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Conservation and
Protection
Environmental Protection Branch
224 West Esplanade
North Vancouver, BC V7M 3H7



CANADA'S GREEN PLAN
LE PLAN VERT DU CANADA

Your file / Votre référence

PE-12763

Our file / Notre référence

4205 27 / M705

April 29, 1994

Bunny

Mr. H.Y. Wong
Regional Manager
Environmental Protection
Lower Mainland Region
Ministry of Environment, Lands and Parks
15326 - 103A Avenue
SURREY, BC
V3R 7A2

Dear Mr. Wong:

Re: Application pursuant to the Waste Management Act
on behalf of Northern Utilities Inc.
dated January 5, 1994

Reference is made to a letter from your office dated January 25, 1994 regarding the subject application to discharge treated effluent to the land and the Mamquam River resulting from rock excavation.

The Mamquam River flows into the Squamish River near its mouth. The Department of Fisheries and Oceans advises the Squamish River supports significant populations of all seven species of Pacific salmon, Dolly Varden char, rainbow trout and other resident species. As well, the River supports heavy recreational fishing. The Mamquam River and its tributaries also support significant populations of Pacific salmon, Dolly Varden char and rainbow trout and other resident species. Anadromous fish migration is blocked by falls near the area of the proposed discharge.

We recommend a sampling program be implemented during effluent discharge to monitor discharge quality. Effluent quality must meet the parameters indicated in the permit application. An environmental monitor should be on site during the operation, especially when discharge is occurring. If the discharge is directed to infiltration ponds, groundwater and surface water monitoring will be required to ensure that receiving water quality is not compromised. In addition, we recommend a contingency plan be developed to ensure all discharge is stopped if effluent quality problems are identified.

Think recycling

. . 2



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MOE-2012-00057

Page 1 of 17

Mr. H.Y. Wong
EP, Surrey
PE-12673

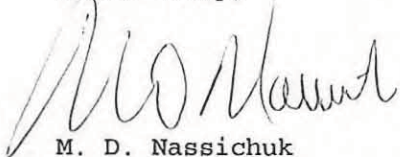
Page Two
4705-37/N705
April 29, 1994

If the waste rock piles are on permeable soil, monitoring of leachate and groundwater will be necessary. Northern Utilities Inc. must carry out the monitoring programs and employ mitigative measures as described in the Memorandum of Understanding for the Mamquam Hydroelectric Project.

Although we expect our recommendations will be reflected in the issued permit, we would appreciate the opportunity to discuss any proposed variance with you as our response has been developed within the context of requirements to protect the fishery resource pursuant to the Fisheries Act. Dr. David Poon may be contacted at 666-2862.

Thank you for giving us the opportunity to comment on this application. Your continued cooperation is appreciated.

Yours truly,



M. D. Nassichuk
Acting Manager
Pollution Abatement Division

cc: Fishery Officer, DFO, Squamish
District Supervisor, DFO, New Westminster
D. Paterson, DFO, New Westminster

Environment
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ProtectionEnvironmental Protection Branch
Pollution Abatement Division
Fax 1-604-666-9701224 West Esplanade
North Vancouver, BC V7M 3H7CANADA'S GREEN PLAN
LE PLAN VERT DU CANADA

Your file Votre référence

Our file Notre référence

PE-12763
4705, 37/1705FACSIMILE HEADER

Date:

April 29, 1994

TO:

Barry Agnew, M.L.P., Surrey

FROM:

Sharon Larson, E.C., N.Y.

Subject:

PE-12763

For comments, as requested.

2 pages plus header

Canada

PROBLEMS RECEIVING THE FAX. PLEASE CALL SHARON
LARSON AT 1-604-666-7643

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CANADA'S GREEN PLAN
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4705-37/N705

April 29, 1994

Mr. H.Y. Wong
Regional Manager
Environmental Protection
Lower Mainland Region
Ministry of Environment, Lands and Parks
15326 - 103A Avenue
SURREY, BC
V3R 7A2

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*How about
being
concerned
on elevated
levels in
discharge or
elevated
levels in River*

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MOE-2012-00057
Page 4 of 17

Mr. H.Y. Wong
EP, Surrey
PE-12673

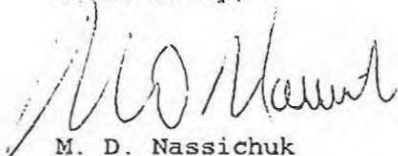
Page Two
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April 29, 1994

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Yours truly,



M. D. Nassichuk
Acting Manager
Pollution Abatement Division

cc: Fishery Officer, DFO, Squamish
District Supervisor, DFO, New Westminster
D. Paterson, DFO, New Westminster



Fisheries
and Oceans

Pêches
et Océans

Box 2360
Squamish, B.C.
V0N 3G0

August 17, 1994

RECEIVED

LOWER MAINLAND DISTRICT
FILE NO.

