Commingling of Production - Oil or Gas Well

Guideline PNG038

August 2019

Revision 1.0

Governing Legislation:

Act: *The Oil and Gas Conservation Act*

Regulation: *The Oil and Gas Conservation Regulations, 2012*

Saskatchewan

Record of Change

Revision	Date	Description
0.0		Initial draft
1.0	August, 2019	Approved first version

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1. Introduction

Commingling of production from two or more oil or gas pools is prohibited unless it has been approved by the Energy Regulation Division (ERD) of the Ministry of Energy and Resources (ER) by means of an order or an authorization granted by ERD through the Integrated Resource Information System (IRIS). This Guideline outlines the procedure for obtaining a commingling authorization via IRIS for an oil or gas well.

Questions relating to this Guideline can be directed to the ER Service Desk at 1-855-219-9373 or ER.servicedesk@gov.sk.ca.

2. What is new?

Prior to August 7th, 2019, all commingling applications submitted through IRIS were processed as generic (i.e. requiring ERD review and authorization). This Guideline outlines a new process in IRIS where a commingling application for an oil or gas well will be handled as either routine or non-routine, depending on answers to declaration questions provided by the applicant. If it is routine, an IRIS authorization is granted automatically by the ERD immediately after the applicant submits the application. If it is non-routine, the application is identified as requiring further review by the ERD prior to being approved or denied.

3. Governing Legislation

These Guidelines are authorized under:

- *The Oil and Gas Conservation Act* (OGCA)
- *The Oil and Gas Conservation Regulations, 2012* (OGCR)

These Guidelines are supplemented by the following directives, guidelines and informational resources:

- *Directive PNG007: Off-Target Well Requirements*
- *Directive PNG009: Public Notice Requirements*
- *Directive PNG017: Measurement Requirements for Oil and Gas Operations*
- *Guideline PNG021: Determining Drainage Units and Target Areas*
- *Guideline PNG024: Reclassification and Recompletion.*
- Pool Orders: list of pools established by Minister's Order
- Saskatchewan's Mining and Petroleum GeoAtlas, which shows the locations of oil and gas wells, pool boundaries and potash restricted drilling areas.

4. Eligibility

An applicant must have an Integrated Resource Information System (IRIS) account and the appropriate permissions assigned by their IRIS Security Administrator to submit a commingling application.

To be eligible for a routine authorization, an operator must meet the following requirements:

- A stabilized production rate of at least six months is established in one of the pools to be commingled;

- The lessor(s) and lessee(s) in all pools are identical;
- One of the pools to be commingled is producing at such a marginal rate that segregating production or drilling a twin well cannot be justified;
- The pools have compatible producing characteristics and reservoir properties, such as similar Sandface pressures;
- The pools are in close proximity in terms of producing depth;
- Oil or gas pools to be commingled do not contain significant underlying water identified in logs or through production;
- Oil pools to be commingled do not contain gas zones identified in logs or through production; and
- There is no enhanced oil recovery project in the immediate area, including waterfloods.

If one or more of the above requirements are not met, the operator may still apply. However, the application will most likely be processed as non-routine.

5. Application Procedure

This section outlines steps for the applicant to navigate through the commingling application process in IRIS.

5.1 Application Type

When applying to commingle two or more pools, there are two application types to select from as shown in figure 1 below. Selecting the "Commingling – Oil/Gas" application type will take the applicant to the new routine and non-routine process for oil and gas wells. Selecting the "Commingling - Disposal/Other" will take the applicant to the generic application process for a disposal well or other type of well (i.e. water source well), which is not covered in this Guideline.

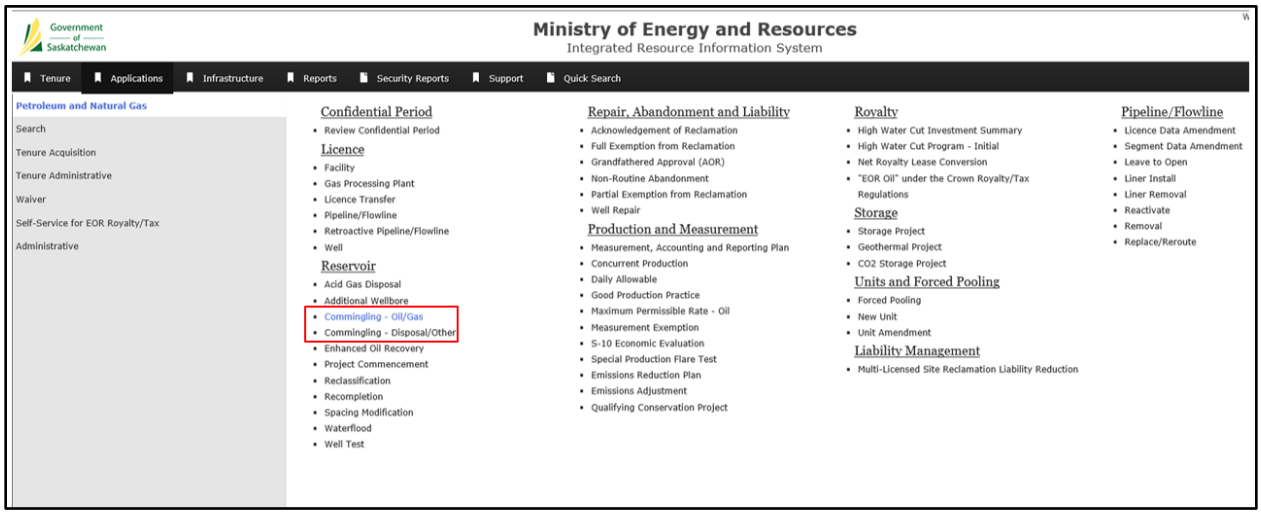


Figure 1: type of application

Well Information
Wellbores Information
Pools for Commingle Production
Disclosure Questions
Application Attachments
Contact Information
Review and Submit

Figure 2: different tabs in the new application

5.2 Well Information Tab

Figure 3: well information screen

Industry Application Reference Number: The applicant may choose to enter in a reference number. This number is only for use of industry. Filling in this field is not mandatory.

On Behalf of BA: Enter in the five-digit Business Associate (BA) ID number. This field will show up only if you are applying on behalf of another company.

Does this well have previous Commingling approval for the subject pools?:
If the subject well received an approval to commingle for the pools that the company is applying to commingle now then select yes or else select no. Answering this question is mandatory.

If you selected yes:

- If the approval was received after the IRIS launch date of November 19, 2015, click "Add a Commingling Authorization" to enter the IRIS authorization number. The ability to search for the authorization number using the well licence is also available;
- If the approval was received before the IRIS launch date, the "Approval to Commingle Production" form must be included in the "Commingling Application Package".

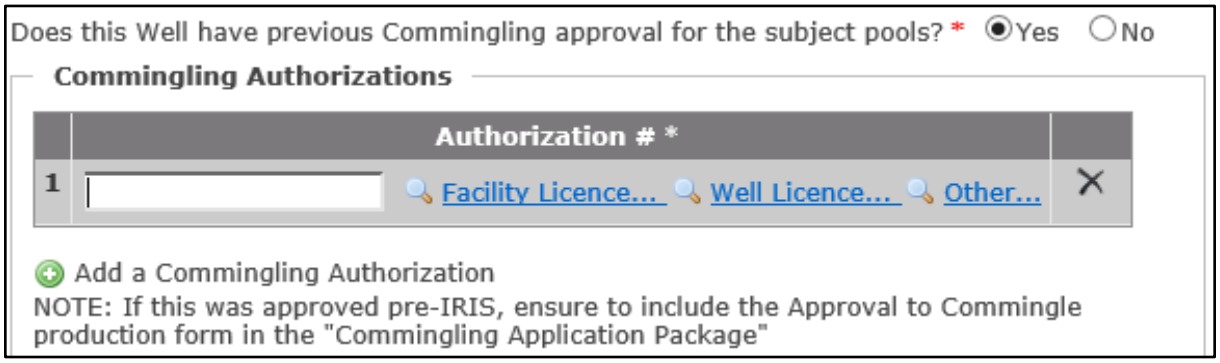


Figure 4: If you select yes, does this well have previous Commingling approval for the subject pools?

Resubmission?: If the subject well was denied on a previous attempt to apply select yes or else select no. Answering this question is mandatory.

