result in noise or emissions exceedances, please elaborate on how tracking each emergency generator's runtimes and alarms will limit the noise and emissions exceedances to 87.6 hours per year?

(b) Has Alberta Environment and Protected Areas indicated if it will regulate the diesel backup generation?

(i) If yes, does Synapse anticipate that the *Environmental Protection and Enhancement Act* approval will require monitoring and reporting of runtime and emissions from the diesel backup generation?

(ii) If not, how will Synapse actively monitor emission exceedances to ensure the cumulative annual exceedance does not exceed 87.6 hours per year?

(c) How will Synapse actively monitor noise exceedances to ensure the cumulative annual exceedance does not exceed 87.6 hours per year?

(d) What combinations of diesel and gas generation would result in noise or emissions exceedances?

Response:

(a) In the event emergency diesel backup generators are in operation during an unplanned natural gas power plant outage, noise levels will be monitored to determine if an exceedance at a nearby receptor is likely to occur. Noise monitoring devices will be installed at the property boundary nearest receptor groups that models indicate are most likely to experience noise exceedances.

Building monitoring systems will maintain a cumulative annual record of any such operating periods and will provide staged alarms as the operating limit is approached. Operating procedures will require controlled load reduction and shutdown of the applicable datacentre load and emergency generators before the cumulative duration reaches 87.6 hours in a calendar year, unless continued operation is authorized by the applicable regulatory authorities.

Events that record an exceedance will be logged and the duration of time in exceedance will be reported to the AUC semi-annually.

See the response to item (b) below for response to emissions exceedances and monitoring.

(b) Yes, due to the capacity of the back-up generation at the power plant, the diesel generators will be regulated in the EPEA approval. Based on EPA's initial review of the EPEA application, EPA expects that operational times will need to be monitored and reported annually. All emission point sources at the plant will also be stated and authorized in the approval.

(i) Based on EPA's initial review of the EPEA application, EPA expects to require Monitoring and Reporting of the diesel generators including runtime. The details of the emissions monitoring have not yet been determined, however EPA expects that there will be requirements to monitor the backup generators for Nox, CO and Formaldehyde and amount of diesel used. Further, EPA expects the approval will include runtime limits for each diesel generator, to be monitored using, for example, Electronic Logging Devices (ELD), engine run time and performance monitoring systems.

(ii) See (i) above. The EPEA approval will include a clause stating that during emergencies the Approval Holder must not operate each diesel generator more than 87 cumulative hours per Calendar year

(c) See response (a) above.

(d) The air-quality and noise assessments evaluated defined operating scenarios rather than every possible combination of gas-fired and diesel-fired generation. Dispersion and receptor sound levels are affected by the location and loading of the operating equipment, and meteorological conditions.

For air quality, the following operating cases were assessed:

- normal operation of all 20 gas turbines and 10 HRSGs
- operation of all 20 gas turbines without the HRSGs
- normal combined-cycle operation together with routine testing of up to six diesel generators for a maximum of one hour
- total emergency backup generation using all 600 diesel generators, with all gas turbines and HRSGs unavailable

For noise, the following operating cases were assessed:

- night time
- day time
- worst case operational scenarios.

Normal night time and day time operational scenarios did not exceed Rule 012 PSLs. Worst case operational scenarios with extended noise control did not exceed Rule 012 PSLs. Worst case operational scenarios without extended noise control exceeded Rule 012 PSLs. The NIA model does not examine partial failure scenarios.

A combination natural gas power plant and emergency backup diesel power generator operating configuration will not be used as a planned operating mode unless it has been demonstrated to comply with the applicable air-quality and noise requirements.

Where an unassessed, partial failure, emergency scenario occurs, Synapse will track its duration and operating conditions and will reduce load, limit the number of diesel generators operating, or safely shut down affected datacentre loads as required to comply with applicable regulatory requirements. These scenarios will be modeled and submitted to the appropriate regulatory authority 90 days prior to plant operations.

Monitoring of these scenarios will be implemented as described in (a) and (b) above.

