Wastewater Assessment User Manual

Created By: Oak Ridge National Laboratory

Last Updated: 3/7/2022

Table of Contents

Module Navigation

Use the top banner to navigate around the module. A footer bar with “Next” and “Back” button can also be used to move through the System Setup to the Report.

Main Tabs

System Setup – Establish your baseline by entering the existing data for your wastewater system.

Assessment – Modify system scenarios to find potential savings opportunities.

Analysis – Analyze system conditions over varying SRT days.

Diagram – Graphical visualization of a waste water treatment system.

Report – Full printable breakdown of the system and potential saving scenarios.

Calculators – Stand alone calculators for wastewater properties.

*Some of the tabs will be disabled until the System Setup is completed.

Additional Buttons

Book – The book will open a new window with the Wastewater User Manual you are reading.

Gear – The gear wheel will navigate you to MEASUR’s global settings page.

Folder – The folder will navigate you to the assessment dashboard folder this assessment is in.

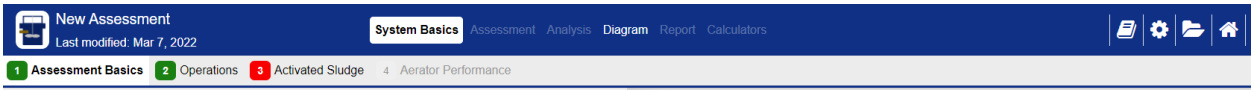
Home – The house will bring you to MEASUR’s home page.

System Setup

The system setup is where you enter the baseline data for your wastewater treatment system. The system setup is broken up into four tabs, each with a related set of input fields to be filled out. Field by field help text is provided for each input field, it will appear in the help panel when an input field is clicked on.

Navigation

Use the second bar to navigate to different sections of the Setup. The tabs will be color coded to indicate the state of the corresponding tab data. Tabs will be disabled in the previous steps have errors in their data.



Assessment Settings – Select the units for the assessment.

Operations – Data entry relating to cost and operation.

Activated Sludge – Data entry relating to field data.

Aerator Performance – Data entry relating to aerator specifications.

Tab colors:

Green - Valid data entered for tab.

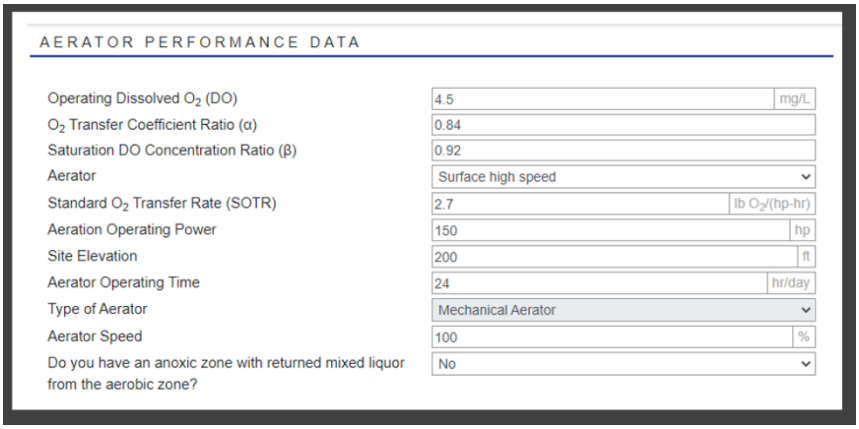
Red – Invalid or missing data entered for tab.

Yellow – Data entered outside of expected range.

Gray – Disabled tab, previous tabs are incomplete.

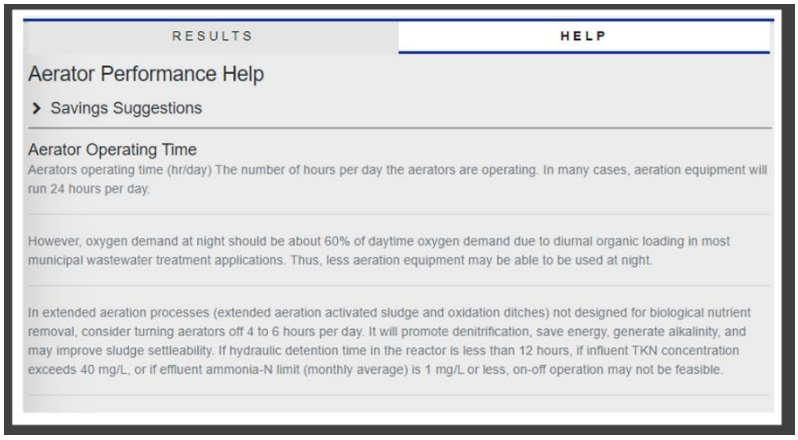
Data Entry

The screenshots below show how to enter data for the System Setup. Input fields will highlight red and an error message will appear if the data that is entered is invalid.

