OPERATIONAL FLEXIBILITY

Follow-up on decision

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GLOSSARY OF TECHNICAL TERMS

1	Dawn	Point located in southern Ontario.
2 3 4	Empress	Point located on the border between Alberta and Saskatchewan, the interconnection point between TCPL's intra-Alberta system and the carrier's main system.
5 6 7	FTI	Firm Transportation Injection; condition included in the FTLH contract which allows Gaz Métro to redirect Empress's natural gas to Parkway rather than being delivered to GMIT.
8 9 10 11	FTLH	Firm Transportation Long Haul; TCPL's firm transportation service between Empress and GMIT EDA/NDA, also used broadly to characterize any firm transportation service contracted between Empress and GMIT EDA/NDA.
12 13 14 15	FTSH	Firm Transportation Short Haul; TCPL's firm transportation service between Dawn or Parkway and GMIT EDA/NDA, also used broadly to characterize any firm transportation service contracted between Dawn and GMIT EDA/NDA.
16 17	FTSN	Firm Transportation Short Notice; TCPL's firm transportation service offering 96 nomination windows.
18 19	F24T and F24S	Union Gas's firm transportation and storage service offering 13 nomination windows.
20 21	GMIT EDA	Set of interconnection points between the Gaz Métro system and the TCPL/TQM systems, located in TCPL's GMIT EDA ("Eastern Delivery Area").
22 23	GMIT NDA	Set of interconnection points between the Gaz Métro system and the TCPL system, located in TCPL's NDA ("Northern Delivery Area").
24 25	LSR	Liquefaction, storage and regasification; abbreviation used to refer to Gaz Métro's liquefied natural gas plant.
26 27	M12 and C1	Union Gas's firm transportation service between Dawn and Parkway (M12), and between Parkway and Dawn (C1).
28	Parkway	Point located in southern Ontario, northeast of Dawn.
29 30 31	STS	Storage Transportation Service; firm transportation service between Parkway and GMIT EDA; this service is available from November 1 to April 15, inclusively, every winter.
32	TCPL	TransCanada PipeLines Limited

INTRODUCTION

As part of the 2013 Rate Case, Gaz Métro Limited Partnership ("Gaz Métro") presented its
supply strategy, which is to relocate its supply structure to Dawn (ref.: R-3809-2012, B-0062,
Gaz Métro-1, Document 1, section 7). The Régie de l'énergie (the "Régie") approved Gaz
Métro's proposal in its decision D-2012-175.

Gaz Métro had listed certain issues and follow-ups that needed to be analyzed and conducted
in order to enable the relocation to Dawn. Some of these follow-ups were done in the 2014 and
2015 rate cases (ref.: R-3837-2013, B-0022, Gaz Métro-2, Document 4 and R-3879-2014, B0258, Gaz Métro-7, Document 1 and B-0421, Gaz Métro-16, Document 1).

9 The follow-up requested in decisions D-2012-175 (para. 93) and D-2014-064 (para. 89) 10 regarding operational flexibility throughout the day in the case of a supply structure relocated to 11 Dawn, including the rate base for associated costs, was presented in the 2016 Rate Case 12 (ref.: R-3879-2014, B-0615, Gaz Métro-103, Document 3, section 1).

In its decision D-2015-181,¹ the Régie acknowledged Gaz Métro's strategy for ensuring
 operational flexibility and postponed examination of the cost evaluation method to phase 2 of file
 R-3867-2013.

In order to facilitate a new examination of the method for evaluating operational flexibility costs, Gaz Métro is reproducing herein the evidence that was submitted in the 2016 Rate Case, including the sections on identifying flexibility needs and the methods available at Gaz Métro to respond to these needs. A few changes have been made to reflect the current situation. The Régie has already acknowledged Gaz Métro's strategy for ensuring operational flexibility, but a review of the conditions governing the various supply sources is first needed to get an overall picture of the supply sources and of their contribution to operational flexibility throughout the day.

¹ Section 3.2.6

1. IDENTIFICATION OF OPERATIONAL FLEXIBILITY NEEDS

Gaz Métro's supply structure is set up in a way that meets customer demand. It is comprised of the transportation capacities on the primary market (TCPL and Union Gas), swap transactions on the secondary market, and withdrawal capacities at the storage sites.

4 Load-balancing is Gaz Métro's ability to adjust its supplies to meet daily fluctuations in 5 customers' consumption in accordance with their consumption profile over the year.

In addition to daily load-balancing, Gaz Métro must be able to adjust its supplies throughout the day in order to respond to more specific customer demand and to injection needs, where applicable. This is what Gaz Métro refers to as operational flexibility. This precise adjustment of supplies throughout the day helps to limit volume imbalances on the TCPL system and, as a result, potential penalties.

11 The following description of the daily plan for a gas day provides a glimpse into the process 12 involved in determining supplies.

The gas day is defined as 10:00 a.m. on the first day to 9:59 a.m. the next day. For example, the May 1 gas day is from May 1, 10:00 a.m., to May 2, 9:59 a.m. The daily plans are determined on the previous business day (in this case, April 30), as follows:

- 1. Evaluation of the forecast customer demand based on a linear regression and the 17 weather forecast for the day in question. This forecast can be adjusted based on 18 specific elements, such as:
- 19 a. information on load variations for major customers;
- 20 b. the load trend observed in recent weeks (similar days and degree-days);
- c. weekends or statutory holidays;
- d. a slight margin in the demand in order to ensure, insofar as possible, the adjustment
 of supplies throughout the day, i.e., an increase during the winter, as it is easier to
 decrease supplies than increase them; and, conversely, a decrease during the
 summer, as it is easier to increase supplies than to decrease them.
- 26 2. Evaluation of other needs, such as compressor fuel to be provided (transportation and 27 storage) and injection needs at the different storage sites; and

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1 2 3 3. Establishment of supply plan tools based on availability, natural gas purchases at the different purchase points, withdrawals from storage sites, if required, and the interruption of interruptible service customers, where applicable.

The supply plan is finalized by sending the nominations to the various suppliers the day preceding the gas day in question: before 1:00 p.m. for TCPL and before 11:45 a.m. for Union Gas (e.g., send on April 30 for the May 1 gas day).