Synapse-AUC-2026JUL19-006

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 20**

Issue: **Diesel generators**

Quote: "Following a loss of generation, the emergency diesel generators may operate for a limited duration, within the operating limits prescribed by regulatory requirements, to support critical facility functions and provide operators with an opportunity to restore normal power generation. If natural gas-fired generation can be re-established within the regulatory permitted period, the facility will transition back to normal operations and the emergency generators will be cycled down.

If normal generation cannot be restored within the permitted emergency operating period, the data center will be transitioned to a controlled shutdown state and the facility will enter a blackout condition. Once the cause of the outage has been resolved, designated emergency diesel generators will provide black-start capability to restore power to essential plant systems and facilitate the restart of the natural gas-fired generating units."

Preamble: For each pair of natural gas-fired combustion turbine generating units and heat recovery steam generator there are 60 diesel generators.

Request:

(a) In the event of a loss of generation from a gas-fired turbine, how many diesel generators would operate?

(b) How many diesel generators are required for black-start capability to restore power and transition to the natural gas-fired generating units?

(c) Please confirm whether the 60 diesel generators attributed to a modular block can be used for another modular block.

Response:

(a) The ten power blocks will be interconnected through a common medium-voltage plant electrical system and managed by a centralized power-management and load-shedding system. The loss of one gas turbine will therefore be addressed on a facility-wide basis rather than as an isolated loss of an entire modular block.

A trip of a single gas-fired turbine would not automatically cause all 60 emergency diesel generators associated with that modular block to start. Immediately following a turbine trip, the data centre's lithium-ion uninterruptible power supply systems will bridge the short-duration power imbalance while the plant control system initiates the applicable response, including:

- increasing output from available gas-fired generating units within their permitted ramp rates,
- utilizing available operating reserve and steam-cycle contribution,
- reducing or shedding non-critical loads (load-shedding), and
- starting emergency diesel generators only where the remaining generation deficit cannot be restored within the UPS ride-through period.

Accordingly, under the intended operating configuration, no diesel generators are expected to be required for the loss of a single gas turbine where sufficient reserve and load-shedding capability are available. Where diesel generation is required, the units will be started sequentially and only in the number necessary to supply the remaining critical-load deficit. The required number will depend on the output of the tripped turbine, the facility load at the time of the event, the available reserve and ramping capability of the remaining generating units, and the amount of load that can be shed.

The final maximum number of diesel generators required for each credible generation contingency will be established through the detailed electrical transient, protection, load-flow and load-shedding studies. These results will be incorporated into the final plant operating system and automatic generator-start sequence prior to operation.

(b) One of the data centre's 3 MW emergency diesel generators is sufficient to provide the auxiliary and starting power required to black-start one gas turbine generating unit. The designated generator would energize the applicable plant auxiliary and starting systems, including controls, lubrication, ventilation, fuel-gas support systems, and the turbine starting equipment.

Once the first gas turbine has reached self-sustaining speed, synchronized and begun producing power, it can energize the common plant electrical system and provide the auxiliary power required to start the remaining gas-fired generating units sequentially.

The final requirement and switching sequence will be confirmed through detailed load-flow, motor-starting, protection and black-start studies before operation.

(c) The 60 emergency diesel generators associated with each modular block are dedicated exclusively to the critical data-centre loads within that block. They will not be electrically connected to, or used to supply, another modular block.

Synapse-AUC-2026JUL19-007

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 20**

Issue: **Diesel generators**

Quote: "Diesel will be stored in generator belly fuel tanks. The belly fuel tanks are double walled with vacuum leak detection. They are expected to be manufactured with heavy gauge steel and powder coated. They are equipped with spill containers at each fill connection that are fixed to the tank and equipped with a manual valve drain into the primary tank. Tanks will also be equipped with vents that will relieve excessive internal pressure caused by exposure to fires. The venting devices will be installed and maintained in accordance with the National Fire Protection Association (NFPA) code NFPA 30, *Flammable and Combustible Liquids Code*."

Request:

(a) Please describe the process of refilling/topping up the diesel fuel tanks for the entire facility.

(b) How many fuel trucks would be required, how long would it take to refuel and how frequently would this operation occur?

