



THE PROVINCE OF BRITISH COLUMBIA

ORDER

*Water Act*

Section 39

File No. 2001985

WHEREAS, British Columbia Hydro and Power Authority (BC Hydro) is the holder of Conditional Water Licence 114268 and Conditional Water Licence 110107.

WHEREAS clause (j) of Conditional Water Licence 110107 states:

*"The licensee must operate the works as set out in clause (h) (of Conditional Water Licence 110107) ... in accordance with:*

1. *procedures ordered by the Comptroller, including an order which regulates the diversion, the rate of diversion and use of water for the preservation of fish,*
2. *any amendment of the procedures ordered by the Comptroller."*


WHEREAS BC Hydro, the Department of Fisheries and Oceans, the Ministry of Fisheries and the Ministry of Environment, Lands and Parks, in an arrangement dated November 24, 1999, have agreed upon a flow release regime from the Daisy Lake Reservoir,

I HEREBY ORDER THAT the works authorized under clause (h) of Conditional Water Licence 110107 be operated to provide water for the preservation of fish in accordance with the following procedures :

1. that flows be released from the Daisy Lake Reservoir into the Cheakamus River that average 45% of inflows over a 7-day period as defined in attached Figure, based on the previous days inflows,
2. that on any given day the flows may vary from 37% to 52% of the previous day's inflow,
3. that flows may exceed 52% when regulating capacity (storage, diversion capacity and spillway control capability) of the system is exceeded or expected to be exceeded,
4. that a minimum flow of 5 cms shall be provided at all times,
5. that this order shall not have effect over BC Hydro's operation required for flood management upstream and downstream of Daisy Lake dam, and
6. for proposed operations, with respect to 5 above, that would cause flows to be outside the recommended flow regime, BC Hydro shall endeavor to discuss the proposed operation with the DFO representative and the MELP representative, as intended by the arrangement.

AND I HEREBY ORDER THAT BC Hydro undertake a monitoring program to assess the effectiveness of the above procedures with regard to the preservation of fish in the Cheakamus River below Daisy Lake dam and that BC Hydro prepare by September 30<sup>th</sup>, 1999, terms of reference for the program. The terms of reference must be developed jointly by the Department of Fisheries and Oceans, the Ministry of Fisheries, the Ministry of Environment, Lands and Parks and BC Hydro in consultation with the Squamish First Nation, the Steelhead Society of BC and other stakeholders as appropriate, and submitted for acceptance of the Comptroller of Water Rights.

Dated at Victoria, British Columbia, this 6<sup>th</sup> day of April, 1999.

A handwritten signature in black ink, appearing to read "Prad Kharé", with a horizontal line underneath the name.

Prad Kharé  
Deputy Comptroller of Water Rights



THE PROVINCE OF BRITISH COLUMBIA  
CONDITIONAL WATER LICENCE

BC Hydro and Power Authority is hereby authorized to divert and use water as follows:

- (a) The stream on which the rights are granted is the Cheakamus River.
- (b) The point of diversion on the Cheakamus River and point of rediversion on Shadow Lake are shown on the attached plan.
- (c) The date from which this licence shall have precedence is 20th of September, 1954.
- (d) The purpose for which this licence is issued is power (general), which is to be generated at the Cheakamus Generating Station and at the Station Service Generator at the Daisy Lake dam.
- (e) The maximum quantity of water which may be diverted from the Cheakamus River, rediverted from Shadow Lake, used at the Cheakamus Generating Station, and discharged into the Squamish River under this licence, is 2295 cubic feet per second (65 cubic metres per second). The maximum quantity of water that may be diverted, used at the Station Service Generator, and discharged into the Cheakamus River under this licence, is 21.2 cubic feet per second (0.60 cubic metres per second).
- (f) Water may be diverted and used throughout the whole year.
- (g) This licence is appurtenant to the undertaking of the licensee to generate and supply power, pursuant to the *Hydro and Power Authority Act*, with respect to the Cheakamus Generating Station situated on Lot A, (Plan 4800), Skowishin Indian Reserve No. 7 and the Station Service Generator situated on District Lot 2665, Group 1, New Westminister Land District.

