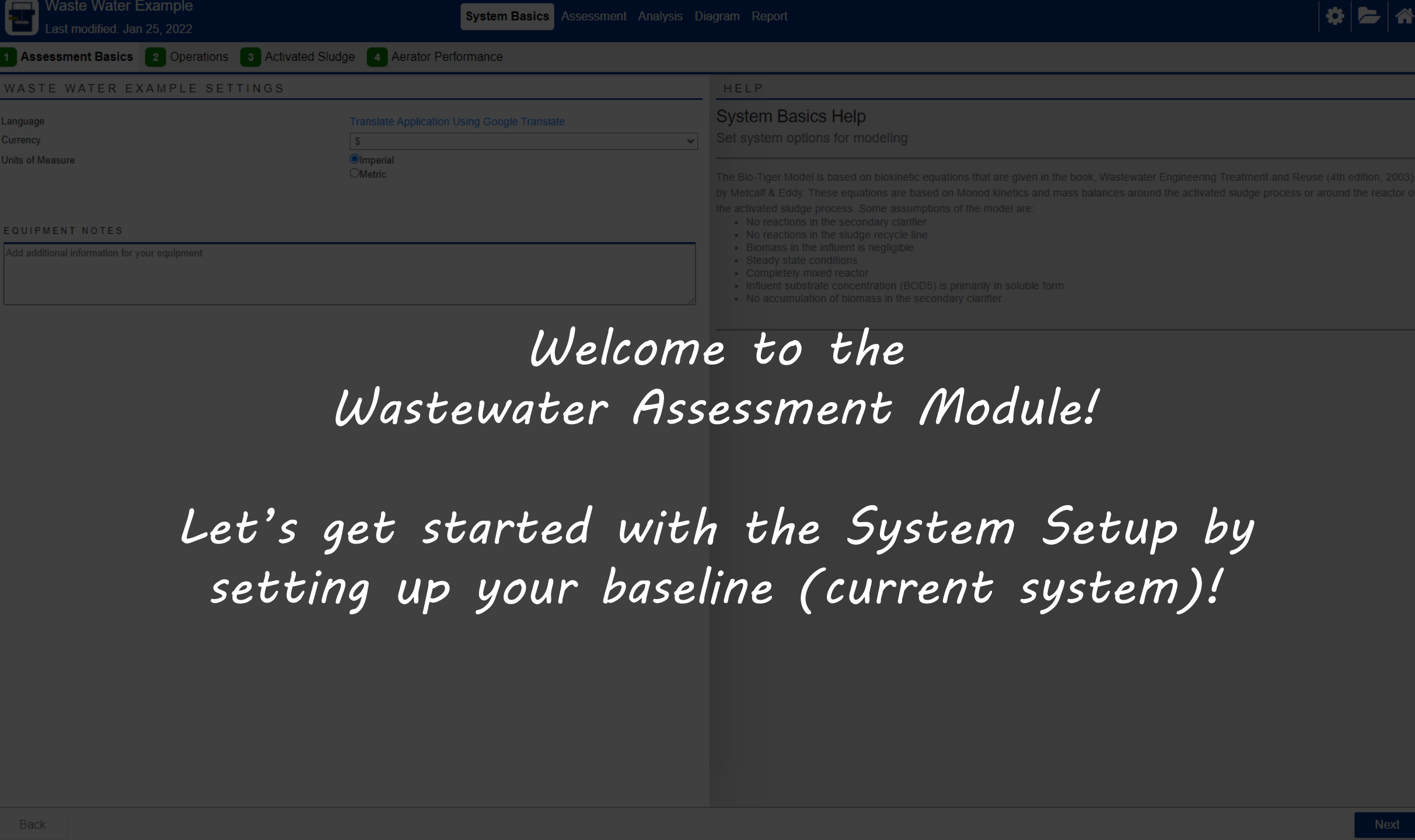


Wastewater

- Setup



*Welcome to the
Wastewater Assessment Module!*

*Let's get started with the System Setup by
setting up your baseline (current system)!*



