



ENVIRONMENTAL PROTECTION

INTERIM LICENCE

Pursuant to the
WATER RESOURCES ACT

N^o 20880

Pine Lake Restoration Society
c/o Box 66
Pine Lake, Alberta
T0M 1S0

File No.: 48967 /
Appl. Id. 001-68330
Priority No.: 1998-03-24-01

having complied with the applicable provisions of the Water Resources Act and the regulations thereunder is hereby authorized, as soon as right-of-way is obtained:

A. To construct works as shown on plans and reports filed, approved and identified in departmental records as:

| <u>W. R. PLAN NO.</u> | <u>TITLE</u> |
|-----------------------|---|
| 48967-01 | Hypolimnetic Withdrawal System Location Plan (Dwg. 1) |
| 48967-02 | Profile & X-Section Plan of Existing Channel (Dwg. 3) |
| 48967-03 | Weir and Vault Detail (Dwg. 4) |
| 48967-04 | Plan View of Outlet System (Dwg. 5) |
| 48967-R1 | Engineering Report For A Hypolimnetic Withdrawal System |

B. To divert and use water as hereinafter specified and described subject to the terms and conditions attached hereto and incorporated herein:

PURPOSE: DIVERSION
(Surface Water Management for a Hypolimnetic Water Withdrawal System)

LOCATION OF WORKS: NE 6 and SE 6-36-24-4

POINT OF OUTLET: SE 6-36-24-4

The term within which construction is to be completed expires on June 19, 1999.

June 19, 1998
Dated at Red Deer


Head, Water Administration Branch, Parkland Region

Original - Department
Copy - Licencee (See over for excerpts)

Pine Lake Restoration Society
c/o Box 66
Pine Lake, Alberta
T0M 1S0

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TERMS AND CONDITIONS - INTERIM LICENCE NO.20880

1. The Licencee is responsible for the construction, operation and maintenance of the works and for any damages that may result.
2. No work is allowed in the waters of Pine Lake and Ghostpine Creek between April 1 and June 30.
3. The deposition of deleterious material in Pine Lake and Ghostpine Creek is prohibited.
4. All disturbed areas are to be stabilized and reclaimed.
5. Precautions shall be taken to prevent soil erosion and siltation.
6. Downstream flow shall be maintained at all times during construction.
7. The weir shall be installed at an elevation no greater than 889.675 geodetic metres.
8. The Head, Water Administration Branch, reserves the right to establish, revise or require the following items in the interim licence and any licence issued:
 - a. install a structure for fish passage between Pine Lake and Ghostpine Creek
 - b. removal of the weir or adjust the weir elevation any time the Head, Water Administration Branch has information indicating unreasonable interference due to the operation of the project on instream flow requirements and/or the aquatic environment.
 - c. changes to operational procedures.
9. The licensee shall record the following:
 - a. lake level readings once a week between May 1 and freeze up and
 - b. downstream water quality for total phosphorous, PH, dissolved oxygen, total suspended solids and total dissolved solids at four week intervals between May 1 and freeze up.
The data must be submitted to the Head, Water Administration Branch within 2 working days of receiving the data results.
10. The licensee shall submit an annual operational report to the Head, Water Administration Branch by January 15 of each year outlining the operation and maintenance of the project including, but not restricted to:
 - a. Estimated flow rates,
 - b. Monitoring of Pine Lake level and water quality parameters,
 - c. Other monitoring as required.
 - d. Semi-annual verification the weir elevation is no greater than 889.675 geodetic metres.

