YUKON TERRITORY WATER BOARD

Pursuant to the Northern Inland Waters Act and Regulations, the Yukon Territory Water Board, hereinafter referred to as the Board, hereby grants to

Curragh Resources Inc. of 117 Industrial Road, Whitehorse, Yukon Y1A 2T8

hereinafter called the Licensee, the right to alter, divert, or otherwise use water, as proposed in water use application IN89-002, subject to the restrictions and conditions contained in the Northern Inland Waters Act and Regulations made thereunder and subject to and in accordance with the conditions specified in this Licence:

Licence Number: IN89-002 Water Management Arca: 02 Yukon

Location: Vangorda Creek area, Yukon

Purpose: To obtain, store, divert, alter and return a flow of water

Description: Two open pit mines, associated waste dumps and water

treatment plant

Rate of Water Use: 3.5 million imperial gallons per day

Effective Date of Licence: The date on which the signature of the

Minister of Indian and Northern Affairs

Canada is affixed.

Expiry Date of Licence: December 31, 2003.

This Licence, issued and recorded at Whitehorse, includes and is subject to the annexed conditions.

Dated this /2 day of

du . 1990

Witness

YUKON TERRITORY WATER BOARD

Chairman

Dated this 25 day of

1900 · 1990

Witness

Approved by:

Minister of Indian and Northern Affairs Canada

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TIONS, LICENCE IN89-002

Definitions:

- (a) "Act" means Northern Inland Waters Act R.S.C. 1985 Chapter N 25, as amended, first supplement Chapter 33 and any amendments thereto.
- (b) "Regulations" means the Regulations made under the Act.
- (c) "Board" means the Yukon Territory Water Board.
- (d) "Inspector" means any person designated as an Inspector under Section 32 of the <u>Act</u>.

Fees

The Licensee shall pay the water use fees prescribed in Section 10 of the Regulations, annually in advance on the first day of January in each year of the term of this licence.

Security

In accordance with Section 13 of the Regulations, the Licensee shall provide security in the amount of \$943,700.00 (nine hundred and fourty-three thousand and seven hundred dollars), representing ten percent of the capital cost of the work.

4. Post Abandonment

The Licensee shall pay \$560,000. (five hundred and sixty thousand dollars) annually into a trust fund to be used for post abandonment costs. The first payment shall be made no later than December 31, 1991. The terms and conditions of the trust, including the adequacy, form of trust, trustees, beneficiary and levy formula shall be reviewed prior to September 30, 1991 and in 1994 and every four years thereafter during the term of this licence.

5. Non-Compliance

In the event that the Licensee fails to comply with any provision or condition of this licence, the Board may, with the approval of the Minister and subject to the Act, cancel the licence. A violation of a provision or condition of the licence may also result in a mandatory injunction to restrain the Licensee from breaching the provision or condition of a licence.

6. Waste Discharge Standards

This licence is issued to the Licensee, subject to the conditions contained herein, with respect to the use or return of water, or the depositing or permitting the deposit of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposit of such waste may enter any waters.

7. Correspondence

Where any direction, notice, order, or report under this licence is required to be in writing, it shall be given:

(a) to the Licensee, if left at or mailed by registered mail to the following address:

> Curragh Resources Inc. 117 Industrial Road Whitehorse, Yukon Y1A 2T8

and shall be deemed to have been given to the Licensee on the day it was left or seven (7) days after the day it was mailed, as the case may be.

(b) to the Board, if left at or sent by registered mail to the following address:

> Yukon Territory Water Board Suite 302, 4114-4th Avenue Whitehorse, Yukon YIA 4N7

and shall be deemed to have been given to the Board on the day it was left or seven (7) days after it was mailed, as the case may be.

8. Interpretation

- (a) Where a Licensee wishes to appeal an interpretation of a licence condition by an inspector, he may do so by applying to the Board within ten (10) days of receiving the interpretation.
- (b) Where there is a discrepancy between water use application IN89-002 and the terms of this licence, the terms of this licence shall prevail.

