



NorthSTAR User Manual
Application for Permit to Drill
Addendum: Wellbore

This function of NorthSTAR is not yet live.

As such the information in the attached user manual is subject to change while the function is being built.

The User Manual will no longer hold this disclaimer, or the *DRAFT* watermark once finalized.

Questions contact oilandgasinfo@nd.gov

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Building/Modifying the Wellbore

Part 1: Features and Cement

This section is used to provide details in four consecutive segments: "Wellbore Information", "Wellbore Construction Feature", "Cement Segment", and "Cement Class".

TIP: You must complete each section for each wellbore in order. (e.g. For Wellbore 1, complete the wellbore information, wellbore construction feature, cement segment, and cement class; then move to wellbore 2)

Click "Save" at the bottom of each picker grid once all strings for all wellbores have been added.

The screenshot displays the 'Features & Cement' application interface. At the top, there are fields for 'All:', 'File No.', 'Field:', 'Type of Well:', and 'Type of Work:'. Below these fields, a prompt asks the user to enter information for the Wellbore, Wellbore Construction Features, Cement, and Cement classes. The interface is divided into four main sections, each with a table and an 'Actions' column:

- Wellbore Information:** The table has columns for Wellbore Code (A...), Wellbore Class (C...), Wellbore Name (W...), Wellbore Status (S...), Wellbore Depth (D...), Total Depth (M...), Total Depth (I...), and Wellbore Status (H...).
- Wellbore Construction Feature:** The table has columns for Feature Name, Install Status, Wellbore Name, Wellbore Top MD, Wellbore Bottom MD, Wellbore Class, Wellbore Status, and Wellbore Name.
- Cement Segment:** The table has columns for Segment ID, Associated Feature, Install Status, Wellbore Name, Wellbore Top MD, Wellbore Bottom MD, and Wellbore Name.
- Cement Class:** The table has columns for Cement Class Name, Associated Cement, Install Status, Cement Name, Cement Class, Wellbore Name, Slurry Class, Wellbore Name, and Wellbore Name.

At the bottom of the interface, there are 'Back', 'Next', and 'Save' buttons.

Wellbore Information

This section is used to add wellbore information. Click the "Actions" dropdown menu and choose "Add Wellbore". A pop-up window will appear.

Note: Repeat these steps for each string in the wellbore (e.g. Surface Hole, Vertical & Curve, and Lateral).

Fields and Functions

Wellbore Type: Choose the type of wellbore from the dropdown menu. Note: do these steps again for each string in the wellbore (e.g. Surface Hole, Vertical & Curve, and Lateral).

Wellbore Sequence #: Choose a "Wellbore Sequence #" for each wellbore from the shallowest depth (i.e. 00) to the deepest depth (e.g. Surface Hole would be "00", while "Vertical & Curve" would be "01", and Lateral would be "02").

Wellbore Code (API-12):

Wellbore Construction Status: Choose "Not drilled" for new wells and choose "Drilled" for existing wells that are being proposed to be re-entered from the dropdown menu.

Parent Wellbore: Choose the appropriate wellbore accordingly (e.g. Surface Hole would be the parent wellbore of Vertical & Curve).

Wellbore Start Depth (ft MD): Indicate the wellbore start depth (MD -Measured Depth). For example, a surface hole's start depth would be "0".

Total Depth (MD ft): Input the total depth. Input the total depth (e.g. A surface holes total depth could be "2100").

Total Depth (TVD ft): Input the total vertical depth (TVD). (i.e. A surface hole's TVD would be coincident with its MD)

Drilling Mud Type: Choose the appropriate mud type from the dropdown menu.

Legal Entry Point & Spacing Unit – Entry Point Coordinates from Well Head: Complete the all fields as they are in relation to the Well Head location in order to demonstrate the legal entry point of the borehole into the pool and spacing unit.

KOP Footages from Nearest Section Line: Choose all pertinent information for each field (i.e. Qtr-Qtr or Lot, Section, Township, Range, and County) from their respective dropdown menu.

Bottom Hole Coordinates from Well Head: Choose all pertinent information for each field [i.e. From WH, (N/S), From WH, and (E/W)] from their respective dropdown menu.