WASTE WATER EXAMPLE SETTINGS

Language

Translate Application Using Google Translate

Currency

\$

Units of Measure

Imperial

EQUIPMENT NOTES

Add additional information about your equipment

HELP

System Basics Help

Set system options for modeling

The Bio-Tiger model is based on biokinetic equations that are given in the book, Wastewater Engineering Treatment and Reuse (4th edition, 2003) by Metcalf & Eddy. These equations are based on Monod kinetics and mass balances around the activated sludge process or around the reactor.

- No reactions in the secondary clarifier
- No reactions in the sludge recycle line
- Biomass in the clarifier is negligible
- Steady state conditions
- Completely mixed reactor
- Influent substrate concentration (S₀) is primarily in soluble form
- No accumulation of biomass in the secondary clarifier

Use the top bar to navigate to different sections of the Assessment or return to the Home page, Settings, or the assessment's Folder

Some sections are locked until you complete your System Setup.

System Setup - Establish your baseline Scenario
Assessment - Establish your modified Scenarios
Diagram, Report, Sankey - Reports and Visuals
Calculators - Pump and Motor stand alone calculators



1 Assessment Basics 2 Operations 3 Activated Sludge 4 Aerator Performance

OPERATIONS

Max. Solids Retention Time (SRT)	100	days
Operating Months	12	months
Electricity Cost	0.09	\$/kWh
Zip code	37830	
eGRID Region		
Total Energy Input (kWh)	178	kg CO ₂ /MWh

Use the second bar to navigate to different sections of the Setup.

Some of these are locked until you complete the previous section.

System Setup

Assessment Settings - Setup units for the assessment

Operations - Data Entry relating to cost & operation

Activated Sludge - Data Entry relating to field data

Aerator Performance - Data Entry relating to aerator specs

HELP

Operations Help

Enter measured data to calculate your system's annual savings potential.



AERATOR PERFORMANCE DATA

Operating Dissolved O ₂ (DO)	4.5	mg/L
O ₂ Transfer Coefficient Ratio (α)	0.84	
Saturation DO Concentration Ratio (β)	0.92	
Aerator	Surface high speed	▼
Standard O ₂ Transfer Rate (SOTR)	2.7	lb O ₂ /(hp-hr)
Aeration Operating Power	150	hp
Site Elevation	200	ft
Aerator Operating Time	24	hr/day
Type of Aerator	Mechanical Aerator	▼
Aerator Speed	100	%
Do you have an anoxic zone with returned mixed liquor from the aerobic zone?	No	▼

RESULTS

HELP

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)	363
Annual CO ₂ Savings (tonne CO ₂)	—
Cost Savings (\$/yr)	—
Energy Savings (MWh/yr)	—

AERATOR PERFORMANCE DATA

Operating Dissolved O₂ (DO)

4.5

mg/L

O₂ Transfer Coefficient Ratio (α)

0.84

Saturation DO Concentration Ratio (β)

0.92

Aerator

Surface high speed

▼

Standard O₂ Transfer Rate (SOTR)

2.7

lb O₂/(hp-hr)

Aeration Operating Power

150

hp

Site Elevation

200

ft

Aerator Operating Time

24

hr/day

Type of Aerator

Mechanical Aerator

▼

Aerator Speed

100

%

Do you have an anoxic zone with returned mixed liquor from the aerobic zone?