Response:

(a) The Project does not include a centralized bulk diesel unloading station or a common diesel-distribution header. Each of the up to 600 emergency generators will be equipped with an integral double-wall belly tank located beneath the generator package. Fuel trucks will approach the applicable outdoor mechanical yard and fill the belly tanks directly through their individual controlled fill connections. Refuelling will normally be completed sequentially by generator group or modular block based on actual tank levels and fuel consumption.

Before filling begins, the delivery operator will confirm the identity of the receiving tank, available tank ullage, normal operation of the interstitial leak-detection system, unobstructed tank venting and the absence of active fuel-system alarms. The delivery vehicle will be secured, bonded, and grounded at the designated connection. Temporary fill barriers and spill-response equipment will be positioned, and the transfer hose will be connected to the applicable belly-tank fill connection.

Diesel delivery will be continuously attended by the fuel-delivery operator and facility personnel. Tank level will be monitored throughout the transfer using the local level indication and audible and visual alarms. Filling will be stopped immediately upon activation of the high-high-level alarm, observation of a visible or audible overfill alarm, loss of interstitial monitoring, evidence of leakage or any other abnormal condition. After filling, the hose will be disconnected, the fill connection secured, the area inspected and the delivered volume reconciled against the tank-level and facility fuel-inventory records.

During normal operation, facility-wide refuelling will not occur on a fixed schedule. Tanks will be topped up following commissioning, scheduled generator testing or emergency operation according to the fuel actually consumed. Because the emergency generators are distributed among 100 groups of six, several fuel trucks may safely refill different generator groups concurrently.

Each belly tank will have a nominal capacity of approximately 17 to 34 m^3. Accordingly, filling all 600 tanks from empty would require approximately 10,200 to 20,400 m^3 of diesel and would be undertaken progressively during construction and commissioning rather than as a single facility-wide event.

The Project is not designed to sustain continuous operation of all 600 emergency generators through indefinite tanker replenishment. If natural gas-fired generation could not be restored within the available stored-fuel duration and applicable emergency operating limits, the data centre would be transitioned to a controlled shutdown. Consequently, a complete 24- or 48-hour facility-wide fuel replacement would represent a bounding emergency logistics case rather than a routine refuelling operation. The final number of trucks, unloading rates and refuelling duration will be established through the detailed fuel-supply and emergency logistics plan with consideration given to the selected tank capacities, fuel-consumption curves, tanker payloads and contracted carrier turnaround times.

(b) For preliminary logistics planning, Synapse assumed a net delivered diesel volume of approximately 50 m^3 per tanker load. Under the 17 m^3 configuration, the total facility storage capacity would be approximately 10,200 m^3, requiring approximately 204 tanker loads to fill all 600 tanks from empty. Under the 34 m^3 configuration, the total storage capacity would be approximately 20,400 m^3, requiring approximately 408 tanker loads.

(c) Because the Project consists of 10 modular blocks, refuelling may occur concurrently in multiple mechanical yards. For preliminary planning purposes, assuming one tanker unloading within each modular block, a net unloading rate of approximately 50 m^3 per hour per tanker and up to 10 concurrent unloading operations, the theoretical minimum aggregate transfer time would be approximately 20.4 hours for the 17 m^3 tank configuration and 40.8 hours for the 34 m^3 configuration.

Allowing for vehicle positioning, bonding and grounding, hose connection and disconnection, verification of available tank capacity, movement between individual generators and post-fill inspection, the practical on-site refuelling duration is preliminarily estimated at approximately 24 to 30 hours for the 17 m^3 configuration and 48 to 60 hours for the 34 m^3 configuration. These estimates exclude off-site tanker travel and terminal loading time and will be refined through the detailed fuel-supply and emergency logistics plan.

Initial filling will occur progressively as each modular block is commissioned. During operation, refuelling will not occur at a fixed facility-wide frequency. Individual tanks will be topped up based on recorded fuel consumption following scheduled generator testing or emergency operation. A complete facility-wide refill would only be required following substantial operation of the full emergency-generation fleet and is not considered as a routine activity.