The original denied application number may be entered in the box next to the dropdown.

Figure 5: If you select yes, Resubmission?

Well Licence: Enter the six-digit well licence number. IRIS will auto-populate the respective surface location, CWI ID, Field Office and Well Trajectory fields for the well.

How to search for the well licence number for your application

A well licence can be searched by entering the information into the fields shown below in figure 6. Once the well licence is entered, IRIS will check if the well is associated to the BA applying for commingling. Also, IRIS will check to make sure that the current well status is not abandoned, Ministry suspended, planned, present or drilling. An error message will be displayed if any of the above scenarios are met as shown in figure 7.

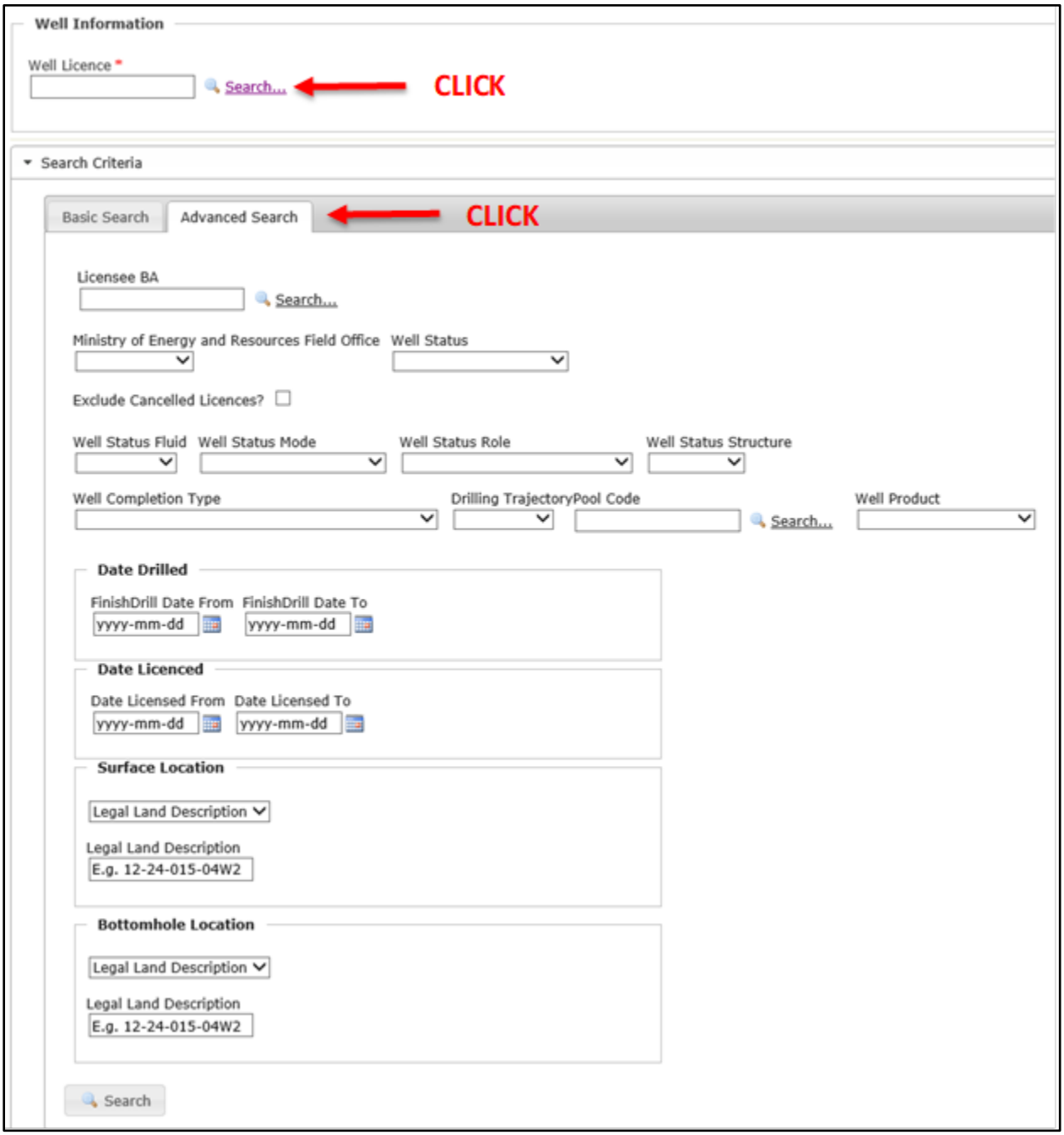


Figure 6: search functionality for well licence

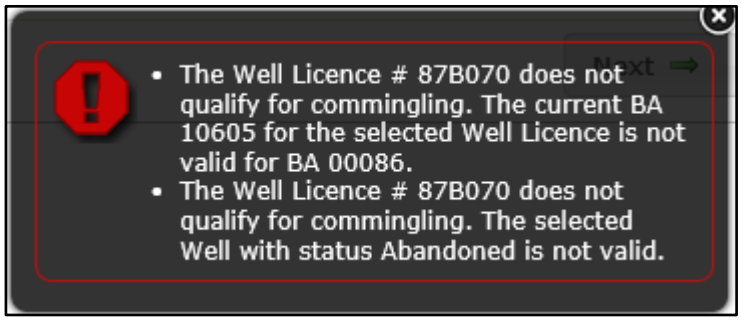


Figure 7: error message when the well licence is not valid for commingling.

Note: If this well is currently being drilled please apply through the "Commingling - Disposal/Other" application process.

5.3 Wellbores Information Tab

The wellbore(s) associated to the selected well licence will auto-populate on this screen. Check the box to select the wellbore(s) in which the commingling will occur. As a wellbore is selected, its bottom hole information is auto-populated on the screen.

The applicant may choose multiple wellbores to commingle, if necessary.

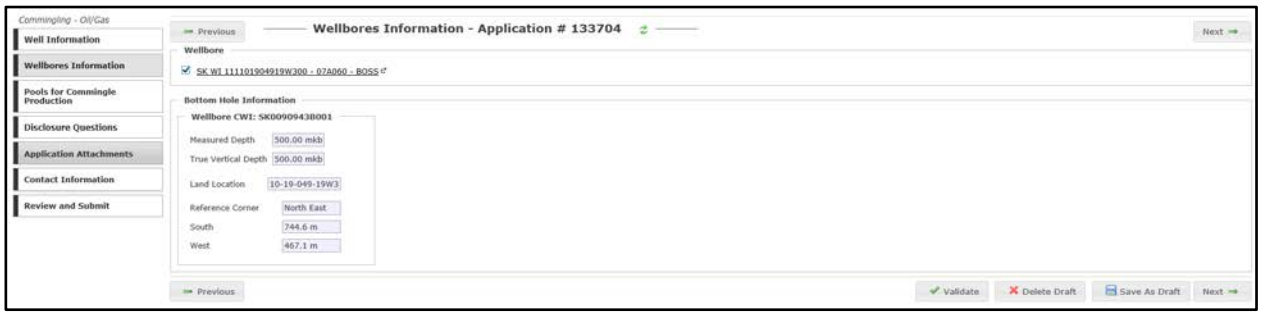


Figure 8: wellbores information screen

Note: If any bottom hole information is missing from the wellbore in IRIS, the applicant will receive a validation error warning message and will not be able to proceed until this information is complete. Please contact the ER Service Desk to submit this information and have it updated in IRIS in order to proceed with the application.

