

H Y D R O - Q U É B E C

INTERDEPARTMENTAL

le 20 janvier 1947.

MEMO AMonsieur R. Latreille,
Commissaire.RE: Département des Ressources hydrauliques
re- Lac Dozois

Nous avons reçu un montant de \$ 200,000.

Dépenses au 31 décembre 1946

Ligne de transmission	\$ 17,365.	
Arpentage et génie	35,431.	
Ligne de téléphone	2,219.	
Routes	<u>95,462.</u>	<u>150,477.</u>

Balance \$ 49,523.

Nous avons un montant à payer immédiatement à
Angus Robertson Limited. - \$ 50,000.

En plus avant le 31 janvier 50,000.

Il faudrait ajouter à ces montants les
dépenses anticipées pour le mois
de janvier et le mois de février.

Le contrôleur



R.W. Louthood

yg/

Copie à Monsieur P.C. Drake.

January 20th, 1947.

War Assets Corporation,
4095 St. Catherine St. West,
Montreal, P. Q.

Dear Sirs:

Attention: Mr. L. H. Duolos.


The Quebec Hydro are constructing a storage dam at Lac Dozois, on the upper Ottawa River; actual work is being carried out by Angus Robertson Ltd., General Contractors, as our agents.

The job is in urgent need of pipe listed on sheets 1603, 1604 and 1621 of your records located at warehouse #42.

Please deliver same immediately to La Haye Incorporated who have agreed to supply and deliver this material without delay, as our construction schedule is greatly affected. Account could be rendered to us or to La Haye Incorporated.

Yours very truly,

CGK:ml.



Raymond Latreille,
Commissioner.

Le 21 janvier 1947.

Monsieur Adjutor Dussault, c.r.,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Monsieur le Sous-Ministre,

Référant à la lettre de l'honorable Paul Beaulieu du 2 décembre, dont copie est incluse, nous demandons la somme additionnelle promise de \$100,000.00 pour payer partie des frais de construction d'un barrage réservoir au lac Dozois et d'une ligne de transmission entre Cadillac-Noranda-Normetal.

Les sommes avancées à date par le département du Trésor au total de \$200,000.00 ont été dépensées et nous apprécierions recevoir, au plus tôt, cette tranche de \$100,000.00.

D'après nos ingénieurs, les travaux vont bientôt entrer dans la phase active et il est anticipé que nous aurons besoin d'une autre avance de \$150,000.00 vers le 10 février.

Nous vous serions obligés de faire la recommandation d'usage.

Votre tout dévoué,



Président.

RL:VB

January 21, 1947.

Mr. L. C. Knowlton,
Secretary-Treasurer,
Angus Robertson Limited,
660 St. Catherine St. West,
Montreal.

LAKE DOZOIS

Dear Sir:

Herewith, for your information, copy
of memorandum concerning interview I had with Mr. Edouard
Paré.

Yours very truly,



Raymond Latreille
Commissioner.

RL:VB
Encl.

January 21, 1947.

Mr. R. W. Louthood,
Comptroller.

Re: Request of Angus Robertson for \$50,000
as an advance for work done at Lake Dozois
in anticipation of accounts to be rendered
about February 15.

Dear Mr. Louthood:

As per conditions of contract, our agent is entitled,
amongst other things, to the following monthly payments:


- a) \$17,000 for rental of equipment
- b) 6,000 for profit
- c) 1,300 for expeditors

On the basis of approximately two months since work
was started, the above would reach close to \$50,000.00. In
addition, 1,000 barrels of cement have been delivered at a price of
about \$2.25 a barrel.

The payroll to date, at the rate of 150 men for
December and 200 men for January, has reached \$35,000.00. Other
miscellaneous items such as lumber, spikes for cofferdam, reinforcing
steel, hardware, etc., would account for additional expenditures.

Under the circumstances, I feel there is ample
justification for above mentioned advance, therefore, will you please
have cheque issued in the amount of \$50,000.00 to the order of Angus
Robertson Limited, and forward to the undersigned.

Yours truly,


Raymond Latreille
Commissioner.

RL:VB



DÉPARTEMENT DES RESSOURCES HYDRAULIQUES
PROVINCE DE QUÉBEC

CABINET DU SOUS-MINISTRE

Québec, le 22 janvier 1947.

Monsieur L.-E. Potvin, Président,
Commission Hydroélectrique de Québec,
107 rue Craig Ouest,
MONTREAL.