Synapse-AUC-2026JUL19-008

References: **Exhibit 30732-X0007, TP 25 - Air Quality Assessment v1.2, PDF page 19;**

Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF pages 2 and 12

Issue: **Generator stack heights**

Quotes: Exhibit 30732-X1223.01, PDF page 2:

"The Project Noise Impact Assessment (NIA) and Air Quality Assessment (AQA) were completed using the performance characteristics of the preferred equipment currently under evaluation by Synapse. Commercial negotiations and procurement activities had not been completed when the assessments were prepared and, as described in the response to (a), remain ongoing. Therefore, the assessments relied on performance-based design criteria rather than identifying a specific manufacturer and model."

Exhibit 30732-X1223.01, PDF page 12:

"The location of the power plant and associated stacks is shown in Exhibit 30732-X0013, on PDF page 6. Each stack is ~450m from the front of the building. The exhaust stack is therefore not readily apparent at the scale of the rendering as it is currently designed with a diameter of 6 m. At the time Exhibit 30732-X0013 was prepared, the stack heights had not yet been finalized. The stack heights were, and continue to be, optimized to ensure compliance with the AAAQO [Alberta Ambient Air Quality Objectives] while minimizing visual impacts."

Preamble: The air quality dispersion modelling assessment (Exhibit 30732-X0007, PDF page 19) lists the stack height of the natural-gas generators as 17.4 metres and the stack height of the emergency backup generators as nine metres

Request:

(a) Please confirm whether the stack heights described in the air quality dispersion modelling assessment are representative of the final stack heights.

(b) Is Synapse able to commit to stack heights of 17.4 metres and nine metres as the maximum stack heights for the natural gas generators and diesel generators, respectively?

Response:

(a) Natural gas generation stack heights have been increased to 25.9m to improve dispersion. Emergency backup diesel generator stack heights remain unchanged at 9.0. An updated Air Quality Dispersion Modelling Assessment has been released as part of EPEA application. This updated stack height has been included in Noise Impact Assessment Stage 2.0, Exhibit 30732_X1244, Synapse W-04-033-01 W5 Olds Data Centre NIA Report_001285, PDF.

(b) Unless otherwise directed by a regulatory authority, Synapse can commit to 25.9m as maximum stack height for the natural gas generators and a maximum 9.0 metre stack height for the diesel generators. Should such a change be required, Synapse will notify the Commission.

Synapse-AUC-2026JUL19-009

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 28**

Issue: **Gas supply**

Quote: "The available gas capacity is as follows:

	Potential Gas Supply per Supplier		Potential Gas Supply Cumulative	
Potential Supply Volume	Normal Baseline (4,900 E3M3/day)	Peak Load (6,720 E3M3/day)	Normal Baseline (4,900 E3M3/day)	Peak Load (6,720 E3M3/day)
900 E3M3/day	18%	13%	18%	13%
2,830 E3M3/day	58%	42%	76%	56%
2,688 E3M3/day	55%	40%	131%	96%
3,500 E3M3/day	71%	52%	202%	148%
2,000 E3M3/day	41%	30%	243%	177%
Up to 6,720 E3M3/day	137%	100%	380%	277%

"

Request:

(a) Please identify the gas plant operators and plant locations (legal subdivision) listed in the table and, for each, provide the corresponding potential gas supply (in 10^3 m^3/day) and the approximate distance from the facility to the project. Please confirm the gas supply is sales gas specification.

(b) Please provide, for each gas plant identified in the table, a five-year history of average gas supply (in 10^3 m^3/day). This information should be presented as monthly average daily values for each of the past five years.

(c) Please confirm which suppliers Synapse is planning to use for the project.

(d) Please confirm whether there is adequate gas supply if any of the planned suppliers have extended planned or unplanned outages (such as plant turnarounds, equipment failures or production upset events).

Response:

(a) Gas plant operators and plant locations will be available as part of Synapse's AER pipeline application. The AER pipeline application is expected to be submitted prior to an AUC hearing. Synapse can confirm gas supply will be sales gas specification.

(b) Synapse has reviewed the five-year monthly average daily gas-supply history for each plant identified in the table. Information was sourced from plant operators and AER production records. Accounting for projected production increases from one key producer/operator, analysis of the 26-month period beginning January 2024 confirms that, excluding planned turnaround periods, available monthly average daily volumes consistently exceeded peak requirements. Furthermore, these volumes exceeded normal requirements by at least 45% throughout the entire 26-month period.