5.4 Pools to Commingle Production Tab

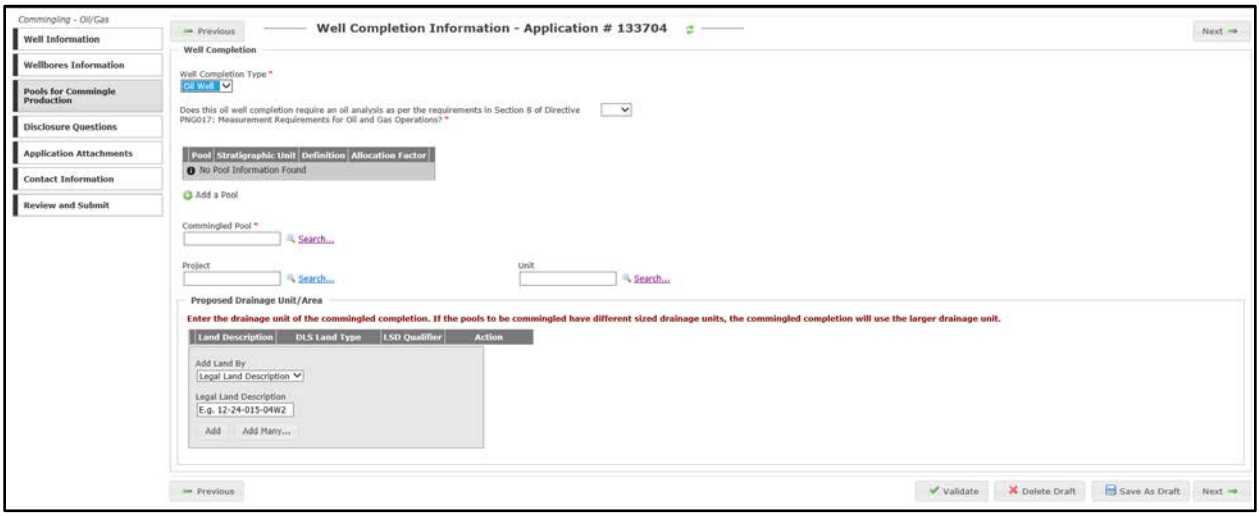


Figure 9: pools for commingled production screen

Well Completion Type: Please select the correct completion type corresponding to the proposed completion to indicate if this completion will be used to produce oil or gas.
If an oil well completion type is selected, a question will be generated pertaining to oil analysis. To answer this question please refer to section 8 of *Directive PNG017: Measurement Requirements for Oil and Gas Operations* for assistance.

Pool: Enter in all pools to be commingled, using the respective pool code. Clicking "Add a Pool" will create a new row entry. A minimum of two pools are required to be entered for the purposes of commingling production. Once the pool code is entered, IRIS will auto-populate the respective stratigraphic unit and definition fields.

How to search for the correct pool code for your application

Figure 10: pool search functionality in the application

Or, pause the application and go to the "Infrastructure" tab

Figure 11: pool search functionality outside the application

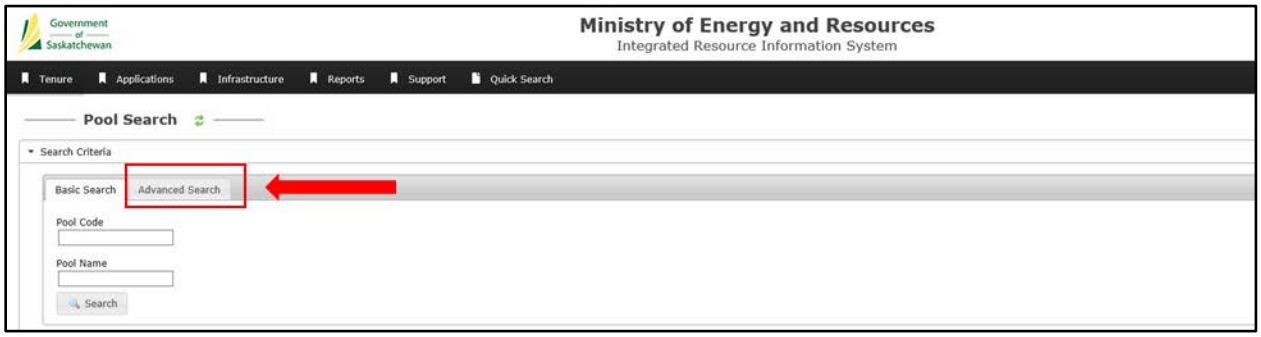
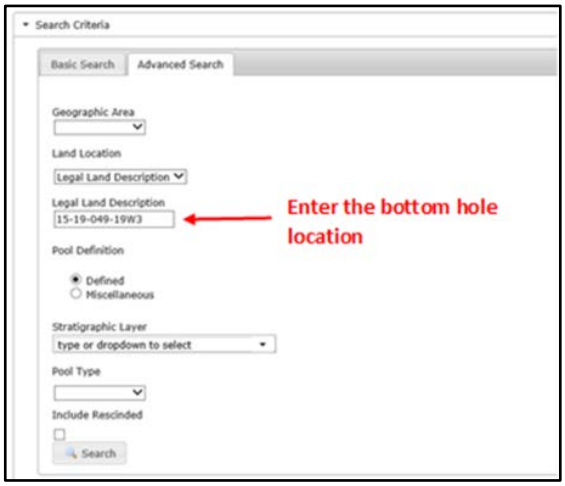


Figure 12: advanced search options for pool search

If the well lies in a defined pool, enter in the bottom hole location and click search. IRIS will pop up a list of pools in that location. Select the correct pool based on the stratigraphic unit you would like to perforate.



The search results can be further refined by adding information such as the stratigraphic unit, pool type, geographic area, etc.

If the stratigraphic unit that you would like to perforate is not associated to a defined pool in the area of the well, click on "Search Criteria" to go back to the advanced search option.

Showing 2 results

Pool Code	Pool Name	Definition	Pool Type	Geographic Area	Actions
231150	Turtlelake Colony Sand Pool	Defined	Oil	Lloydminster	
231347	Turtlelake Waseca Sand Pool	Defined	Oil	Lloydminster	

Figure 13: searching defined pools

Select the Pool definition as “Miscellaneous”, select the stratigraphic unit of interest from the drop down and then click search.

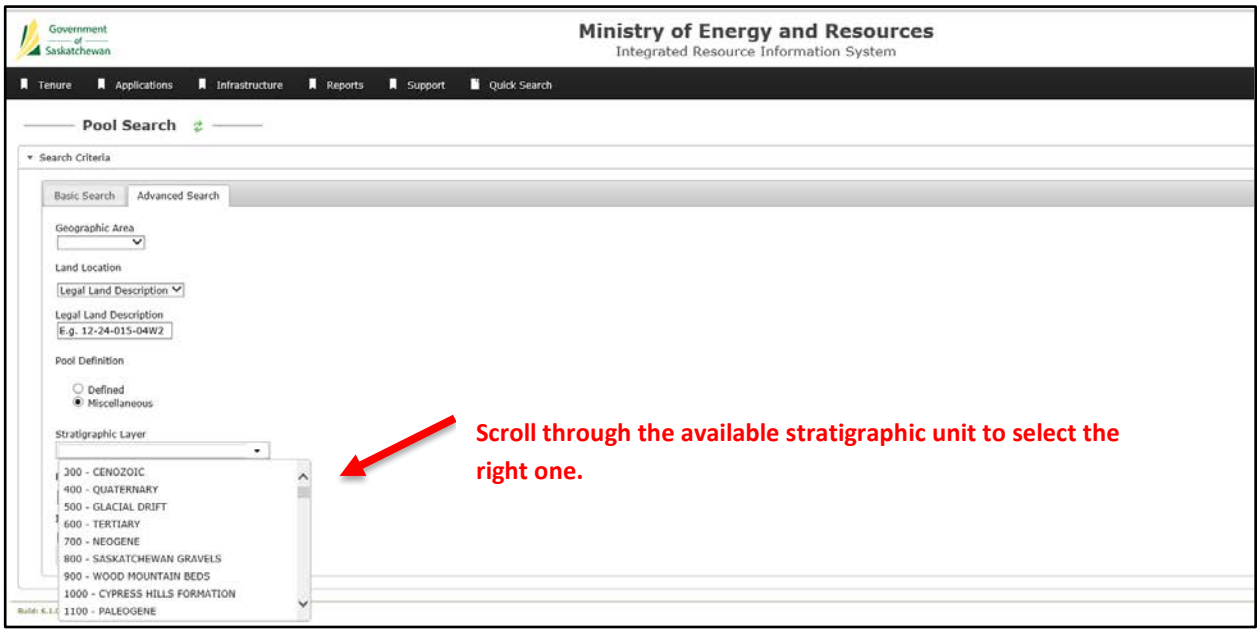
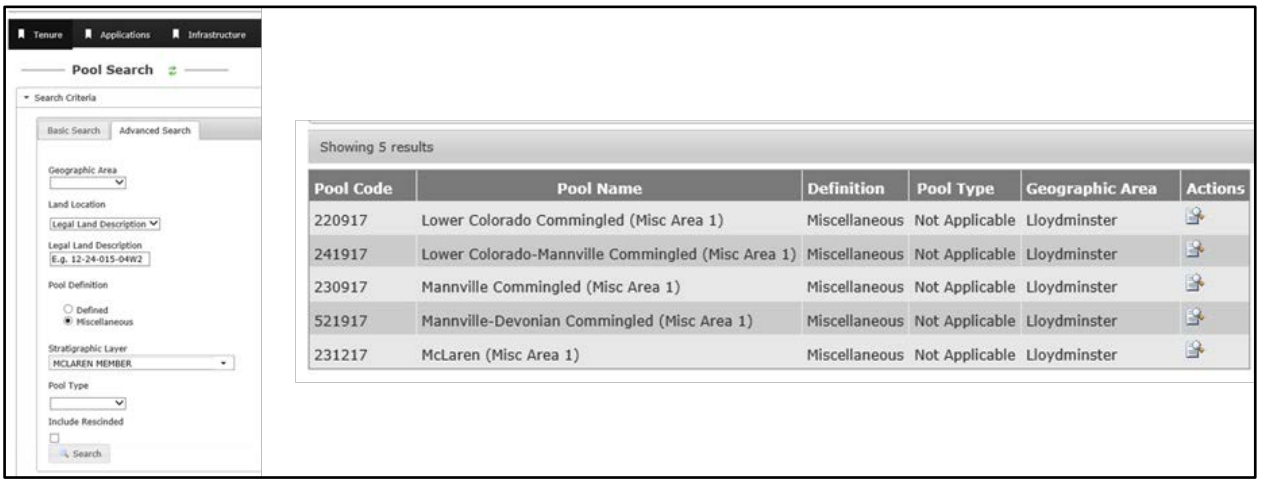