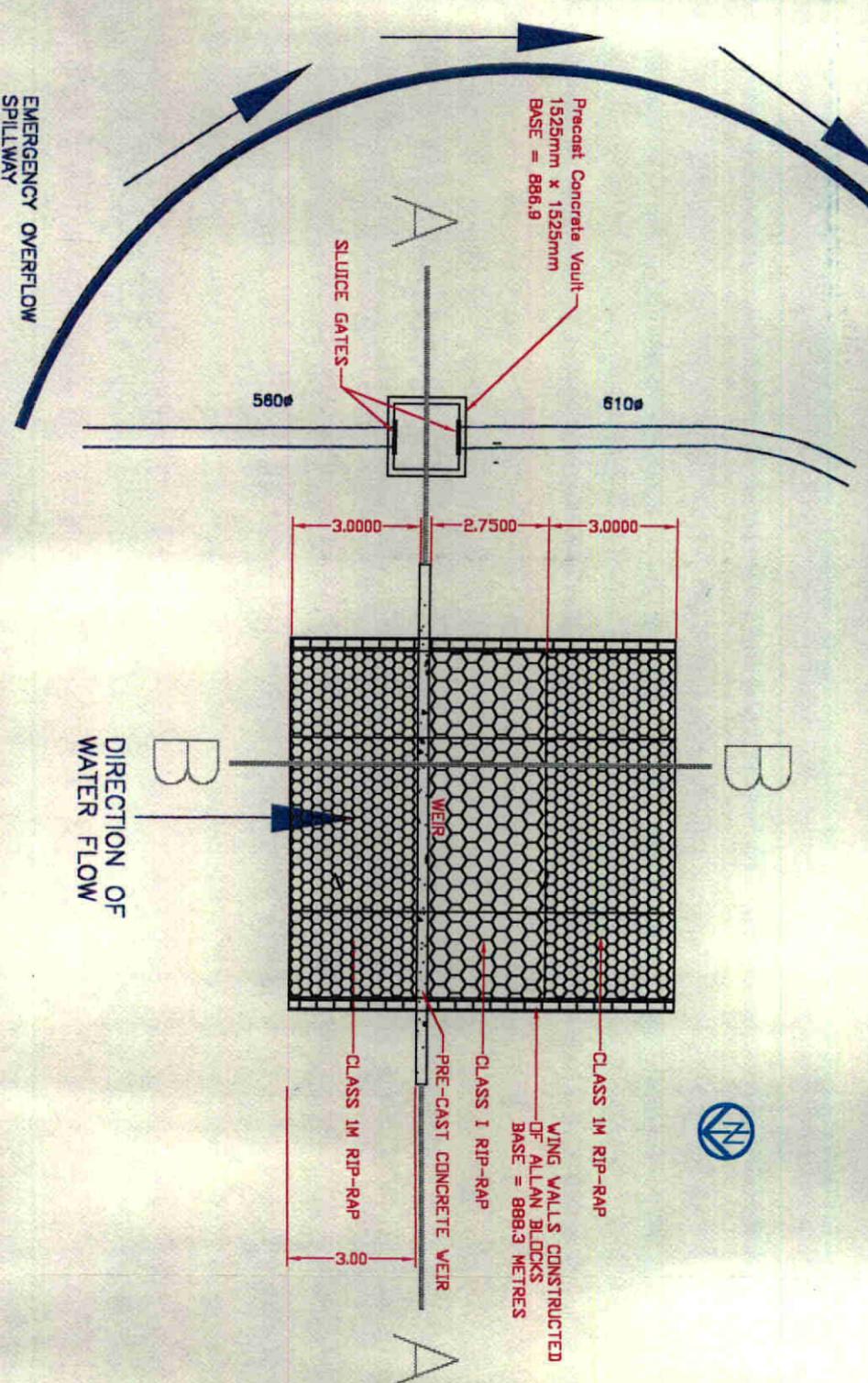
June 19, 1998
Dated at Red Deer



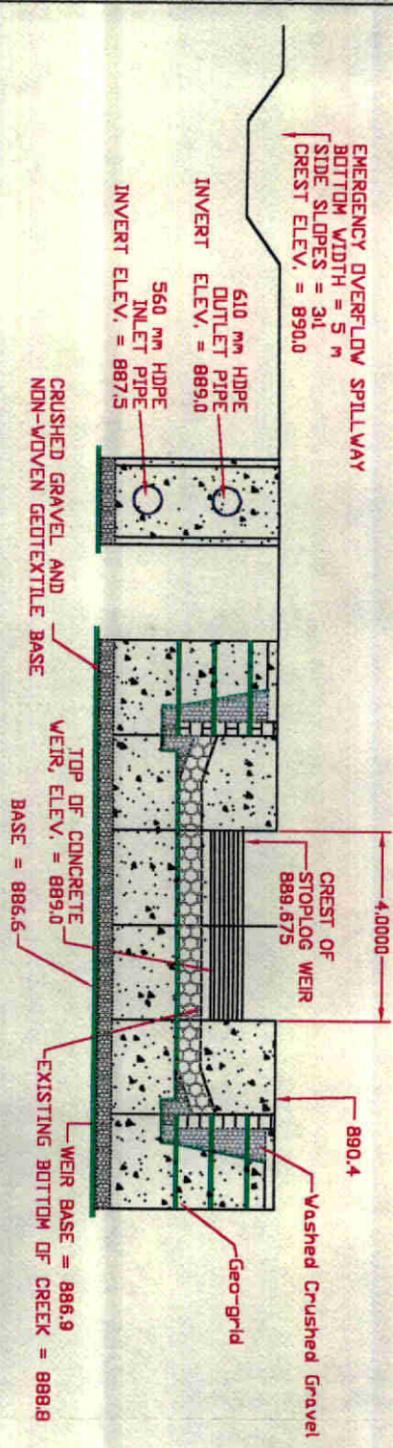
Head, Water Administration Branch, Parkland Region

Reviewed By: *[Signature]*
Date: June 19/98
Head, Water Admin. Branch, Parkland Region

PLAN VIEW OF WEIR STRUCTURE AND VAULT



CROSS-SECTION A-A OF WEIR AND VAULT STRUCTURE



SPECIFICATIONS

GENERAL
The Pine Lake Restoration Society or the contractor shall locate all utilities prior to the commencement of construction.

EXCAVATION
Excavate whatever material is encountered until all unsuitable material is removed or to a minimum depth of 886.6 beneath the weir and vault structure. Excavate whatever material is encountered until all unsuitable material is removed or to a minimum depth of 888.3 beneath the rock riprap and the Allen Block wing walls.

SUBGRADE AND BASE PREPARATION FOR THE WEIR AND VAULT
The subgrade will be prepared by scarifying the top 300 mm and recompacting a suitable clay material in 150 mm lifts to 97% of Standard Proctor Density at optimum moisture content. A non-woven geotextile with a minimum grab tensile strength of 0.650 kN will be placed on top of the compacted clay under the entire weir and vault system and extending a minimum of 1.0 metres beyond the weir and vault boundaries. A 300 mm layer of 20mm washed crushed gravel will be placed on top of the geotextile in the area of the concrete weir structure and under the vault and compacted to 97% of Standard Proctor Density. This gravel layer will be at least 5 times the width of the concrete weir. The gravel under the vault will extend at least 0.75 metres beyond the base of the vault. The remaining area shall be filled with suitable clay material compacted to 85% of Standard Proctor Density. The gravel base shall be level and ready for the placement of the precast concrete panels and the vault.

SUBGRADE AND BASE PREPARATION FOR THE ALLEN BLOCK WING WALLS AND THE ROCK RIP RAP
The subgrade beneath the Allen Block wing walls will be prepared by scarifying the top 300 mm and recompacting a suitable clay material to 97% of Standard Proctor Density at optimum moisture content. A non-woven geotextile with a minimum grab tensile strength of 0.650 kN will be placed on top of the compacted clay under the wing walls and extend a minimum of 0.5 metres beyond the wing walls base and up the side slopes as shown on the plan. A similar non-woven geotextile will also be placed under the rock rip-rap and extend a minimum of 0.5 metres beyond the edge of the rip-rap. A 300 mm layer of 20mm crushed gravel will be placed on top of the geotextile in the area of the wing walls and be compacted to 97% of Standard Proctor Density. This gravel layer at the base will be at least 4 times the width of the Allen Blocks.