Your file Votre référence

Our file Notre référence

Greg Dixon, P. Eng
Project Manager
Peter Kiewit and Sons Co. Ltd.
38154 Second Avenue
Squamish, B.C.
V0N 3G0

FIA FAX

Re: Placement of overburden on the B.C. Hydro Right of Way
C44368

From our on site review on Tuesday August 9, 1994, and plans submitted to this department for review, it is my understanding that you wish to deposit approximately 15,000 cubic meters of overburden consisting of granular native material on the above noted site. Also, a geotechnical investigation conducted by H.H. Hartmaier was submitted to this office as supporting documentation. I have reviewed the plans and report submitted and have no concerns regarding this proposal providing that the following conditions are adhered to:

1. As only temporary storage of wood debris is being approved by this department, the overburden shall not be mixed with wood debris, and must be placed in separate areas.
2. That no material shall be deposited within 30 meters from the break in slope of the unnamed creek, or within 5 meters of the ditch that flows into unnamed creek; these boundaries must be flagged off with a snow fence.
3. The material shall be deposited and contoured in such a way to ensure that there is no sloughing of the material, and that there is no slope destabilization.
4. Measures must be taken to ensure that no sediment-laden run-off enter any surface water.
5. No machinery will work within 30 meters from the break in slope of the unnamed creek, or 5 meters from the ditch that flows into unnamed creek.

.../2

Canada

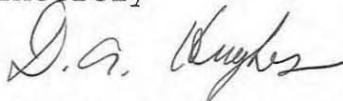
August 17, 1994
Page 2

6. The overburden shall not exceed a depth of 2 meters.

If you have any questions or concerns please contact Debra Hughes at 892-3230.

This letter of approval is based on assessment on the fisheries resource of the Mamquam River system and shall not be construed as permission to undertake work without the approval of other agencies that may have jurisdiction in this matter.

Sincerely



Debra Hughes
A/Habitat Technician
Squamish Field Office

c.c. B. Reid

K. Carrusca, BCE

J. Dennett, Triton Environmental Services

L. Dutta, DFO

D. Coulter, Knight Piesold

S. Peardon, B.C. Hydro



610 Derwent Way
Annacis Island
New Westminster, B.C.
V3M 5P8

Your file Votre référence

August 17, 1994

Our file Notre référence

Greg Dixon, P. Eng
Project Manager
Peter Kiewit Sons Co. Ltd.
38154 Second Avenue
Squamish, B.C.
V0N 1G0

**Re: Mamquam Hydroelectric Project - Proposal to Temporarily Store Wood Debris on
B.C. Hydro Right of Way C44368**

I understand you would like a formal approval for the short term storage of wood debris on the B. C. Hydro Right of Way between the temporary powerhouse site access road and the unnamed creek. This Department has no objection to the short term storage of wood waste on this site subject to the following conditions:

1. Leachate generated from the woodwaste does not cause any contamination of groundwater in the area;
2. Leachate generated from the woodwaste does not enter any surface water;
3. The proponent will relocate and dispose of the material at an approved site and in an approved manner by November 30, 1994; plans for this disposal must be submitted and approved by this office. Also, this may involve application for a Waste Management Branch Permit.
4. As only temporary storage of wood debris is being approved by this department, the overburden shall not be mixed with wood debris and must be placed in separate areas.

We will not approve material that has been processed in a wood hogger or chipper and using it as a soil amendment. The generally wet nature of the area, volume of woodwaste and exposed surface area of the chipped material would provide perfect conditions for the generation of leachate.

.../2

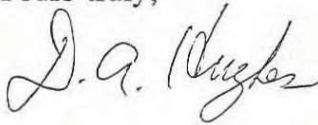
August 17, 1994

Page 2

On another issue, further to our telephone conversation of August 4, 1994, I would be happy to review any information you have on dust suppressants. We have had some problems with toxicity and fish kills resulting from the use of dust suppressants.

Please contact D. Hughes at 892-3230 or myself at 666-0845 if you wish to discuss this matter.

Yours truly,



For

Karen Hutton, RPBio
Water Quality Biologist
Habitat Management Unit
Fraser River Division

cc: K. Carrusca, BCE
J. Dennett, Triton (c/o P.K.S.)
D. Hughes, Squamish
S. Peardon, B.C. Hydro



Fisheries
and Oceans
610 Derwent Way
New Westminster, B.C.
V3M 5P8

Pêches
et Océans

August 3, 1994

PE 12763
Your file Votre référence

Our file Notre référence

Mr. Greg Dixon, P. Eng.
Peter Kiewit Sons Co. Ltd.
38154 - 2nd Avenue
Squamish, B. C.
V0N 3G0

Dear Mr. Dixon:

Re. MAMQUAM RIVER HYDROELECTRIC PROJECT.
(SPOIL DISPOSAL AT HYDRO R.O.W.)