Description: Enter a detailed description of each string in the wellbore.

Click "Save" at the bottom of the pop-up window, then repeat steps for each string in the wellbore.

* Indicates Required Field

Wellbore Type * <input type="text"/>	Wellbore Sequence # * <input type="text"/>	Wellbore Code (API-12) <input type="text"/>
Wellbore Construction Status * ⓘ <input type="text" value="Not Installed"/>		
Record Status <input type="text" value="New"/>	Parent Wellbore * ⓘ <input type="text"/>	
Wellbore Start Depth (ft MD) * <input type="text"/>	Kick Off Point (MD ft) <input type="text"/>	
Azimuth° <input type="text"/>	Total Depth (MD ft) * <input type="text"/>	Total Depth (TVD ft) * <input type="text"/>
Drilling Mud Type * <input type="text"/>	MWD Contractor <input type="text"/>	Hole Size (in) <input type="text"/>

Although not shown as required; indicate the following (if known):

- MWD Contractor
- Hole Size

Legal Entry Point into Pool & Spacing Unit - Entry Point Coordinates from Well Head ⓘ

<input type="text"/>	From WH	<input type="text"/>	(N/S)	<input type="text"/>	From WH	<input type="text"/>	(E/W)
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KOP Footages From Nearest Section Line

<input type="text"/>	Feet From	<input type="text"/>	Line	<input type="text"/>	Feet From	<input type="text"/>	Line
Qtr-Qtr/Lot	Section	Township	Range	County			
<input type="text"/>							

Bottom Hole Coordinates From Well Head

<input type="text"/>	From WH *	<input type="text"/>	(N/S) *	<input type="text"/>	From WH *	<input type="text"/>	(E/W) *
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Bottom Hole Footages From Nearest Section

<input type="text"/>	Feet From	<input type="text"/>	Line	<input type="text"/>	Feet From	<input type="text"/>	Line
Qtr-Qtr	Section	Township	Range	County			
<input type="text"/>							

Description

Wellbore Specific Requirements from Oil and Gas Permitting Dept:

Surface Hole Wellbore:

- Should not have any deviation, so there is no need to indicate the Azimuth, or Kick Off Point.
- Required field is bottom hole coordinates.

Vertical & Curve Wellbore:

- Legal Entry Point into Pool & Spacing Unit: (enter the coordinates for the point at which the well is legal into the Pool & Spacing unit)
- KOP Footages from Nearest Section Line: Enter all pertinent data.
- Bottom Hole Coordinates from Well Head: This point will typically be the end of the curve.
- Bottom Hole Footage

Lateral Wellbore:

- Do not need Legal Entry Point into Pool & Spacing Unit
- Do not need to repeat KOP information (unless there is more than 1-Lateral)
- Enter Data for Bottom Hole Coordinates from Well Head & Bottom Hole Footages from Nearest Section.

Wellbore Construction Feature

This section is used to add wellbore construction feature information. Click the "Actions" dropdown menu and choose "Add Feature". A pop-up window will appear.

Note: Do these steps again for each string in the wellbore.

Fields and Functions

Feature: Choose a feature from the dropdown menu (e.g. Surface Casing 1) that you had created from the "Wellbore Information" step.

Wellbore Start: Choose a wellbore start from the dropdown menu (e.g. Surface Casing 1) that was created from the selection from the "Feature" dropdown menu.

Wellbore End: Choose a wellbore end from the dropdown menu (e.g. Surface Casing 1) that was created from the selection from the "Wellbore Start" dropdown menu.

Construction Status: Choose "Not drilled" for new wells and choose "Drilled" for existing wells that are being proposed to be re-entered from the dropdown menu.

Feature Top MD (ft): Input the top depth (i.e. "0" for Surface Casing 1)

Feature Bottom MD (ft): Input the bottom depth (i.e. "0" for Surface Casing 1).

Click "Save" at the bottom of the pop-up window, then repeat steps for each string on the wellbore.