7 Throughout the gas day (here, May 1), Gaz Métro then adjusts the use of its supplies based on 8 fluctuations observed in the demand over the elapsed period and the impact on the total 9 anticipated consumption for the day. These fluctuations can be due to changes in the weather 10 (over the elapsed period and based on forecasts for the rest of the day), customer consumption 11 variations for reasons unrelated to the weather, or purely operational reasons that were forecast 12 to ensure a reserve of firm capacities, as explained in point 1d) above.

The following table presents the supply plan tools by rank. This table is adapted daily, depending on the availability of the tools. It is an application guide on special operational circumstances that could lead to different decisions being made. Application relating to the allocation of costs and rate structure of Gaz Métro, R-3867-2013



The use of transportation capacities between Dawn and the Gaz Métro territory (TCPL and Union Gas) is combined with natural gas purchases at Dawn or withdrawals from the Union Gas storage site. Natural gas purchases at Dawn contracted in advance will be prioritized, since they are already contracted. The balance of supply needs will be met with withdrawals from the storage site and daily (spot) purchases of natural gas, depending on the contract terms and the storage management strategy at Union Gas.

7 The operational flexibility to adjust supplies to fluctuations in daily demand varies with each tool,

8 with some being more flexible than others, and some having no flexibility at all.

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1 The contract condition that guarantees operational flexibility is the presence of nomination 2 windows for each tool (transportation and withdrawal/injection capacities at the storage sites) 3 throughout the day, and, more specifically, the windows that are commonly used.

The supplies resulting from swap transactions on the secondary market and the deliveries from customers who provide their own transportation service create no operational flexibility throughout the day. This is the case for the Saint-Flavien storage site, whose daily withdrawal and injection profile is not adjusted throughout the day, as defined in the annual performance notice.

8 The Pointe-du-Lac storage site offers three nomination windows throughout the day. This 9 storage site is used only during the winter. It is a tool used to load-balance the consumption of 10 heating customers. Gaz Métro therefore feels that these costs should be considered under the 11 load-balancing service.

12 The following table presents the different nomination windows by contract type and names used 13 in the gas industry for TCPL and Union Gas transportation services.

During the gas day

Table 2 TCPL Union Gas Effective (1) Name Time Shift⁽¹⁾ FTLH & ST S & M12, C1 & FT SH⁽²⁾ FTI (8) Storage (4) Timely 13 h 00 10 h 00 Next day х х х P revious (NAESB) day of the Evening 19 h 00 10 h 00 Next day х х x gas day (NAESB) STS 11 10 h 00 12 h 00 Same day х х Intra-day 1 11 h 00 18 h 00 Same day х х х (NAESB) STS 17 16 h 00 18 h 00 Same day х х

х

х

х

х

х

х

х

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(1) Eastern Standard Time

18 h 00

00 h 00

04 h 00

Intra-day 2

(NAESB) STS 1

STS 5

(2) FTLH = Firm Transportation Long Haul (Empres-GMIT EDA)

FTSH = Firm Transportation Short Haul (Dawn or Parkway-GMIT EDA) (3) STS = Storage Transportation Service (Parkway-GMIT EDA) FTI = Firm Transportation Injection (Empres-Parkway)

22 h 00

02 h 00

08 h 00

Same day

Same day

Same day

(4) M12 = Transportation Contract with Union Gas (Dawn-Parkway)
 C1 = Transportation Contract with Union Gas (Parkway-Dawn)
 The time shift of the Timely window is fixed to 11 h 45 for Union Gas

Note that only Timely nominations are firm. Any changes throughout the day are subject to

2 approval by the carriers. Effective April 1, 2016, the nomination windows were slightly changed,

3 including the addition of an NAESB window to replace the STS-17 window. However, the STS-1

4 and STS-5 windows remain the same.

5 The STS (Storage Transportation Service) contract allows Gaz Métro to transport natural gas 6 between Dawn and GMIT. This service is firm between November 1 and April 15. Outside of this 7 period, the service is offered by TCPL on a "Best Effort" basis. This service is conditional on 8 having FTLH contracts and storage contracts at Dawn.

9 The FTI (Firm Transportation Injection) service is a condition included in the FTLH contract, 10 which allows Gaz Métro to redirect natural gas from Empress to Parkway to then be transported 11 to Dawn—using Union Gas C1 transportation capacities—rather than being delivered to GMIT. 12 This is a year-round firm service (at the first nomination window) but is mainly used during the

13 summer. The option of using FTI is dependent on having an STS contract.

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The historical principle underlying the management of these capacities was as follows: To withdraw natural gas from the storage site and use the STS from Parkway to GMIT, an injection must have been made the previous summer using the Empress FTI to Parkway. A specific follow-up of quantities injected by FTI and withdrawn by STS is in place (Storage Balance); this point will be discussed in more detail in section 2.1. The FTI service is mainly used during the summer to adjust supplies, while the STS is mainly used during the winter, when this service is firm.

Note that TCPL filed an application with the National Energy Board to change this service as of April 1, 2017.² The main change affecting Gaz Métro is that the STS will be divided between the EDA and NDA zones, both in terms of capacities and management of the "Storage Balance," whereas both zones are currently managed together. The use of this service will remain the same.

12 The nomination windows made available by Union Gas correspond to the STS and FTI 13 windows, both for transportation and storage.

As such, throughout the gas day, there are six windows for FTI, STS, and Union Gas services,

compared to two windows for the FTSH and FTLH. The following example illustrates the use

16 throughout the day of adjustments to FTI and STS.

The following figure illustrates the current situation, i.e., the transportation capacities forecast for summer 2016 by delivery point: Empress, Dawn, and franchises.

² File RH-001-2016: "Application for Approval of Storage Transportation Service Modernization and Standardization"



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1 The following figures illustrate the planning process at the start of and through the course of the

2 day, based on a summertime demand that is higher during the day and that decreases

3 thereafter.

- 1 Figure 2 illustrates the planning of transportation capacities at the first nomination window
- 2 based on a demand of 17,400 10³m³/day. The black arrows indicate the planned gas flows at
- 3 the first nomination.