Months prior to January 2024 were excluded from this analysis, as production trends showed consistent growth throughout the subsequent 26-month period.

Any gas supply available through suppliers such as TC Energy/NGTL and ATCO would be in addition to that provided in the analysis.

(c) See response (a) above. In addition to local gas plant operators, potential suppliers include, but are not limited to, TC Energy/NGTL and ATCO. Commercial conversations will be finalized following AUC permit issuance.

(d) Confirmed. Synapse intends to maintain sufficient contracted supply from multiple sources to satisfy the Project's peak demand while preserving alternative supply capacity during planned maintenance or an unplanned outage at any individual source. Planned supplier turnarounds will be coordinated through the fuel-supply planning process and accommodated using alternative contracted sources. Unplanned outages will be addressed through the remaining contracted suppliers and, where available, supplemental market gas.

Synapse-AUC-2026JUL19-010

References: **Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF pages 28-29**

Issue: **Gas supply**

Quote: "To ensure reliable gas supply over the lifetime of the Project, other options are being explored with a variety of suppliers including:

i. increasing number of additional private suppliers;

ii. working with major local sources to increase natural gas supplier production capacity;

iii. working with major local sources to improve gas plant reliability;

iv. working with major local sources to improve gas plant utilization;

v. connection to non-regulated long and short duration gas storage facilities; and

vi. the use of existing ATCO pipeline through property or supply from other nearby gas utility providers.

Synapse is committed to ensuring reliable gas supply to the facility and supporting central Alberta local natural gas producers and contractors. In the unlikely event the supply diversity and storage options identified above are not determined to provide reliable gas supply to the facility, Synapse will examine connection options into the Integrated Alberta System."

Request: Please confirm whether any local natural gas producers hold any proven undeveloped reserves in the project area and, if so, whether there are any current or planned development activities associated with those reserves.

Response: Synapse's current gas-supply assessment is based on production, gas-processing capability, and available deliverability from the operating supply sources identified. Some producers in the area have proven undeveloped gas reserves available for development. At least one plant operator's current forecast plans for a moderate increase in production. The Project does not exclusively rely upon the development of those reserves to meet the initial or peak gas requirements. Synapse will prioritize purchase of natural gas from central Alberta local natural gas producers and contractors.

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References: **Exhibit 30732-X0001, Rule 007 - Thermal Power Plant Application, PDF page 3;**

Exhibit 30732-X1223.01, Synapse Response to AUC IR No. 1, PDF page 38

Issue: **Water usage**

Quotes: Exhibit 30732-X0001, PDF page 3:
"**The cooling system details:**

- Type: 100% dry cooling system utilizing air-cooled condensers for steam cycle heat rejection and air-cooled radiators for auxiliary glycol/water systems. No continuous water consumption is required, as all process water (e.g., blowdown, sampling) is captured, treated, and returned to the closed-loop condensate cycle. The current design basis indicates a total maximum make-up water requirement of approximately 20 m^3 [cubic metres]/day across all ten (10) power blocks, attributable primarily to evaporative losses within the boiler feedwater cycle."

Exhibit 30732-X1223.01, PDF page 38:
"Synapse anticipates a total daily water demand of 60m^3, consisting of approximately 20m^3 for plant operations and 40m^3 for onsite staff."

Request:

(a) Please provide examples of real-world gas power plants using the proposed dry cooling system along with the generation capacity and water usage of those examples.

(b) Please comment on the assumptions and level of certainty associated with the water use estimates. In your response, provide the qualifications or relevant expertise of the individual(s) who prepared or reviewed the estimates.

Response:

(a) Synapse confirms that the Project's cooling-system design basis is a 100% dry-cooling configuration. Steam-turbine exhaust will be condensed using air-cooled condensers, and auxiliary heat loads will be rejected through closed-loop glycol / water systems using air-cooled radiators.

The statement in Exhibit 30732-X0001, Rule 007 - Thermal Power Plant Application that "no continuous water consumption is required" was intended to refer to cooling-water consumption for steam-cycle and auxiliary heat rejection. It was not intended to indicate that the power plant would require no process make-up water. The same response identified a maximum make-up-water design allowance of approximately 20 m³/day across the ten power blocks.

