



Disposal Well Dashboard Background and Instructions

VERSION 1.4: December 2024

About the Regulator

The BC Energy Regulator (Regulator) is the single-window regulatory agency with responsibilities for regulating oil and gas activities in British Columbia, including exploration, development, pipeline transportation and reclamation.



The Regulator's core roles include reviewing and assessing applications for industry activity, consulting with First Nations, ensuring industry complies with provincial legislation and cooperating with partner agencies. The public interest is protected by ensuring public safety, protecting the environment, conserving petroleum resources and ensuring equitable participation in production.

Vision, Mission and Values

Vision

A resilient energy future where B.C.'s energy resource activities are safe, environmentally leading and socially responsible.

Mission

We regulate the life cycle of energy resource activities in B.C., from site planning to restoration, ensuring activities are undertaken in a manner that:



Protects public safety and the environment



Supports reconciliation with Indigenous peoples and the transition to low-carbon energy



Conserves energy resources



Fosters a sound economy and social well-being



Values

Respect is our commitment to listen, accept and value diverse perspectives.

Integrity is our commitment to the principles of fairness, trust and accountability.

Transparency is our commitment to be open and provide clear information on decisions, operations and actions.

Innovation is our commitment to learn, adapt, act and grow.

Responsiveness is our commitment to listening and timely and meaningful action.

Additional Guidance

As with all Regulator documents, this document does not take the place of applicable legislation. Readers are encouraged to become familiar with the acts and regulations and seek direction from Regulator staff for clarification.

The Regulator publishes both application and operations manuals and guides. The application manual provides guidance to applicants in preparing and applying for permits and the regulatory requirements in the planning and application stages. The operation manual details the reporting, compliance and regulatory obligations of the permit holder. Regulator manuals focus on requirements and processes associated with the Regulator's legislative authorities. Some activities may require additional requirements and approvals from other regulators or create obligations under other statutes. It is the applicant and permit holder's responsibility to know and uphold all legal obligations and responsibilities. For example, Federal Fisheries Act, Transportation Act, Highway Act, Workers Compensation Act and Wildlife Act.

Throughout the document there are references to guides, forms, tables and definitions to assist in creating and submitting all required information. Additional resources include:

- [Glossary and acronym listing](#) on the Regulator website.
- [Documentation and guidelines](#) on the Regulator website.
- [Frequently asked questions](#) on the Regulator website.
- [Advisories, bulletins, reports and directives](#) on the Regulator website.
- [Regulations and Acts](#) listed on the Regulator website.

In addition, this document may reference some application types and forms to be submitted outside of the Application Management System but made available on the Regulator's website. Application types and forms include:

- Heritage Conservation Act, Section 12
- Road use permits
- Water licences
- Master licence to cut
- Certificate of restoration
- Waste discharge permit
- Experimental scheme application

Manual Revisions

The Regulator is committed to the continuous improvement of its documentation. Revisions to the documentation are highlighted in this section and are posted to the [Documentation Section](#) of the Regulator’s website. Stakeholders are invited to provide input or feedback on Regulator documentation to ServiceDesk@bc-er.ca or submit feedback using the [feedback form](#).

Version Number	Posted Date	Effective Date	Chapter Section	Summary of Revision(s)
1.2	Feb. 17, 22	Feb 17, 22		This is a new document. Users are encouraged to review in full.
1.3	Aug.25, 23	Mar.1,23		Links and contact info updates.
1.3	Nov.12, 24		Pg5	Disposal well dashboard link updated/corrected; pg5.
1.4	Dec.10.24			Added descriptions of 6 new tabs.

[LINK TO DISPOSAL WELL DASHBOARD](#)

Disclaimer

This information/tool is provided for the convenience of the industry; however, users are cautioned that the estimated capacity and forecasting relies on several approximations and assumptions that may not be appropriate for every well. The Regulator accepts no liability for any errors or omissions or for loss or damages incurred by any person or business entity based on the use of this information/tool.

If there is any conflicting approval information (eg. maximum reservoir storage pressure) between the Dashboard and the formal approval document (searchable [here](#)), the formal approval document is considered the correct value. Permit holders are responsible for operating their disposal wells per the conditions of the formal approval.