Figure 2

- 1 Subsequently, an increase in demand of 1,100 10³m³/day is forecast and planned at the STS-17
- 2 nomination window, sent at 4:00 p.m. for effective application at 6:00 p.m. Figure 3 illustrates
- 3 the actions to take. The red arrows indicate the planned gas flows at the second nomination.



- 4 As indicated in Table 2, at the STS-17 window, the nominations from FTSH (Parkway and
 - 5 Dawn) cannot be changed (grey values in the figure). As such, use of the STS and M12 will be
 - 6 considered in order to meet the need. As for the natural gas needed to meet the demand,
 - 7 a withdrawal of $1,100 \ 10^3$ m³/day from the Union Gas storage site is nominated.

Finally, a decrease in the demand of 600 10³m³/day is forecast during the night, requiring adjustments to the STS-5 nomination window, sent at 4:00 a.m. for effective application at 6:00 a.m., i.e., four hours before the end of the gas day. The figure below illustrates the actions to take. The green arrows indicate the planned gas flows at the third nomination.





As presented in Table 2, the nominations for SH-Parkway and SH-Dawn transportation 5 capacities (grey values in the figure) can only be changed at the STS-5 window. Only STS and 6 FTI contracts can be changed. However, in the event supplies are revised downward, the 7 concept of "no negative flow rate" is taken into account, in compliance with TCPL's nomination 8 conditions. This means that we cannot reduce the nomination to below the quantity that is 9 considered to have flowed. In the example illustrated in Figure 4, the initial nomination of 10 1,100 103m3 from STS (STS-17) covered 16 hours (from 6:00 p.m. to 10:00 a.m. the following 11 day) and the revision is applicable for the last four hours. Therefore, a quantity of 825 10³m³ 12 (1,100/16x12) would have flowed over the previous 12 hours. The reduction permitted for the 13 14 STS and M12 nomination is therefore 275 10³m³ (1,100 10³m³ - 825 10³m³).

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The balance of the downward adjustment in supplies would then be achieved using the 1 Empress FTI to Parkway. The concept of "no negative flow rate" is also taken into account but 2 does not cause a problem in the example used because the FTLH capacity could be decreased 3 to 7,954 10³m³ (9,545/24x20). The FTLH reduction of 425 10³m³ (700 – 275 10³m³) and the 4 engagement of an equivalent FTI quantity are nominated. Based on the example given, 5 a decrease in the nomination for M12 transportation capacities would also be considered. The 6 engagement of the C1 contract is not required in this example, because the decrease in the 7 nomination (700 10³m³) is less than the quantity nominated under the M12 contract. The 8 9 concept of "no negative flow rate" does not apply to Union Gas contracts, meaning that the total 10 reduction from the example can be applied to the M12 contract.

11 To complete the final plan for the day, a decrease in withdrawals from the Union Gas storage 12 site would also be considered in terms of the supply.

13 While several scenarios can occur throughout the day, the above-mentioned principles would

still apply. As such, operational flexibility throughout the day will mainly be managed by the FTI,

15 STS, M12, and C1 services and by the Union Gas storage site.

The following tables present the nomination variations observed over the summer (October 2013 and from April 1 to September 30, 2014, i.e., 214 days) under the FTI service and over the winter (from November 1, 2013, to March 31, 2014, i.e., 151 days) under the STS. The last column represents the frequency of variations between the Intra-day-2 window (the last window available for FTLH and FTSH contracts) and the STS-5 window (the last window available for STS and FTI contracts). It demonstrates the use of the STS-1 and STS-5 windows to adjust supplies after the nomination of the Intra-day-2 window.

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Table 3

Variations of FTI nominations (Summer)

	Nomination window - effective time			Variation		
10³m³	12 : 00 vs Timely	18 : 00 vs 12 : 00	22 : 00 vs 18 : 00	02 : 00 vs 22 : 00	06 : 00 vs 2 : 00	6 : 00 vs 22 : 00
x < -1,979	0	1	0	0	0	0
-1,979 < x <= -1,320	0	2	1	0	0	0
-1,320 < x < = -660	0	21	9	0	0	0
-660 < x <= 0	0	19	16	25	34	51
x = 0	214	164	167	146	78	41
0 < x <= 660	0	5	14	35	96	100
660 < x <= 1,320	0	2	6	8	6	22
1,320 < x <= 1,979	0	0	0	0	0	0
1,979 < x	0	0	1	0	0	0
# of days	214	214	214	214	214	214

Table 4

Variations of STS nominations (Winter)						
	Nomination window - effective time				Variation	
10³m³	12 : 00 vs Timely	18 : 00 vs 12 : 00	22 : 00 vs 18 : 00	02 : 00 vs 22 : 00	06 : 00 vs 2 : 00	6 : 00 vs 22 : 00
-2,641 < x <= -1,979	0	4	0	0	0	0
-1,979 < x <= -1,320	0	4	1	3	0	6
-1,320 < x < = -660	0	6	11	25	5	33
-660 < x <= 0	0	5	5	20	70	55
x = 0	151	121	126	91	62	38
0 < x <= 660	0	7	8	11	14	18
660 < x <= 1,320	0	1	0	1	0	1
1,320 < x <= 1,979	0	1	0	0	0	0
1,979 < x	0	2	0	0	0	0
# de jours	151	151	151	151	151	151

- 1 The last effective window at 6:00 a.m. (STS 5) is highly used given that 75% of the gas day has
- 2 already elapsed at the time the nominations are reviewed. Conversely, the 10:00 p.m. window
- 3 (Intra-day 2) is hardly ever used since only 33% of the gas day has elapsed by 6:00 p.m., when
- 4 the nomination must be sent to the carriers.

- 1 These tables clearly show that the adjustments made throughout the day are mainly done using
- 2 the FTLH transportation capacities (FTI and STS portions), given the use of the STS-1 and
- 3 STS-5 windows after the last Intra-day 2 window available for FTLH and FTSH.

2. STRATEGIES TO MEET THE NEED FOR FLEXIBILITY GIVEN THE RELOCATION TO DAWN

Following the relocation of the supply structure to Dawn, and in accordance with the Agreement
with TCPL, Gaz Métro will hold minimum FTLH transportation capacities of 2,243 10³m³/day
(85,000 GJ/day) between Empress and its territory until December 31, 2020.