Dry cooling using air-cooled condensers is an established technology in operating Canadian combined-cycle natural-gas facilities. However, the Synapse Project differs from examples cited in Table 1, below, because its design basis combines air-cooled condensers with air-cooled auxiliary systems and the recovery, treatment and return of process drains, sampling flows and boiler-cycle water wherever practicable. As a result Synapse is able to reduce Plant water consumption by over 80% when compared to other modern air-cooled thermal plants such as the Cascade Power Plant, Chinook Power Station, Great Plains Power Station, and Greenlight Electricity Centre.

Table 1: **Example AB & SK Power Plant Capacity and Water Usage** - *Reported water estimates are drawn from publicly available project documentation and regulatory filings. They represent different measurement bases (withdrawal, consumption, make-up or wastewater discharge) and are <u>not directly comparable on a like-for-like basis</u> without adjusting for design configuration, operating regime and reporting methodology.*

Facility	Capacity	Reported Water Estimate	Approx. m^3/day per MW	Notes Regarding Water Estimates
Cascade Power Plant (Edson, AB)	~900 MW	~681 m^3/day	~0.76	Project design estimate from publicly filed project description; not represented as measured operating consumption. Value is subject to final design.
Chinook Power Station (Swift Current, SK)	353 MW	~46–50 m^3/day	~0.13–0.14	Figure identified in project documentation in association with the air-cooled condenser and process-wastewater system. Represents a wastewater or process-water design stream rather than a directly reported total operating water-consumption value; not directly comparable to the Project's make-up-water allowance.

Facility	Capacity	Reported Water Estimate	Approx. m^3/day per MW	Notes Regarding Water Estimates
Great Plains Power Station (Moose Jaw, SK)	370 MW	~350 m^3/day	~0.95	Early project description estimate of maximum water allocation for boiler-water makeup. Publicly available project information confirms the dry-cooled configuration, although a directly comparable published total operating water-consumption value has not been identified.
Greenlight Electricity Centre (Sturgeon County, AB)	Up to 1,864 MW	~1,250 m^3/day	~0.67	Approved facility included as a contemporary Alberta design benchmark. Preliminary total water requirement identified is subject to final design.
Synapse Data Center Power Plant (Olds, AB)	1,400 MW	~20 m^3/day	~0.014	Maximum operational make-up-water design allowance across all ten power blocks. Design basis combines air-cooled condensers, air-cooled auxiliary systems, and recovery, treatment and return of process drains, sampling flows and boiler-cycle water. Not yet a final vendor-guaranteed operating value.

These examples demonstrate that air-cooled condensers are commercially established at utility scale. They substantially reduce or eliminate the water demand that would otherwise be associated with wet steam-cycle heat rejection. Total facility water demand varies across air-cooled condenser designs according to:

- steam-generator configuration,
- boiler blowdown requirements,
- water-treatment recovery and reject rates,
- auxiliary cooling-system design,
- turbine washing,
- vents, drains and sampling practices,

- condensate recovery,
- operating regime, and
- whether the published value represents withdrawal, consumption, make-up or wastewater discharge.

The previously submitted Project water-demand figures remain unchanged as it represents the design basis of the facility:

- approximately 2 m^3/day per power block,
- approximately 20 m^3/day across all ten power blocks for power-plant operations,
- approximately 40 m^3/day for domestic use by on-site personnel, and
- approximately 60 m^3/day total normal site water demand.

At the time the original engineering studies and environmental assessments were initiated, the Project design basis used conventional HRSG technology, relying on condensate capture, zero-liquid discharge technologies, reverse osmosis and condensate polishing, and steam vapour condensate capture. Synapse has since continued to evaluate an OTSG configuration that may further improve upon the water-management performance of the original HRSG-equipped design. Final steam-generator selection remains subject to completion of the ongoing engineering, cost evaluations, and detailed integration engineering review.

The OTSG configuration under evaluation does not incorporate steam drums or a routine boiler-blowdown system. Published OTSG operating-experience literature indicates that OTSG combined-cycle systems without process-steam export can operate with make-up requirements of approximately 0.1% or less of cycle flow when paired with appropriate condensate recovery and high-quality feedwater treatment. OTSG and air-cooled-condenser combinations have also been deployed in industrial cogeneration and compressor-station applications. These references establish technical precedent for the individual systems but are not represented as exact capacity or operating analogues for the Synapse Project.