Cher monsieur Potvin,

Vous trouverez sous pli un
chèque au montant de \$100,000.00 relativement
aux travaux du lac Dozois.

Ce montant représente la
balance sur l'avance de \$250,000.00 que vous
aviez sollicitée.

Veillez me croire,

Votre tout dévoué,

A. Dussault
Sous-ministre.-

AD/IL.
Incl.

T-1 100,000.00 - 200.00
200,000.00

January 23, 1947.


Angus Robertson Limited,
660 St. Catherine St. West,
Montreal.

Attention of Mr. L. C. Knowlton,
Secretary-Treasurer.

Dear Sirs:

Pursuant to your request, enclosed please
find cheque in the amount of \$50,000.00 for work done at
Lake Dozois in anticipation of accounts to be rendered.

Yours very truly,


Raymond Latreille
Commissioner.

RL:VB

Le 24 janvier 1947.

Monsieur Adjutor Dussault, c.r.,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Monsieur le Sous-Ministre,

J'accuse réception, avec remerciements, de votre
lettre du 22 janvier adressée au président, par laquelle
vous nous transmettez un chèque au montant de \$100,000.00
re travaux au lac Dozois.

Votre tout dévoué,



Raymond Latreille
Commissaire.

RL:VB

(C o p y)

February 4, 1947.

Mr. J. P. Marion,
Superintendent,
Rapid VII.

Dear Sir:-

We expect to close the cofferdam at Lac Dozois on February 7th, so that the inflow to your Reservoir will be considerably reduced. We hope to have the flow partially re-established by spring break-up and in this connection have checked over the reports for the past few years and have assumed that we can maintain the closure until the end of March.

In the meantime, in order to maintain the flow down the river, we have estimated that you should discharge the following rates of flow at Rapid VII:-

Feb. 7 - 10	3,250 sec.-ft.	March 1 - 5	2,650 sec.-ft.
" 10 - 15	3,100 " "	" 5 - 10	2,600 " "
" 15 - 20	2,900 " "	" 10 - 15	2,600 " "
" 20 - 25	2,800 " "	" 15 - 20	2,650 " "
" 25 - Mch.1	2,700 " "	" 20 - 25	3,100 " "

With this discharge, we estimate that the level of the reservoir at the end of March will be 1008.5, if there were no natural inflow. With the expected inflow below Lac Dozois, it will not go below 1010.0.

Yours very truly,

(sgd) M. V. Sauer

M. V. Sauer
Chief Hydraulic Engineer & General Supt.,
Generating Stations
Electrical Department.

MVS/DB

cc R. Latreille

It may be that the flows may differ from what we expect and that it will be necessary to revise the above figure from time to time.

M.V.S.

Mr. Lamm
" Labrille ✓
File

Lake Dozois, February 20th, 1947.

REPORT: on trip to Lake Dozois, February 19th, & 20th.

GENERAL PROGRESS:

Cofferdam was closed February 9th, and pumping commenced immediately. The water was low enough to commence cleaning up foundations by February 15th.

Cofferdam is tight and requires only occasional pumping.

Forms were started February 19th, on the East wing of the North abutment.

FOUNDATIONS:

The seams in the rock ^{dip} in a general North Easterly direction and the angle at the deep sluice portion appears to be about 20°. These seams are tight; to date, no shaley or rotten rock has shown up.

The appearance of the rock, together with the information report from the diamond drilling, does not leave any reason for concern, as to the soundness of the foundation.

QUARRY & CRUSHER

There is presently approximately 3600 tons of crushed rock at the mixer plant. This work now proceeding on single shift, at about 250 tons per day.

MIXER PLANT

Installation complete and ready for operation, with the exception of one additional boiler, shortly to be installed.

Sand and gravel is being heated.

CAMP & TEMPORARY BUILDINGS:

Substantially complete.

LABOR FORCE:

February 18th, shows a total of 439 men, including kitchen staff. 74 carpenters and 86 laborers are shown on pay-roll.

GENERAL:

It is hoped to start concreting Feb. 25th, and complete North abutment in time to bye-pass water March 20th.

Present flow indications are that this should leave a slight margin for delays.

Le 27 février 1947.

Monsieur Adjutor Dussault, c.r.,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Avance re Dozois

Monsieur le Sous-Ministre,

Pour payer les frais de construction d'un barrage-réservoir au lac Dozois et d'une ligne de transmission entre Cadillac-Noranda-Normetal, nous aurions besoin d'une autre avance de \$150,000.00. Prière de faire la recommandation d'usage au département du Trésor.

