



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)  
UNDERGROUND INJECTION CONTROL MAJOR PERMIT MODIFICATION: CLASS II

Permit Number: MI-009-2D-0072

Facility Name: Mancelona West #1-27 SWD

Pursuant to the provisions of the Safe Drinking Water Act, as amended (42 U.S.C. §300f *et seq.*, commonly known as the SDWA) and implementing regulations promulgated by the USEPA at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (40 CFR),

**BreitBurn Operating Limited Partnership of Gaylord, Michigan**

is hereby authorized to operate an existing injection well located in Michigan, Antrim County, T29N, R6W, Section 27, SW 1/4 Section, for injection into the Dundee Limestone at depths between 2570 feet and 2841 feet, upon the express condition that the permittee meet the restrictions set forth herein.

The purpose of the injection is limited to non-commercial disposal of salt water from production wells owned or operated by BreitBurn Operating Limited Partnership.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This is a major modification of a permit that was signed on November 30, 1993. The modification shall become effective on \_\_\_\_\_. The permit shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR §§144.39, 144.40 or 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. This permit will be reviewed at least every five years from the effective date specified above.

Signed and dated: \_\_\_\_\_

**DRAFT**

\_\_\_\_\_  
Tera L. Fong  
Division Director, Water Division

**OPERATING, MONITORING AND REPORTING REQUIREMENTS**

| CHARACTERISTIC                      | LIMITATION | MINIMUM MONITORING REQUIREMENTS |      | MINIMUM MONITORING REQUIREMENTS |
|-------------------------------------|------------|---------------------------------|------|---------------------------------|
|                                     |            | Frequency                       | Type | Frequency                       |
| *Injection Pressure (maximum)       | 675 psig   | weekly                          |      | monthly                         |
| Annulus Pressure                    |            | weekly                          |      | monthly                         |
| Flow Rate                           |            | weekly                          |      | monthly                         |
| Cumulative Volume                   |            | weekly                          |      | monthly                         |
| Annulus Liquid Loss                 |            | quarterly                       |      | quarterly                       |
| **Chemical Composition of Injectate |            | annually                        | grab | annually                        |

**SAMPLING LOCATION:** The sampling location shall be at the tap valve located on the disposal string approximately 2 feet from the wellhead.

- \* The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula:  $[ \{ 0.8 \text{ psi/ft} - (0.433 \text{ psi/ft})(\text{specific gravity}) \} \times \text{depth} ] - 14.7 \text{ psi}$ . The maximum wellhead pressure is dependent upon depth and specific gravity of the injected fluid. The Dundee Limestone at 2570 feet was used as the depth and a specific gravity of 1.228 was used for the injected fluid.
- \*\* Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.



United States Environmental Protection Agency  
Washington, DC 20460

### PLUGGING AND ABANDONMENT PLAN

|                              |                                    |
|------------------------------|------------------------------------|
| Name and Address of Facility | Name and Address of Owner/Operator |
|------------------------------|------------------------------------|

|  |   |   |               |
|--|---|---|---------------|
| <p>Locate Well and Outline Unit on Section Plat - 640 Acres</p>  | State   | County  | Permit Number |
|  | Surface Location Description<br>____ 1/4 of ____ 1/4 of ____ 1/4 of ____ 1/4 of Section ____ Township ____ Range ____   |   |               |
|  | Locate well in two directions from nearest lines of quarter section and drilling unit<br>Surface<br>Location ____ ft. frm (N/S) ____ Line of quarter section<br>and ____ ft. from (E/W) ____ Line of quarter section. |   |               |
| TYPE OF AUTHORIZATION<br><input type="checkbox"/> Individual Permit<br><input type="checkbox"/> Area Permit<br><input type="checkbox"/> Rule<br>Number of Wells ____ |   | WELL ACTIVITY<br><input type="checkbox"/> CLASS I<br><input type="checkbox"/> CLASS II<br><input type="checkbox"/> Brine Disposal<br><input type="checkbox"/> Enhanced Recovery<br><input type="checkbox"/> Hydrocarbon Storage<br><input type="checkbox"/> CLASS III |               |
| Lease Name   |   | Well Number   |               |

| CASING AND TUBING RECORD AFTER PLUGGING |            |                        |                         |           | METHOD OF EMPLACEMENT OF CEMENT PLUGS  |  |
|---|------------|------------------------|-------------------------|-----------|--|--|
| SIZE                                    | WT (LB/FT) | TO BE PUT IN WELL (FT) | TO BE LEFT IN WELL (FT) | HOLE SIZE |  |  |
|   |            |                        |                         |           | <input type="checkbox"/> The Balance Method<br><input type="checkbox"/> The Dump Bailer Method<br><input type="checkbox"/> The Two-Plug Method<br><input type="checkbox"/> Other |  |
|   |            |                        |                         |           |  |  |
|   |            |                        |                         |           |  |  |
|   |            |                        |                         |           |  |  |