Synapse is concurrently evaluating:

- high-recovery reverse-osmosis treatment,
- continuous inline condensate treatment and polishing,
- electrochemical treatment of suitable recoverable water streams,
- recovery and return of suitable process drains, vents, and sampling flows, and

- segregation of water streams through ZLD technologies that are otherwise unsuitable for return to the steam cycle.

These technologies are being evaluated as means of achieving or improving upon the previously reported 20 m³/day operational design allowance. Synapse is not presently reducing its regulatory water-demand estimate below 20 m³/day based on OTSG or water-treatment performance that has not yet been confirmed through final equipment selection, vendor data and the integrated heat-and-mass balance.

Synapse has not identified a publicly documented utility-scale combined-cycle facility incorporating the identical complete combination of dry steam condensation, dry auxiliary cooling, OTSG technology, high-recovery membrane treatment, electrochemical treatment and extensive process-water recovery proposed for evaluation by Synapse. The Project may therefore represent one of the first large-scale integrations of these technologies. However, Synapse is not relying on a claim of uniqueness to support the water-use estimate.

(b) The estimate of approximately 2 m³/day per power block, or 20 m³/day across all ten power blocks, remains the Project's current maximum operational make-up-water design allowance. The approximately 40 m³/day domestic demand remains separate, resulting in a total normal site-demand estimate of approximately 60 m³/day

The operational estimate is based on the following principal assumptions:

1. Dry steam-cycle heat rejection - Steam-turbine exhaust will be condensed using air-cooled condensers. No wet cooling tower or other continuous evaporative condenser-cooling system is included in the current design basis.
2. Dry auxiliary heat rejection - Auxiliary equipment will be cooled using closed-loop glycol / water systems connected to air-cooled radiators. The design does not rely on continuous evaporative auxiliary cooling.
3. Condensate return - Condensate produced by the air-cooled condensers will be returned to the condensate and boiler-feedwater cycle.
4. No external process-steam export - The steam cycle is intended to operate as a closed power-generation cycle without continuous export of steam or condensate to an external process.

5. Recovery of suitable process streams - Suitable process drains, sampling flows, condensate streams and water-treatment streams will be collected, treated and returned wherever their quality permits.
6. Steam-cycle loss minimization - Losses associated with gland-steam systems, steam ejectors or other vacuum-system equipment, vents, drains, startup, shutdown and normal equipment operation will be minimized and recovered where practicable.
7. Water-treatment recovery - Water-treatment equipment will be configured to maximize the recovery and reuse of suitable streams. The design team is evaluating reverse osmosis, final polishing and electrochemical treatment as parts of the overall treatment and recovery train.
8. Boiler blowdown - The original HRSG configuration contemplated the recovery and treatment of boiler-cycle water wherever practicable. If the OTSG configuration is selected, the design objective will include the elimination of routine boiler blowdown. No reduction below the existing 20 m^3/day allowance has presently been credited for this potential improvement.
9. Minor unrecovered losses - The 20 m^3/day allowance provides for minor unrecovered steam-cycle, water-treatment, operating and maintenance losses requiring replacement with process make-up water.

The phrase "evaporative losses within the boiler feedwater cycle" in the original response was intended to describe minor water losses from the steam-water cycle and associated operating systems. It was not intended to indicate the use of a cooling tower, evaporative condenser or other wet heat-rejection system.

The Applicant considers the 20 m^3/day estimate to be an appropriate upper bound engineering and permitting design basis for the Project's current stage of development.

The principal cooling configuration has a relatively high level of certainty because the Project remains committed to:

- air-cooled steam condensation,
- air-cooled auxiliary heat rejection,
- closed-loop condensate return, and
- recovery and reuse of suitable process-water streams.

