

# CLASS II INJECTION WELL PERMIT OG-03 GUIDANCE

**Prior to submitting your application, please make sure to complete all applicable pages, attach all required schematics, plots, and documents, and sign the form.**

## 1.1 CASING TYPE

In the event multiple production strings are located within the surface casing, identify each by numbering each production casing. Complete the corresponding row for each casing type. See drop down menu example below. If additional blanks are necessary to complete the table, please attach a supplemental table to the applications following the same format and provide a note on the original table.

Note the rows associated with the casing type need to be completed. Cement is an estimated value and will be updated upon receipt of the OG-09 well completion report which is required within 30 days of completion of the well (including non-productive wells) or within 30 days of the expiration of the permit if not drilled or converted.

Fill up volume (FUV) or Cement Yield is the amount of cubic feet 1 sack of cement will equal after the addition of additives and water. For example, Class A cement has a FUV or Cement Yield of 1.18 ft<sup>3</sup>/sack.

*Highlighted area provides an example of dropdown menu selection items.*

Proposed Well Construction and Operation			
Casing Type (see OG-3 Guidance 1.1)	Casing Diameter (inches)	Casing Depth (feet)	
Surface			
Production #1			
Production #2			
Casing Type			
Intermediate			
Liner			
Other			
Production #1			
Production #2			
Production #3			
Production #4			
Production #5			

  

Packer & Tubing	
Packer Depth (feet)	Packer Tubing Diameter (inches)

Note The rows associated with the casing type need to be completed. Cement is an estimated value and will be updated upon receipt of the OG-09 well completion report which is required within 30 days of completion of the well (including non-productive wells) or within 30 days of the expiration of the permit if not drilled or converted. Fill up volume (FUV) or Cement Yield is the amount of cubic feet 1 sack of cement will equal after the addition of additives and water. For example, Class A cement has a FUV or Cement Yield of 1.18 ft<sup>3</sup>/sack.

## 1.2 PACKER TYPE

In the event multiple packers are used, identify each by numbering each packer based upon the corresponding production casing numbering. Complete the corresponding row for each packer entry. If additional blanks are necessary to complete the table please attach a supplemental table to the applications and provide a note on the original table.

### 1.3 PROPOSED MIP (Ref 62 Ill. Adm. Code 240.320(i) - 62 Ill. Adm. Code 240.340(e))

If the proposed maximum injection pressure exceeds that calculated in accordance with 62 Ill. Adm. Code 240.340(e)(1), the applicant shall submit the most recent information showing that the proposed maximum injection pressure will not initiate or propagate fractures in the injection interval or overlying strata that could enable the injection fluid or the fluid in the injection interval to leave the permitted injection intervals.

If a treatment or step rate test is provided to demonstrate the proposed maximum injection pressure will not initiate or propagate fractures in the injection interval or overlying strata, include the **reference number, test or treatment date and well name** for the well in which the treatment or test was performed along with the following:

Note: The new OG-30 Frac or Acid Treatment and OG-31 Step Rate Test forms are available under Oil and Gas Forms at [Forms Lists Logs](#). Class II UIC permit applications received after April 1, 2018, requesting a Maximum Injection Pressure based upon a treatment or test must include the corresponding OG-30 or OG-31 form. Failure to utilize the new forms may lead to the receipt of a deficiency letter and delay the permit review process.

Evidence that the proposed maximum injection pressure will not initiate fractures in the injection zone or overlying strata such as:

- A. A copy of the ticket (data record of each injection pressure and corresponding time) and chart (pressure vs. time) from a "frac" or "acid" treatment in the injection interval in the proposed well, or from the same interval or a stratigraphically higher interval in a well within 1 mile of the proposed well, that shows the Instantaneous Shut-In Pressure (ISIP). The shut-down pressure, instantaneous shut-in pressure and 5-minute shut-down pressure must be obtained, read, and recorded. The maximum allowable injection pressure shall be 10% less than the ISIP measured at the surface unless the specific gravity of the treatment fluid is less than the specific gravity of the proposed injection fluid, in that case the ISIP shall be measured at the injection interval; or
- B. The results of a step rate test, both ticket (record of each time step, the rate, and corresponding pressure) and chart (injection rate and resulting pressure vs time), from the injection interval in the proposed well, or from the same interval or a stratigraphically higher interval in a well within 1 mile of the proposed well. The maximum allowable injection pressure shall be 10% less than the ISIP, measured at the surface if the formation fracture pressure was exceeded during the test or an existing fracture was opened. In the event the formation fracture pressure was not exceeded, and an existing fracture was not opened, the maximum allowable injection pressure shall be the highest step pressure recorded during the step rate test. A step rate test shall at a minimum include the following:
  - i) A statement specifying the length of the shut-in period (not less than 24 hours). Prior to testing, shut in the well long enough so that the bottom-hole pressure approximates shut in formation pressure.
  - ii) Measurement of at least six rate steps recording the injection rate, pressure, and elapsed time of each.
  - iii) An initial zero injection rate (pressure stabilizing) step.
  - iv) Each rate step after the zero-injection rate step shall be at least 120 percent of the preceding rate.
  - v) Each rate step shall be of equal length and of at least 4 minutes in duration.
  - vi) At least three rate steps below the formation fracture pressure are required; if the formation fracture pressure was not exceeded and an existing fracture was not opened, at least five rate steps are required.
  - vii) If the formation fracture pressure was exceeded, at least two rate steps above the formation fracture pressure are required.
  - viii) If an existing fracture is opened during the test, no further rate steps are required.
  - ix) If the formation fracture pressure was exceeded or an existing fracture was opened, the shut-down pressure, instantaneous shut-in pressure and 5-minute shut-down pressure must be obtained, read, and recorded.
  - x) If the Department has reason to believe induced fractures have occurred as a result of long term injection above the fracture pressure, the Department shall determine if the results of a step rate test are acceptable to permit the proposed maximum injection pressure.

**1.4 PROPOSED MIR** (Ref 62 Ill. Adm. Code 240.320(i) - 62 Ill. Adm. Code 240.340(e))

If a static fluid level (SFL) measurement is provided for purposes of addressing wells of concern in the AOR, please include the following items:

1. A completed OG-22 (OOGRM Field Inspector observed SFL measurement); or
2. The reference number of the well in which the measurement was obtained, the well name, and the date the SFL measurement was observed by the field inspector.
  - o The distance from the proposed well to the SFL measurement well must be less than or equal to 1,320 ft.
  - o The well should be shut in for at least 24 hours prior to obtaining the SFL measurement.
  - o The well must be open to the same formation as the proposed well at the time the SFL measurement is recorded to be considered representative.
  - o Additionally, the applicant may elect to include the MIR DETERMINED BY STATIC FLUID LEVEL MEASUREMENT form, if not included, the MIR will be determined using the default values established on the form. Form Link: [ALTERNATIVE STATIC FLUID LEVEL FORM](#)

The default values are as follows:

Value Name	Default Value
Injection Fluid Viscosity (u) (centipoise (cp))	1.1
Form Vol Factor RB/STB Bw	1
Permeability (md) k	50
Compressibility (1/psi) c	$7.5 \times 10^{-6}$
Porosity (percent) $\phi$	8%
Time (days) t	30 years or 10,950 days

**1.5 PROPOSED INJECTION FORMATION(s) AND RESERVOIR(s) IF DIFFERENT THAN FORMATION(s)**

- For each proposed formation to be perforated, provide the geologic name (formation name and reservoir name if different than formation – not the system, series, or member name) and the depth of the top and bottom of the formation and reservoir if different than formation (not to be confused with the perforated intervals in the casing). The formation information goes on the application and in the public notice.
- The **proposed perforation(s)** (perforated intervals in the casing) depths shall be identified on the well schematic.
- The **actual perforation(s)** (perforated intervals in the casing) depths and corresponding formation names shall be reported on the OG-09 Well Completion Report.

## **2.1 WELL LOCATION SURVEYED, GPS AND GROUND ELEVATION** *(Ref 62 Ill. Adm. Code 240.320(b))*

The well location, including the GPS (Global Positioning System) latitude and longitude location and ground elevation of the well, must be surveyed by an Illinois licensed land surveyor or Illinois registered professional engineer. A survey or GPS location is not required for a converted or deepened well, for a drilled out plugged hole if the original well location was surveyed, or for a well permitted under 62 IAC Section 240.310(f). The GPS location shall be recorded as degrees and decimal degrees recorded to 6 decimal places in the North American Datum 1983 projection and shall be accurate to within 3 feet. The reported GPS location is required to be an actual GPS field measurement and not a calculated or conversion measurement.