- (h) The works authorized are the Shadow Lake saddle dam, Daisy Lake dam, Daisy Lake saddle dam, spillways, discharge facilities, intakes, tunnel, canals, penstocks, powerhouse, tailrace, access road and the Station Service Generator at the Daisy Lake dam. The powerhouse for the Cheakamus Generating Station includes turbines, generators, transformers and switchgear. The works for the Daisy Lake Reservoir include auxiliary equipment and structures for operation of the reservoir.
- (i) Prior to December 31, 2001, the licensee must:
1. submit, for acceptance by the Comptroller, a report defining the operational parameters for Daisy Lake Reservoir and the Cheakamus Generating Station,
  2. submit, to the Comptroller, procedures based on the parameters of 1. above, for the operation of works authorized in clause (h),
- (j) The licensee must operate the works as set out in clause (h) above in accordance with:
1. procedures ordered by the Comptroller, including an order which regulates the diversion, rate of diversion and use of water for the preservation of fish,
  2. any amendment of the procedures ordered by the Comptroller.
- (k) This licence is issued in substitution of Conditional Water Licence 22284 and the application for a water licence on file no. 2001985.



Prad Kharé  
Deputy Comptroller of Water Rights



## Province of British Columbia *Water Act*

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### Order *Water Act* Sections 87 and 88

File No. 2001985

WHEREAS British Columbia Hydro and Power Authority (BC Hydro) is the holder of Conditional Water Licence 110107 and Conditional Water Licence 114268, which authorise the diversion, storage and use of water for power purpose at the Cheakamus power development; and

WHEREAS the works have been regulated by an Order dated April 6<sup>th</sup>, 1999; and

WHEREAS BC Hydro engaged in public consultation to determine values for system parameters and to develop operating procedures that may provide benefits as described below; and

WHEREAS the licensee has submitted the Cheakamus Project Water Use Plan, which recommends changes to the operations of the Cheakamus power development for fish, wildlife, recreation, power and for flood routing benefits; and

WHEREAS I have accepted the Cheakamus Project Water Use Plan dated October 1, 2005; and

WHEREAS the Cheakamus Project Water Use Plan proposes a monitoring program to determine if operating the works in accordance with the operating parameters and procedures in the Water Use Plan will provide the expected benefits;

#### I HEREBY ORDER THAT:

1. The Section 39 order, file no. 2001985, dated April 6, 1999, is revoked.
2. The works authorised under clause (h) of Conditional Water Licence 110107 be operated in accordance with the following procedures:
  - a) To reduce flood risk downstream of Daisy Dam, between October 1 and December 31 the target maximum reservoir level shall be 373.5m, measured at Daisy Lake Dam using the local datum;