The detailed allocation of the 20 m³/day allowance among individual steam-cycle and water-treatment loss mechanisms has a lower level of certainty because the following items are being finalized:

- final HRSG-versus-OTSG selection,
- final steam-cycle heat-and-mass balance,
- final ACC and vacuum-system configuration,
- final condensate-polishing requirements,
- reverse-osmosis recovery and reject rates,
- electrochemical-treatment performance,
- startup and shutdown drain-recovery arrangements,
- final maintenance-water requirements, and
- vendor-specific leakage and operating allowances.

Accordingly:

- the 20 m³/day figure remains the current Project design allowance,
- it is not yet a final vendor-guaranteed operating value,
- the Applicant is not reducing the figure based on anticipated OTSG or advanced-treatment benefits,
- the ongoing design is intended to achieve or improve upon the allowance, and

This characterization is consistent with the previous AUC response, which identified the 20 m³/day value as a preliminary design basis to be confirmed through process modelling, heat-and-mass balances and vendor-specific equipment data.

The current water-use design basis and the ongoing integrated design review are being managed by Paul Cornellier, P.Eng, Vice President, Operations, Synapse Data Center Inc. His CV can be found in **Synapse-AUC-2026JUL19-011 Attachment - Cornellier CV**.

The Project's water-use and steam-cycle design is not being developed by a single individual or organization. Mr. Cornellier is supported by a multidisciplinary group with the following relevant organizational capabilities:

- A global power-generation water-treatment systems organization with experience in raw-water pretreatment, reverse osmosis, demineralization, boiler protection, condensate polishing, wastewater recovery, process optimization and integrated water-treatment equipment.

- An international industrial-water chemistry and service organization with expertise in boiler-water treatment, cooling-water treatment, process water, wastewater, reverse-osmosis membrane protection, laboratory analysis, monitoring and water-reuse optimization.
- A British Columbia-based water-technology developer specializing in modular electrochemical treatment, including electrocoagulation, electro-oxidation, contaminant removal, industrial wastewater treatment and treatability testing of project-specific water streams.
- Established steam-generation OEM expertise covering conventional HRSG systems, pressure parts, heat-transfer equipment, boiler performance and combined-cycle applications.
- Specialized OTSG design and operating expertise covering gas-turbine exhaust heat recovery, once-through steam generation, feedwater-quality requirements, combined-cycle and cogeneration applications, condensate polishing and elimination of routine steam-drum blowdown.
- A Calgary-based multidisciplinary engineering organization with experience in power-generation FEED, detailed mechanical design, electrical engineering, instrumentation and controls, automation, process safety, field verification, constructability and commissioning support.
- A global power and automation organization with experience in distributed control systems, turbine controls, generator protection, synchronization, electrical balance of plant, instrumentation, project engineering and commissioning for thermal and combined-cycle power facilities.
- A Calgary-based Owner's Engineering and project-integration organization responsible for independent coordination and review of engineering interfaces, supplier deliverables, design development and North American implementation requirements.
- A Canadian professional-engineering and subject-matter-expert network with experience in power generation, turbogenerator inspection and testing, asset integrity, risk management, regulatory compliance, incident investigation and project execution.
- Process-safety specialists with experience in Process Safety Management, Process Hazard Analysis, HAZOP, What-If analysis, LOPA, project risk assessment, operating-facility troubleshooting and process-safety training.

The design-development process therefore combines Project-level engineering management with specialist OEM, water-treatment, mechanical, electrical, automation and process-safety expertise.

The Applicant will continue to refine the integrated water balance through final equipment selection, process modelling, vendor data and treatment-system testing. Final design documentation will identify:

- normal operating make-up-water demand,
- the allocation of losses among the principal process systems,
- expected treatment recovery and reject rates,
- startup, shutdown and maintenance requirements,
- water streams suitable for recovery and return,
- water streams requiring segregation,
- applicable vendor guarantees, and
- instrumentation used to verify water use during operation.

Dedicated totalizing flow measurement will be incorporated into the final design for overall plant make-up water and, where practicable, for individual power blocks and principal treatment-system streams. This will allow actual operating performance to be measured and compared against the 20 m^3/day Project design allowance.

The approximately 40 m^3/day domestic demand remains separate from the power-plant operational estimate. The current total normal site-demand estimate therefore remains approximately 60 m^3/day, consisting of approximately 20 m^3/day for plant operations and approximately 40 m^3/day for domestic use