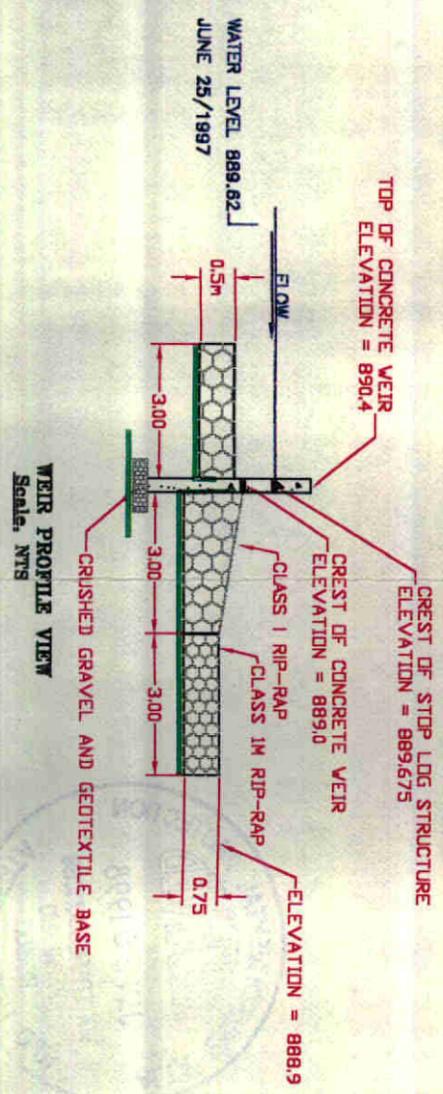
PRECAST CONCRETE WEIR PANELS AND VAULT
The concrete panels and vault will be made of concrete possessing a minimum 28 day compressive strength of 25 Mpa, be air entrained, Type 50 sulphate resistant cement and designed in accordance with CSA Standard CAN3-423.1-87, in conjunction with a minimum water to cement ratio of 0.45. The installation of the precast concrete weir panels and vault will be according to the manufacturers specifications or as approved by the engineer.

ALLEN BLOCK WING WALLS
The Allen Blocks will be laid on the prepared base according to the manufacturers specifications. Blocks forming the wing walls will be interlocked to improve the stability of the wall. 12.5 mm washed crushed gravel or an alternative material approved by the engineer will be placed within the Allen Blocks and in between the Allen Blocks and the geotextile.

A geo-grid with a minimum width with tensile strength of 55 kN/m will be used for the reinforcement of the Allen Blocks. A geo-grid will be tied into the first, fourth, seventh, tenth and fifteenth block layers. The geo-grid will extend a minimum of 2.0 metres into the surrounding re-compacted clay material.

ROCK PROTECTION
Class 1 and Class 1M Rip-Rap will be placed as shown on the plan. A non-woven geotextile with a minimum grab tensile strength of 0.650 kN will be placed under all Rip-Rap protection.

PROFILE VIEW OF WEIR STRUCTURE, SECTION B-B



WEIR AND VAULT DETAIL

| | | | | | | | |
|------------|----------|-------------|----------------|------------|------|-------------|------|
| Permit No. | 1 | Date | 1/27 | By | Q.L. | Checked By | Q.L. |
| Drawn By | Q.L. | Design By | Q.L. | Checked By | Q.L. | Approved By | Q.L. |
| Scale | AS SHOWN | Date | Sept. 17, 1987 | Drawn By | Q.L. | Design By | Q.L. |
| Checked By | Q.L. | Approved By | Q.L. | | | | |

AWARE Engineering Ltd.
Agriculture
Water & Aquatic Resources & Environmental

3801 - 44th Avenue, RED DEER, AB
Phone/Fax (403) 247-2620
e-mail: aware@rednet.ab.ca

Client: Pine Lake Restoration Society
Name of Project: HYPOLIMNETIC WITHDRAWAL SYSTEM
PINE LAKE, ALBERTA