To complete the relocation of its supply structure to Dawn, Gaz Métro will ask TCPL to cover 7 almost all the FTLH and FTSH transportation capacities between Parkway and its territory. The 8 objective will be to maintain a minimum transportation capacity of 26 10³m³/day (1,000 GJ/day) 9 between Empress and GMIT EDA, and an equivalent capacity between Empress and 10 GMIT NDA to preserve STS's usage rights toward these two points. In fact, contractually 11 speaking, Gaz Métro must hold FTLH transportation contracts (Empress-GMIT) in order to be 12 able to hold STS transportation contracts (Parkway-GMIT) and have access to the FTI service 13 (Empress-Parkway). Given that TCPL contracts usually take effect on November 1, this 14 conversion could realistically take effect on November 1, 2021. 15

As such, the strategy for meeting operational flexibility needs will be different before and after
 November 1, 2021.

2.1. Operational flexibility before November 1, 2021

- As mentioned previously, Gaz Métro will hold FTHL transportation capacities of 2,243 10³m³/day until October 31, 2021, the deadline for finalizing the conversion of capacities.
- For now, Gaz Métro does not foresee any major obstacles to meeting its operational flexibility needs given the presence of the FTI service included in the FTLH contract.
- Gaz Métro may be required to use the STS over the summer if the capacity available under the FTI service is insufficient to meet flexibility needs throughout the day. The STS contract provides for a firm service (at the first nomination window) from November 1 to April 15. For the period from April 16 to October 31, the service is provided on a "Best Effort" basis. It

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should be available barring any problems with the TCPL system. In previous years, Gaz
Métro rarely used this service during the summer. The historical data from 2013-2014 show
an actual use of around 30 days out of a potential 214 days, mainly at the last effective
nomination window, at 6:00 a.m. (STS-5), in order to balance the final demand during the
last nomination.

A special feature of STS and FTI companion contracts relates to costs. There is an account 6 called "Storage Balance" in which quantities used under the FTI accumulate and from which 7 quantities used under the STS are deducted. As long as the account balance is positive, i.e., 8 9 the total quantities transported under the FTI are greater than those transported under the 10 STS, use of the STS is billed at TCPL's STS rate. If the account is at zero or negative, 11 additional fees apply to the volumes transported and represent the difference between 125% of the SH-Parkway rate and 100% of the STS rate. Based on the TCPL rates currently 12 in effect, the SH Parkway and STS rates to GMIT are identical. Therefore, the surcharge 13 represents 25% of the STS rate, applied to the transported volumes. 14

- 15 The "Storage Balance" account is currently posting a positive balance. However, it could be 16 depleted by 2017-2018 if no changes are made to the management strategy.
- 17 The following table illustrates the historical use of the FTI.

Year	Total FTLH	FTI	Ratio
	10 ⁶ m³	10 ⁶ m³	
2013-2014	3,116	306	9.8%
2012-2013	1,762	171	9.7%
2011-2012	1,807	162	9.0%

Table 5

Assuming that 10% of the FTLH capacities are actually used for FTI and that use of the STS corresponds to the winter forecast in the 2016-2019 supply plan, i.e., concentrated use during the winter, the cumulative amount in the "Storage Balance" account until 2019 would be as follows:

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Table 6

Year	FTLH Capacity	FTI	STS	Cumulative
	10 ⁶ m³	10 ⁶ m³	10 ⁶ m³	10 ⁶ m³
(1)	(2)	(3)	(4)	(5)=(2)+(3)-(4)
30/09/2014				546
2014-2015	3,244	324	412	458
2015-2016	3,497	350	327	481
2016-2017	1,080	108	323	266
2017-2018	822	82	292	56
2018-2019	819	82	283	-145

However, up until 2021, during which the FTLH capacity between Empress and EDA will be 2,243 m³/day, Gaz Métro could apply a strategy whereby, from May to September, it would 3 redirect a portion of the natural gas to Parkway (rather than EDA) using the FTI service 4 (e.g., 1,188 m³/day). To meet needs in EDA, it would prioritize the use of the Parkway-EDA 5 FTSH and the STS for flexibility purposes. This type of management could help sustain the 6 "Storage Balance" account and avoid surcharges on STS contracts for a little while longer.

The following table presents a forecast for the "Storage Balance' account based on this strategy
 applied over the horizon of the supply plan, while maintaining the intended use of the STS:

Table	7
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Year	FTLH Capacity	FTI *	STS	Cumulative
	10 ⁶ m³	10 ⁶ m³	10 ⁶ m³	10 ⁶ m³
(1)	(2)	(3)	(4)	(5)=(2)+(3)-(4)
30/09/2014				546
2014-2015	3,244	324	412	458
2015-2016	3,497	350	327	481
2016-2017	1,080	182	323	340
2017-2018	822	182	292	229
2018-2019	819	182	283	128
2019-2020	821	182	283	27
2020-2021	819	182	283	-74

* 2014-2015 and 2015-2016 = 10 % of FTLH

Thereafter = 1,188 10³ m³ from May to September, that is to say 153 days

However, such a strategy could involve an increased use of the STS, which would speed up
 the depletion of the "Storage Balance" account.

That said, once the "Storage Balance" account is almost completely depleted, Gaz Métro 3 will consider converting all or part of the current STS capacities to a Short Haul Enhanced 4 Market Balancing Service (SH-EMB) contract in order to maintain operational flexibility. The 5 balance will then be converted to an FTSH contract. The quantities to be contracted under 6 7 each service will be determined in order to meet the need, while optimizing costs. The SH-EMB is a new service developed by TCPL, as part of the Agreement between TCPL and the 8 three gas distributors (Union Gas, Enbridge, and Gaz Métro), and which is similar to the 9 10 STS, i.e., a firm service from November 1 to April 15, and a "Best Effort" service from April 16 to October 31. However, it does not include a requirement to hold FTLH. Moreover, the 11 nomination windows available under the STS are also available for the SH-EMB. The main 12 difference with this service is the rates, which correspond to a 10% increase in the FTSH 13 rate applicable to the total capacity contracted. 14

The following table presents the STS costs, based on a zero or negative balance for the "Storage Balance" account (25% surcharge on capacities used), compared to the SH-EMB costs (10% higher rate). The actual STS capacities (contracted and used) were taken into consideration.