Les sommes avancées à date s'élèvent à \$300,000.00.

Votre tout dévoué,

RL:VB


Président.

(C O P Y)

H Y D R O - Q U E B E C

Lake Dozois, February 27th, 1947.

Mr. C. G. Kingsmill,
Assistant-Hydraulic Engineer,
General Superintendent,
Generating Stations,
Quebec Hydro-Electric Commission,
107 Craig St. West,
MONTREAL, P.Q.

Dear Sir:

The attached is the result of an interview between Mr. Eugene Bondu and Mr. Cousineau, with reference to flooding out jobbing operations at Lake Desmarais near Blind River.

Mr. Bondu was in the office in my absence and I did not hear the conversation myself, but from Mr. Cousineau and Mr. Murphy, who visited the area on the date noted, February 14th, I am told that the water did not prevent actual cutting but the slushy condition of the ice did handicap the men going to and from their work.

Mr. Murphy also says that he learned from the men that the three or four foot depth of snow caused them to be wet almost to the waist.

The above is sent for your information.

Yours very truly,

(sgd) G. C. Godard

G. C. Godard
Resident Engineer.

GCG/mc

N.B. Blind River appears to flow into Lac Desmarais, and is in vicinity of the North Eastern portion of the Reservoir.

C.G.K.

*Copy for
Mr. Labreille*

Lake Dozois, March 14th, 1947.

Mr. M. V. Sauer,
Chief Engineer,
Generating Stations &
Hydraulic Division,
Quebec Hydro-Electric Commission,
107 Craig St. West,
MONTREAL, P.Q.

Dear Sir:

I wish to submit herewith a brief report on my trip to Dozois, March 13th, and 14th.

General Progress:

The final concrete on the north abutment was completed on the evening of March 11th. The work is proceeding rapidly on completion of cofferdam, to retain foundations for deep sluice section and first pier.

It is expected that sluices in the cofferdam, at the head of the rapids, will be open tonight or tomorrow morning, to pass sufficient water to prevent Lake Dozois from rising anymore.

The present flow on the lake is estimated to be 1500 c.f.s. and Lake Dozois is at present elevation 1110.2 and should not rise above 1110.4.

Rock excavation for deep sluices is proceeding and dynamiting for these foundations should be substantially complete by the middle of next week.

Schedule for immediate future.

It is expected to commence concrete in the bottom of the deep sluice section, about March 19th, and to complete the concrete in the deep sluice section and first overflow section up to elevation 1113, by April 3rd.

The above schedule would permit of flooding this area by the time the flow in the river has reached 5000 c.f.s. This appears to be reasonable for any but an abnormally early spring break up.

Lake Dozois, March 14th, 1947.

Mr. M. V. Sauer,

Miscellaneous

Quarry and rock crushing operations have continued and, to date, 5200 cubic yards has been crushed and delivered to the mixer plant, which should be sufficient to complete the winter concreting or first stage concreting.

Sand deliveries are 4843 cubic yards and well ahead of requirements.

The cofferdam, at the upperstream side of the earth embankment, from the north shore to the upstream corner of north abutment, has been built up to elevation 1113, except for 2-35 foot gaps to pass the Spring flood. These gaps have been bridged.

- - - - -

Mr. Maurice Brochu, who was office Manager for Angus & Robertson Limited, has been replaced by Mr. R. McDermid, as of February 25th. Since that time, there has been some reorganization in the office. Mr. Senecal, head timekeeper, has also been replaced. These changes have already brought about a substantial improvement in the office end of the work.

Mr. J. Collett, from Montreal Office, has been here on February 18th, to 21st, & Feb. 25th, to date, working under direct instructions from Mr. Don Robertson, on the office matters.

Mr. Don. Robertson visited the job, from Feb. 26th, to 28th, and also on March 5th, to March 7th.

Yours very truly,

C. G. Kingsmill
C. G. Kingsmill,
Asst. Chief Engineer,
Generating Stations and
Hydraulic Division,

CGK/mc



DÉPARTEMENT DES RESSOURCES HYDRAULIQUES
PROVINCE DE QUÉBEC

CABINET DU SOUS-MINISTRE

Québec, le 26 mars 1947.