| CEMENTING TO PLUG AND ABANDON DATA:                      |  |  |  | PLUG #1 | PLUG #2 | PLUG #3 | PLUG #4 | PLUG #5 | PLUG #6 | PLUG #7 |
|--|--|--|--|---------|---------|---------|---------|---------|---------|---------|
| Size of Hole or Pipe in which Plug Will Be Placed (inche |  |  |  |         |         |         |         |         |         |         |
| Depth to Bottom of Tubing or Drill Pipe (ft)             |  |  |  |         |         |         |         |         |         |         |
| Sacks of Cement To Be Used (each plug)                   |  |  |  |         |         |         |         |         |         |         |
| Slurry Volume To Be Pumped (cu. ft.)                     |  |  |  |         |         |         |         |         |         |         |
| Calculated Top of Plug (ft.)                             |  |  |  |         |         |         |         |         |         |         |
| Measured Top of Plug (if tagged ft.)                     |  |  |  |         |         |         |         |         |         |         |
| Slurry Wt. (Lb./Gal.)                                    |  |  |  |         |         |         |         |         |         |         |
| Type Cement or Other Material (Class III)                |  |  |  |         |         |         |         |         |         |         |

| LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any) |    |      |    |
|---|----|------|----|
| From  | To | From | To |
|   |    |      |    |
|   |    |      |    |
|   |    |      |    |
|   |    |      |    |

Estimated Cost to Plug Wells

**Certification**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possiblity of fine and imprisonment. (Ref. 40 CFR 144.32)

|  |                                 |             |
|--|---------------------------------|-------------|
| Name and Official Title (Please type or print) | Signature<br><i>Joe Latulip</i> | Date Signed |
|--|---------------------------------|-------------|

| Original Well Construction Operation<br>Mancelona West 1-27 |                 |                   |                 | Plugged and Abandonment Construction<br>Mancelona West 1-27<br>(#47997) |                      |                   |                 |
|---|-----------------|-------------------|-----------------|---|----------------------|-------------------|-----------------|
| Surface   |                 |                   |                 | 0   |                      | Surface           |                 |
| Top of Cement   | <u>N/A</u>      |                   |                 | Top Plug  | <u>0 - 50</u>        |                   |                 |
|   |                 | Surface Csg.      | <u>43 ft</u>    |   |                      | Surface Csg.      | <u>43 ft</u>    |
|   |                 | USDW Base         | <u>782 ft</u>   | USDW Plug   | <u>732 - 934</u>     | USDW Base         | <u>782 ft</u>   |
|   |                 |                   |                 | Intermediate Cut Plug   | <u>N/A - N/A</u>     | Intermediate Cut  | <u>N/A</u>      |
| Top of Cement   | <u>0 ft</u>     |                   |                 |   |                      |                   |                 |
|   |                 | Intermediate Csg. | <u>884 ft</u>   | Middle Plug   | <u>2,316 - 2,566</u> | Intermediate Csg. | <u>884 ft</u>   |
|   |                 |                   |                 | Long String Cut Plug  | <u>N/A - N/A</u>     | Long String Cut   | <u>N/A</u>      |
| Top of Cement   | <u>0 ft</u>     | Packer Depth      | <u>2,541 ft</u> |   |                      |                   |                 |
|   |                 | Long String Csg.  | <u>2,566 ft</u> | Bottom Plug   | <u>2,566 - 2,841</u> | Long String Csg.  | <u>2,566 ft</u> |
| Perforations  | <u>N/A</u>      |                   |                 | Mechanical Plug   | <u>N/A</u>           |                   |                 |
| Hole Size   | <u>6 1/2 in</u> | Depth             | <u>2,841 ft</u> |   |                      | Depth             | <u>2,841 ft</u> |
| ** Add any additional information<br>* May not apply        |                 |                   |                 | ** Add any additional information<br>* May not apply                    |                      |                   |                 |

| List of all open and/or perforated intervals and intervals where casing will be varied |       |       |                |
|--|-------|-------|----------------|
| Perforations or open hole  | From  | To    | Formation Name |
| Open Hole  | 2,566 | 2,841 | Dundee         |
|  |       |       |                |
|  |       |       |                |
|  |       |       |                |
|  |       |       |                |