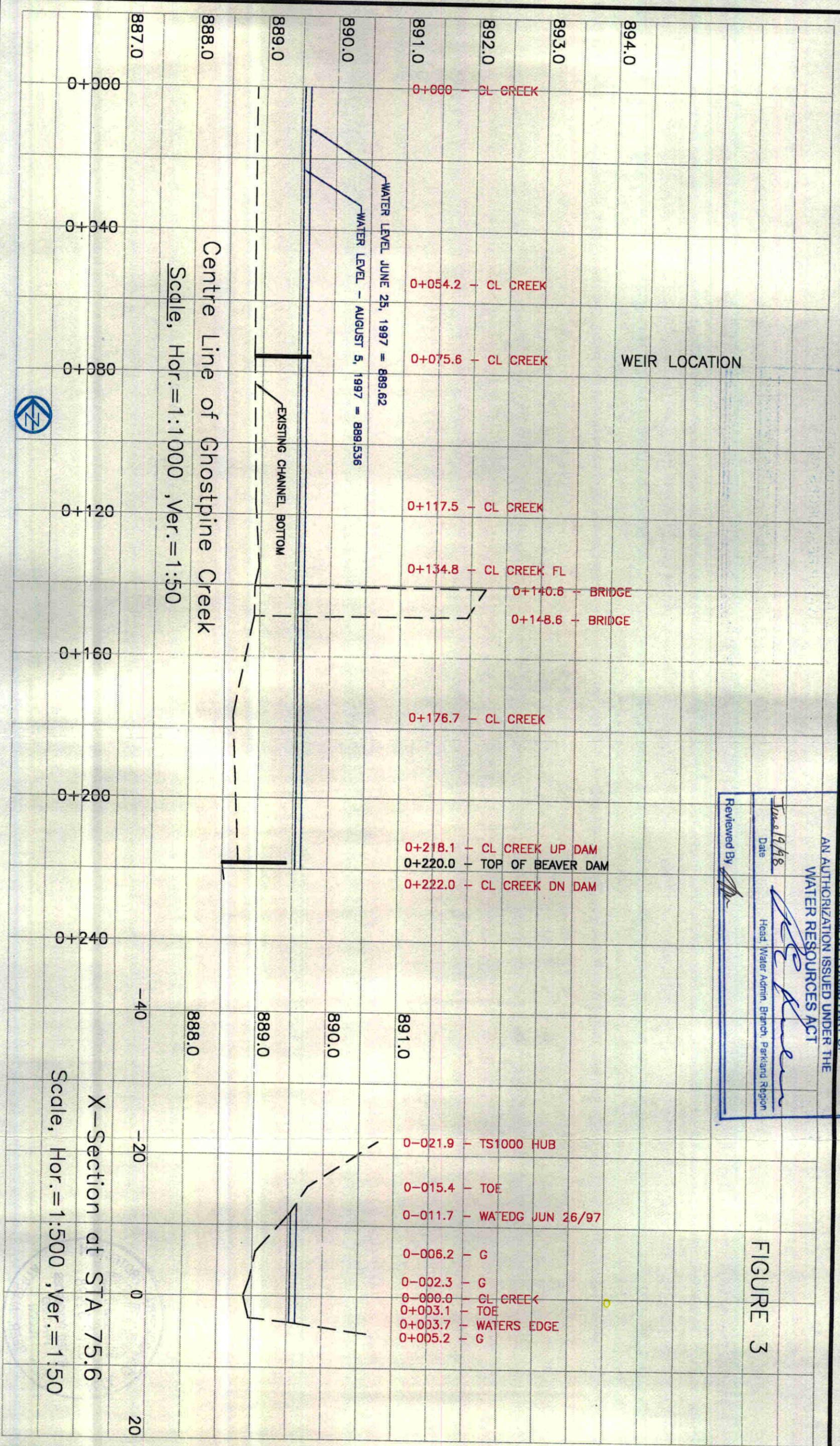
Project No. PLK01
Sheet 4 of 5

: LANNO. 48967-02

THIS DOCUMENT FORMS PART OF
AN AUTHORIZATION ISSUED UNDER THE
WATER RESOURCES ACT

Reviewed By: *[Signature]*
Date: June 19/98
Head, Water Admin. Branch, Parkland Region