No

▼

The left side is where you enter your data

RESULTS	HELP
	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
WAS 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
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Solids Retention Time (Days)	28
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Aerator Energy Use (MWh/yr)	842.4
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Annual CO ₂ (tonne CO ₂)	363
Annual CO ₂ Savings (tonne CO ₂)	—
Cost Savings (\$/yr)	—
Cost Savings (MWh/yr)	—

1 Assessment Basics2 Operations3 Activated Sludge4 Aerator Performance

AERATOR PERFORMANCE DATA

Operating Dissolved O ₂ (DO)	4.5	mg/L
O ₂ Transfer Coefficient Ratio (α)	0.84	
Saturation DO Concentration Ratio (β)	0.92	
Aerator	Surface high speed	
Standard O ₂ Transfer Rate (SOTR)	2.7	lb O ₂ /(hp-hr)
Aeration Operating Power	150	hp
Site Elevation	200	ft
Aerator Operating Time	24	hr/day
Type of Aerator	Mechanical Aerator	▼
Aerator Speed	100	%
Do you have an anoxic zone with returned mixed liquor from the aerobic zone?	No	▼

RESULTSHELP

Aerator Performance Help

> Savings Suggestions

Aerator

Standard oxygen transfer rate (SOTR) is the oxygen transfer rate in tap water at 20 °C, zero DO concentration, and sea level (one atmosphere of pressure). Aeration equipment manufacturers test their equipment at standard conditions to determine the SOTR. The design engineer must adjust the SOTR for field conditions.

Standard oxygen transfer rate in tap water at 20°C, zero DO, & sea level lb O₂/(hp-hr)

	lb O ₂ /(hp-hr)
Diffused Air Systems	
Ultra-fine bubble diffusers	3.7
Fine bubble diffusers	3.1
Medium bubble diffusers	2.4
Coarse bubble diffusers	1.9
Mechanical Aerators	
Surface slow speed	3.1
Surface slow speed w/ draft tube	2.8
Surface high speed	2.7
Surface downdraft turbine	2.6
Submerged turbine w/ sparger	2.6
Submerged impeller	2.6
Surface brush and blade	2.7
Surface Orbal disc	2.4
Aspirator	2.1
Hybrid Aerators	
Static tube system	2.3
Jet	2.9

Please note that standard oxygen transfer capacity for diffused aeration systems is typically expressed as a percent transfer efficiency and was converted to lb O₂/(hp-hr) by assuming a compressor efficiency of 75%, tank depth of 15 ft (4.572 m), and diffusers at 1.5 ft (0.4572 m) above tank bottom.

BackNext

On the right side you can find field Help text to give you more direction ...

AERATOR PERFORMANCE DATA

Operating Dissolved O₂ (DO)

4.5

mg/L

O₂ Transfer Coefficient Ratio (α)

0.84

Saturation DO Concentration Ratio (β)

0.92

Aerator

Surface high speed

Standard O₂ Transfer Rate (SOTR)

2.7

lb O₂/(hp-hr)

Aeration Operating Power

150

hp

Site Elevation

200

ft

Aerator Operating Time

24

hr/day

Type of Aerator

Mechanical Aerator

Aerator Speed

100

%

Do you have an anoxic zone with returned mixed liquor from the aerobic zone?

No

RESULTS

HELP

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 O₂ Transfer Rate (lb O₂/hp-hr)

0.94

VOLR (lb BOD/kft³-day)

12.48

Total O₂ Requirements (lb/day)

3,121.4

Total O₂ Supplied (lb/day)

3,394.2

Effluent TSS (mg/L)

8

Effluent Ammonia-N (mg/L)

0.38

Effluent NO₃-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 CO₂ (tonne CO₂)

363

Annual CO₂ Savings (tonne CO₂)

—

Cost Savings (\$/yr)

—

Energy Savings (MWh/yr)

—

... or the Results of the baseline.
Just select the tab you would like to see.

