

October 21, 2004

2850-4060-59240-16  
OGC-04304

Elizabeth Oberhofer, P. Eng.  
Senior Reservoir Engineer  
Burlington Resources Canada  
2100, 250 – 6<sup>th</sup> Avenue SW  
Bow Valley Square IV  
Calgary, AB T2P 3H7

Dear Ms. Oberhofer:

**Re: Application For Acid Gas Injection  
Burlington Burnt a-94-A/93-O-8; WA 7908  
Burnt River Pardonet-Baldonnel "A" Pool**

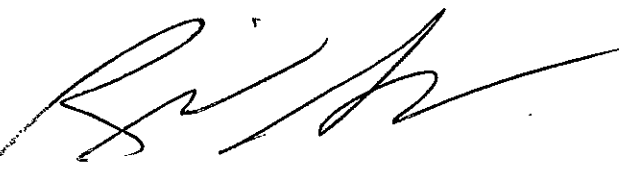
This refers to your application dated March 10, 2004 wherein a scheme for acid gas injection/disposal into the well a-94-A/93-O-8 of the subject pool was requested.

Attached please find Approval 04-16-001 for the application granted under Section 100 of the Petroleum and Natural Gas Act.

It should be noted that an "Application to Alter" for re-completion of the wellbore may be required to be submitted to the Commission's office in Fort St. John.

We wish to point out that the Commission must be notified, in writing, of the date of commencement of acid gas injection for the subject well as specified in condition 13 of the Approval.

Sincerely,



*PET*  
Craig Gibson, P. Eng.  
Director  
Resource Conservation Branch

Attachment

Approval Letters to Industry  
GEP, SWD, CONCURRENT PROD,  
PRESSURE MAINTENANCE,  
WATERFLOOD, ETC.

Copy 9.

<input type="checkbox"/>	Wellfile (originals)
<input type="checkbox"/>	59240
<input type="checkbox"/>	Dally
<input type="checkbox"/>	Resource Revenue
<input type="checkbox"/>	S. Chicorelli
<input type="checkbox"/>	R. Stefik
<input type="checkbox"/>	G. Farr
<input type="checkbox"/>	R. Slocomb
<input type="checkbox"/>	D. Krezanoski

**RESOURCE CONSERVATION BRANCH**

PO Box 9329 Stn Prov Gov't, Victoria BC V8W 9N3 Tel: (250) 952-0302 Fax: (250) 952-0291  
Location: 6<sup>th</sup> Fir 1810 Blanshard St. Victoria BC

Headquarters: #200, 10003 110<sup>th</sup> Ave, Fort St. John BC V1J 6M7 Tel: (250) 261-5729 Fax: (250) 261-5744  
www.ogc.gov.bc.ca

**THE PROVINCE OF BRITISH COLUMBIA**  
**PETROLEUM AND NATURAL GAS ACT**  
**OIL AND GAS COMMISSION**

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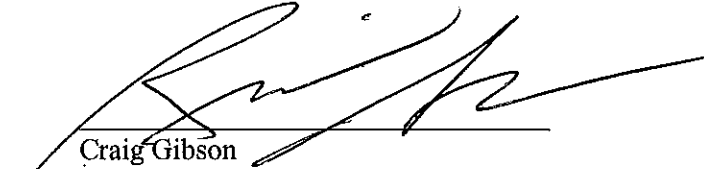
IN THE MATTER of a proposal (the Scheme) by Burlington Resources Canada (the Operator) to inject acid gas into the Pardonet-Baldonnel "A" pool in the well Burlington Burnt a-94-A/93-O-08 (the well).

NOW THEREFORE, the Commission, pursuant to section 100 of the Petroleum and Natural Gas Act, R.S.B.C. 1996, c.361 hereby orders as follows:

The Scheme of the Operator for the injection of acid gas (hydrogen sulphide and carbon dioxide) into the Pardonet-Baldonnel "A" pool through the well, as such proposal is described in an application from the Operator to the Commission dated March 10, 2004 is hereby approved, subject to terms and conditions herein contained.

1. Acid gas shall be injected only into the Pardonet-Baldonnel "A" pool through the well.
2. The area of the Scheme shall consist of units 72-75, 82-85 and 92-95 of Block A and units 2-5 of Block H/93-O-8.
3. The wellhead injection pressure must not exceed 10,000 kPag.
4. The sandface injection pressure must not exceed 30,000 kPag.
5. The injection rate must not exceed  $900 \text{ } 10^3 \text{ m}^3/\text{d}$  expressed at 101.325 kPaa and 15 degrees Celsius.
6. The cumulative volume injected must not exceed  $1,250.0 \text{ } 10^6 \text{ m}^3$  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 reservoir 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 H<sub>2</sub>S 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 that 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 Commission for each six-month period the Scheme 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 scheme,
  - 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 carbon dioxide disposed on a monthly and cumulative basis.
13. The Scheme shall be deemed to have commenced upon initiation of acid gas injection into the well. The Director, Operations Engineering Branch 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 Director, Operations Engineering Branch prior to commencement of the injection operations.
  15. The operations of the acid gas injection scheme will be subject to periodic review by the Commission. The Director, Resource Conservation Branch or the Director, Operations Engineering Branch, 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 for non-compliance of the conditions or unsafe operations.

  
per Craig Gibson  
Director  
Resource Conservation Branch

DATED AT the City of Victoria, in the Province of British Columbia, this      day of October, 2004.

October 14, 2004

**RE: Decision on an Application for Acid Gas Disposal from Burlington  
Burnt River Pardonet-Baldonnel "A" pool (a-94-A/93-O-08; WA# 7908)**

Reserves Estimates:

	OGC	Fekete
OGIP ( $10^6 \text{ m}^3$ )	2000.0	1820.0
IR ( $10^6 \text{ m}^3$ )	1300.0	1300.7
RF	65%	71.5%

The Burnt River Pardonet-Baldonnel "A" pool contains two wells. One well that is currently producing at around  $30 \times 10^3 \text{ m}^3/\text{d}$  (Talisman Amoco Burnt c-61-A/93-O-8) and the well under application (Burlington Burnt a-94-A/93-O-8) which watered out in August 1999. The table shown above indicates that there is very little argument as to how much gas is recoverable from this pool, despite the difference in OGIP's. The OGC would like to rule out losing any future development opportunities within this pool, and hence determine whether any gas will be stranded as a result of approving the subject application. All of the rights within this pool are owned by either Burlington or Talisman.

In an e-mail to Peter Attariwala from Elizabeth Oberhofer (Burlington), dated May 7, 2004 she indicated drilling costs in the order of \$9.0 MM and completion costs of another \$1.5 MM. If we assume a 5-15% incremental gas addition by drilling a new well, this would result in an additional 100-300  $10^6 \text{ m}^3$  (3.5-10 Bcf) of recoverable raw gas. Assuming an 80% shrinkage factor, marketable gas reserves would be 80-240  $10^6 \text{ m}^3$  (3-8 Bcf), which at \$5.00/mcf would yield \$15-\$40 MM. This does not take into account tie-in costs, taxes, operating costs or royalties. Elizabeth Oberhofer and Carmine Vertone (MEM) both indicated that 15 Bcf is the minimum prize that industry would drill for in this area. It appears that the Province would likely not be risking much in terms of reserves by approving this application.

**Recommendation:** Approve this application as is, for use initially as a back-up injector to a-43-B/93-P-5. Upon fill-up of a-43-B, the subject well will become the primary disposal site (anticipated to be mid 2006).

Richard Slocomb, P.Eng.  
Supervisor, Reservoir Engineering