Reference is made to my letter of July 23, 1994 regarding the subject. Reference is also made to our discussions at site on August 2, 1994 pertaining to the same subject.

As promised, I have discussed the matter with Ms. Karen Hutton, our Water quality Biologist (telephone: 666 - 0845). Ms. Hutton has agreed to review your proposal and I would like to suggest that you kindly contact her directly in this regard. Ms. Hutton has further advised me that the proponent, in this case Peter Kiewit Sons Co. Ltd., should also contact:

Mr. R.H. (Raymond) Robb, P. Eng.
Head, Industrial Section
B.C. Waste Management Branch
Telephone: 582 - 5299.

In closing I would like to point out that my initial objection was meant to gather detailed information to make a proper assessment of impact of your proposal. If Ms. Hutton and Mr. Robb approve the disposal site, we will not raise any objection.

Yours truly,

Lee Dutta
Civil Engineer
Water Use Section
Habitat Management Unit
Fraser River Division

BDA Site
AKC RCL

RECEIVED

AUG 08 1994

Karen Hutton
Ray Robb
Debra Hughes
Alexander Eunall
Douglas Coulter
Don Gamble
Jack Dennett
Brian Clark
Mark Anderson

Water Quality Unit, H.M.U., DFO.
B.C. Waste Management Branch
DFO - Squamish
Northern Utilities Incorporated
Knight Piesold Consulting Engineers
Triton Environmental Consultants
Triton Environmental Consultants
B.C. Environment - Surrey
Ministry of Forests - Squamish

LOWER MAINLAND REGION
FILE NO.



Fisheries and Oceans
610 Derwent Way
New Westminster, B.C.
V3M 5P8

Pêches et Océans

December 13, 1993

Your file Votre référence

Our file Notre référence

Dr. Alexander N. Eunall
Northern Utilities Inc.
614 - 850 West Hastings Street
Vancouver, B.C.
V6C 1E1

Dear Dr. Eunall:

Re. ENVIRONMENTAL IMPACT MANAGEMENT AND
MONITORING PROGRAM (DRAFT).

Reference is made to your letter dated November 12, 1993 and the attached draft entitled, "Mamquam River Hydroelectric Project - Environmental Impact Management and Monitoring Program".

We reviewed the document and the following are our comments and recommendations:

Page 2, Figure 1:

Reference is also made to your letter dated December 7, 1993 and the attached figure 1 showing alternate route for the tunnel and alternate site for the powerhouse.

*Skip
not relevant*
Department of Fisheries and Oceans has no objection to the proposed alternate options. In fact we prefer the proposed options to the original ones in that these eliminate the need to cross the Mamquam River and accordingly minimize the possible environmental impacts.

Page 7: 3.1 Roles and Responsibilities

"Liaising with regulatory government agencies as required and communicating any events which contravene approvals and permits".

Our expectation is that the Environmental Supervisor's duty is to ensure that all construction related activities are conducted as per terms and conditions of the approvals and permits.

Page 12: 4.3 Transmission Line and Access Roads

The first sentence of the first paragraph should be rewritten as follows:

Transmission line clearing and access road construction have the potential to create increased levels of suspended sediment.

Page 13

Parameter	Criterion
pH	6.5 - 8.5
Suspended solids	25 mg/l above background (dry weather), 75 mg/l above background (during design storm events).
Oil and grease	10 mg/l

Page 14: 4.4 Post Construction Monitoring

"Dissolved oxygen and total gas pressure at five sites (such as 2500, 16,000 metres)".

Please note that our requirement is to monitor and report water quality data in the close proximity of the outlet of the tailrace channel only.

*Intron suggests 3 sites. - 145
175*

Appendix 1. Environmental Specifications

1 of outlet

Page 2 3.0 Contractor-furnished permits, licences and approvals:

Please note that the referral/approval process involving B.C. Environment and Federal Departments (DFO, Environment Canada etc.) takes time and Northern Utilities Inc. will benefit by submitting applications now rather than waiting for the award of the contract.

Page 7: Section 5.1.7

"This window is tentatively identified as the period from August 1 to September 15".

The in stream construction window from DFO perspective should be from July 1 to August 31.