Figure 14: searching miscellaneous pools



Pool Code	Pool Name	Definition	Pool Type	Geographic Area	Actions
220917	Lower Colorado Commingled (Misc Area 1)	Miscellaneous	Not Applicable	Lloydminster	
241917	Lower Colorado-Mannville Commingled (Misc Area 1)	Miscellaneous	Not Applicable	Lloydminster	
230917	Mannville Commingled (Misc Area 1)	Miscellaneous	Not Applicable	Lloydminster	
521917	Mannville-Devonian Commingled (Misc Area 1)	Miscellaneous	Not Applicable	Lloydminster	
231217	McLaren (Misc Area 1)	Miscellaneous	Not Applicable	Lloydminster	

Figure 15 miscellaneous pool search results

Allocation Factor: to the right of the definition field, enter in the pool allocation factor as a percentage.

Allocation Factor refers to the portion of production that is attributed to each of the stratigraphic units that contribute to the commingled flow of oil or gas. This is important to calculate as it is used to estimate annual reserves.

How to calculate the allocation factor

The allocation factor is for ER use only. It is used to calculate the yearly crude oil and natural gas reserves for the province and is subject to change.

The applicant must provide the allocation factor for each of the proposed pools to be commingled. The sum of all allocation factors should always be 100 per cent.

The allocation factor may vary based on different calculations or testing methods. Decline analysis and production analysis are popular ways of calculating the expected production from the well as well as from each stratigraphic unit. For areas that have had previous commingling in similar pools, analyzing the nearby wells is another technique that can be used to derive allocation percentages.

The applicant is also required to provide a technical write up on how these estimates were calculated. This is part of the commingling application package (refer to page 27).

Commingled Pool: Enter the pool code for the commingled pool from which all subsequent production will be reporting from.

What is the correct commingled pool code for your completion?

Defined Commingled pool

Below is the list of all defined commingled pools. Once you have the correct pool codes that are being proposed to be commingled, find the commingled code that corresponds to all of those pool codes.

Table 1 :Defined Commingled Pool Codes

COMMINGLED CODE	COMMINGLED POOL	INCLUDED POOLS Pool Code/Name
230921	Big Gully East Mannville Sands Pool	232522 Big Gully East G.P. Sand Pool 234145 Big Gully East Lloydminster Sand Pool 231224 Big Gully East McLaren Sand Pool 232120 Big Gully East Sparky Sand Pool 231346 Big Gully East Waseca Sand Pool
230924	Big Gully Mannville Sands Pool	231202 Big Gully McLaren Sand Pool 232154 Big Gully Sparky Sand Pool 231309 Big Gully Waseca Sand Pool
230915	Buzzard North Mannville Sands Pool	232521 Buzzard North G.P. Sand Pool 234144 Buzzard North Lloydminster Sand Pool 232149 Buzzard North Sparky Sand Pool 231335 Buzzard North Waseca Sand Pool

COMMINGLED CODE	COMMINGLED POOL	INCLUDED POOLS Pool Code/Name
230903	Celtic Mannville Sands Pool	100019 Celtic Central McLaren Sand Pool 231151 Celtic Colony Sand Gas Pool 232511 Celtic G.P. Sand Pool 232122 Celtic Sparky Sand Pool 231313 Celtic Waseca Sand Pool
230909	Dee Valley East Mannville Sands Pool	232125 Dee Valley East Sparky Sand Pool 231316 Dee Valley East Waseca Sand Pool
230928	Dee Valley Mannville Sands Pool	232163 Dee Valley Sparky Sand Pool 231310 Dee Valley Waseca Sand Pool
230904	Edam West Mannville Sands Pool	232141 Edam West Sparky/G.P. Sand Pool 231323 Edam West Waseca Sand Pool
230913	Epping Mannville Sands Pool	232504 Epping G.P. Sand Pool 232104 Epping Sparky Sand Pool
230916	Evesham North Mannville Sands Pool	231208 Evesham North McLaren Sand Pool 232145 Evesham North Sparky Sand Pool
230902	Forest Bank Mannville Sands Pool	232123 Forest Bank Sparky Sand Pool 231305 Forest Bank Waseca Sand Pool
230914	Freemont Mannville Sands Pool	232130 Freemont Sparky Sand Pool 231315 Freemont Waseca Sand Pool
230906	Golden Lake North Mannville Sands Pool	232112 Golden Lake North Sparky Sand Pool 231306 Golden Lake North Waseca Sand Pool
230919	Lashburn Mannville Sands Pool	231220 Lashburn McLaren Sand Pool 232116 Lashburn Sparky Sand Pool
230908	Golden Lake South Mannville Sands Pool	232107 Golden Lake South Sparky Sand Pool 231308 Golden Lake South Waseca Sand Pool
230918	Lashburn South Mannville Sands Pool	231223 Lashburn South McLaren Sand Pool 232129 Lashburn South Sparky Sand Pool 231314 Lashburn South Waseca Sand Pool
230927	Lone Rock Mannville Sands Pool	232525 Lone Rock G.P. Sand Pool 232103 Lone Rock Sparky Sand Pool
230912	Maidstone Mannville Sands Pool	231205 Maidstone McLaren Sand Pool 232156 Maidstone Sparky Sand Pool 231322 Maidstone Waseca Sand Pool
230925	Mervin South Mannville Sands Pool	232161 Mervin South Sparky Sand Pool 231344 Mervin South Waseca Sand Pool
230926	Mervin West Mannville Sands Pool	231156 Mervin West Colony Sand Pool 231227 Mervin West McLaren Sand Pool
230911	Neilburg Mannville Sands Pool	231105 Neilburg Colony Sand Pool 231203 Neilburg McLaren Sand Pool
100025	Neilburg North Mannville Sands Pool	100023 Neilburg North Rex Sand Pool 100022 Neilburg North Sparky Sand Pool
230920	Pikes Peak Mannville Sands Pool	232507 Pikes Peak G.P. Sand Pool 232128 Pikes Peak Sparky Sand Pool 231312 Pikes Peak Waseca Sand Pool
230905	Rush Lake Mannville Sands Pool	232519 Rush Lake G.P. Sand Pool 232140 Rush Lake Sparky Sand Pool 231321 Rush Lake Waseca Sand Pool
230922	Silverdale Mannville Sands Pool	232523 Silverdale G.P. Sand Pool 232101 Silverdale Sparky Sand Pool
230923	Standard Hill North Mannville Sands Pool	232520 Standard Hill North G.P. Sand Pool 233117 Standard Hill North Rex Sand Pool 232148 Standard Hill North Sparky Sand Pool 231333 Standard Hill North Waseca Sand Pool