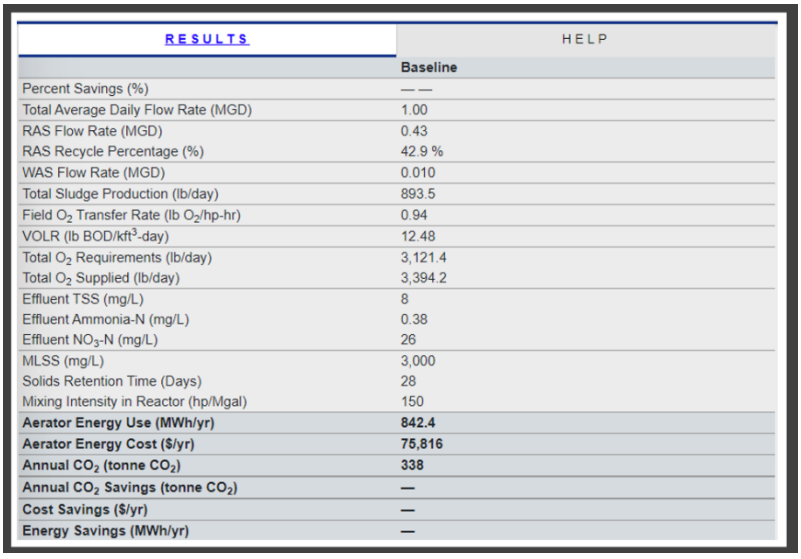


Use the left panels in the System Setup to enter the data for your existing wastewater system.

The right sides of the panel contains help text. The panel will show help relating to the field you are currently focused on.



In the “Aerator Performance” screen, once your system setup is completed, the “Results” tab will give you the calculated results for your Baseline.



	Baseline
Percent Savings (%)	— —
Total Average Daily Flow Rate (MGD)	1.00
RAS Flow Rate (MGD)	0.43
RAS Recycle Percentage (%)	42.9 %
WAS Flow Rate (MGD)	0.010
Total Sludge Production (lb/day)	893.5
Field O_2 Transfer Rate (lb O_2/hp-hr)	0.94
VOLR (lb BOD/kft^3-day)	12.48
Total O_2 Requirements (lb/day)	3,121.4
Total O_2 Supplied (lb/day)	3,394.2
Effluent TSS (mg/L)	8
Effluent Ammonia-N (mg/L)	0.38
Effluent NO_3-N (mg/L)	26
MLSS (mg/L)	3,000
Solids Retention Time (Days)	28
Mixing Intensity in Reactor (hp/Mgal)	150
Aerator Energy Use (MWh/yr)	**842.4**
Aerator Energy Cost ($/yr)	**75,816**
Annual CO_2 (tonne CO_2)	**338**
Annual CO_2 Savings (tonne CO_2)	**—**
Cost Savings ($/yr)	**—**
Energy Savings (MWh/yr)	**—**

Assessment

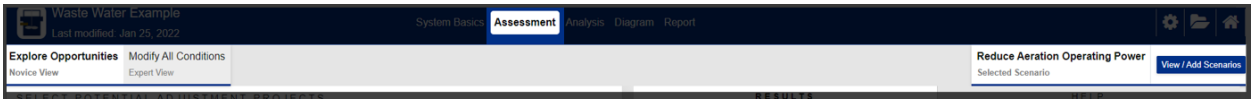
The assessment section of the module allows you to explore how modification scenarios for your system may provide cost, energy and emissions savings. Your baseline must be setup completely prior to making modifications.

There are two ways to conduct assessments which will be explained in further detail later in this section.

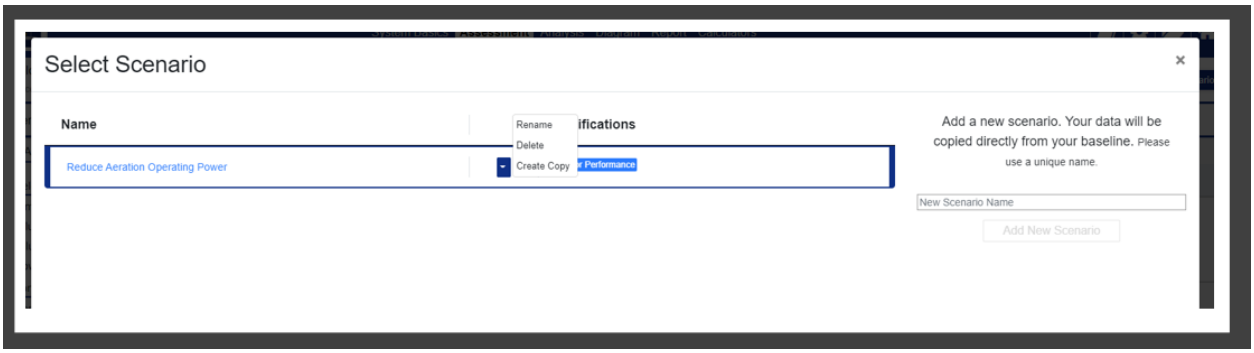
- Explore Opportunities (Novice View)
- Modify All Conditions (Expert View)

Navigation

As with the System Setup, there is a secondary set of tabs to navigate between the two assessment options.