Page ¹²13:

Parameter	Criterion
Total ammonia	1.30 mg/l
Un-ionized ammonia	0.02 mg/l
pH	6.5 - 8.5
Suspended solids	25 mg/l over background (dry weather), 75 mg/l over background (during design storm events).
Nitrate	concentrations that stimulate prolific weed growth are to be avoided.
Nitrite	0.06 mg/l
Oil and grease	10 mg/l

The same standards apply for construction of the transmission line right-of-way as well.

Appendix 2

Environmental Procedures Manual

Page 9:

Cast-in-place concrete

We are not sure if 48 hour curing period will be enough to allow pH to reach neutral levels. In this connection, we refer you to an environmental monitoring report prepared by Phoenix Environmental Services Limited in connection with the Cariboo Dam concrete apron repair work undertaken by GVSDD in the summer of 1993. Reference to remedial measures applied to control elevated pH levels may be useful in handling similar problems during cast-in-situ concrete works.

Page 12: Stripping and grading

* Organic debris and topsoil:

Expand to address how what actions could be used if nitrate became a problem.


"20 metres away from the Mamquam River and its tributaries".

The reference point must be specified i.e. from the centre line, water's edge, high water mark or top of the bank. In this case it should be from the high water mark.

We hope these comments will be of some help to you in finalizing the manual. If you require any additional information or clarification please call Lee Dutta at 666 - 3491.

With kindest regards.

Yours truly,



for

S.A. Macfarlane, R.P. Bio.
Head, Water Use Section
Habitat Management Unit
Fraser River Division

cc:

Brian Clark
Lee Nikl
Karen Hutton
Debra Hughes

MOELP - Fish & Wildlife Management
HMU - Water Quality
HMU - Water Quality
Squamish



To: Paul Matysek
From: Mac Chaudhry, Lab Scientist

December 18, 1992

Re: Mamquam River Hydroelectric Project
Acid Rock Drainage Potential

A part of the proposed tunnel is placed in the Gambier Group which hosts the Britannia Mine and three prospects located within 4 km south of the confluence of Mamquam River and Raffuse Creek as listed below. These prospects show a significant sulphide mineralization of pyrite, chalcopyrite, sphalerite and galena. (see enclosed minfile records).

1. 092 GNW 039 Raffuse Creek (Cu, Zn, As)
2. 092 GNW 043 Slide Creek (Cu, Sn, Pb, AS)
3. 092 GNW 010 Mulligan (Cu, Zn, As)

Further south of this area there are five prospects listed in Minfile and covered by D.G. Reddy et. al in Geological Fieldwork (1987) pp.295-324.

In view of the above mineral accumulation it would appear that this area cannot be considered free of sulphide mineralization. Therefore, acid rock drainage from the excavated material during tunnel construction cannot be ruled out. In order to assess the acid rock drainage potential of this project, it is recommended that the following predictive tests be carried out in stages outlined below. Further information can be obtained from the publication 'Draft Acid Rock Drainage Technical Guide, Volume II', enclosed.

1. Acid-Base Accounting Analysis

This is a measure of the acid producing and acid consuming capacity of a rock as determined by chemical analysis

An unoxidized, representative sample of each of the geological unit which the tunnel would intersect, based on lithology and mineralogy, be submitted for this test to a commercial laboratory

.../2

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FEB 06 1995

LOWER MAINLAND REGION

Province of
British ColumbiaMinistry of
Forests

FAX HEADER

Province of
British ColumbiaMinistry of
Forests
FOREST SERVICE

TO	
NAME	<u>Rick Laird</u>
MINISTRY OFFICE OR FACILITY	<u>BC Environment</u>
PHONE NO.	<u>582-5308</u>
FAX NO.	<u>660-8926</u>

NAME
MINISTRY OFFICE OR FACILITY
PHONE NO.

John Evdekimoff
Resource Assistant
Timber
Main: (604) 898-2100
Direct: (604) 898-2168
Fax: (604) 898-2191

Squamish Forest District
42000 Loggers Lane
Squamish
British Columbia
V0N 3G0

SENT BY	DATE <u>95/02/06</u>	NO. PAGES TO FOLLOW <u>0</u>	AUTHORIZED SIGNATURE <u>JE</u>
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MESSAGE
<u>Re: Plan For Crusher - Peter Keiwit + Sons, Manguam River</u>
<u>I went out today and looked at Kiewit's aggregate crusher, screening and water discharge system.</u>
<u>Area is within leased boundary, land had been previously cleared and it appears all measures are being taken to filter the water before it enters the Forest floor.</u>

FS 7188 88/04

BLAND BUSINESS FORMS LTD. 4344

If you require further info or even site visits - just call.

John Evdekimoff
R.A. Timber
Squamish.