COMMINGLED CODE	COMMINGLED POOL	INCLUDED POOLS Pool Code/Name
230901	Tangleflags Mannville Sands Pool	231144 Tangleflags Colony Sand Pool 232505 Tangleflags G.P. Sand Pool 234121 Tangleflags Lloydminster Sand Pool 231206 Tangleflags McLaren Sand Pool 232114 Tangleflags Sparky Sand Pool 231340 Tangleflags Waseca Sand Pool
230907	Tangleflags West Mannville Sands Pool	232508 Tangleflags West G.P. Sand Pool 234132 Tangleflags West Lloyd. Sand Pool 231207 Tangleflags West McLaren Sand Pool 232131 Tangleflags West Sparky Sand Pool
230910	Westhazel Mannville Sands Pool	232510 Westhazel G.P. Sand Pool 232136 Westhazel Sparky Sand Pool 231329 Westhazel Waseca Sand Pool
222402	Battle Creek West Milk River-SWS Gas Pool	219509 Battle Creek West Milk River Gas Pool 223037 Battle Creek West Second White Specks Gas Pool
222503	Bigstick-Crane Lake Milk River-Med Hat-SWS Gas Pool	219506 Crane Lake Milk River Gas Pool 222145 Crane Lake Medicine Hat Gas Pool 223030 Bigstick Second White Specks Gas Pool
222404	Bigstick-Crane Lake Milk River-SWS Gas Pool	219506 Crane Lake Milk River Gas Pool 223030 Bigstick Second White Specks Gas Pool
222502	Bigstick-Hatton Milk River-Med Hat-SWS Gas Pool	219501 Hatton Milk River Gas Pool 222144 Hatton Medicine Hat Sand Gas Pool 223030 Bigstick Second White Specks Gas Pool
222403	Bigstick-Hatton Milk River-SWS Gas Pool	219501 Hatton Milk River Gas Pool 223030 Bigstick Second White Specks Gas Pool
219702	Burstall Milk River-Medicine Hat Gas Pool	222151 Burstall Medicine Hat Sand Gas Pool 219503 Burstall Milk River Gas Pool
219703	Crane Lake Milk River-Medicine Hat Gas Pool	222145 Crane Lake Medicine Hat Gas Pool 219506 Crane Lake Milk River Gas Pool
222504	Crane Lake South Milk River-Med Hat-SWS Gas Pool	222146 Crane Lake South Medicine Hat Gas Pool 219507 Crane Lake South Milk River Gas Pool 223032 Crane Lake South Second White Specks Gas Pool
219704	Crane Lake South Milk River-Medicine Hat Gas Pool	222146 Crane Lake South Medicine Hat Gas Pool 219507 Crane Lake South Milk River Gas Pool
222405	Crane Lake South Milk River-SWS Gas Pool	219507 Crane Lake South Milk River Gas Pool 223032 Crane Lake South Second White Specks Gas Pool
219701	Hatton Milk River-Medicine Hat Gas Pool	219501 Hatton Milk River Gas Pool 222144 Hatton Medicine Hat Sand Gas Pool
222505	Hatton-Richmound Milk River-Med Hat-SWS Gas Pool	219501 Hatton Milk River Gas Pool 222144 Hatton Medicine Hat Sand Gas Pool
222407	Hatton-Richmound Milk River-SWS Gas Pool	219501 Hatton Milk River Gas Pool 222144 Hatton Medicine Hat Sand Gas Pool223041 Richmound Second White Specks Gas Pool
216001	Vidora Bearpaw-Belly River Sands Gas Pool	215005 Vidora Bearpaw Sand Gas Pool 217037 Vidora Belly River Sand Gas Pool

Miscellaneous Pool Codes

If the pools that are being commingled do not fall together under a defined commingled code, the commingled production needs to be assigned to a miscellaneous pool code.

Below is the list of miscellaneous commingled pool codes (separated based on the Field Office areas). Find the code that has all the stratigraphic units that are being proposed to be commingled in the application.

Table 2 :Miscellaneous Commingled Pool Codes

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
AREA 1 - LLOYDMINSTER		
220917	Lower Colorado Commingled (Misc Area 1)	3600 - Second White Speckled Shale 4000 - Fish Scale Zone 4300 - St. Walburg Sandstone 4500 - Viking Formation 4700 - Joli Fou Formation 4800 - Spinney Hill Member 5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member
230917	Mannville Commingled (Misc Area 1)	5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member
241917	Lower Colorado-Mannville Commingled (Misc Area 1)	3600 - Second White Speckled Shale 4000 - Fish Scale Zone 4300 - St. Walburg Sandstone 4500 - Viking Formation 4700 - Joli Fou Formation 4800 - Spinney Hill Member 5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
521917	Mannville-Devonian Commingled (Misc Area 1)	5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member 15000 - Duperow Formation
AREA 2 - KINDERSLEY		
220939	Lower Colorado Commingled (Misc Area 2)	3500 - Medicine Hat Sand 3600 - Second White Speckled Shale 4000 - Fish Scale Zone 4300 - St. Walburg Sandstone 4500 - Viking Formation 4700 - Joli Fou Formation 4800 - Spinney Hill Member 4900 - Mannville Group 6100 - Basal Mannville Group
241939	Lower Colorado-Mannville Commingled (Misc Area 2)	3500 - Medicine Hat Sand 3600 - Second White Speckled Shale 4000 - Fish Scale Zone 4300 - St. Walburg Sandstone 4500 - Viking Formation 4700 - Joli Fou Formation 4800 - Spinney Hill Member 4900 - Mannville Group 5100 - Upper Mannville Group 6100 - Basal Mannville Group 7500 - Success Formation
222406	Commingled Milk River-SWS (Misc Area 2)	3000 - Milk River Formation 3600 - Second White Speckled Shale
230939	Mannville Commingled (Misc Area 2)	4900 - Mannville Group 5100 - Upper Mannville Group 6100 - Basal Mannville Group 7500 - Success Formation
430939	Mississippian Commingled (Misc Area 2)	11900 - Madison Group 13900 - Bakken Formation
431939	Mannville-Mississippian Commingled (Misc Area 2)	4900 - Mannville Group 6100 - Basal Mannville Group 7500 - Success Formation 8400 - Roseray Formation 9100 - Shaunavon Formation 9200 - Upper Shaunavon Member 9400 - Lower Shaunavon Member 11900 - Madison Group 13900 - Bakken Formation

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
221939	Upper Cretaceous-Lower Colorado Commingled (Misc Area 2)	1700 - Battle Formation 1800 - Whitemud Formation 1900 - Eastend Formation 2000 - Bearpaw Formation 2200 - Belly River Group 2300 - Judith River Formation 2400 - Oldman Formation 2500 - Foremost Formation 2600 - Lea Park Formation 2800 - Ribstone Creek Member 2900 - Victoria Member 3000 - Milk River Formation 3300 - First White Speckled Shale 3400 - Niobrara Formation 3500 - Medicine Hat Sand 3600 - Second White Speckled Shale 3800 - Belle Fourche Formation 4000 - Fish Scale Zone 4200 - Westgate Formation 4300 - St. Walburg Sandstone 4500 - Viking Formation 4700 - Joli Fou Formation 4800 - Spinney Hill Member 4900 - Mannville Group 6100 - Basal Mannville Group
521939	Mannville-Devonian Commingled (Misc Area 2)	4900 - Mannville Group 5100 - Upper Mannville Group 6100 - Basal Mannville Group 7500 - Success Formation 8400 - Roseray Formation 9100 - Shaunavon Formation 9200 - Upper Shaunavon Member 9400 - Lower Shaunavon Member 11900 - Madison Group 14900 - Birdbear Formation 15000 - Duperow Formation
881939	Silurian-Ordovician-Cambrian Commingled (Misc Area 2)	17100 - Interlake Group 17700 - Stonewall Formation 18000 - Stony Mountain Formation 18400 - Red River Formation 18900 - Winnipeg Formation 19300 - Deadwood Formation
AREA 3 – SWIFT CURRENT		
210969	Upper Cretaceous Commingled (Misc Area 3)	2000 - Bearpaw Formation 2200 - Belly River Group 2300 - Judith River Formation 2400 - Oldman Formation 2600 - Lea Park Formation 2800 - Ribstone Creek Member 3000 - Milk River Formation
216002	Bearpaw-Belly River (Misc Area 3)	2000 - Bearpaw Formation 2200 - Belly River
219758	Milk River-Medicine Hat (Misc Area 3)	3000 - Milk River Formation 3500 - Medicine Hat Sand