### 3.1 INJECTION FLUID ANALYSIS (Ref 62 Ill. Adm. Code 240.320(i) - 62 Ill. Adm. Code 240.340(d))

The applicant shall submit:

- The date the sample is collected. (Samples must be collected no earlier than 1 year prior to the date of the application)
- The depth and geologic name of the formations from which the injection fluid is to be obtained.
- Date analyzed (samples must be analyzed no earlier than 1 year prior to the date of filing of the application)
- A standard laboratory analysis of a representative sample of the fluid to be injected.

If the fluid is water, the sample shall be analyzed for at least the following parameters:

- pH,
- Chloride,
- Total Dissolved Solids, and
- Specific Gravity

If the fluid is other than water, the sample shall be analyzed for at least the following parameters:

- Chemical components, and
- Specific Gravity

### 3.2 WELL SCHEMATIC (Ref 62 Ill. Adm. Code 240.320(i)- 62 Ill. Adm. Code 240.340(b))

#### A. Present Status (if conversion, drilled out plugged hole, deepening, or renewal)

The applicant shall submit a schematic diagram of the current status of the injection well showing:

- Total depth and if applicable, the plugged back depth of the well;
- The sizes and depths of the holes drilled for the surface casing, mine or intermediate casing, and production casing;
- The sizes and depths of all casing in the well;
- The amount of cement used for each string of casing in the well;
- The size of the tubing and setting depth of the packer, if present;
- The top and bottom depths of all perforated intervals in the casing; and
- The geologic name (formation name and reservoir name if different than formation) and the depth of the top and bottom of the (formation and reservoir if different than formation) proposed injection interval (not to be confused with the perforation top and bottom depth required above).

#### B. Proposed Status

The applicant shall submit a schematic diagram of the proposed status of the injection well showing:

- Total depth and if applicable, the plugged back depth of the well;
- The sizes and depths of the holes drilled for the surface casing, mine or intermediate casing, and production casing;
- The sizes and depths of all casing in the well and any additional casing to be used in the well;
- The amount of cement used for each string of casing in the well and any additional cement to be used in the well;
- The size of the tubing and setting depth of the packer;
- The top and bottom depths of all perforated intervals in the casing; and
- The geologic name (formation name and reservoir name if different than formation) and the depth of the top and bottom of the (formation and reservoir if different than formation) proposed injection interval (not to be confused with the perforation top and bottom depth required above).

### 3.3 MAP (Ref 62 Ill. Adm. Code 240.320(c))

The applicant shall submit a map including the following:

- The boundaries of the leasehold or enhanced oil recovery unit, if applicable;
- The names of all permittees of producing leaseholds within ¼ mile of the proposed Class II UIC Well;
- The location of the well proposed to be drilled, deepened or converted;
- The location of all wells penetrating the proposed injection interval within the ¼ mile area of review as defined in 62 IAC 240.360(a).

### 3.4 AREA OF REVIEW WELL CONSTRUCTION *(Ref 62 Ill. Adm. Code 240.320(l) - 62 Ill. Adm. Code 240.360)*

1. The applicant shall submit evidence that all wells which penetrate the injection formation within the area of review contain an adequate amount of cement and are constructed or plugged in a manner which will prevent the injection fluid and the fluid in the injection formation from entering the freshwater zone. The types of evidence that will be considered acceptable by the Department include, but are not limited to: well completion reports, cementing records, well construction records, cement bond logs, tracer surveys, oxygen activation logs, and plugging records.
2. Alternatively, an applicant may check the box **Supplied Upon Request**. In this scenario the applicant will wait until the initial review has been completed. Through a “Deficiency Letter” the OGRM will identify all known wells that are not constructed or plugged in a manner which will prevent the injection fluid and the fluid in the injection formation from entering the freshwater zone. The applicant will be afforded 60 days from the date of the “Deficiency Letter” to:
  - Submit evidence that will be considered acceptable by the Department which includes, but is not limited to: well completion reports, cementing records, well construction records, cement bond logs, tracer surveys, oxygen activation logs, and plugging records; AND/OR
  - Submit a static fluid level measurement or reservoir pressure measurement from the proposed well or a well located within the ¼ mile AOR that is perforated in the same formations as the proposed well. The Department will use the static fluid level measurement, if determined to be from a representative well, to determine the Maximum Injection Rate (MIR) that provides protection of the freshwater zone; AND/OR
  - Provide a timetable to rework, repair, or replug the wells in question appropriately to eliminate any issues with protection of the freshwater zone. Proper documentation of any rework, repair, or replug will be required to be submitted for review. Additionally, the applicant shall provide a statement waiving the permit review time frames;

AND/OR

- In the event the applicant believes the well or wells in question are located outside the AOR; provide documentation demonstrating the distance from the well in question to the proposed well is greater 1,320 feet.

