



Copies for Approval Letter to Industry (11)
RE: GEP, Salt Water Disposals, etc.

- G. Miltenberger
- Data Management
- R. Stefik
- D. Richardson
- P. Attariwala
- G. Farr
- S. Chicorelli
- Resource Revenue
- 59240
- Wellfiles (originals)
- Daily

File: 8100-4800-59240-16
980416

May 6, 1998

Mr. David W. Lui, P. Eng.
Petroleum Engineering Consultant
Novagas Canada Ltd.
800 707 8th Ave. SW
Calgary AB T2P 3V3

Dear Mr. Lui:

**Re: Application For Acid Gas Injection
Novagas et al W Stoddart 1-33-87-21 W6M (WA 9887)
Halfway Formation**

This refers to your Application dated February 10, 1998 wherein you requested approval of acid gas injection into the subject well.

Attached, please find Approval 98-16-002 for the Application, granted under section 100 of the Petroleum and Natural Gas Act.

The Ministry must be notified, in writing, of the date of commencement of acid gas injection into the well.

Yours sincerely,

Bou van Oort, P. Eng.
Director
Engineering and Operations Branch

PSA/mef

Attachment

APPROVAL 98-16-002

**PETROLEUM AND NATURAL GAS ACT
THE PROVINCE OF BRITISH COLUMBIA
MINISTRY OF ENERGY AND MINES
ENERGY AND MINERALS DIVISION**

IN THE MATTER of a proposal by Novagas Canada Ltd. (the Operator) to inject acid gas into the Halfway formation in the well Novagas et al W. Stoddart 1-33-87-21 W6M (the well).

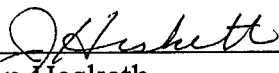
The Minister of Energy and Mines, pursuant to section 100 of the Petroleum and Natural Gas Act, R.S.B.C. 1996, c.361, hereby orders as follows:

1. The proposal of the Operator for the disposal of acid gas (hydrogen sulphide and carbon dioxide) into the Halfway formation in the well, as such proposal is described in:
 - a) applications from the Operator to the Ministry dated February 10, 1998,
 - b) an application for a Project Approval Certificate from the Operator to the Environment Assessment Office dated December 9, 1997,
 - c) supplementary information filed in support thereof,is hereby approved, subject to terms and conditions herein contained.
2. Acid gas shall be injected only into the Halfway Formation of the well.
3. The wellhead injection pressure must not exceed 10,500 kPag.
4. The sandface injection pressure must not exceed 20,000 kPag.
5. The injection rate must not exceed $391 \times 10^3 \text{m}^3/\text{d}$ expressed at 101.325 kPaa and 15 degrees Celsius.
6. The cumulative volume injected must not exceed $1,876 \times 10^6 \text{m}^3$ expressed at 101.325 kPaa and 15 degrees Celsius.
7. The Operator must monitor the casing, conduct annular packer isolation tests and implement appropriate corrosion protection measures.
8. The Operator must monitor pressure in the offsetting wells and maintain the hydraulic isolation of the injection zone.

9. The Wellhead Emergency Shut-Off Device must be linked to H₂S detector heads at the wellhead and a Subsurface Safety Valve or Injection Check Valve must be installed in the tubing string to operate "fail-safe".
10. A barricade must be installed around the wellhead which is capable of withstanding vehicle collision.
11. All injection operations must be immediately suspended if any injection equipment, monitoring equipment or safety devices considered necessary for safe operation should fail.
12. The Operator must submit a progress report to the Energy and Minerals Division for each six-month period the project is in operation, determined from the first day of injection. The requirement may be amended at the request of the operator after the scheme has been in operation for a period of three years. The progress report is due within 60 days after the end of each period and must contain:
 - a) details of any workover or treatment program done on the well with reasons for the workover and results of the workovers,
 - b) a discussion of any changes in injection equipment and operations,
 - c) a general review of the operation of the project including identification of problems, remedial action taken and results of the remedial action on project performance,
 - d) a discussion of the overall performance of the project,
 - e) an evaluation of all monitoring done during the reporting period including corrosion protection, fluid analyses, logs and any other data collected,
 - f) a table showing monthly volumes of injected fluid, corresponding maximum wellhead injection pressures, maximum daily injection rates, average wellhead temperatures and hours on injection,
 - g) the volume-weighted average composition and formation volume factor for the injected fluid,
 - h) a plot showing monthly injection volume and average pressure versus time on an ongoing basis,
 - i) a table showing tonnes of sulphur and CO₂ disposed on a monthly and cumulative basis.

13. The project shall be deemed to have commenced upon the initiation of acid gas injection into the well. The Manager, Regional Oil and Gas Operations, at Charlie Lake must be notified in writing 72 hours prior to the commencement of injection operations.
14. An emergency response plan procedure must be filed with the Manager, Regional Oil and Gas Operations prior to the commencement of injection operations.
15. The operations of the acid gas injection scheme will be subject to review by the Ministry. The Director of Engineering and Operations Branch or the Manager, Regional Oil and Gas Operations, may issue general guidelines regarding the operations of the acid gas injection scheme.
16. The approval or any condition of it may be modified or rescinded by the Director of Engineering and Operations Branch for non-compliance of the conditions or unsafe operations.

Nov. 1/98



Joan Hesketh
Acting Deputy Minister
Ministry of Energy and Mines

DATED AT the City of Victoria, in the Province of British Columbia, this
30th day of April, 1998.