- b) For fisheries habitat, the licensee shall release from Daisy Lake Dam a minimum flow of:
    - i) 3.0 cubic metres per second from November 1 to December 31;
    - ii) 5.0 cubic metres per second from January 1 to March 31;
    - iii) 7.0 cubic metres per second from April 1 to October 31;
  - c) For fisheries habitat and recreational use, the licensee shall release additional flows to those specified in 2b) above in order to maintain a minimum flow at the location of Water Survey of Canada (WSC) gauge 08GA043 near Brackendale of:
    - i) 15.0 cubic metres per second from November 1 to March 31;
    - ii) 20.0 cubic metres per second from April 1 to June 30,
    - iii) 38.0 cubic metres per second from July 1 to August 15,;
    - iv) 20.0 cubic metres per second from August 16 to August 31, unless directed by the Comptroller to maintain flows at 38 m<sup>3</sup>/s for the benefit of recreation;
    - v) 20.0 cubic metres per second from September 1 to October 31;
  - d) Ramping rates shall not exceed the maximum rates prescribed in Schedule "A" attached;
3. The licensee shall install, maintain and operate a staff gauge at the Ashlu River Bridge in accordance with WSC standards;
4. The licensee shall submit to the Comptroller within one year of the date of this Order, terms of reference with a proposed budget and schedule to monitor;
- i) Salmonid spawner abundance and smolt output in the Cheakamus River, and in its side channels;
  - ii) Juvenile and resident adult rainbow abundance in relation to habitat features in the Cheakamus River;
  - iii) Steelhead spawning abundance and timing, and daily stream temperatures from the beginning of spawning to the end of fry emergence;
  - iv) Stage changes on the Squamish River as observed daily at the Ashlu River Bridge;
  - v) Stranding at the tailrace of the Cheakamus powerhouse;
  - vi) Stranding downstream of Daisy Lake Dam in relation to rate of change of stage at or near minimum flow releases;
  - vii) Groundwater levels in side channels to the Cheakamus River in relation to mainstem flows;
  - viii) Benthos, periphyton and nutrient levels at sites on the Cheakamus River monitored in 1996 and 2000; and
  - ix) Changes in channel morphology, gravel quantity and quality, and vegetation distribution on the Cheakamus River below Daisy Lake Dam; and
  - x) The benefits to recreational fishing access associated with increasing minimum flows from 3.0 to 5.0 cubic meters per second between January 1 to March 31.
5. The licensee shall implement monitoring in accordance with the terms of reference accepted by the Comptroller of Water Rights under 4 above, and shall provide annual monitoring reports to the Comptroller until the conclusion of each monitoring study;

6. With respect to the maintenance of provision of records the licensee must:
- a) keep records of:
    - i) Daisy Lake Reservoir elevations;
    - ii) Discharge from Daisy Lake Dam into the Cheakamus River;
    - iii) Discharge from Cheakamus River generating station; and
    - iv) Cheakamus River flow as measured at WSC gauge 08GA043.
  - b) provide a written report to the Comptroller on or before February 1 and August 1 of each year summarising the records from the previous six months; and
  - c) provide on request from the Comptroller records collected under 6a.
7. The licensee may operate the works in an alternate manner in the event of an emergency, a dam safety requirement, or an extreme hydrologic event;
8. All emergency operations or other deviations from those ordered above shall be reported to the Comptroller of Water Rights in a timely manner.

Dated at Victoria, B.C., this 17th day of February, 2006.