### 3.5 GROUNDWATER AND POTABLE WATER SUPPLY – POTABLE WELLS W/IN 200 FEET OR MUNICIPAL W/IN 2500 FEET. *(Ref 62 Ill. Adm. Code 240.320(k) - 62 Ill. Adm. Code 240.350)*

The applicant shall submit a statement certifying there are no potable water wells located within 200 feet of the proposed Class II UIC well, and there are no municipal water supply wells located within 2500 feet of the proposed Class II UIC well. Checking the box “YES” or “NO” for either question on the application effectively serves as a certifying statement provided the application is appropriately signed.

### 3.6 GROUNDWATER AND POTABLE WATER SUPPLY– FRESHWATER WELLS IN AOR *(Ref 62 Ill. Adm. Code 240.320(k) - 62 Ill. Adm. Code 240.350)*

The applicant shall submit a standard laboratory analysis of fresh water from 2 or more freshwater wells if located within ¼ mile of the proposed injection well showing:

- The location and depth of the well;
- The dates the samples were obtained;
- The samples shall be analyzed for at least the following parameters: using the applicable American Society for Testing and Materials (ASTM) standards, i.e.,
  - pH, using Standard D1293-99 (Standard Test Methods for pH of Water (2005));
  - Chloride, using Standard D4458-09 (Standard Test Method for Chloride in Brackish Water, Seawater and Brines (2009));
  - Total Dissolved Solids, using Standard D5907-10 (Standard Test Methods for Filterable Matter (Total Dissolved Solids) and Nonfilterable Matter (Total Suspended Solids) in Water (2010));
  - Specific Gravity, using Standard D1429-08 (Standard Test Methods for Specific Gravity of Water and Brine (2008)) from ASTM International, P.O. Box C700, West Conshohocken PA 19428-2959 (all incorporations by reference contain no later amendments or additions); and
  - Date Analyzed.
- If, due to circumstances beyond his or her control, the applicant cannot obtain the analysis required, the applicant shall submit in lieu of that analysis a statement explaining why the analysis could not be obtained.

### **3.7 REQUIREMENTS IN MINE AREAS** (Ref 62 Ill. Adm. Code 240.320(g)- 62 Ill. Adm. Code 240.1305)

If the location of a well to be drilled for oil or gas, or any purpose in connection with that drilling, will penetrate an active mine or through the mined out and inaccessible or sealed off area of an active mine, or will penetrate those areas in a temporarily abandoned mine, or the undeveloped limits of any such mine property, as included in the shadow areas set forth in an approved mining permit, the applicant shall submit documentation establishing compliance with Section 240.1305.

Documentation for active areas includes a copy of the agreement jointly signed by the applicant for a permit and the mine owner agreeing to the drilling of the well which includes the location and a map or sketch showing the well location, its relation to shafts and mine buildings, and to each coal seam and mine working's underling the applicant's lease. See 62 IAC 240.1305 for more details and alternate methods of demonstrating compliance.

In inactive mining areas where the existence of workable coal is known and the coal rights are owned by someone other than the lessor under than oil and gas lease, the applicant shall provide a copy of the notice and return receipt of the registered notice to the owner of the workable coal with the application. See 62 IAC 240.1305 for more details and alternate methods of demonstrating compliance.

### **3.8 REQUIREMENTS FOR UNDERGROUND GAS STORAGE FIELDS** (Ref 62 Ill. Adm. Code 240.320(h) - 62 Ill. Adm. Code 240.1820)

If the application is for a newly drilled well located over an underground gas storage field as defined in Section 240.1805(c) or the gas storage rights are owned by someone other than the lessor under the oil and gas lease, the applicant shall submit documentation establishing compliance with Section 240.1820. 240.1820 further states this requirement applies to proposed locations to drill, deepen, convert or amend an oil or gas production or Class II well or test hole. To comply, the applicant shall submit a copy of an agreement previously reached with the gas storage operator which governs the relationship between the applicant and the gas storage operator with respect to safety precautions and well drilling, completion, operation, and plugging issues.