Annual Reports

- (a) Pursuant to Section 15 of the Regulations, the Licensee shall submit to the Board, on or before the first day of March of the year next following the year reported, an annual report which shall detail all water quantities used during the year with a summary and an interpretation of any trends or variations in the data.
- (b) In addition to the information referred to under Part A, Section β(a) of this licence, the annual report shall contain:
 - (i) both tabular and graphical summaries of all data generated under Schedule A of this licence, including an analysis and interpretation by a qualified individual or firm and a discussion of any variances from base line conditions or from previous years;

- (ii) a detailed record of any major maintenance work carried out on the waste dumps, diversion works, water treatment plant or any other aspect of works on the property which may have an impact on water.
- The Licenses shall immediately contact the Water Resources Division of Indian and Northern Affairs Canada in Whitehorse (403) 667-3100 or the 24-hour Yukon Spill Report number (403) 667-7244, should a spill or an unauthorized discharge occur. A detailed written report on any such event, including but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, shall be submitted to the Board not later than fifteen (15) days after its occurrence.

11. Term of Licence

The term of this licence is for the period from the effective date to December 31, 2003.

12. Other Laws

No term of this licence limits the application of any other federal or territorial law.

PART B - DESIGN CONSTRUCTION AND MODIFICATION, LICENCE IN89-002

- The Licensee shall submit to the Board the final design construction drawings and specifications for the structures proposed in application IN89-002 including, but not limited to, waste dumps, water collection system, water treatment plant, Vangorda Creek diversion and sludge settling/storage pond, prior to commencement of construction and/or modification of these structures.
- The Licensee shall file with the Board at least ten (10) days prior to the commencement of any construction work referred to in Part B, Section 1 of this licence, a detailed construction schedule.
- 3. The Licensee shall provide as-constructed plans and drawings of the works referred to in Part B, Section 1 of this licence within one hundred and twenty (120) days after completion of construction. These shall be submitted on transparencies reproducible with the use of a standard printer and shall be certified by a professional engineer.
- 4. All construction referred to in Part B, Section 1 shall be constructed using sound engineering practices, supervised by a technically qualified person and inspected by a professional engineer.

- The Licensee shall notify an inspector prior to the commencement of any instream construction.
- 6. The Licensee shall construct the cellularized Vangorda Waste dump as outlined in SRK report 60609, February 1990 (section 3, alternative 1.4).
- The Licensee shall construct the Grum Waste Dump as outlined in SRK report 60609, February 1990 (section 4, alternative 2.2).
- 8. Without limiting the generality of Part B, Section 1, detailed designs of the Vangorda Waste Dump and Grum Main Waste Dump shall include a stability analysis of the dump slopes toward Vangorda Creek.
- Upon abandonment the Licensee shall construct the Vangorda pit wall covers as outlined in SRK report 60609, February 1990 (section 5, alternative 3.2).
- 10. The Licensee shall construct the acid mine drainage collection ditches and collection pond and water treatment plant as outlined on Figure 2.16 of application IN89-002, Vangorda Plateau Development Water Use Application, Volume III Figures. The ditches shall be designed, constructed and maintained so that any seepage flows freely into the collection pond and the pond shall be designed, constructed and maintained so that no significant seepage proceeds into the ground.
- 11. All seepage water from the Vangorda and Grum pits and dumps shall be collected and treated at the water treatment plant.
- 12. (a) The Licensee shall construct and maintain a temporary diversion of Vangorda Creek as proposed in Application IN89-002, Section 2.5.1 of Volume I - Report.
 - (b) The dam and culvert of the diversion referred to in Part B, Section 12(a) shall be designed to accommodate the twenty year peak flow and shall have a contingency capacity for a one hundred year flow.
- During the term of this licence, including any period of temporary consation, the Licensee shall maintain all works on the property in good order in accordance with sound engineering and environmental practices.

PART C - CONDITIONS APPLYING TO OPERATION, LICENCE IN89-002

Water Supply

The Licensee may withdraw water from wells in the Vangorda Creek area, in a quantity not to exceed 6000 imperial gallons per day, as proposed in water use application IN89-002 and subject to this licence.