Monsieur Raymond Latreille, Commissaire,
Commission Hydroélectrique de Québec,
107 rue Craig Ouest,
MONTREAL.

Cher monsieur,

Le comptable du département
me demande s'il y aurait possibilité de leur donner
un chiffre relativement aux prévisions budgétaires
pour le mois d'avril 1947, Re: Construction du barra-
ge au lac Dozois.

Votre tout dévoué,

A. Dussault
Sous-ministre.

AD/IL.

H Y D R O - Q U É B E C

INTERDEPARTMENTAL

le 1er avril 1947.

MEMOIRERE: Lac DozoisDépenses

R.T. 18223 - Ligne de transmission	\$ 19,815.06
18245 - Génie	38,868.20
18246 - Ligne de téléphone	2,491.44
18247 - Construction des chemins	199,412.40
18255 - Contrat - Angus Robertson	313,963.71
Palement - Canadian Vickers	<u>1,123.20</u>
	\$ 575,674.01
Montants reçus du Trésorier Provincial	<u>300,000.00</u>
Solde	<u>\$ 275,674.01</u>

le contrôleur,



R.W. Louthood.

yg/

Le 1er avril 1947.

Monsieur J. E. Cousineau,
Commission Hydroélectrique de Québec,
s/d Angus Robertson Limited,
Val d'Or, Qué.

Cher monsieur Cousineau:

Prière de prendre connaissance
des documents inclus et de me retourner le tout avec
votre autorisation de paiement.

Votre tout dévoué,



R. LATREILLE
Commissaire

RL/JL

D104.95
Cte La Valdorienne



DÉPARTEMENT DES RESSOURCES HYDRAULIQUES
PROVINCE DE QUÉBEC

CABINET DU SOUS-MINISTRE

Québec, le 1er avril 1947.

Monsieur L.-E. Potvin, Président,
Commission Hydroélectrique de Québec,
107 rue Craig Ouest,
MONTREAL.

Cher monsieur Potvin,

Vous trouverez sous pli un
chèque au montant de \$150,000.00, Re: Travaux au lac
Dozois.

Votre tout dévoué,
Louisault
Sous-ministre.

IL.
Incl.

Le 2 avril 1947.

Monsieur Adjutor Dussault, c.r.,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Monsieur le Sous-Ministre,

Nous accusons réception, avec remerciements,
d'un chèque au montant de \$150,000.00 re: travaux au lac
Dozois et ligne de transmission Cadillac-Noranda-Normetal.

Les avances à date de ce chef totalisent
\$450,000.00.

La semaine prochaine je vous fournirai un
état des prévisions pour avril, tel que demandé par votre
lettre du 26 mars.

Votre tout dévoué,



Raymond Latreille
Commissaire.

RL:VB

Hydro-Quebec
NOTES TAKEN AT MEETING HELD IN HYDRO QUEBEC OFFICE ON APRIL 8TH, 1947.

RE: LAC DOZOIS JD-GRUYE

PRESENT - MESSRS. H. SAUER, B. KINGSMILL, H. J. O'CONNELL, R. THIBAUT
AND F. ROUSSEAU.

PICK-UP TRUCK RENTED TO HYDRO QUEBEC BY H. J. O'CONNELL TO BE INVOICED AT THE RATE OF \$1.40 PER HOUR. CREDIT TO BE GIVEN FOR INVOICES ALREADY IN. HEAVY DUTY SNOW PLOW TO BE INVOICED AT THE RATE OF \$12.00 PER HOUR FOR ALL WORKING HOURS. THIS RATE COVERS ALL OPERATING COSTS. INVOICES ALREADY SENT IN ARE ACCEPTED.

SUMMER TRUCKING TO BE PAID FOR AT THE RATE OF \$3.50 PER HOUR FOR ANY WORKING HOURS. MINIMUM NUMBER OF HOURS GUARANTEED PER TRUCK PER MONTH WILL BE A TOTAL OF 260 HOURS FOR DAY AND NIGHT WORK.

IT WAS AGREED THAT THE WAGES FOR THE ADDITIONAL DRIVERS REQUIRED FOR THE PERFORMANCE OF THE WORK WILL BE PAID. THE AMOUNT OF HOURS TO BE PAID FOR THE ADDITIONAL DRIVERS WILL BE CALCULATED AS FOLLOWS:-

NUMBER OF DRIVER HOURS ON MONTHLY PAYROLL, LESS NUMBER OF TRUCK HOURS PAID, LESS 780 HOURS FOR 3 ADDITIONAL DRIVERS THAT H. J. O'CONNELL HAVE TO SUPPLY AS SPARES FOR THE MINIMUM PERFORMANCE.