### **3.9 NOTIFICATION REQUIREMENTS**

#### **A. Guidelines for a Public Notice for UIC Class II Injection Wells**

- 1) the name and address of the applicant;
- 2) the date on or before which the application will be filed;
- 3) the legal description of the location of the proposed injection well, including both the United States Public Land Survey and GPS coordinates if required under Section 240.320(b);
- 4) the geologic name and depth of the (formation and reservoir name if different than formation) injection intervals;
- 5) the proposed maximum injection pressure and maximum injection rate;
- 6) the address and telephone number for the Office of Oil and Gas Resource Management; and
- 7) a statement that the public has 15 days to comment on the application and that comments must be made in writing to the Office of Oil and Gas Resource Management. The deadline for filing comments shall appear in the notice. The comment period shall be either:
  - i. 15 days from the date the application is filed with the Department, when the application is filed after notice has been published; or
  - ii. 15 days from the date of publication of the notice, when the notice is published after the application is filed.

NOTE: If the notice does not contain all the information listed above or as listed in 62 Ill. Adm. Code 240.370, or if the application is not received on or before the date designated in subsection 62 Ill. Adm. Code 240.370(a)(1)(B) or the date the notice is published, whichever is later, the applicant shall be required to republish the notice.

## EXAMPLE PUBLIC NOTICE

In accordance with the Illinois Administrative Code, notice is hereby given that (*INSERT COMPANY NAME*), located at (*INSERT COMPANY ADDRESS*), is seeking permission to **amend an existing**, UIC Injection well, as identified below. The application will be filed with the Illinois Department of Natural Resources on or before (*INSERT THE DATE THE APPLICATION IS FILED*). (*Choose a date in the future based on when you send the application so that the department will have the application in house prior to the start of the 15-day comment period or choose the date the public notice will appear.*)

Well Name: (*INSERT WELL NAME*)

Well Location: (*INSERT WELL LOCATION (e. g., 0600N 0330E NWc NE)*) (*INSERT SEC XX, T XXX, R XXX (e.g., Sec 05, T 03N, R 10W)*)

County Name: (*INSERT COUNTY NAME*), IL

Proposed Depth & Formation: (*INSERT FORMATION & DEPTH (e.g., CYPRESS 1380'-1385')*) (*this should be the formation name and top and bottom depths of the formation not the perforation depths. Perforation formation & depths shall be reported on the OG-09 and well schematic*)

Proposed Maximum Injection Rate: (*INSERT X,XXX B/D*)

Proposed Maximum Injection Pressure: (*INSERT X,XXX PSI*)

Within 15 days from the (*INSERT EITHER “date the application is filed” or “date of this notice” see below*), interested persons may make written comments to the Illinois Department of Natural Resources, Office of Oil and Gas Resource Management, One Natural Resources Way, Springfield, IL 62702-1271. For additional information, the Department may be contacted by phone at 217-782- 7756.

If the date the notice will appear in the paper is on or after the date the application is filed, choose “**DATE OF THIS NOTICE**” otherwise choose “**DATE THE APPLICATION IS FILED**”.

### **B. Other Notice Guidelines**

A copy of the published notice, or a letter containing the same information as in the notice, shall be mailed by certified mail, return receipt requested to the owner of the surface of the land on which the proposed injection well is to be located, and to each permittee of a producing leasehold, and the owner or manager of all mines, including the mined-out area and undeveloped limits of all mines, located within ¼ mile of the proposed Class II UIC well. Evidence of mailing shall be submitted to the Department prior to approval of the application. The returned certified mail receipt card, or a copy of the card, shall serve as evidence of mailing.

### **3.10 FRESHWATER AQUIFER EXEMPTIONS.**(*Ref 62 Ill. Adm. Code 240.312*)

*See referenced regulation for further details regarding the applicability and requirements regarding freshwater aquifers.*

### **NOTE: DISPOSAL WELLS**

A review of an application for a disposal or commercial disposal well will include an evaluation of the drowning with water any stratum or part thereof capable of producing oil or gas. Production wells located within a 1-mile radius of the proposed well will be considered in this evaluation.

If known active production wells are located within a 1-mile radius of the proposed wells, consider submitting evidence with the application indicating the drowning of any stratum or part capable of producing oil or gas.