2. Waste Discharge

(a) No waste discharge shall exhibit constituents or characteristics exceeding the following limits:

Suspended Solids - not greater than 15 mg/L
pN - not less than 6.5 pN units
Colour - not greater than 20 Pt-Co units
Turbidity - not greater than 15 Jackson
Turbidity units

- (b) No waste discharge shall contain floating solids.
- (c) No visible or floating oils or grease shall be present in any waste discharge.
- (d) The concentrations of substances which shall not be exceeded in any waste discharge are listed below:

		Maximum Concentration for grab mample								
Ammonia	(as N)	total	3.50 mg/L							
Antimony	(Sb)	total	0.10 mg/L							
Armenic	(Aa)	dissolved	0.05 mg/L							
Barium	(Ba)	total	1.00 mg/L							
Cadmium	(Cd)	total	0.02 mg/L							
Copper	(Cu)	total	0.20 mg/L							
Cyanide	(as CN)	total	0.05 mg/L							
Lead	(Pb)	total	0.20 mg/L							
Mercury	(Hg)	total	0.005 mg/L							
Molybdenum	(Mo)	total	0.50 mg/L							
Nickel	(Ni)	total	0.50 mg/L							
Selenium	(Se)	total	0.05 mg/L							
Silver	(Ag)	total	0.10 mg/L							
Zinc	(2n)	total	0.50 mg/L							

(e) The effluent standards listed in Part C, Section 2 of this licence shall be met at all points of entry to all receiving waters.

- (f) The Licensee shall operate the water treatment plant towards compliance with an objective of a 96 hour LC50 Bioassay of 100% when sample pN is adjusted to 8.0. In the event that the treatment system is not capable of achieving this objective, the Licensee shall
 - (i) investigate the causes of the failure to achieve that objective, and
 - (ii) conduct chemical analyses for total and dissolved metals plus major anions, which shall be obtained from an aliquot of the bioassay sample, and
 - (iii) evaluate potential mitigation measures, and
 - (iv) submit to the Board, within ninety days of the sample collection, a report which details the results of the activities required by Part C Section (f), subsections (i), (ii) and (iii).

Tailings Disposal

The Licensee is permitted to deposit milled tailings generated from the Vangorda and Grum pits behind what is known as the Intermediate dam, referred to and identified in Curragh Resources Inc. water licence IN89-001 and/or in any other location which may be determined through amendment to licence IN89-001.

PART D - MONITORING AND SURVEILLANCE, LICENCE IN89-002

Surveillance Network

- (a) The Licensee shall compile data relating to the surveillance network program into a monthly report. The report shall be submitted to the Board within thirty (30) days of the end of each month for which the report is compiled.
- (b) (i) The Licensee shall comply with the Surveillance Network Program attached as Schedule "A" hereto and shall comply with all provisions for sampling, sample preservation, reporting and analysis specified in this licence.
 - (ii) Unless otherwise specified in the quality assurance/quality control program, all analysis shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water", prepared and published jointly by the American Water Works Association and the Water Pollution Control Federation.

- (iii) The Licensee may use an internal lab providing that a quality assurance/quality control program has first been submitted to the Board. The objective of the quality assurance/quality control program shall be to validate data and provide quality assurance.
- c) During any period of temporary cessation, the Licensec shall comply with the surveillance network program appended as Schedule A, Part IV of this licence.

Benthic Invertebrate Monitoring Program

- (a) The Licensee shall conduct biological sampling at the following sites:
 - V1 Vangorda Crcek upstream from the mine and Blind Creek road;
 - ii) V5 West fork of Vangorda Creek upstream of mine access road;
 - iii) V8 Vangorda Creek near bridge to Faro town water supply;
 - iv) V27- Main stem of Vangorda Creek just upstream of confluence with Shrimp Creek.
- (b) Commencing in 1991, the Licensee shall collect three replicate samples every second year from the sites indicated in Part D, Section 2(a), using an artificial substrate sampler for approximately five weeks.
- (c) Water samples shall be collected and analyzed for total hardness, alkalinity, sulphate, suspended solids and ammonia.
- (d) Water samples shall be collected and analyzed for the following total and dissolved metals:
 - i) copper;
 - ii) iron;
 - iii) lead;
 - iv) zinc.
- (e) Sample collection, identification, enumeration, and data interpretation shall be performed by an independent consultant.
- (f) The Licensee shall compile a report of all data collected and shall submit this report to the Board as a component of the annual report required by Part A, Section 8.