Construction Feature

* Indicates Required

Feature *
Construction Status *
Record Status

Wellbore Start *
Wellbore End *

Feature Top MD (ft) *
Feature Bottom MD (ft) *
Outside Diameter (decimal inches)
Inside Diameter (decimal inches)

Weight (lbs)
Grade/Type
Burst Pressure (psi)

Feature Condition
Install Date
Remove Date

Pulled
Connection Type

Description

Cancel Save

Although not shown as required; indicate the following for all casing strings (if known):

- Outside Diameter
- Weight
- Grade/Type
- Feature Condition

Cement Segment

This section is used to add cement segment information. Click the "Actions" dropdown menu and choose "Add Cement Segment". A pop-up window will appear.

Note: Do these steps again for each string in the wellbore.

Fields and Functions

Associated Feature: Choose an associated feature from the dropdown menu (e.g. Surface Casing 1).

Inside/Outside Casing?: Dependent upon which wellbore was chosen in the previous step, select "Inside", "N/A", or "Outside"

Construction Status: Choose "Not drilled" for new wells and choose "Drilled" for existing wells that are being proposed to be re-entered from the dropdown menu.

Click "Save" at the bottom of the pop-up window, then repeat steps for each string in the wellbore.

The screenshot shows a web form titled "Cement Segment". It contains several input fields and dropdown menus. The fields are: "Associated Feature" (dropdown), "Inside/Outside Casing?" (dropdown), "Construction Status" (dropdown, currently set to "Not Installed"), "Record Status" (dropdown, currently set to "New"), "Top MD (ft)" (text input), "Bottom MD (ft)" (text input), "Verify Method" (dropdown), "Cementing Company" (text input), "Install Date" (calendar icon), "Remove Date" (calendar icon), and "Description" (text area). There are asterisks and a small "i" icon next to "Associated Feature", "Inside/Outside Casing?", and "Construction Status". A "Save" button is partially visible at the bottom right.

Although not shown as required; indicate the following for all casing strings (if known):

- Top & Bottom MD
- Verify Method (typically will be calculated)
- Cementing Company

Cement Class

This section is used to add cement class information. Click the "Actions" dropdown menu and choose "Add Cement Class". A pop-up window will appear.

Note: Do these steps again for each string in the wellbore.

Fields and Functions

Associated Cement Segment: Choose an associated cement segment that was created in the "Cement Segment" step from the dropdown menu (e.g. C2).

Cement Type: Choose the appropriate cement type from the dropdown menu.

Construction Status: Choose "Not drilled" for new wells and choose "Drilled" for existing wells that are being proposed to be re-entered from the dropdown menu.

Click "Save" at the bottom of the picker grid (Figure 24) once all strings for all wellbores have been added.

Cement Class

* Indicates Required Field

Associated Cement Segment * Cement Type * Construction Status * ⓘ
[Dropdown] [Dropdown] [Not Installed] [Dropdown]

Record Status Compressive Strength (psi) Weight (lbs/gal) Slurry Consistency (Bu)
[New] [Text] [Text] [Text]

Lead/Tail Volume (Sacks) Yield (cu ft per sack)
[Dropdown] [Text] [Text]

Description
[Text Area]

Cancel Save

Although not shown as required; indicate the following for all segments (if known):

- Weight
- Lead/Tail
- Volume

Part 2: Completion & Perforation Details

This section allows the applicant to provide the details in two segments: "Completion Interval" and "Completion Open Hole or Perforations".

Please disclose as much information as known for the completion of the wellbore.

TIP: Select "Action" in the grid to add features to each completion interval. Select "Action" in the row to edit a specific feature that has been previously added.

The screenshot displays two data entry sections within a software interface. The top section is titled "Completion Interval" and features a table with the following columns: Co... Int..., Co... Int..., P... St..., P... D..., P... C..., In... St..., R... St..., Top M..., B... M..., Fl..., P..., and Actions. Below the table, the text "Completion Interval" is centered in red. The bottom section is titled "Completion Open Hole or Perforations" and features a table with the following columns: Perfora... Unique ID, Accool... Compl... Interval..., Install Status, Record Status, Type, Open ... Perfor... Status, Top MD (ft), Bottom MD (ft), and Actions. Below this table, the text "Completion Open Hole or Perforation" is centered in red. At the bottom of the interface, there are three buttons: "Back", "Next", and "Save". A large, light gray "DRAFT" watermark is overlaid on the page.