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Table 8

	ST	S	SH-EMB
	(1)	(2)	(3)
Utilisation	actual	+28%	
Contracted Capacity			
10 ³ m ³ /day	5,705	5,705	5,705
10 ⁶ m³/year	2,082	2,082	2,082
Rate (¢/m³)	2.505	2.505	2.755
Fixed Cost (\$,000)	52,155	52,155	57,371
Utilised Capacity (10³m³/year)	651,060	833,357	
Surcharge (¢/m ³)	0.626	0.626	
Variable Cost (\$,000)	4,076	5,218	n/a
Total Cost (\$,000)	56,232	57,373	57,371

1 This calculation shows that the SH-EMB is not necessarily a less costly option than 2 maintaining the STS with a negative "Storage Balance" account. The SH-EMB would 3 become less costly, all things being equal, if the capacity used under the STS were 4 increased by 28%.

5 Use of the STS to meet operational flexibility needs will therefore be analyzed in more detail 6 over the coming years, once the relocation to Dawn is completed, in order to pinpoint 7 exactly when the SH-EMB would become more advantageous and to evaluate the quantity 8 needed to meet operational flexibility needs.

9 The following sample plan, similar to that presented in section 1, illustrates the strategy that 10 could be applied—this time in the 2017 context—with the structure relocated to Dawn.

Figure 5 presents the forecast available capacities for 2017, by delivery point: Empress, Dawn, and franchise.





- 1 The following figures illustrate the planning process at the start of and through the course of 2 the day. For illustration purposes, an FTI nomination of 1,188 10³m³ is planned from the first
- 3 nomination in order to support the "Storage Balance" account.
- Figure 6 illustrates the planning of transportation capacities at the first nomination window
 based on a demand of 17,400 10³m³/day.

6

As of the first nomination, a quantity of STS is nominated to meet operational needs. This service is used to adjust the capacities throughout the day to the STS windows, in order to meet fluctuations in demand. The FTSH service is used, but the quantities cannot be changed at the STS-1 and STS-5 windows later in the gas day.



Figure 6

Subsequently, an increase in demand of 1,100 10³m³/day is forecast and planned at the STS-17 nomination window, sent at 4:00 p.m. for effective application at 6:00 p.m. Figure 7 illustrates the actions to take. The red arrows indicate the planned gas flows at the second nomination.

As mentioned above, at the STS-17 window, the nominations from FTSH (Parkway and Dawn) cannot be changed (grey values in the figure). As such, an increase in the STS and M12 is being considered to meet the demand. As for the natural gas required to meet the demand, a withdrawal of 1,100 10³m³ from the Union Gas storage site is nominated.



Figure 7

Application relating to the allocation of costs and rate structure of Gaz Métro, R-3867-2013

Finally, during the night, a downward revision in the demand is forecast and requires adjustments at the STS-5 nomination window, sent at 4:00 a.m. for effective application at 6:00 a.m., i.e., four hours before the end of the gas day. The figure below illustrates the actions to take. The green arrows indicate the planned gas flows at the third nomination.



The nominations for SH-Parkway and SH-Dawn transportation capacities (grey values in 5 Figure 8) cannot be changed at the STS-5 window. Only STS and FTI contracts can be 6 changed. Considering the concept of "no negative flow rate," the STS capacity can be 7 reduced to 1,825 10³m³ at the STS-5 window. To complete the decrease in the demand, the 8 FTI nomination will be increased, leading to a drop in FTLH capacities. Again, the concept of 9 "no negative flow rate" applies, and the FTLH can be reduced up to 965 103m3. As such, it 10 can be nominated at the target level of 1,033 103m3. A decrease in withdrawals from the 11 storage site would also be considered in terms of supply. 12

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- Note that in this example, the heavier use of the STS (1,825 10³m³) compared to the FTI
 (1,313 10³m³) would result in a drop in the "Storage Balance" account.
- In conclusion, operational flexibility before November 1, 2021, will be achieved using FTI,
 STS, or SH-EMB supplies, M12, C1, and the Union Gas storage site.

2.2. Operational flexibility after November 1, 2021

As of November 1, 2021, Gaz Métro will have relocated almost all of its supply structure to
 Dawn, potentially keeping only 53 10³m³/day of FTLH capacity toward its territory, in order to
 maintain its rights to the STS.

8 In this context, the operational flexibility currently available via the FTI service associated 9 with the FTLH service will no longer exist.

The option to convert part of the current STS capacities to an SH-EMB contract in order to maintain operational flexibility, and the balance convertible to an FTSH contract will be implemented, if this has not already been done. If the STS or SH-EMB remained available over the summer even though they are services offered on a "Best Effort" basis, Gaz Métro could then continue to use them to meet its operational flexibility needs.

On the other hand, if obstacles on the TCPL system threaten the availability of these services over the summer, Gaz Métro will then have to consider contracting the Firm Transportation Short Notice (FTSN) service from TCPL, in combination with Union Gas's F24T and F2S4 services.

19 TCPL implemented the FTSN service in November 2006. This service, developed and 20 intended mainly for cogeneration plants in Ontario, offers 96 nomination windows (every 21 15 minutes). Moreover, nominations are firm at all windows. Contracting this service 22 requires a specific delivery point (e.g., a TCPL meter installed at a customer) rather than a 23 general delivery point, such as GMIT EDA. The rate for this service corresponds to the 24 FTSH rate plus 10%, resulting in a price equivalent to the SH-EMB.

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Gaz Métro could use this service between Parkway and its territory if it defined one or more delivery points in GMIT EDA and GMIT NDA as specific points, depending on the needs evaluation. To do so, TCPL would need to install meters dedicated to this service, in addition to the existing meters, and define the capacities attributed to said service. The TCPL would have to apply to the National Energy Board (NEB) to add these meters. Meanwhile, Gaz Métro might also need to install additional meters to validate TCPL's readings.

In addition to this service, Gaz Métro would also have to contract the F24T transportation service from Union Gas to connect Parkway and Dawn, as well as F24S storage capacity to withdraw from or make injections at the site. These services provide a total of 13 nomination windows, compared to the 8 currently available. Moreover, nominations are firm at all windows. The rate for the F24T service is determined based on the M12 rate, plus \$0.00227/GJ (0.0086¢/m³). As for the F24S storage capacity, the price is negotiated like any other storage contract.