FIGURE 3



| | | | | | | | | | |
|---|--|---|--|--|--|--|--|--|--|
| PERMIT TO PRACTICE AWARE ENGINEERING LTD. Signature: <i>[Signature]</i> Date: 12/12/97 PERMIT NUMBER: P 8507 The Association of Professional Engineers and Geoscientists of Alberta | | Engineer's Stamp Date: Sept. 17, 1997 Drawn By: G.L. Designed By: G.L. Checked By: G.L. Approved By: G.L. | | Title of Drawing PROFILE & X-SECTION PLAN OF EXISTING CHANNEL | | AWARE Engineering Ltd. Agriculture & Aquatic Resources & Environmental 5801 - 44th Avenue, RED DEER, AB (403) 247-3625 Fax (403) 247-3625 | | PINELAKE RESTORATION SOCIETY HYDROLIMNETIC WITHDRAWAL SYSTEM Project No. PLK 01 Date: 3/98 | |
|---|--|---|--|--|--|--|--|--|--|

Date June 19/98

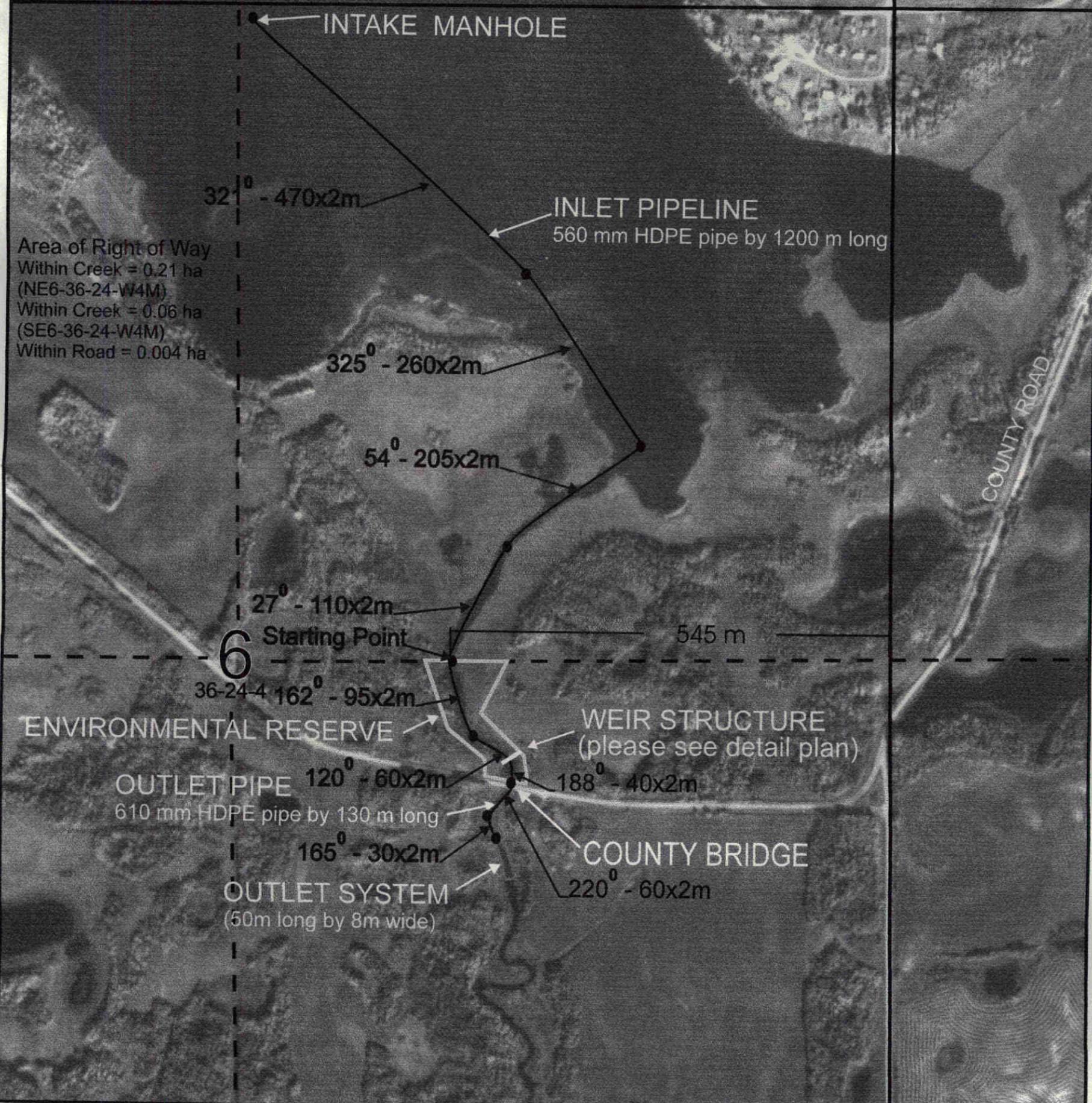
Head, Water Admin. Branch, Parkland Region