3. Sediment Monitoring Program

The Licensee shall monitor the levels of sediment in Vangorda Creek through compliance with the following sediment monitoring program:

- (a) Sample locations shall be those stipulated in Part D, Section 2(a).
- (b) Sampling shall be undertaken concurrently with sampling under Part D, Section 2(b).
- (c) Samples shall be in triplicate.
- (d) Each sample shall be passed through a 100 mesh (0.15 mm) stainless steel sieve and the portion passing through the sieve shall be analyzed for total metals listed in Part C, Section 2(d) of this licence.
- (e) The Licensee shall submit a report on the sediment monitoring program concurrent with the report on the benthic invertebrate monitoring program report required by Part D, Section 2(f) of this licence.

4. Seepage and Groundwater Monitoring Program

- (a) The Licensee shall, within 6 months of construction of the waste dumps, submit to the Board a seepage monitoring program and shall implement this program within a reasonable time thereafter.
- (b) Within 6 months of activating the seepage monitoring program referred to in Part D, Section 4(a) the Licensee shall submit to the Board a groundwater monitoring program and shall implement this program within a reasonable time thereafter.

5. Fish Monitoring Program

The Licensee shall develop and implement a multi-year fish monitoring program to determine fish abundance, population composition and fish growth and habitat measurement in the lower reaches of Vangorda Creek.

6. Physical Monitoring Program

The Licensee shall ensure that all earthworks including, but not limited to, open pits, waste dumps, collector ditches, Vangorda Creek diversion and sludge pond are inspected by June of each year of this licence by a qualified professional engineer. The Licensee shall, by September 1 of each year, submit to the Board a report of the results of this inspection.

PART E - REPORTS AND STUDY PROGRAMS, LICENCE IN89-002

Sludge Stability and Disposal

- (a) The Licensee shall, as a component of the 1991 annual report, submit to the Board a program for the detailed study of sludge stability and composition and shall implement this program in accordance with the schedule included in the program.
- (b) The Licensee shall, by December 31, 1992, submit to the Board a detailed sludge disposal plan.

2. Technical Advisory Committee

- (a) The Licensee shall make every reasonable effort to co-ordinate the formation of a technical advisory committee hereinafter referred to as the "TAC".
- (b) Membership on the TAC shall be extended to, but not necessarily limited to, representatives of:

Government of Yukon;
The Yukon Conservation Society;
Ross River Dena Council;
Selkirk First Nations;
Curragh Resources Inc.;
Environment Canada;
Fisheries and Oceans Canada; and
Indian and Northern Affairs Canada.

- (c) The TAC shall meet quarterly or more frequently as required and shall determine its operational and administrative procedures.
- (d) The objects of the TAC shall be:
 - to coordinate the design and implementation of a research program to assist in the establishment of water quality objectives for preservation of aquatic life in lower Vangorda Creek;
 - (ii) to share and exchange technical data pertaining to study results and monitoring and surveillance requirements of this licence;
 - (iii) to promote and foster co-operative efforts designed to develop a better understanding of membership concerns and issues;
 - (iv) to provide advice to the Licensee in developing the detailed terms of reference for various studies and research requirements to be undertaken pursuant to this licence.

- (e) The TAC shall make every effort to solicit financial participation from its members and others to fund the purposes established by Part E, Section 2(d) of this licence.
- (f) The Licensee shall, as part of each annual report required by Part A, Section 8, submit an annual report to the Board regarding the activities of the technical advisory committee. The annual report will include:
 - (i) Copies of all studies undertaken on behalf of the committee; and
 - (ii) Comprehensive listing of all planned studies and related schedules.

3. Performance Evaluation Reports - Water Treatment Plant

- (a) The Licensee shall, within six months of the start-up of the water treatment plant, and thereafter as a component of each annual report required by Part A, Section 8 of this licence, submit to the Board an annual performance evaluation report pertaining to the water treatment plant.
- (b) The evaluation required under Part E, Section 3 (a) of this license shall be conducted by an independent person with training and experience relevant to the water treatment plant operated by the Licensee.
- (c) The report required under Part E, Section 3(a) of this license will include:
 - (i) In the case of the first report only: detailed documentation of the operation of the water treatment plant including start-up problems and related resolutions.
 - (ii) In the case of the first and each subsequent report:
 - (a) An analysis of the plants performance in terms of treatment efficiency, capacity and compliance; and,
 - (b) A review of water treatment plant daily operators' logs; and,
 - (c) Recommended remedial action, where such remedial action is deemed to be appropriate.