15 At first glance, these services seem like a good option for meeting operational flexibility needs, but they would lead to an increase in costs related to the installation of separate 16 meters and to a considerable increase in operational management needs, given the delivery 17 points in addition to the existing GMIT EDA and GMIT NDA points, and the fractionation of 18 nominations required between these different points at different windows. A major IT 19 development would be needed to operationalize the management of such contracts. This 20 option would therefore be considered as a last-resort solution if the other services offered by 21 22 TCPL are unable to meet the flexibility needs.

2.3. TCPL's Limited Balancing Agreement (LBA)

To complete the information, it is necessary to determine the financial impacts if Gaz Métro is unable to perfectly adjust supplies to the total demand for a given day. This type of imbalance is subject to the contractual terms of the "Limited Balancing Agreement" (LBA).

The variation between nominations and consumption is observed the following day. TCPL produces a daily report to this effect, which shows the fluctuation in total demand that Gaz Métro was unable to adjust during the gas day using the nomination windows. If an

- imbalance—positive or negative—occurs during the day, it must be adjusted as soon as
 possible to avoid incurring penalties (LBA fees).
- 3 Penalties are billed as soon as the daily variance exceeds 2%, with an incremental increase
- in fees at 4%, 8%, and beyond 10%. Moreover, additional fees related to the cumulative
 variance greater than 4% and 6% are also applicable.
- 6 As such, the first 2% variance in a given day is not subject to penalties.
- 7 The 2% tolerance level is applied at a maximum between the daily nomination and the
- 8 average nominations over the past 30 days. For illustrative purposes, the monthly averages
- 9 of tolerances evaluated daily for 2013-2014 are as follows:

Month	Nomination	Tolerance of 2%
	10 ³ m ³ /day	10 ³ m ³ /day
October	13,303	266
November	18,975	380
December	22,425	448
January	22,980	460
February	22,669	453
March	21,681	434
April	18,384	368
May	13,985	280
June	11,662	233
July	10,746	215
August	10,887	218
September	11,499	230
Minimum	10,284	206
Maximum	24,713	494

Table 9

- 10 These results show that the tolerance level during the summer is much lower than that 11 applicable during the winter, resulting directly from the drop in demand during the summer 12 and, consequently, in the daily nomination.
- As an example, the following table presents the estimated penalty for a daily variation during the summer of 800 10³m³ added to the cumulative variation for the previous day of 100 10³m³, generating a cumulative variation of 900 10³m³ for the gas day. For illustration

8.364 ¢/m3

- 1 purposes, the tolerance levels were calculated based on a daily nomination of 10,284 10³m³,
- 2 i.e., the minimum nomination observed in 2013-2014 identified in Table 9.

Table 10

TCPL Rate (FTLH)

Example of LBA charges calculation

Daily Nomination	10,284	10³m³
Cumulative Variance the previous day	100	10³m³
Daily Variance of the gas day	800	10³m³
Cumulative Variance of the gas day	900	10³m³

LBA charges calculation by level						
Daily Tolerance						
% of the daily nomination	<=2%	2% to 4%	4% to 8%	8% to 10%	> 10%	Total
Lower bound (103m3)	0	206	/11	823	1 028	
Upper bound (10 ³ m ³)	206	411	823	1,028	none	
Excess Volume per level (10 ³ m ³)	206	206	389	0	0	800
Penality in % of FTI H rate	0	20%	50%	75%	100%	
Unit cost (¢/m ³)	0.000	1.673	4.182	6.273	8.364	
Penality daily tolerance (\$)	0	3,441	16,252	0	0	19,692
Cumulative Tolerance	. 40/	40/ to 60/	. 60/			
% of the daily normination	<=4%	4% 10 6%	> 0%			
Lower bound (10 ³ m ³)	0	411	617			
Upper bound (10 ³ m ³)	411	617	none			
	444	000	000			000
Excess volume per level (103m3)	411	206	283			900
Penality in % of FTLH rate	0	15%	25%			
Unit cost (¢/m³)	0.000	1.255	2.091			
Penality cumulative tolerance (\$)	0	2,580	5,916	0	0	8,497
Total I BA abargaa for the variance of th		(¢)				20 100

As such, a daily variation in nominations of 800 10³m³/day could result in LBA fees of almost \$30,000 for a single day. As previously mentioned, Gaz Métro aims to adjust the cumulative variation as soon as possible, normally throughout the day, on receipt of the report from TCPL, in order to limit recurring fees related to the cumulative variation. If an adjustment is not possible during the day, LBA fees will begin to accumulate.

- Note that the LBA was not designed for use as a service. Article 7 of Section XXII of the
 General Terms and Conditions of TCPL's Transportation Tariff also stipulates the following:
- 3 « 7. Obligation to Balance Accounts
- Payments of balancing fees under this Section XXII do not give Shipper the right to
 receive or deliver unauthorized quantities, or incur Cumulative or Daily Variances, nor
 shall payment of the balancing fees be a substitute for other remedies available to
 TransCanada. »

8 The LBA is not a tool, and the penalties that may be incurred are an indication of insufficient 9 operational flexibility. Moreover, depending on its extent, an imbalance can affect TCPL's 10 system and, as a result, Gaz Métro's system.

- If Gaz Métro had to use this service to balance its demand, despite the terms of Article 7 of 11 Section XXII of the General Terms and Conditions of TCPL's Transportation Tariff, this could 12 earn it an "Emergency Operating Condition" (EOC). This would result in it being billed fees 13 14 equivalent to one or two times a price index, depending on the variance level. This index corresponds to the highest price of the commodity at one of TCPL's delivery points for the 15 16 day on which the variance occurred. This means that the penalties for volume imbalances 17 can be significant. Based on the example in Table 10 of a daily variance of 800 10³m³ and a 18 cumulative variance of 900 103m3, as well as the maximum price index observed in 19 2013-2014, the penalties could amount to almost \$2 million.³
- 20 Regardless of the LBA fees that could be incurred, Gaz Métro does not deem it prudent to 21 affect the TCPL transportation system by generating volume imbalances, and would like to 22 respect the TCPL rate, as approved by the NEB.
- 23 As such, Gaz Métro must have the supplies required to meet its needs, including operational needs.