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
221969	Upper Cretaceous-Lower Colorado Commingled (Misc Area 3)	1700 - Battle Formation 1800 - Whitemud Formation 1900 - Eastend Formation 2000 - Bearpaw Formation 2100 - Matador Member 2200 - Belly River Group 2300 - Judith River Formation 2400 - Oldman Formation 2500 - Foremost Formation 2600 - Lea Park Formation 2800 - Ribstone Creek Member 3000 - Milk River Formation 3300 - First White Speckled Shale 3400 - Niobrara Formation 3500 - Medicine Hat Sand 3600 - Second White Speckled Shale 3800 - Belle Fourche Formation 4000 - Fish Scale Zone 4200 - Westgate Formation 4500 - Viking Formation 4700 - Joli Fou Formation 4900 - Mannville Group 5600 - Cantuar Formation 6100 - Basal Mannville Group
222401	Commingled Milk River-SWS (Misc Area 3)	3000 - Milk River Formation 3600 - Second White Speckled Shale
222501	Commingled MR/MH/2WS	3000 - Milk River Formation 3500 - Medicine Hat Sand 3600 - Second White Speckled Shale
222601	Commingled Medicine Hat/2WS	3500 - Medicine Hat Sand 3600 - Second White Speckled Shale
222701	Commingled Upper Colorado-SWS (Misc Area 3)	3200 - Upper Colorado Group 3600 - Second White Speckled Shale
332969	Shaunavon Commingled (Misc Area 3)	9200 - Upper Shaunavon Member 9400 - Lower Shaunavon Member
330969	Jurassic Commingled (Misc Area 3)	8400 - Roseray Formation 9100 - Shaunavon Formation 9200 - Upper Shaunavon Member 9400 - Lower Shaunavon Member 9600 - Gravelbourg Formation
331969	Mannville-Jurassic Commingled (Misc Area 3)	4900 - Mannville Group 8400 - Roseray Formation 9100 - Shaunavon Formation 9200 - Upper Shaunavon Member 9400 - Lower Shaunavon Member 9600 - Gravelbourg Formation
881969	Silurian-Ordovician-Cambrian Commingled (Misc Area 3)	18900 - Winnipeg Formation 19300 - Deadwood Formation
AREA 4 - ESTEVAN		
230949	Mannville Commingled (Misc Area 4)	4900 - Mannville Group 7000 - Wapella Sand

241949	Lower Colorado-Mannville Commingled (Misc Area 4)	4500 - Viking Formation 4900 - Mannville Group 7000 - Wapella Sand
430949	Mississippian Commingled (Misc Area 4)	12200 - Ratcliffe Beds 12500 - Midale Beds 12800 - Frobisher-Alida Beds 12900 - Frobisher Beds 13200 - Kisbey Sandstone 13300 - Alida Beds 13500 - Tilston Beds 13600 - Lodgepole Formation 13700 - Souris Valley Beds 13900 - Bakken Formation
441949	Jurassic-Mississippian Commingled (Misc Area 4)	12200 - Ratcliffe Beds 12500 - Midale Beds 12800 - Frobisher-Alida Beds 12900 - Frobisher Beds 13200 - Kisbey Sandstone 13300 - Alida Beds 13500 - Tilston Beds 13600 - Lodgepole Formation 13700 - Souris Valley Beds 13900 - Bakken Formation
540949	Devonian Commingled (Misc Area 4)	15000 - Duperow Formation 15300 - Souris River Formation 16200 - Winnipegosis Formation 17100 - Interlake Group
751949	Devonian-Ordovician Commingled (Misc Area 4)	14600 - Torquay Formation 14900 - Birdbear Formation 15000 - Duperow Formation 16200 - Winnipegosis Formation 17100 - Interlake Group 17700 - Stonewall Formation 18000 - Stony Mountain Formation 18400 - Red River Formation 18900 - Winnipeg Formation
700949	Ordovician Commingled (Misc Area 4)	17700 - Stonewall Formation 18000 - Stony Mountain Formation 18400 - Red River Formation 18900 - Winnipeg Formation
541949	Mississippian-Devonian Commingled (Misc Area 4)	12200 - Ratcliffe Beds 12500 - Midale Beds 12800 - Frobisher-Alida Beds 12900 - Frobisher Beds 13200 - Kisbey Sandstone 13300 - Alida Beds 13500 - Tilston Beds 13600 - Lodgepole Formation 13700 - Souris Valley Beds 13900 - Bakken Formation 14600 - Torquay Formation 14900 - Birdbear Formation 15000 - Duperow Formation 16200 - Winnipegosis Formation

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
761949	Silurian-Ordovician Commingled (Misc Area 4)	17100 - Interlake Group 17700 - Stonewall Formation 18000 - Stony Mountain Formation 18400 - Red River Formation 18900 - Winnipeg Formation
881949	Silurian-Ordovician-Cambrian Commingled (Misc Area 4)	17100 - Interlake Group 17700 - Stonewall Formation 18000 - Stony Mountain Formation 18400 - Red River Formation 18900 - Winnipeg Formation 19300 - Deadwood Formation

Examples to find the correct commingled pool code

Case I: Commingling defined pools that have a defined commingled pool

Pools to be commingled: 232522 - Big Gully East G.P. Sand Pool; 234145 - Big Gully East Lloydminster Sand Pool; and 231224 - Big Gully East McLaren Sand Pool.

Commingled pool code: 230921 - Big Gully East Mannville Sands Pool

COMMINGLED CODE	COMMINGLED POOL	INCLUDED POOLS	
		Pool Code	Pool Name
230921	Big Gully East Mannville Sands Pool	232522	Big Gully East G.P. Sand Pool
		234145	Big Gully East Lloydminster Sand Pool
		231224	Big Gully East McLaren Sand Pool
		232120	Big Gully East Sparky Sand Pool
		231346	Big Gully East Waseca Sand Pool

Case II: Commingling defined pools that do not have a defined commingled pool

Pools to be commingled: 231150 - Turtlelake Colony Sand Pool and 231334 - Turtleford Waseca Sand Pool.

Scan Table 1 for a defined commingled code. Find the area that the subject well belongs in Table 3 under that area and find the commingled code that has all the stratigraphic units associated to the pools to commingle production in the application.

Commingled pool code: 230917 - Mannville Commingled (Misc Area 1)

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
AREA 1 - LLOYDMINSTER		
230917	Mannville Commingled (Misc Area 1)	5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member

Case III: Commingling miscellaneous pools

If all the proposed pools are miscellaneous then the commingled pool will also be miscellaneous.

Pools to be Commingled : 232117 - Sparky (Misc Area 1) and 231217 - McLaren (Misc Area 1)

Find what area the subject well belongs . In Table 2 under that area find the commingled code that has all the stratigraphic units that are part of the application.

Commingled Pool Code : 230917 - Mannville Commingled (Misc Area 1)

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
AREA 1 - LLOYDMINSTER		
230917	Mannville Commingled (Misc Area 1)	5300 - Colony Member 5400 - McLaren Member 5800 - Waseca Member 6000 - Sparky Member 6200 - General Petroleum Member 6400 - Rex Member 6500 - Lloydminster Member 6800 - Cummings Member 6900 - Dina Member

Case IV: Commingling a combination of defined pools and miscellaneous pools

If you are applying to commingle a miscellaneous pool with a defined pool the commingled pool will always be a miscellaneous pool.

Pools to be Commingled: 219501 Hatton Milk River Gas Pool; 222144 - Hatton Medicine Hat Sand Gas Pool; and 219136 - Ribstone Creek (Misc Area 3).

Find the area that the subject well belongs to. In Table 2 under that area find the commingled code that contains all of the stratigraphic units associated to the pools to commingle production in the application.