Glen Davidson, P. Eng  
Deputy Comptroller of Water Rights

## Schedule "A"

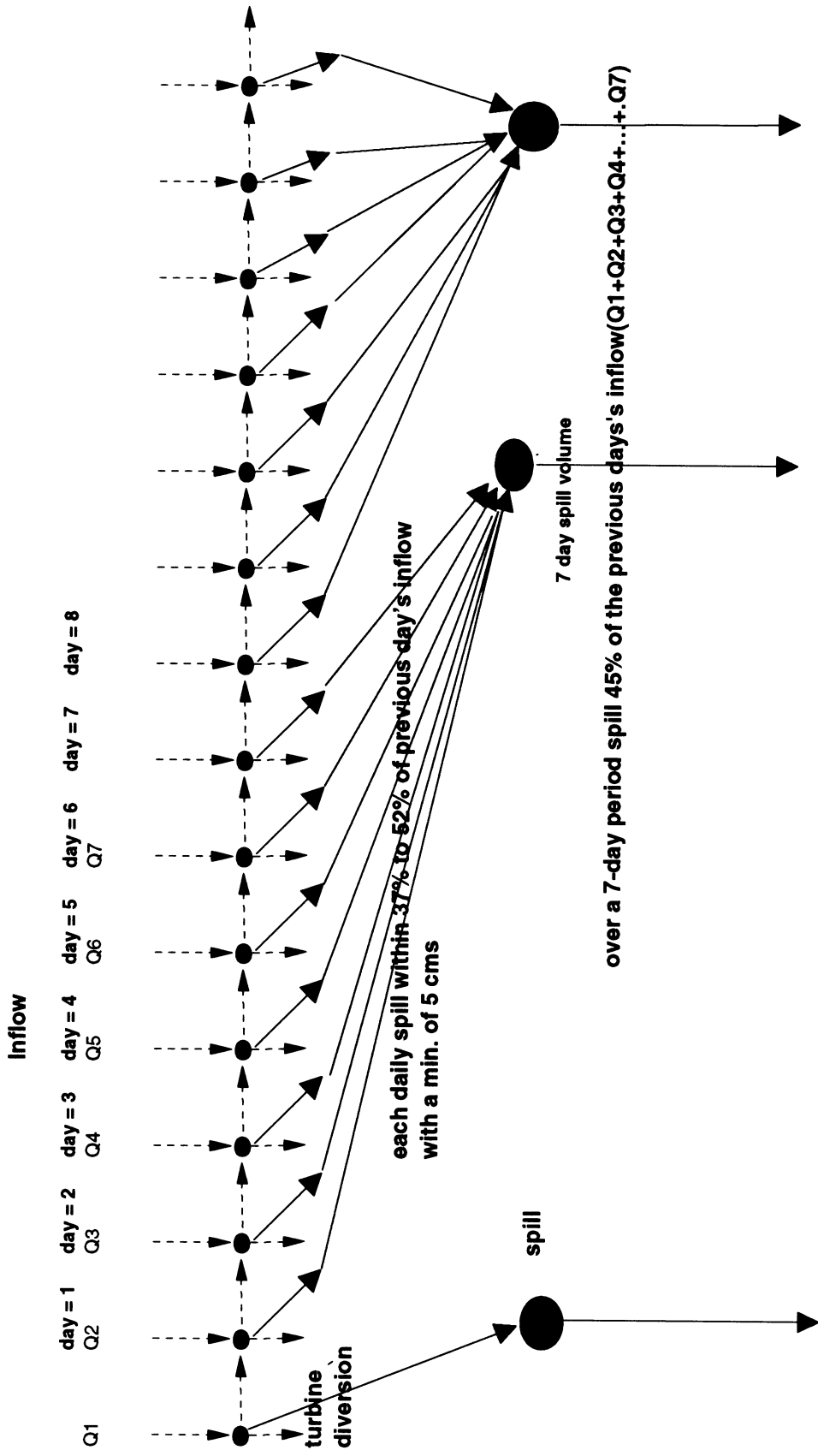
### RAMPING RATES

1. With respect to the Cheakamus River below Daisy Lake Dam, BC Hydro shall limit changes to flow rates according to the following table:

Total Discharge from Daisy Lake Dam	Maximum Rate of Increase	Maximum Rate of Decrease
Less than 10 m <sup>3</sup> /s	13 m <sup>3</sup> /s per 15 minutes	1.0 m <sup>3</sup> /s per 60 minutes
10-62 m <sup>3</sup> /s	13 m <sup>3</sup> /s per 15 minutes	13 m <sup>3</sup> /s per 60 minutes
Greater than 62 m <sup>3</sup> /s	13 m <sup>3</sup> /s per 10 minutes	13 m <sup>3</sup> /s per 10 minutes

2. The above ramping rates will be reviewed following results of the monitoring outlined in 4 vi) of the order.
3. During reduction of load at the Cheakamus powerhouse between loads of 40 MW and 10 MW, the rate of reduction shall not exceed 10 MW every 5 minutes. Turbine ramping rates will be reviewed following results of the monitoring outlined in 4 iv) and v) of the order.