³ Highest price observed at Iroquois on January 22, 2014: \$74.13/GJ.

2.4. Change to TCPL services

Operational flexibility constraints stem from the fact that the FTSH services have only two nomination windows during the day (three, according to the new nomination schedule), the last being effective at midday, but nominated at the one-third point of the day, just before midday according to the new nomination schedule. If all of the windows available for the STS and FTI services were applicable to the other types of services, then Gaz Métro would have all the flexibility it needed to adjust its supplies.

As previously mentioned, TCPL added the SH-EMB, which is equivalent to the STS. This
 service includes the same nomination windows as the STS, but remains a firm service only
 during the winter.

Gaz Métro therefore intends to continue to make TCPL aware of the issue of operational flexibility with firm SH services that have only two nomination windows during the day. Whether the solution is firm year-round STS and SH-EMB services, or any other option, Gaz Métro wants to be able to rely on a transportation service that will give it the operational flexibility it needs during both the winter and the summer.

3. IDENTIFICATION OF COSTS

As outlined in the previous sections, operational flexibility throughout the day is managed by the terms of FTI and STS contracts with TCPL, combined with M12 and C1 services, and storage at Union Gas.

The nomination windows provided for under these services are only a portion of the total related costs, and the current TCPL or Union Gas rates do not specifically target the value of providing additional nomination windows. The purpose of this section is to estimate the portion of costs attributable to operational flexibility.

3.1. TCPL's STS

Currently, the rate for the STS is equivalent to the FTSH service between Parkway and Dawn. As explained in section 2, the costs for this service are subject to a "Storage Balance" volume account, which is increased by the quantities used under the FTI and depleted by the quantities used under the STS.

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As long as the account balance is positive, use of the STS is billed at TCPL's STS rate, which is equivalent to the FTSH-Parkway rate. If the account balance is zero or negative, additional fees will apply to the volumes used, representing the variance between 125% of the SH-Parkway rate and 100% of the STS rate. In concrete terms, the surcharge represents 25% of the STS rate, applicable to the STS volumes used.

6 This characteristic of the "Storage Balance" account suggests that managing the nomination 7 windows in the STS does not involve additional costs as long as the volume account 8 balance remains positive. However, if the volume account balance were to fall below zero 9 and a surcharge were applied, this could be considered an operational flexibility cost related 10 to the STS.

As mentioned in section 2, Gaz Métro will consider converting STS contracts to FTSH-EMB contracts once the "Storage Balance" account is almost completed depleted. For the moment, no operational flexibility cost would be considered for this service.

Gaz Métro proposes that the specific cost of operational flexibility related to the STS be equal to the 25% surcharge on the STS rate on the STS volumes used, if such a surcharge is billed.

If TCPL's proposal were accepted and if the STS had to be managed separately for the
 GMIT EDA and GMIT NDA zones, this proposed cost processing method would remain in
 place, but be applied based on the findings for each zone.

3.2. TCPL's FTI service

As explained in section 1, the FTI service is a condition included in the FTLH contract that allows Gaz Métro to redirect the natural gas from Empress to Parkway mainly during the summer, based on a firm service at the first nomination. However, it is conditional to having STS transportation capacities and storage capacity at Dawn. 1 In terms of rates, Gaz Métro is not billed any surcharge for the right to use the FTI service.

For example, if a Gaz Métro customer has an FTLH transportation contract between Empress and the EDA with TCPL, but does not have any STS transportation capacity or storage capacity at Dawn, it cannot avail itself of the conditions of the FTI contract. Yet this customer pays the same price as Gaz Métro.

6 As such, no operational flexibility cost would be considered for this service.

3.3. Union Gas service – M12

The M12 transportation service between Dawn and Parkway, combined with TCPL's
 services (SH-Parkway, STS and, where applicable, SH-EMB), address the supply needs of
 the section between Dawn and Gaz Métro's territory.

Evaluation of M12 capacities for operational flexibility

The capacity related to operational flexibility would be equivalent to the TCPL capacities identified as operational flexibility tools, i.e., STS and, where applicable, SH-EMB. Since the SH-Parkway capacities are not identified as being operational flexibility tools, the same applies for the corresponding M12 capacities.

The following table presents the breakdown of M12 capacities associated with the SH-Parkway and STS capacities, pro rata to the capacities held with TCPL, for the three years of the supply plan.

Λ	nnligation	relating to	the allocation	of agata and ra	to otructure of	Co- Mátro	D 2067 2042
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Table 11

TCPL - Parkway - City Gate			M12 related to			
Year	SH-Parkway	STS	Total	SH-Parkway	STS	Total
	10 ⁶ m³					
2016-2017	4,134	2,082	6,217	4,187	2,109	6,295
	66.5%	33.5%				
2017-2018	4,779	2,082	6,861	4,839	2,109	6,948
	69.7%	30.3%				
2018-2019	4,809	2,082	6,891	4,869	2,109	6,978
	69.8%	30.2%				

Evaluation of operational flexibility cost

1 Union Gas's rate for the M12 service is \$0.085/GJ (0.322¢/m³).

2 To evaluate the operational flexibility related to the nomination windows for the M12 service,

3 Gaz Métro used the additional costs of the F24T service offered by Union Gas as a baseline.

- This is a firm transportation service for the four NAESB windows and nine additional windows, i.e., a firm service all day long. The additional cost for this service, based on current Union Gas rates, is \$0.00227/GJ (0.009¢/m³). Following discussions with Union Gas, the latter indicated that close to 75% of this cost is related to the possibility of making a firm nomination at one of the windows, and 25% to the supply of the 13 nomination windows.
- 9 As such, the operational flexibility cost related to the M12 capacities can be estimated at $0.002 c/m^3$ (= 25% x $0.009 c/m^3$), i.e., 0.66% of the M12 rate.
- 11 The annual cost of operational flexibility related to M12 would be forecast as follows over the 12 horizon of the supply plan following the relocation to Dawn:

Table 12

Year	M12 related to STS	Cost of the Operational Flexibility	
	10 ⁶ m³	¢/m³	\$,000
2016-2017	2,109	0.002	46
2017-2018	2,109	0.002	45
2018-2019	2,109	0.002	45

3.4. Union Gas service – C1

1 The C1 transportation service between Parkway and Dawn serves to transport surplus 2 natural gas to Parkway for injection at the Union Gas storage site. It is mainly used during 3 the summer when the FTI service is in use. It helps to ensure operational flexibility 4 throughout the day.