Introduction

This tool aggregates operational data and approval information into plots and data tables for wells approved and operating for disposal of produced water, nonhazardous waste, and acid gas. Additionally, the Dashboard utilizes this data to estimate and display the remaining disposal volume capacity and date of fill-up. The Dashboard also allows for the export of the approval data utilized by the Dashboard in csv/Excel format.

Tabs and Content

1. Info Tab: Contains General Information on the Dashboard and a link to this instructions document
2. Dashboard (WATR/NHW) Tab: The user selects a produced water or non-hazardous waste disposal well using its permit number (WA#) and completion event using a drop-down menu and then the following items are displayed:
 - Four plots
 - Monthly disposal volume, injection pressure, maximum approved injection pressure, and reservoir pressure vs date
 - Cumulative disposal volume, reservoir pressure, and ultimate storage pressure vs date

- Reservoir pressure vs cumulative disposal volume, plus a linear forecast of disposal capacity and lines representing the initial and ultimate reservoir pressures
 - Injectivity vs cumulative injected volume
 - Well name, WA #, completion event, and current status
 - A table summarizing the well's injection operational info, approval info, estimated capacity, and more
 - Values denoted with an asterisk (*) are estimated/forecasted values. When these values are blank, it means that a forecast was impossible due to either there only being a single data point or the linear regression returned a negative best fit slope.
3. Wells Summary (All) Tab: Shows the number of disposal wells in various visuals.
- The chart at the top left shows the number of operating disposal wells by calendar year.
 - The chart at the top right shows the number of operating wells* by geologic formation.
 - The chart at the bottom left shows the number of operating wells* by permit holder (company).
 - The table in the center right shows the number of operating wells* by fluid type
 - The checklist at the bottom right allows users to filter the page to only show disposal wells of certain fluid types.
4. WATR/NHW Summary Tab: Show disposal volume for produced water and non-hazardous waste disposal wells by date, formation, and company. The button at the bottom left allows users to toggle from showing average annual rates or total annual volume.
5. Map & Well List (WATR/NHW) Tab: The map on the left shows the location of produced water and non-hazardous waste disposal wells that have been active in the past 12 months, with the colour of the bubble representing the formation and the size representing the disposal volume over the past 12 months. The table to the right lists all produced water and non-hazardous waste disposal wells that have been active in the past 12 months, showing their formation, annual volume, 12 month average rate, and 12 month max rate.
6. Dashboard (AGD) Tab: The user selects a acid gas disposal well using its permit number (WA#) and completion event using a drop-down menu and then the following items are displayed:
- Four plots

- Monthly disposal volume, injection pressure, maximum approved injection pressure, and reservoir pressure vs date
 - Cumulative disposal volume, reservoir pressure, and ultimate storage pressure vs date
 - Reservoir pressure vs cumulative disposal volume, plus a linear forecast of disposal capacity and lines representing the initial and ultimate reservoir pressures
 - Injectivity and temperature vs cumulative injected volume
 - Well name, WA #, completion event, and current status
 - A table summarizing the well's injection operational info, approval info, estimated capacity, and more
 - Values denoted with an asterisk (*) are estimated/forecasted values. When these values are blank, it means that a forecast was impossible due to either there only being a single data point or the linear regression returned a negative best fit slope.
7. Approval Data Tab: A table containing information from each well's Section 75 Special Project Approval Order (eg. Maximum Storage Pressure, MWHIP, etc.).
- Contains a link at the top left to download the data as a csv
8. GWM Req: List all disposal wells and indicates which have groundwater monitoring requirements.
9. Monthly Data: Provides a table of raw monthly disposal volume records which several filtering options.

Users may navigate between the tabs using the arrows at the bottom center of the webpage.

This tool provides the Regulator an overview for disposal well surveillance, compliance, and estimation of the province's "disposal reserves".

Instructions

Selecting a well (Dashboards)

Wells are selected by clicking on the drop-down box titled *WA Number & CE Filter*, and then clicking the checkbox beside the desired well. The user can also type into the search bar at the top of the well list to apply a filter to the list and search for a specific well. Each disposal well is identified by its WA number and completion event. The WA

number is also known as the well permit number (called license number in other jurisdictions). The plots and tables are automatically updated upon selection of a well.

Plots (Dashboards)

The legend for each plot is displayed at the top of each plot. Some plots have zoom sliders (black line with white circles on each side) on their X and/or Y axis to allow the user to zoom into a desired portion of the plot.