THIS AGREEMENT WILL BE ENFORCED FROM APRIL 19TH, 1947.

TRUCKS DAMAGED BY US, DURING THE PERFORMANCE OF WORK -

IT WAS AGREED THAT ANGUS ROBERTSON LIMITED WILL REPAIR TRUCKS DAMAGED BY THEM AND THAT THE COST WILL BE CHARGED TO THE JOB. IT IS UNDERSTOOD THAT THESE REPAIRS WILL BE DONE DILIGENTLY, AND THAT THE TRUCKS WILL RETURN TO WORK IMMEDIATELY. THE TIME WHEN TRUCKS ARE BEING REPAIRED WILL BE PAID AT THE RATE OF \$3.50 PER HOUR FOR THE REST OF THE WORKING DAY.

IN CASES WHERE TRUCKS ARE SEVERELY DAMAGED AND OUT OF SERVICE FOR SOME CONSIDERABLE TIME, IT WAS UNDERSTOOD THAT ANGUS ROBERTSON LIMITED WOULD NOT PAY FOR MORE THAN 2 DAYS OF STAND BY TIME.

Le 9 avril 1947.

Monsieur Adjutor Dussault,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Re: Barrage réservoir lac Dozois et ligne de
transmission Cadillac-Noranda-Normetal

Monsieur le Sous-Ministre,

Faisant suite à ma lettre du 2 avril et à la vôtre du 26 mars, je dois vous informer que les dépenses anticipées pour avril s'élèveront à près de \$150,000.00.

Ces prévisions ne comprennent pas les dépenses de construction des ponts sur la Camatose et l'Outaouais et non plus les travaux d'exhaussement de la route Mont-Laurier - Senneterre, lesquelles devraient être obtenues des ministères des Travaux publics et de la Voirie.

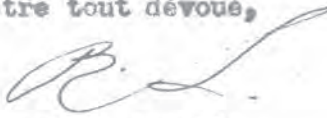
Je profite de la présente pour vous fournir un état détaillé des montants payés à date par l'entremise de l'Hydro-Québec.

DEPENSES FACTUREES ET PAYEES:

Ligne de transmission	\$ 19,815.06
Génie	38,868.20
Ligne de téléphone	2,491.44
Chemin d'accès au lac Dozois	95,462.40
Route Mont-Laurier - Senneterre	103,950.00
Barrages:	
Angus Robertson	467,572.09
Canadian Vickers	<u>1,123.20</u>
	\$ 729,282.39
Montants reçus du	
Trésorier Provincial à date	<u>450,000.00</u>
SOLDE	<u>\$ 279,282.39</u>

Il ressort de l'état ci-haut que l'Hydro-Québec apprécierait recevoir un montant substantiel du Trésor pour couvrir le solde de \$279,282.39.

Votre tout dévoué,


Raymond Latreille
Commissaire.

RL:VB

cc h. P. M. P. ...

*W.M. (Adm.) De Dussault & M.W.
avoir de. m.m. X*

Le 30 mai 1947.

Monsieur Adjutor Dussault, c.r.,
Sous-Ministre des Ressources hydrauliques,
Hôtel du gouvernement,
Québec, Qué.

Réservoir Lac Dozois et ligne de
transmission Cadillac-Noranda-Normetal

Cher monsieur Dussault,

La Commission apprécierait recevoir du département du Trésor une somme additionnelle de \$1,000,000.00 pour couvrir une autre tranche des dépenses faites et à venir relatives à l'exécution de ces deux projets.

Ci-dessous vous trouverez un état détaillé des montants payés à date sous divers chefs, du total des argents perçus du Trésor et de la somme avancée par l'Hydro-Québec.

RESERVOIR DOZOIS:

Génie	\$ 51,955.61
Ligne de téléphone	2,491.44
Chemin d'accès au lac Dozois	95,462.40
Route Mont-Laurier - Senneterre	357,052.68 (x)
Barrage:	
Angus Robertson	858,672.50
Canadian Vickers	1,123.20

LIGNE DE TRANSMISSION
CADILLAC-NORANDA-NORMETAL

Génie, etc.	<u>88,765.73</u>
	\$1,455,523.56
Argents reçus du Trésor	<u>729,282.39</u>
Somme avancée par l'Hydro-Québec	<u>\$ 726,241.17</u>

(x) Proportion attribuable au coût du
réservoir à être déterminée plus tard.