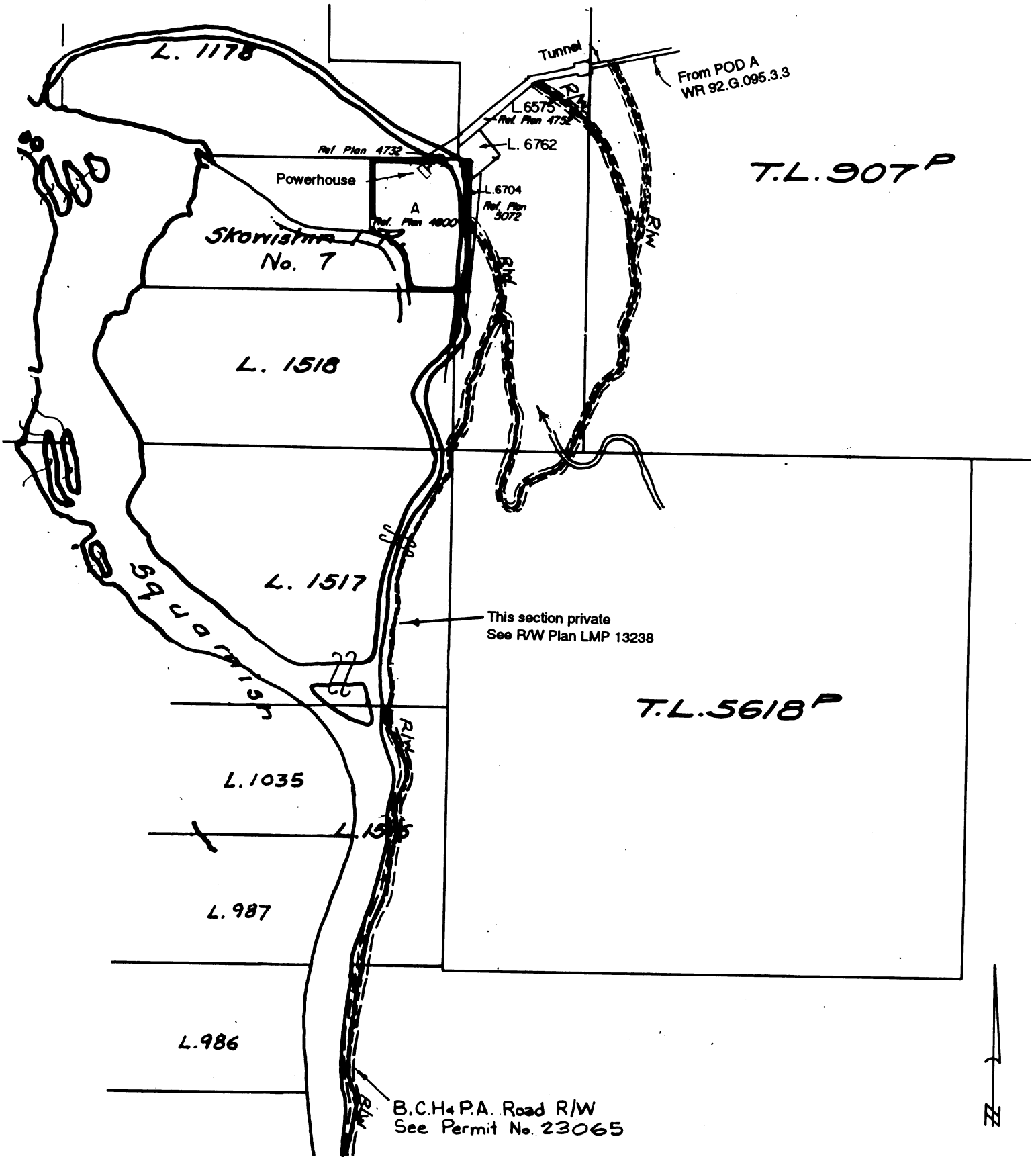




**Figure - Cheakamus Flow Agreement**



# Province of British Columbia



WATER DISTRICT : Vancouver  
 PRECINCT : Howe Sound  
 LAND DISTRICT : New Westminster

### LEGEND

Scale : 1 : 20 chains  
 Point of Diversion : POD  
 Map Number : WR 8233

Permit over Crown Land:

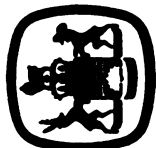
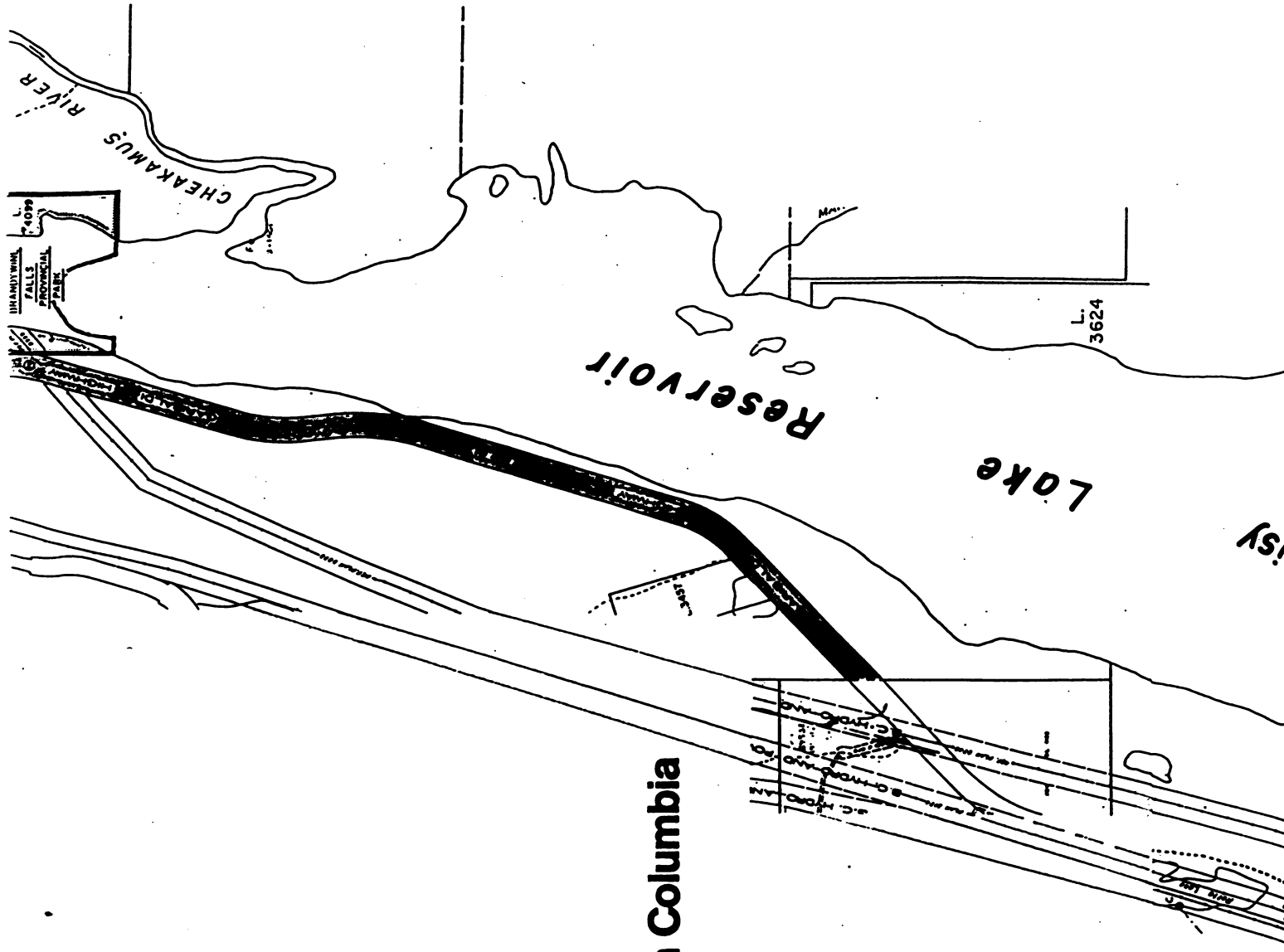
Signature *Richard*  
 Date April 6/99

CL 110107  
 File 2001985  
 P.C.L. 23065

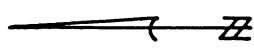
Plat No. 1 of 2

The boundaries of the land to which this licence is appurtenant are shown thus:

For storage see CL 114268



Province of British Columbia



CL 110107  
File 2001985

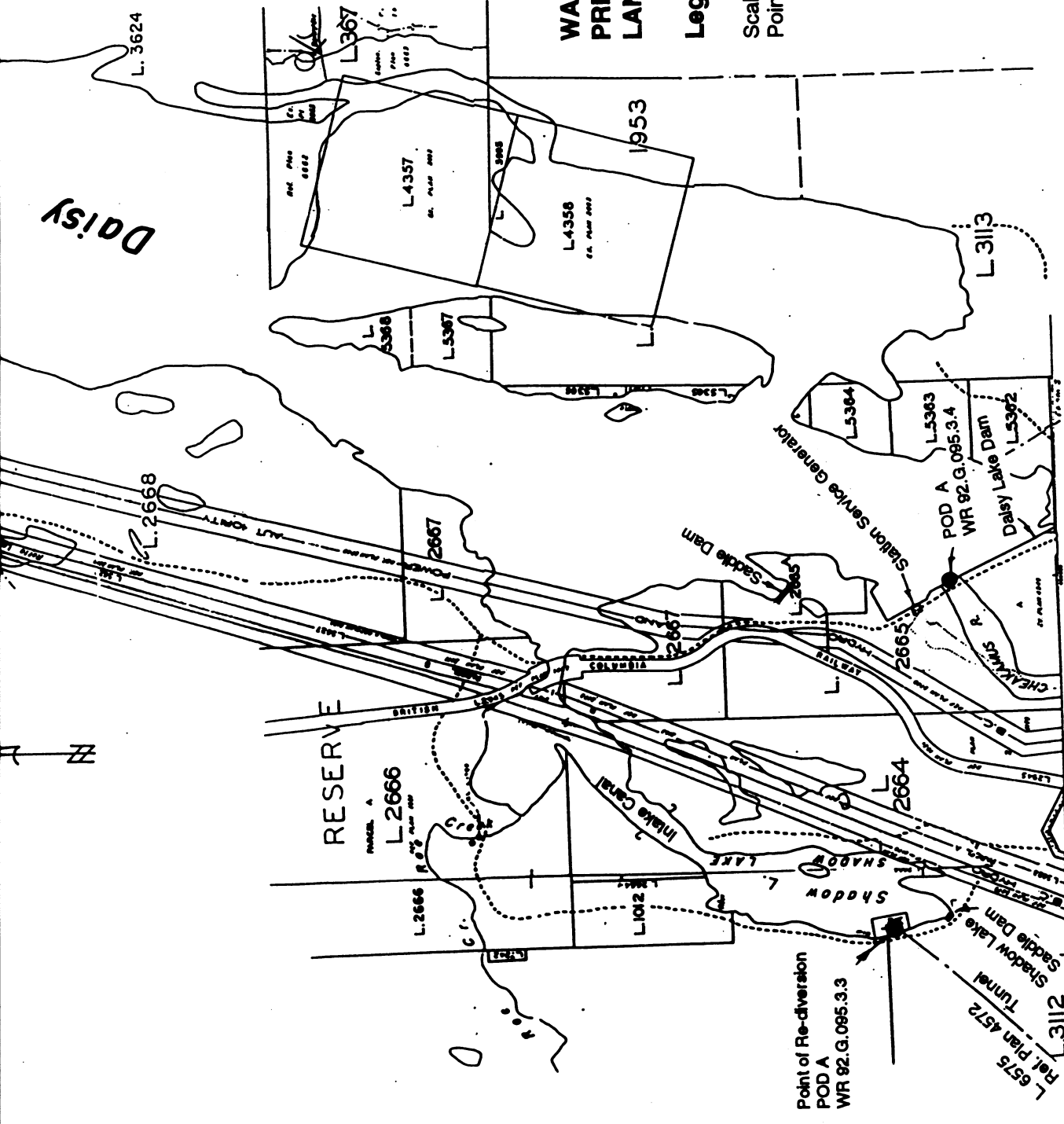
Plat No. 2 of 2

For storage see CL 114268

WATER DISTRICT : Vancouver  
PRECINCT : Howe Sound  
LAND DISTRICT : New Westminster

Legend

Scale : not to scale  
Point of diversion : POD



Signature *John*

Date 99/04/06  
(APRIL 6)