Approval Data Export

From tab 3, Approval Data Tab, users may download the approval data by clicking the link at the top left (“Click here to download this data as CSV”). This link brings the user to a page called “BC-ER External Reports”. To download the approval information, click on the Actions button, then click the Download option from the list, select the desired file format from the pop-up window and click the download button (see figure 1).

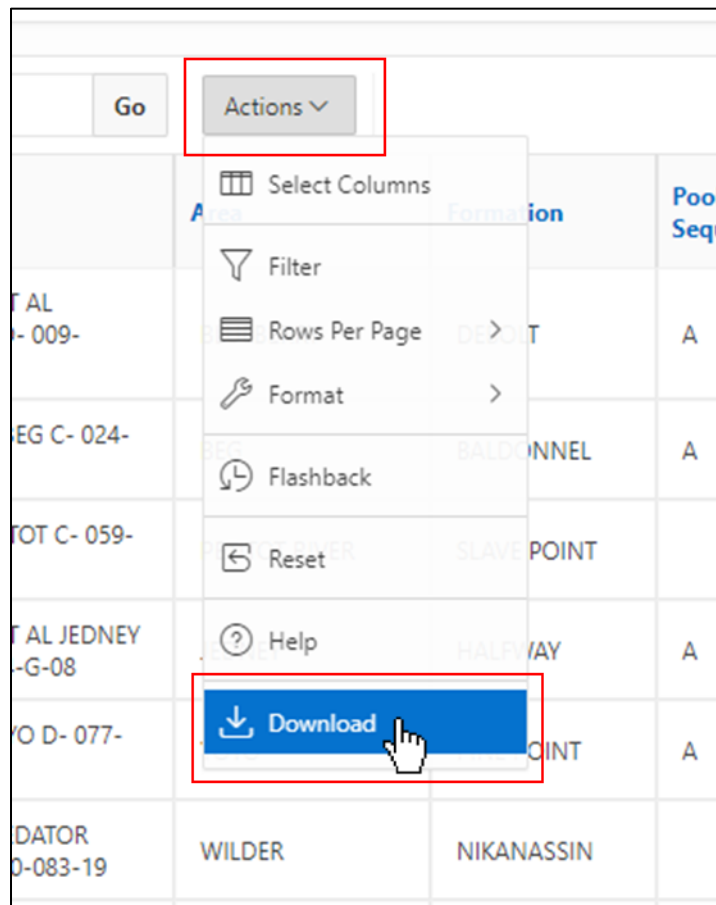


Figure 1: Approval Data Export

Forecast Assumptions

- Wells will inject at a flat rate equal to the average rate of their last year on injection
 - In reality, injection rate is dependent on several variables (disposal needs in the area, injectivity, etc.) and will change over time
- Forecasted disposal rate has a lower bound of 150 m³/month (or 150 e³m³/d for acid gas)
 - This is somewhat arbitrary. It was done to stop wells with very low injection rates from going on forever.
- Cumulative Disposal Volume and change in reservoir pressure are linearly related
 - In theory, should be correct for semi-infinite aquifer with incompressible fluids, but in reality, many factors make the relationship stray from linearity, such as
 - Compressible gas, water, oil, formation
 - Multi-laminated reservoirs, etc.
- Only one isolated disposal reservoir per disposal well
 - Sometimes proximal production/injection in the same formation can impact the reservoir pressure at a disposal well
- Reservoir pressure tests are assumed to be true stable reservoir pressures
 - In reality, some tests are not stable or may have other reliability issues. Additionally, the method used to “pick” the reservoir pressure may not be consistent from one test to the next.
- Wells will continue injection until they reach their capacity
 - If no further disposal needs in area, operator will cease injection prior to reaching capacity
 - Scale, water compatibility issues, and other operational issues can end a disposal well’s operational life early

If you have any questions regarding this tool, please contact:

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Glossary

Term/Acronym/Abbreviation	Description
CE / Comple Ev	Completion Event
Cum	Cumulative
Depl	Depleted
Disp	Disposal
Inj	Injection/Injected
Injectivity	[Injection Rate] / [Wellhead Injection Pressure] – an approximate measure of how easy/difficult it is to inject fluid into a formation
Mo	Month
MWHIP	Maximum wellhead injection pressure
Pres	Pressure
Res	Reservoir
Vol	Volume