Completion Interval

This section is used to add completion interval information. Click the "Actions" dropdown menu and choose "Add Completion Interval". A pop-up window will appear.

Fields and Functions

Wellbore: Choose a wellbore from the list (e.g. Surface Hole 1)

Completion Interval Type: Select the appropriate type (e.g. Oil & Gas, Salt Water Disposal, Coal Bed Methane etc.).

Pool Status: Select the appropriate status (e.g. Permitted to Drill, Permit to Re-Complete, Permit to Re-Entry, Salt Water Disposal etc.).

Top MD (ft): Input the appropriate depth (i.e. '0' for Surface hole 1)

Bottom MD (ft): Input the appropriate depth (i.e. '2100' for Surface Hole 1).

Longstring: Choose all the pertinent information for each field (i.e. Qtr-Qtr or Lot, Section, Township, Range, and County) from their respective dropdown menu and be sure to include footages.

Click "Save" at the bottom of the pop-up window.

Note - An example of "Longstring" on a typical Bakken well is seven-inch casing set into the pool and across the hard lines.

Although not shown as required; indicate the following for a lateral wellbore in a typical well (if known):

- Pool Status (typically would be permitted to Drill)
- Top Coordinates would typically indicate the 7" casing point. Or the point at which the well is legal within the spacing unit and setbacks.
- Long string Casing Point information (typically the 7" casing point)
- Spacing/Drilling Unit Type
- Acres in Unit
- Industrial Commission Order
- Legal Description of the Spacing/Drilling Unit
- Reservation Surface boundary intersected by Spacing/Drilling Unit

Wellbore * Completion Interval Type * Pool Status

Vertical Hole 1 Oil & Gas []

Interval Construction Status * ⓘ Record Status

Not Installed New

Top MD (ft) * Top TVD (ft) Bottom MD (ft) * Bottom TVD (ft)

7500 7500 10000 10000

Top Coordinates (ft): * Bottom Coordinates (ft): *

1250	From WH	S	N/S	1250	From WH	N	N/S
750	From WH	W	E/W	750	From WH	W	E/W

Longstring Casing Point

Footages:				Coordinates (ft):			
[]	Feet From	[]	Line	[]	From WH	[]	N/S
[]	Feet From	[]	Line	[]	From WH	[]	E/W
Qtr-Qtr	Section	Township	Range	County			
[]	[]	[] N	[] W	[]			

Enhanced Recovery Unit Field Pool

[] JIM CREEK BAKKEN

Spacing/Drilling Unit Type Permit Classification Acres in Unit Industrial Commission Order

[] [] [] []

Legal Description of the Spacing/Drilling Unit ⓘ

[]

Reservation Surface Boundary Intersected by Spacing/Drilling Unit ⓘ

[]

Description

Completion Open Hole or Perforation

To add completion open hole or perforations information, click the "Actions" dropdown menu and choose "Add Completion Open Hole or Perforation". A pop-up window will appear.

Fields and Functions

Associated Completion Interval: Choose the appropriate wellbore (e.g. C3 which is for Lateral 1).

Construction Status: Choose "Not drilled" for new wells or "Drilled" for existing wells that are being proposed to be re-entered from the dropdown menu.

Type: Choose the appropriate type for completion (e.g. Sliding Sleeve)

Open Hole or Perforation Status: For new wells, choose "proposed". Otherwise, choose the appropriate type.

Top MD (ft): Input the appropriate depth for the start of the process.

Bottom MD (ft): Input the appropriate depth for the end or bottom of the process.

Objective Horizons:

Click "Save" at the bottom of the pop-up window, then click "Save" at the bottom of the picker grid.

Completion Open Hole or Perforation

* Indicates Required Field

Associated Completion Interval *
Construction Status * ⓘ
Record Status

Type *
Open Hole or Perforation Status *

Top MD (ft) *
Bottom MD (ft) *

Perforation Diameter (inches)
Perforation Spacing (ft)

Number of Shots (per foot)
Perforated Date

Objective Horizons *

Description

Cancel Save

Although not shown as required; please fill out as much information in this section known at the time of permitting.