Reviewed By



PINE LAKE

SCALE 1 : 5000



Area of Right of Way
Within Creek = 0.21 ha
(NE6-36-24-W4M)
Within Creek = 0.06 ha
(SE6-36-24-W4M)
Within Road = 0.004 ha

COUNTY ROAD

ENVIRONMENTAL RESERVE

WEIR STRUCTURE
(please see detail plan)

OUTLET PIPE
610 mm HDPE pipe by 130 m long

COUNTY BRIDGE

OUTLET SYSTEM
(50m long by 8m wide)

AWARE Engineering Ltd.

Agriculture 5801 - 44th Avenue, Red Deer, AB
Water & Phone/Fax (403) 347-3655
Aquatic e-mail aware-en@telusplanet.net
Resources &
Environmental

Figure # 1

Applicant: Pine Lake Restoration Society

Name of Project

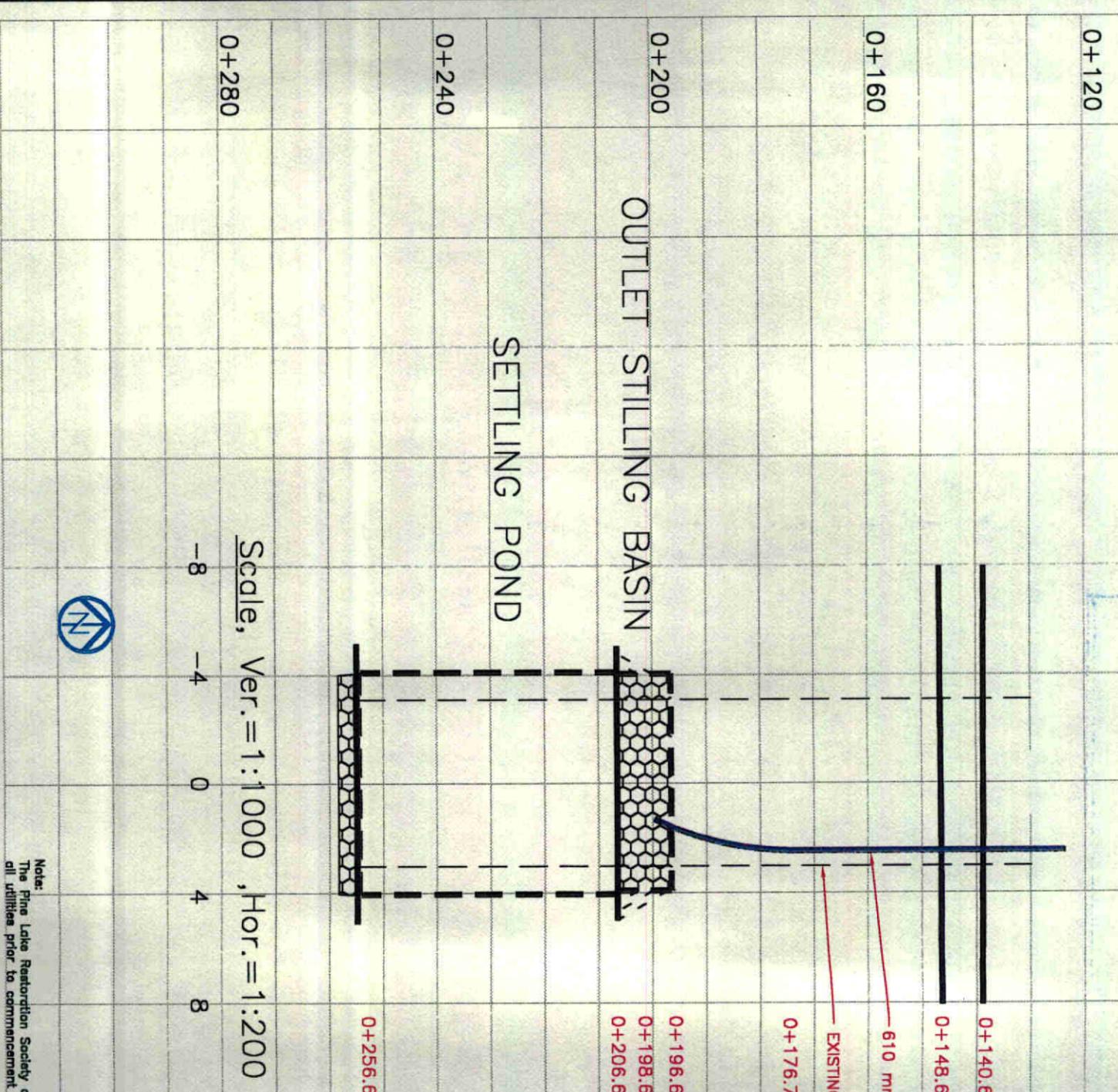
**HYPOLIMNETIC WITHDRAWAL SYSTEM
PINE LAKE, ALBERTA
NE 6 & SE 6 - 36 - 24 - w4**