Votre tout dévoué,

B
Raymond Latreille
Commissaire.

RL:VB
CC:M.R.-W. Louthood
MM. M.-V. Sauer & C.G.Kingsmill



DÉPARTEMENT DES RESSOURCES HYDRAULIQUES
PROVINCE DE QUÉBEC

CABINET DU SOUS-MINISTRE

Québec, le 2 juin 1947.

Monsieur R. Latreille, Commissaire,
Commission Hydroélectrique de Québec,
107 rue Craig Ouest,
MONTREAL.

Cher monsieur Latreille,

Re: Réservoir Lac Dozois et ligne de
transmission Cadillac-Noranda-Norme-
tal.

J'accuse réception de votre lettre du 30 mai dernier, dans laquelle vous dites que votre Commission apprécierait recevoir du département du Trésor une somme additionnelle de \$1,000,000.00 pour couvrir une autre tranche des dépenses faites et à venir relatives à l'exécution des deux projets ci-dessus.

Je vais m'aboucher immédiatement avec l'Honorable Trésorier de la Province, à ce sujet et je l'inviterai à donner suite à votre demande.

Votre tout dévoué,

Sous-ministre.

AD/IL.

LAG DOZOIS DAM

Statement of Approximate Expenditures to May 14th and
Comparison with Estimates

Invoices passed, including pay roll to May 4th	867,400.00
Estimate Pay Roll May 4th to 14th Inc.	33,000.00
ADD: 1/2 Contractor's fee	37,500.00
1/2 Plant Rental	95,000.00
1/2 item for Material expediting etc.	7,500.00
Material purchased but not invoiced (estimated)	30,000.00
Trucking Cost Since April 1st (Estimated)	<u>35,000.00</u>
	1,105,400.00
Deduct Credit due on account of Fire loss	<u>26,000.00</u>
	<u><u>1,079,400.00</u></u>

ESTIMATE OF WORK DONE - April 18th 1947

<u>Item</u>	<u>Estimate</u>	<u>Completed</u>	<u>Amount</u>	<u>Total</u>
General Works	\$932,878.00	50%	\$466,400.00	
ADD: Additional Allowance for temporary buildings		90%	45,000.00	
Winter conditions, complete		100%	20,000.00	
Plant Installation		90%	<u>4,500.00</u>	\$535,900.00
Earth Excavation	25,300.00	16%	4,000.00	
Rock "	18,000.00	70%	12,600.00	
Drilling & grouting	1,000.00	100%	1,000.00	
Concrete	264,000.00	41.8%	110,500.00	
Embankments	147,825.00	0%	00.00	
Rip Rap. etc	52,000.00	0%	<u>00.00</u>	\$128,100.00
<u>OTHER CREDITS:</u>				
Crushed stone & sand on hand			25,000.00	
Cement - 20,000 bags at 70 cts to include hauling			14,000.00	
Material & Spare Parts			10,000.00	
Kitchen Equipment etc.			<u>10,000.00</u>	\$ 59,000.00
		TOTAL		<u>\$723,000.00</u>

Total expenditures to date as per sheet No 1	\$1,079,400.00
Cost of work performed as per sheet No 2	<u>723,000.00</u>
Excess to-date, over estimate	\$ 356,400.00

LAKE DOZOIS STORAGE DAM

ESTIMATE OF WORK DONE - May 14th, 1947.