Multiple scenarios can be created, the current “Selected Scenario” will be displayed on the right hand side of this bar. The “View / Add Scenarios” button opens up a modal used to manage your scenarios:

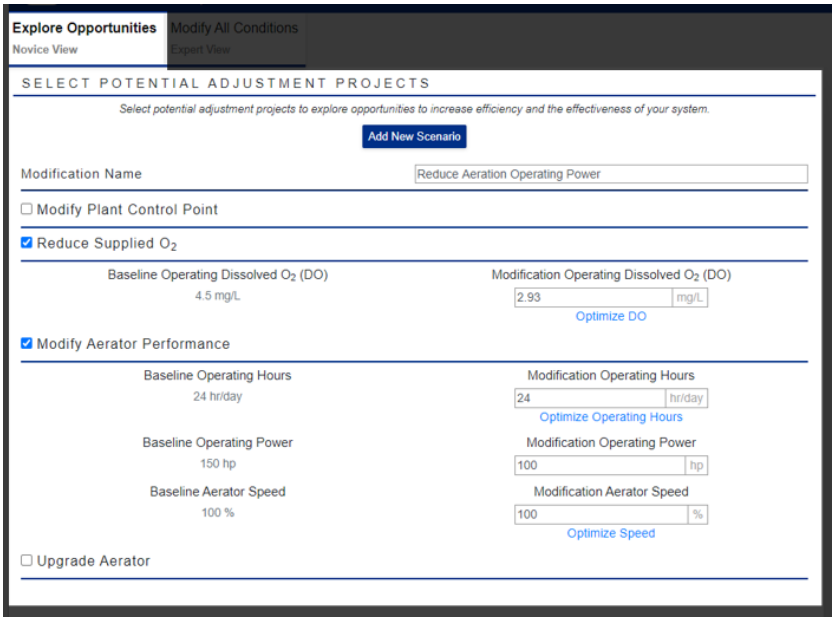


The modal can be used to:

- Create new scenarios
- Create copies of existing scenarios
- Delete or rename scenarios
- Selecting scenarios for viewing and modifying

Explore Opportunities (Novice View)

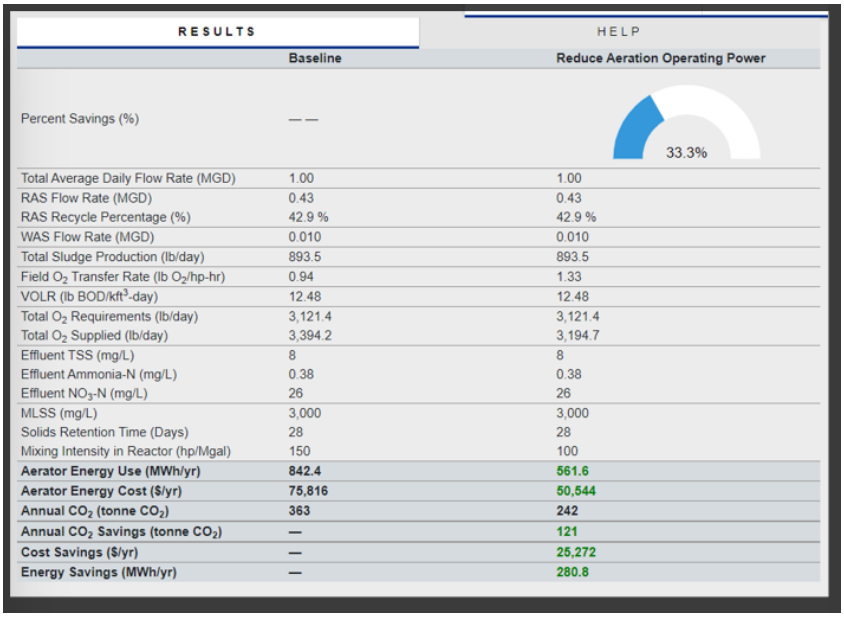
In “Explore Opportunities” there are fewer data entry fields to find savings opportunities. The page is split into two sections. The left hand side has a checklist of likely modifications to improve your system. The right hand side provides results, a sankey diagram and field by field help text.



Each checklist item will provide input fields to modify the scenario. The data for your baseline is also displayed on the left.