Commingled Pool Code: 221969 - Upper Cretaceous-Lower Colorado Commingled (Misc Area 3)

COMMINGLED CODE	COMMINGLED POOL	INCLUDED STRATIGRAPHIC UNITS
AREA 3 – SWIFT CURRENT		
221969	Upper Cretaceous-Lower Colorado Commingled (Misc Area 3)	1700 - Battle Formation 1800 - Whitemud Formation 1900 - Eastend Formation 2000 - Bearpaw Formation 2100 - Matador Member 2200 - Belly River Group 2300 - Judith River Formation 2400 - Oldman Formation 2500 - Foremost Formation 2600 - Lea Park Formation 2800 - Ribstone Creek Member 3000 - Milk River Formation 3300 - First White Speckled Shale 3400 - Niobrara Formation 3500 - Medicine Hat Sand 3600 - Second White Speckled Shale 3800 - Belle Fourche Formation 4000 - Fish Scale Zone 4200 - Westgate Formation 4500 - Viking Formation 4700 - Joli Fou Formation 4900 - Mannville Group 5600 - Cantuar Formation 6100 - Basal Mannville Group

Project/Unit: If the well is part of a unit or project, the applicant may enter the information respectively. This can be checked by entering the land or bottom hole location in IRIS for the well. Filling in these fields is not mandatory.

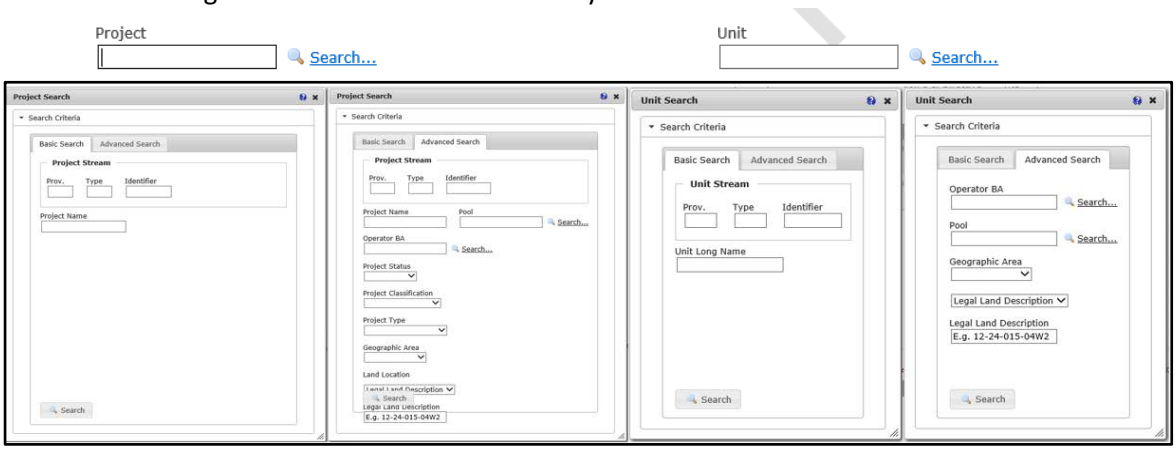


Figure 16: search functionality for projects and units

Proposed Drainage Unit/Area: Enter the drainage unit for the commingled completion.

- If the pools to be commingled are same-sized drainage units, the commingled completion will use the same drainage unit.
- If the pools to be commingled have different-sized drainage units, the commingled completion will use the larger drainage unit.

For more information on how to determine drainage units, please refer to *Guideline PNG021: Determining Drainage Units and Target Areas*

5.5 Disclosure Questions Tab

The disclosure questions shown in figures 17 and 18 below are based on the information provided in the application. Disclosure questions will be populated in this section of the application.

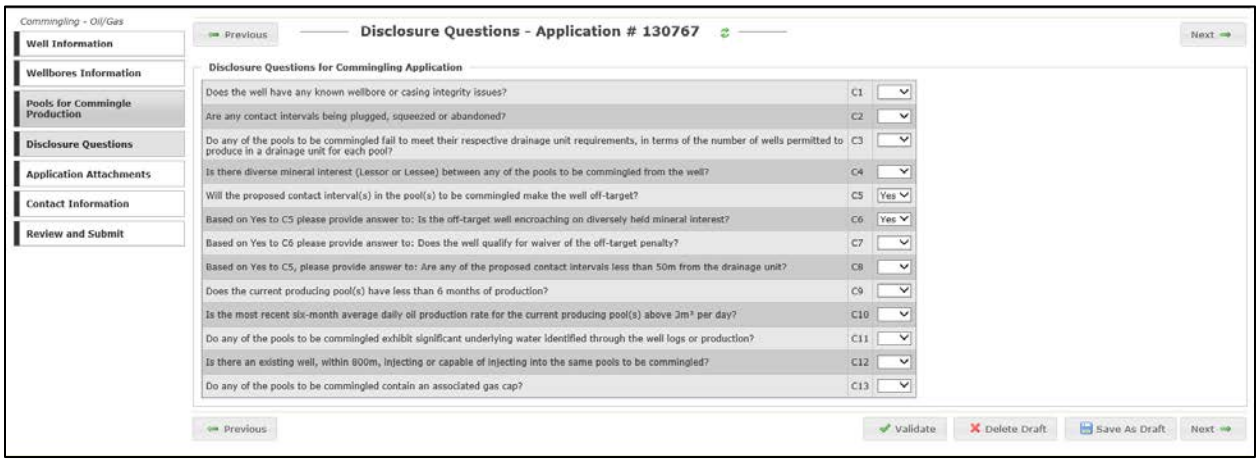


Figure 17 : disclosure questions screen (for oil completion)

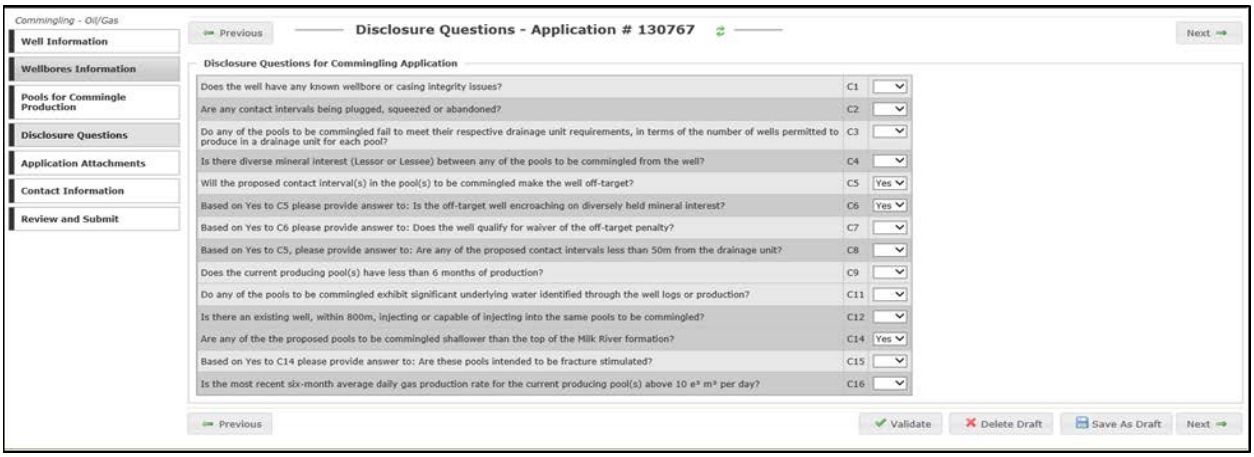


Figure 18 :disclosure questions screen (for gas completion)

Table 3 : Disclosure Questions

Disclosure Question C1 – Is there a known wellbore or casing integrity issue with the well?
Yes – Non-routine (Will be sent to Field Office for review) No – Routine Application Please refer to ***Directive PNG005: Casing And Cementing Requirements*** for further details.
Disclosure Question C2 – Are any contact intervals being plugged, squeezed or abandoned?
Yes – Non-routine (Will be sent to Field Office for review) No – Routine Application Please refer to ***Directive PNG015: Well Abandonment Requirements*** for further details.