<u>Item</u>	<u>Estimate</u>	<u>Completed</u>	<u>Amount</u>	<u>Total</u>
General Works.				
Camps for 300 men	\$ 40,000.00	100%	40,000.00	
Construction Bldgs.	24,000.00	100%	24,000.00	
Installation	54,000.00	90%	48,600.00	
Transportation	100,000.00	75%	75,000.00	
Cofferdams	102,000.00	70%	71,400.00	
Bridges	39,875.00	75%	30,000.00	
Operating House	22,000.00	0%	00.00	
Winter Condition	25,000.00	100%	25,000.00	
Operation & Maintenance: Camps	55,000.00	70%	38,500.00	
Power Plant Pumping Station				
etc. Miscellaneous Equip't.				
Pump Kitchen	15,000.00	100%	15,000.00	
Permanent Houses	16,000.00	30%	4,800.00	
Indirect Cost	160,000.00	60%	96,000.00	
Equipment rentals	190,000.00	50%	95,000.00	
Material Expediting	15,000.00	50%	7,500.00	
Contractor's Fee	75,000.00	50%	37,500.00	
				608,300.00
Earth Excavation	25,300.00	16%	4,000.00	
Rock Excavation	18,000.00	70%	12,600.00	
Drilling and Grouting	1,000.00	100%	1,000.00	
Concrete	264,000.00	41.8%	110,500.00	
Embankments	147,825.00	0%	00.00	
Rip Rap	52,000.00	0%	00.00	
	1,441,000.00			128,100.00
CREDITS.				
Crushed Stone & Sand on hand			25,000.00	
Cement 20,000 bags			14,000.00	
Materials & Spare Parts			10,000.00	
Kitchen Equipment			10,000.00	
Heaters, Chlorinator			1,000.00	
Reinforcing Steel			3,725.00	
Placing of Reinforcing Steel			1,275.00	
Meals, Hydro-Quebec Staff			1,500.00	
				66,500.00
				\$802,900.00

LAC DOZO IS STORAGE DAM

STATEMENT SHOWING THE APPROXIMATE EXPENDITURES TO MAY 14TH, 1947

INVOICES PASSED, INCLUDING PAYROLL TO MAY 4TH	867,000.00
ESTIMATE PAYROLL MAY 4TH TO 14TH INC.	33,000.00
ADD 1/2 CONTRACTOR'S FEE	37,500.00
1/2 PLANT RENTAL	95,000.00
1/2 ITEM FOR MATERIAL EXPEDITING, ETC.	7,500.00
MATERIALS PURCHASED BUT NOT INVOICED (ESTIMATED)	50,000.00
TRUCKING COST SINCE APRIL 1ST (ESTIMATED)	35,000.00
	<hr/>
	1,125,000.00
DEDUCT CREDIT DUE ON ACCOUNT OF FIRE LOSS	26,000.00
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TOTAL	1,099,000.00
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COST OF WORK PERFORMED TO MAY 14TH, 1947 AS PER ESTIMATE	802,900.00
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EXCESS TO MAY 14TH, 1947 OVER ESTIMATE	296,100.00
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ANGUS ROBERTSON LIMITED

GENERAL CONTRACTORS



660 ST. CATHERINE ST. WEST
MONTREAL 2, QUE.

June 4th, 1947.

Mr. L.E. Potvin, President,
Quebec Hydro-Electric Commission,
107 Craig St. W.,
Montreal, Quebec.

Re: Lake Dozois Storage Dam

Dear Mr. Potvin:

We are enclosing herewith a statement showing the amount of work done to May 14th, 1947 and a statement showing the approximate expenditures to the same date.

You will note that the expenditures overrun the estimate by a large amount. We wish to enumerate some factors or causes which, we believe, were largely responsible for this overrun.

1. Underestimating of Difficulties

Construction work, such as encountered at Lake Dozois, cannot be estimated to any degree of accuracy because it is dependent on too many factors or conditions that cannot be foreseen. In our case, we strived to base our estimate on those factors or conditions we thought would be normal.

Unfortunately, we had to execute our work in the most severe and long winter that was ever experienced in Abitibi for well over twenty-five years. We had to break and remove by hand, at great cost, 8 to 10" of ice overlaying the foundation of our work in the river and which had formed during a very cold spell in the few days we took to unwater our cofferdam.

We had made provision for 600 tons of coal for the whole winter, in our estimate. We have bought so far, 1,439 tons of coal. This additional 839 tons of coal at \$13.25 a ton plus \$4.60 for transportation and \$1.00 for loading and unloading represents an additional cost of \$15,834.00 without counting what it cost to use it.

May we note that this long and severe winter did not improve the already admitted low efficiency of present day labour.

Borings seemed to indicate that the rock foundation of the structure would be fair; this is the condition we assumed in our estimate. Instead

the rock was in ledges, much of it loose, with frozen gravel in between. To be sure that this ice cemented gravel would not be mistaken for solid rock, we had to steam the entire surface under tarpaulins. The cleaning of the foundation was very costly. The foundation of the deep sluices, presented another problem; water would come through the holes drilled for the anchor rods. This condition caused a delay of a month in the concreting of the deep sluices.