5 The daily capacity contracted under this service is $2,639 \ 10^3 \text{m}^3$, for an annual total 6 of $963 \ 10^6 \text{m}^3$.

7 Union Gas's rate for this service is \$0.021/GJ (0.080¢/m³).

8 The operational flexibility cost inherent to the C1 service can be estimated by applying the 9 same percentage flexibility cost as for the M12 service, i.e., 0.66%. This represents 10 a flexibility cost of 0.0005¢/m³.

11 On an annual basis, the operational flexibility cost related to the C1 service can be 12 estimated at \$5,058.

3.5. Union Gas service – Storage

13 The previous sections covered the operational flexibility costs inherent to the transportation 14 services. However, to complete this flexibility, the use of the Dawn storage site is essential. 15 Throughout the day, variations in the demand also require actions in terms of the natural gas supply. A drop in demand will be reflected by a surplus of gas to be injected at Union 16 17 Gas (or a decrease in withdrawals). Conversely, an increase in the demand will require the withdrawal of gas at Union Gas (or a decrease in injections). As such, the nomination 18 windows available to the storage service, identical to those offered for the M12 and C1 19 services, help to meet the operational flexibility need. 20

Union Gas offers an F24S storage service, which can be combined with the F24T transportation service described in section 3.3 to make the same nomination windows available. This service is priced on a market basis. Therefore, it has no specific rate. For commercial reasons, Union Gas refused to quantify the additional value of the F24S service. However, Union Gas points out that this service is broader than simply adding nomination windows. It is a matter of making the nominations firm throughout the day. As for the F24T service, close to 75% of the additional cost would be related to the firm service, and 25% to
 the supply of the 13 nomination windows.

In the absence of a specific quantification by Union Gas, Gaz Métro estimated that an additional 10% would be added to the basic storage costs for the F24S service. This estimate is similar to the surcharge established by TCPL for the SH-EMB. As such, the cost of operational flexibility related to the availability of nomination windows at the Union Gas storage site would represent 2.5% of the fixed storage cost (= 10% x 25%).

8 The annual cost of operational flexibility, given the current storage capacities and costs, is 9 calculated as follows:

Contract	Sto	orage Capa	pacity			
Contract	10 ⁶ m ³	¢/m³	\$,000			
LST 065	116	3.18	3,696			
LST 080	116	2.20	2,552			
LST 081	117	2.27	2,655			
LST 068	n/a		792			
Total		9,695				
Cost of the operational flexibility						
(2.5% of the s	t)	242				

Table 13

3.6. Penalties on firm service

In section 2, Gaz Métro mentioned that if it was unable to adjust its supplies to meet the daily demand, it could find itself in a situation of volume imbalance vis-à-vis TCPL and potentially incur penalties based on the level of daily or cumulative variation resulting from the rate conditions in the "Limited Balancing Agreement" (LBA).

These costs are directly related to operational flexibility, resulting from the inability to ultimately adjust supplies. No forecast for these costs is established in the rate case. "Penalties on firm service" are incorporated into the annual report to reflect the actual costs incurred during the fiscal year.

3.7. Other TCPL or Union Gas services

As previously mentioned, Gaz Métro aims to possibly convert the transportation capacities under the STS into FTSH and SH-EMB or, at least, into an FTSN service. Gaz Métro could also call on Union Gas's F24T transportation services and F24S storage services in order to comply with the FTSN contract, where applicable. These services would generate the operational flexibility needed to adjust supplies throughout the day, in order to meet demand if the current services are unable to meet this need.

If new services needed to be contracted, the costs related to operational flexibility would
 then be established by evaluating the additional cost of the specific service at the rate of
 a regular service.

3.8. Total operational flexibility costs

Based on the different costs identified in the previous sections, the total operational flexibility costs for the three years of the plan following the relocation to Dawn are as follows:

Opertional Flexibility tool	Total Costs of the Oprational Flexibility (\$,000)			
	2016-2017	2017-2018	2018-2019	
FTI	0	0	0	
STS	0	0	0	
M12	45	45	45	
C1	5	5	5	
Union Storage	242	242	242	
Penality on firm service	0	0	0	
Total	293	293	293	

Table 14

1 The total transportation and load-balancing costs are over \$500 million, of which operational 2 flexibility costs represent close to 0.1%.

3 These costs represent the evaluation of operational flexibility in the current context. 4 However, the following factors must be taken into consideration in this analysis:

- the costs related to the nomination windows are inherent to the rates, except for STS
 and SH-EMB contracts;
- the STS contracts may include a 25% surcharge applicable on withdrawals from this
 service if the "Storage Balance" is zero or negative, which could represent \$4 million.
 SH-EMB contracts will include a 10% surcharge applicable on the contracted
 capacities, which could represent \$5 million (see Table 8);
- There is no surcharge for the FTI service associated with the FTLH contracts (see 3.2);
- Union Gas confirmed that the availability of additional nomination windows is only
 a small part of the services offered under its transportation and storage contracts,
 i.e., 25% of the surcharge for firm F24T and F24S services (see 3.3 and 3.5).
- As such, the operational flexibility costs could represent at least 1% of the total costs or more if LBA fees were incurred during the fiscal year, or if Gaz Métro were to contract more
- 18 flexible services from Union Gas (F24T and F24S).

storage capacities contracted from Union Gas.

CONCLUSION

In the follow-up to Decision D-2015-181, Gaz Métro is resubmitting the analysis of operational flexibility once the relocation to Dawn is completed, which was submitted as part of the 2016 Rate Case (ref.: R-3879-2014, B-0615, Gaz Métro-103, Document 3, section 1), including the operational flexibility cost evaluation method for the various supply plan tools used for this purpose.

Gaz Métro asks the Régie to approve the operational flexibility cost evaluation method
 described in the subsections of section 3, with consideration, however, for the changes
 proposed in the exhibit Gaz Métro-5, Document 6 to the evaluation of costs related to

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