Disclosure Question C3 – Do any of the pools to be commingled fail to meet their respective drainage unit requirements, in terms of the number of wells permitted to produce in a drainage unit for each pool?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application Please refer to ***Guideline PNG021: Determining Drainage Units and Target Areas*** for further details.
Disclosure Question C4 – Is there diverse mineral interest (Lessor or Lessee) between any of the pools to be commingled from the well?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application If answered yes, please attach the appropriate consents or agreements as additional documents or have these ready to be provided on request.
Disclosure Question C5 – Will the proposed contact interval(s) in the pool(s) to be commingled make the well off-target?
Yes – Answer additional questions No – Routine Application Please refer to ***Directive PNG007: Off-Target Well Requirements*** for further details.
Disclosure Question C6 - Is the off-target well encroaching on diversely held mineral interests?
Yes – Answer additional questions No – Routine Application
Disclosure Question C7 - Does the well qualify for waiver of the off-target penalty?
Yes – Routine Application No – Non-routine (Will be sent to an Engineer for review) If answered yes, please attach Public Notification for Waiver of Off-Target Penalty or Written Consent for Waiver of Off-Target Penalty
Disclosure Question C8 – Based on Yes to C5, please provide answer to: Are any of the proposed contact intervals less than 50m from the drainage unit?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application You are required to attach document of consent from the offsetting mineral owners to allow new completion.
Disclosure Question C9 – Does the current producing pool(s) have less than 6 months of production?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application You can attach additional information to support your application for commingling ,based on a nearby well productions and on economic reasons or other reasons.
Disclosure Question C10 (Only for Oil Well Completions) – Is the most recent six-month average daily oil production rate for the current producing pool(s) above 3 m^3 per day?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application
Disclosure Question C11 – Do any of the pools to be commingled exhibit significant underlying water identified through the well logs or production?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application You can attach additional information to support your application for commingling.
Disclosure Question C12 – Is there an existing well, within 800 metres, injecting or capable of injecting into the same pools to be commingled?

Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application
Disclosure Question C13 (Only for Oil Well Completions) - Do any of the pools to be commingled contain an associated gas cap?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application
Disclosure Question C14 (Only for Gas Well Completions) - Are any of the proposed pools to be commingled shallower than the top of the Milk River formation?
Yes – Answer additional questions No – Routine Application
Disclosure Question C15 – Based on Yes to C14 please provide answer to: Are these pools intended to be fracture stimulated?
Yes – This type of application is not permitted No – Routine Application
Disclosure Question C16 (Only for Gas Well Completions)– Is the most recent six-month average daily gas production rate for the current producing pool(s) above 10 e^3 m^3 per day?
Yes – Non-routine (Will be sent to an Engineer for review) No – Routine Application

5.6 Application Attachments Tab

Based on how the disclosure questions are answered, IRIS will generate a list of required documents to be submitted, as shown in figure 19 below.

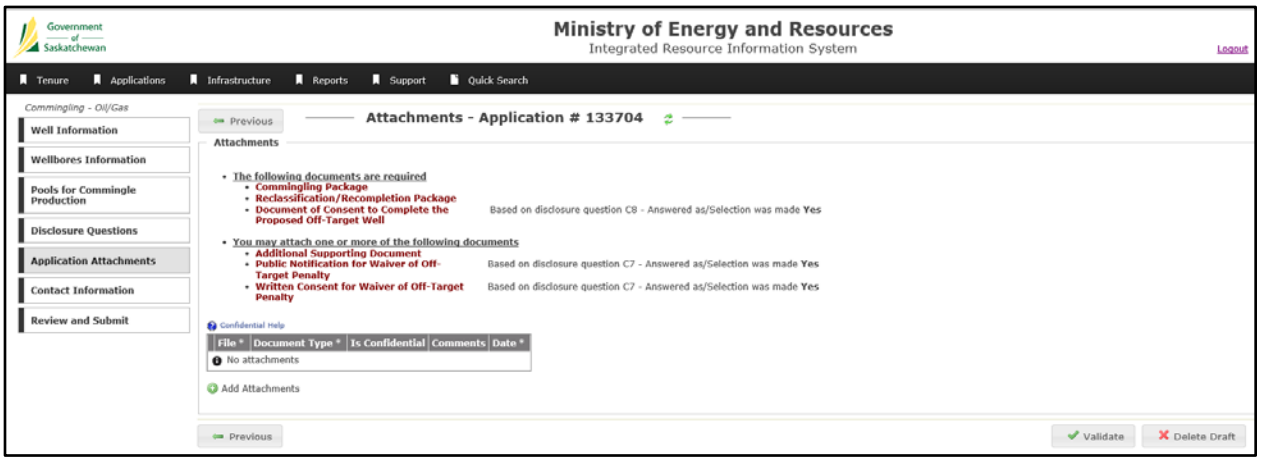


Figure 19: application attachments screen

Commingling Package
Combine the following documents into a single "Commingling Package" document. This is a mandatory attachment for every application.

- **Geological Discussion**
  Provide a short write-up on the geology of the reserves/pools that are being proposed to be commingled. Key points to cover include types of formations, net pay of the zones and other reservoir characterstics;
- **Well Logs (indicating existing, plugged and proposed depths)**
  Provide well logs to show the accumulation of hydrocarbon (oil or gas) for the proposed and existing perforations. For directional wells mark the True Vertical Depth (TVD) and Measured Depth (MD) on the well logs;
- **Production Chart(s)**
  Provide production charts for the well's existing zone to show the declining trends in production;
- **Project Map(s)**
  Provide a map showing the subject well and the surrounding legal subdivisions. Clearly mark all lessors and lessees on the map;
- **Allocation Factor Calculations**
  Provide a write-up or calculation on how the allocation factors were calculated for all the single zone pools in the new commingled pool completion.

Reclassification/Recompletion Package
Combine the following documents into a single "Reclassification/Recompletion Package" document. This is a mandatory attachment for every application.

- Reclassification/Recompletion Form (part of reservoir) and any required attachments.
  For more information, see *Guideline PNG024: Reclassification and Recompletion*.

For Off-Target Well Completions

- If the proposed completion is off-target and the proposed contact intervals are less than 50 m from the drainage unit boundary. Attach the Consent letter(s) from the offsetting mineral owners to allow new completion. This is mandatory if Disclosure question C8 is answered Yes.
- If the proposed completion is off-target, a production penalty may be applied to the commingled production unless one of the following is included with the application:
  - A completed Public Notice Process package (please refer to *Directive PNG009: Public Notice Requirements* for further details); or
  - Consent letter(s) from the offsetting mineral owners waiving the off-target penalty.

One of the two listed documents is mandatory if Disclosure question C7 is answered Yes.

If required, you may also attach additional documents to support the application.

5.7 Contact Information Tab

Enter the contact information in this section. This information may be used to direct any questions regarding the application to the appropriate person(s). At least one contact is required.

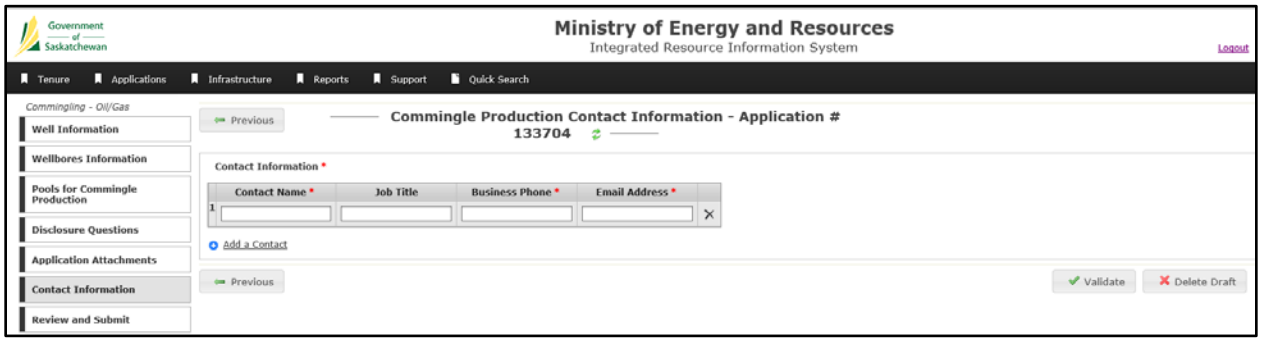


Figure 20: contact information screen

5.8 Review and Submit Tab

An overview of the submission information can be viewed from this screen. The applicant must ensure all information has been filled out accurately and to the best of their knowledge. Once the information has been verified, click the "submit" button to complete the submission process as seen in figure 21 below. At any time before submission, the application may be saved as a draft. The information filled out will be saved in draft form so that it can be submitted at a later time or deleted if the applicant chooses to do so.

Figure 21 : declaration statement

APPENDIX 1: LIST OF FIGURES AND TABLES