PART F - CONTINGENCY PLANS, LICENCE IN89-002

1. Water Treatment Plant

- (a) The Licensee shall, as a component of the 1991 annual report, submit to the Board a contingency plan to address remedial action to be taken in any instance where the operation of the water treatment plant is unsuccessful to the degree that any discharge standard, particularly zinc, will be exceeded.
- (b) The parameters of the contingency plan referred to in Part F, Section 1 shall include, but not be limited to:
 - (i) Potential failure caused by unusual hydraulic loading due to storm event, and
 - (ii) Potential failure due to process or mechanical failure.

2. General Hazards and Spill Contingency Plans

The Licensee shall, within one year of the date for submission of final as-constructed designs required by Part B, Section 3 of this license, submit to the Board a comprehensive Risk Assessment of all aspects of the project. The risk assessment, using accepted methodology, shall identify potential hazards including, but not limited to, failures in water collection, storage and treatment systems, and shall assess the probable impact of such failures and propose mitigative contingency plans.

PART G - ABANDONMENT, LICENCE IN89-002

- All discharges from the property after abandonment shall not exceed the concentrations listed in Part C of this license.
- The Licensee shall continue to maintain and operate a water treatment plant in perpetuity in order to ensure that the standards imposed by Part C of this license are not exceeded.
- 3. The Licensee shall ensure that waste dumps are designed, constructed, maintained and abandoned in such a manner as to minimize acid generation after abandonment of the project.
- 4. The Licensee shall, by June 15, 1994, submit to the Board a detailed plan for the abandonment of the Grum/Vangorda project. The Licensee shall comply with the abandonment monitoring program as proposed in Section 4.9 of Exhibit 1(a) of application IN89-002.
- 5. The Licensee shall, by June 15, 1998 and every fourth anniversary thereafter, submit to the Board a comprehensive analysis of the effectiveness of the mitigative measures of the abandonment plan, particularly as they pertain to acid mine drainage.

SCHEDULE A - PART I TO LICENCE IN89-002 SURVEILLANCE NETWORK PROGRAM SCHEDULE OF SITES

- V1 Vangorda Creek, upstream from the mine and Blind Creek road
- V2 Grum Creek, upstream from its confluence with Vangorda Creek
- V4 Shrimp Creek, upstream from its confluence with Vangorda Creek
- V5 West fork of Vangorda Creek upstream of mine access road
- V6A A small tributary (AEX Creek) to the west fork of Vangorda Creek
- V7 Overflow from Grum portal
- V8 Vangorda Creek near the bridge to Faro town water supply
- V14 Southwest sump Grum main waste dump
- V15 Sulphide cell sump Grum main waste dump
- V16 Southeast sump Grum main waste dump
- V17 Grum northwest interceptor ditch, when interceptor wells are pumping
- V18 Grum southeast interceptor ditch, when interceptor wells are pumping
- V19 Vangorda pit northwest interceptor ditch
- V20 Vangorda pit southeast interceptor ditch
- V21 Vangorda waste dump collector sump
- V22 Vangorda pit water and Vangorda Lake at closure
- V23 Grum pit water and Grum Lake water at closure
- V24 Influent to treatment plant

- V25 Effluent from clarification pond decant
- V26 "Little Creek" between Vangorda pit and waste dumps
- V27 Main stem of Vangorda Creek just upstream of confluence with Shrimp Creek

SCHEDULE A - PART II to LICENCE IN89-002 SURVEILLANCE NETWORK PROGRAM DURING NORMAL OPERATION

TABLE OF STATIONS, PARAMETERS AND MONITORING FREQUENCY

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W = weekly (once per week)

M = monthly (once per month)

Q = quarterly (once per three month)

== while we'lls pumping, or sump discharging

C= continuous record

F= while lake, filling

SCHEDULE A - PART IV TO LICENCE IN89-002 SURVEILLANCE NETWORK PROGRAM DURING TEMPORARY SUSPENSION OF OPERATIONS

TABLE OF STATIONS, PARAMETERS AND MONITORING FREQUENCY

		PARAMETER															
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Q = quarterly

C = continuous

W - weekly

* = when treatment plant is operating

SCHEDULE A - PART III to LICENCE IN89-002 SURVEILLANCE NETWORK PROGRAM

MONITORING/SAMPLING SITE LOCATIONS