THIS DOCUMENT FORMS PART OF
AN AUTHORIZATION ISSUED UNDER THE
WATER RESOURCES ACT

Reviewed By: *[Signature]*
Date: *June 19/88*
Head, Water Admin. Branch, Parkland Region

FIGURE 5

PLAN VIEW OF OUTLET SYSTEM



Scale, Ver.=1:1000, Hor.=1:200

Note: The Pine Lake Restoration Society or the contractor shall be responsible for locating all utilities prior to commencement of work.

SPECIFICATIONS

OUTLET STILLING BASIN

Class 1 Rip-rap will be placed on the 5m upstream portion of the stilling basin.

Class 1M Rip-rap will be placed on the 5m downstream portion of the stilling basin.

A non-woven geotextile with a minimum grab tensile strength of 0.65 kN will be placed under all rip-rap protection.

SETTLING POND

Place the precast concrete weirs on a suitable base constructed of clay material. The top of both weirs will be at an elevation of 888.8 meters.

Excavate the pond area in between the weirs to a maximum depth of 1.5 to 2.0 metres using 3:1 side slopes.

Place Class 1M Rip-rap along the entire length of the downstream face of the downstream weir. The rip-rap shall extend a minimum of 1.5 metres downstream of this weir.

OUTLET PIPE

The outlet of the pipe shall be securely fastened to the ground by using concrete weights. The invert elevation of the pipe will be at 888.9 metres.

| | |
|---------------|--------------------------------|
| Permit Status | Permit to Practice |
| Signature | <i>[Signature]</i> |
| Date | 1988 |
| Permit Number | P-8507 |
| Issued by | Manager of Inspection of Works |

Professional Engineer's Stamp

Scale: AS SHOWN
Date: Sept. 17, 1987

Drawn By: G.L.
Designed By: G.L.
Checked By: G.L.
Approved By: G.L.

Title of Drawing: PLAN VIEW OF OUTLET SYSTEM

AWARE Engineering Ltd.
Agriculture & Aquatic Resources & Environmental
3801 - 44th Avenue, Red Deer, AB
Tel: (403) 347-3625
Fax: (403) 347-3625

Client: PINELAKE RESTORATION SOCIETY

Project Name: HYPOLIMNETIC WITHDRAWAL SYSTEM

Project No.: PLK 01
Drawn By: 5
Checked By: 5