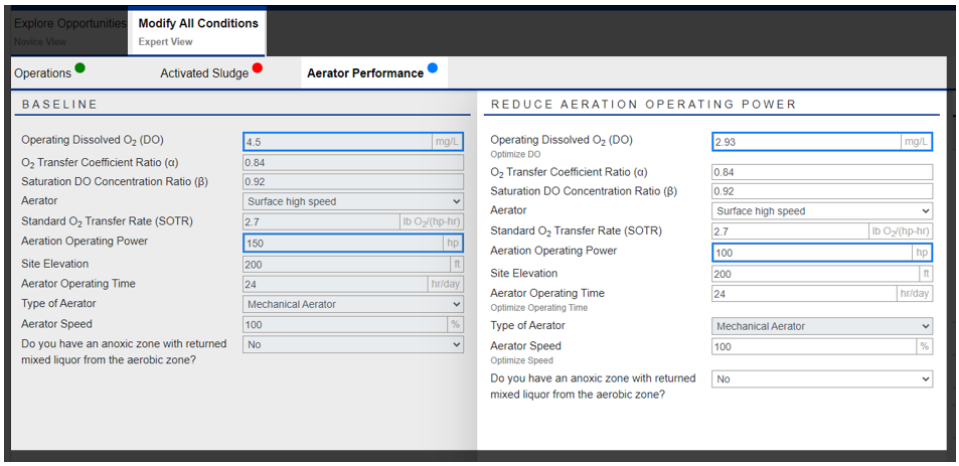
The “Results” tab will show the calculated results and savings of the modified scenario.

Field by field help text will display in the “Help” panel as input fields are clicked on.



Modify All Conditions (Expert View)

The “Modify All Conditions” tab allows you to adjust all aspects of the wastewater system that was entered in the System Setup, allowing more control of the changes you make to your baseline.



The left input panel will show the input data for the baseline setup. The right input side will show the input data for the selected scenario you are adjusting.

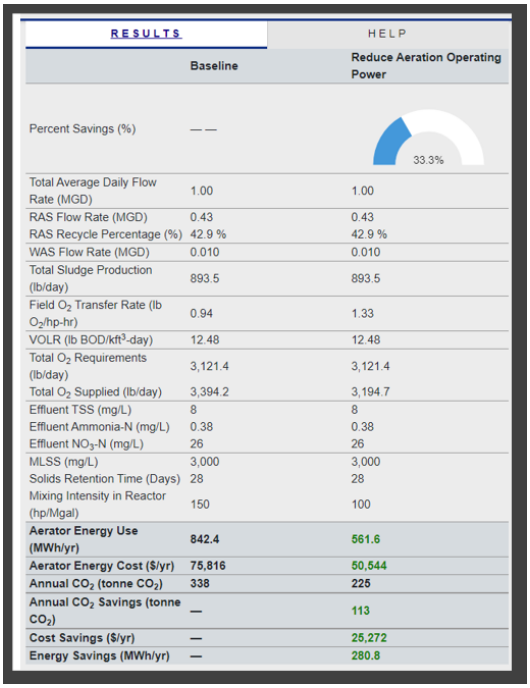
The tabs correspond to the tabs from the System Setup, with the color coded dots corresponding to the changes that have been made to that category of the wastewater system.

- Green = Everything is the same as the baseline
- Blue = Something has been changed from the baseline
- Red = There is invalid data somewhere in the baseline or modification scenario
- Orange = A data field has a valid value but is outside of an expected calculated range

The furthest right hand side will have a panel with a set of tabs.

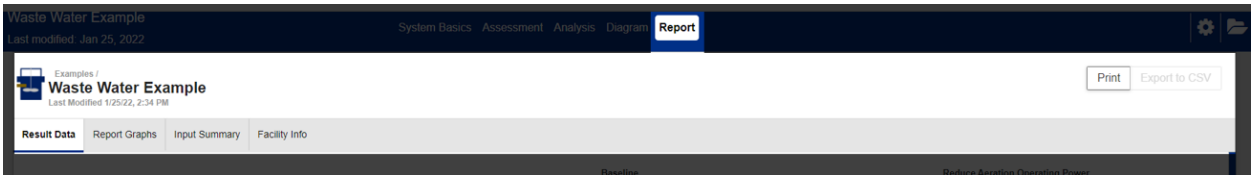
“Results” shows the live results of the baseline and selected scenarios with savings results calculated.

“Help” again provides field by field help text for each input field.



Report

The report is a printable summary of the baseline and scenarios you have created in the assessment. Tables and graphs are provided to analyze the impacts the changes have on each scenario comparitively. There is a secondary set of tabs to navigate to different pieces of the report. The “Print” button in the top right hand corner will generate a PDF report.



- Result Data: Provides a table of calculated results and summary of the selected energy projects in each scenario.
- Report Graphs: A set of graphical representations of the energy in the system.
- Input Summary: A table of the input data for the baseline and each scenario.
- Facility Info: The facility information provided for the folder that this assessment was created in.