As a certain amount of work had to be done this winter without fail, notwithstanding these difficulties, we had to hire a greater number of men than anticipated and build more camps to accommodate them. At one time we had well over 500 men instead of 300 as figured.

The difficulty of ascertaining what certain conditions are going to be in the future may be well exemplified by the following experience. Records from 1941 to 1945 indicate that the maximum normal flow of the river is in the order of 16,000 C.F.S. which checks with the accepted figure of 5 C.F.S. per square mile of drainage area in most of the Province of Quebec. Consequently, provision was made to handle a probable high of 18,000 to 20,000 C.F.S. during the execution of the work. The river unexpectedly delivered a high of over 30,000 C.F.S. and the corresponding run-off was well over 36,000 C.F.S. This condition caused considerable delays and increases in the cost of the work and will cause further delays in the execution of our work. This, however, is beyond the scope of this report.

2. Delays

In the execution of our work we had to cope with delays beyond our control. Some were the logical effect of the difficulties encountered in our work and which we enumerated above.

The access road to the dam had been scheduled for November 15th, 1946 but was ready only on December 1st. This delay added considerably to the cost of the work as we had to establish a camp at the main road and re-handled all our equipment and supplies which came before December 1st.

Poor delivery of materials was another cause for delays, though on the whole we regard this condition as having been not too bad. We had made some deal to have our piping early in December but it was delivered only at the end of January and the pipefitters waited all this time for the pipe which was supposed to be delivered from day to day.

Delays resulted necessarily in an increase in the cost of the work which is almost impossible to value. The natural tendency during delays is to keep a greater number of men than required as nobody can foresee their duration. This condition applies mostly at present as men are hard to get. The delays also decrease the already low efficiency of labour as men have the natural instinct not to work themselves out of a job.

In large works delays do not effect the cost as much as they do in works the size of ours. For example on large jobs it is always possible to keep a carpenter and a concrete gang at work all the time, even if some part of the job presents some difficulties. In our case all our work is concentrated in one spot, something goes wrong and the carpenter and concrete gangs cannot do any more work and have to be transferred to other functions.

3. Cost of Materials and Labour.

Though the fair wage schedule specifies a rate of 60¢ per hour for labour, we had to pay 65¢ in order to secure a sufficient field force.

In order to rush the work, we were obliged to have the men work overtime all winter. Up to May 17th we had spent \$69,733.00 for overtime, that is \$23,244.00 more for the half time alone.

As materials were scarce, we had to pay a little more than we anticipated to get them. When we finally secured our piping we had to rush it to the job by truck at a cost of \$492.00 for transportation only.

The expediting of materials at the job is such a problem that the telephone bills amount to \$500.00 monthly.

Much equipment and supplies had to be shipped by express or by truck from Montreal.

The transportation was more expensive than anticipated as materials and supplies could not be delivered on a schedule on account of their scarcity and a shortage of freight cars. Many trips had to be made to rail heads to secure part loads of spare parts and materials urgently needed.

4. Inefficiency of Labour.

It is unnecessary to make comments on this condition. It is commonplace that the efficiency of labour has dropped considerably.

For a total of 324 men presently working we had to hire a total of 1,699 men. When a man would be used to a certain function, he would quit.

5. Miscellaneous Causes.

When we prepared our estimate we thought that we could secure good concrete gravel in the vicinity of our job. After considerable investigation by Hydro Quebec Engineers and ourselves, it was found that the local gravel would be too soft. Over-night we had to set up a crusher plant to provide crushed granite aggregate, this entailing an additional expense of about \$25,000.00

Approximately 2,000 tons of crushed granite had to be spread over the access road because the gravel used to build this road didn't contain enough coarse aggregate.

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The cost of reinforcing steel was not included in our estimate because none was shown on the preliminary plans on which we based our estimate and we assumed that the steel would be included with the equipment and structural steel furnished by Hydro-Quebec. Note that we had to keep a structural steel foreman at \$65.00 a week to place an approximate tonnage of 50 tons over a period of seven months.

We do not claim that flaws could not be found in our organization, no contracting firm could make such a claim, but these flaws account only to a small extent for the increased cost of the work.

Rush work is always expensive, especially when difficulties are encountered.

May we add also that the price shown in the contract is about \$100,000.00 less than the price shown in our original estimate.

Yours very truly,

ANGUS ROBERTSON LIMITED



F. Rousseau
Ass't Chief Engineer.

FR:RW
Encl.