Wastewater

- Assessment

Explore Opportunities

Modify All Conditions

Novice View

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Reduce Aeration Operating Power

☐ Modify Plant Control Point

☒ Reduce Supplied O₂

Baseline Operating Dissolved O₂ (DO)

4.5 mg/L

Modification Operating Dissolved O₂ (DO)

2.93

mg/L

Optimize DO

☒ Modify Aerator Performance

Baseline Operating Hours

24 hr/day

Modification Operating Hours

24

hr/day

Optimize Operating Hours

Baseline Operating Power

150 hp

Modification Operating Power

100

hp

Baseline Aerator Speed

100 %

Modification Aerator Speed

100

%

Optimize Speed

☐ Upgrade Aerator

RESULTS

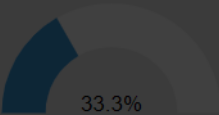
HELP

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

— —



Total Average Daily Flow Rate (MGD)	1.00	1.00
RAS Flow Rate (MGD)	0.43	0.43
RAS Recycle Percentage (%)	42.9 %	42.9 %
WAS Flow Rate (MGD)	0.010	0.010
Total Sludge Production (lb/day)	893.5	893.5
Field O ₂ Transfer Rate (lb O ₂ /hp-hr)	0.94	1.33
VOLR (lb BOD/kft ³ -day)	12.48	12.48
Total O ₂ Requirements (lb/day)	3,121.4	3,121.4
Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Effluent TSS (mg/L)	8	8
Effluent Ammonia-N (mg/L)	0.38	0.38
Effluent NO ₃ -N (mg/L)	26	26
MLSS (mg/L)	3,000	3,000
Solids Retention Time (Days)	28	28
Mixing Intensity in Reactor (hp/Mgal)	150	100
Aerator Energy Use (MWh/yr)	842.4	561.6
Aerator Energy Cost (\$/yr)	75,816	50,544
Annual CO ₂ (tonne CO ₂)	363	242
Annual CO ₂ Savings (tonne CO ₂)	—	121
Cost Savings (\$/yr)	—	25,272
Energy Savings (MWh/yr)	—	280.8

Waste Water Example

Last modified: Jan 25, 2022

System Basics

Assessment

Analysis

Diagram

Report

Explore Opportunities

Novice View

Modify All Conditions

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Reduce Aeration Operating Power

☐ Modify Plant Control Point

☒ Reduce Supplied O₂

Baseline Operating Dissolved O₂ (DO)

4.5 mg/L

Modification Operating Dissolved O₂ (DO)

2.93

mg/L

Optimize DO

☒ Modify Aerator Performance

Baseline Operating Hours

24 hr/day

Modification Operating Hours

24

hr/day

Optimize Operating Hours

Baseline Operating Power

150 hp

Modification Operating Power

100

hp

Optimize Power

Baseline Aerator Speed

100 %

Modification Aerator Speed

100

%

Optimize Speed

☐ Upgrade Aerator

RESULTS

HELP

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

— —

33.3%

Total Average Daily Flow Rate (MGD)	1.00	1.00
Flow Rate (MGD)	0.43	0.43
Flow Rate Increase (%)	—	42.9 %
WAS Flow Rate (MGD)	0.010	0.010
Total Sludge Production (lb/day)	893.5	893.5
Sludge Production Rate (lb/day)	1.33	1.33
VOLR (lb BOD/ft ³ -day)	12.48	12.48
Total O ₂ Requirements (lb/day)	3,121.4	3,121.4
Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Effluent Ammonia-N (mg/L)	8	8
Effluent NO ₃ -N (mg/L)	0.38	0.38
MLSS (mg/L)	26	26
Solids Retention Time (Days)	3,000	3,000
Mixing Intensity in Reactor (hp/Mgal)	28	28
Aerator Energy Use (MWh/yr)	150	100
Aerator Energy Cost (\$/yr)	842.4	561.6
Annual CO ₂ (tonne CO ₂)	75,816	50,544
Annual CO ₂ Savings (tonne CO ₂)	363	242
Cost Savings (\$/yr)	—	121
Energy Savings (MWh/yr)	—	25,272
	—	280.8

This is the Assessment, where you modify your setup to find savings opportunities!

Waste Water Example
Last modified: Jan 25, 2022

System BasicsAssessmentAnalysisDiagramReport

Explore Opportunities
Novice View

Modify All Conditions
Expert View

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Reduce Aeration Operating Power

☐ Modify Plant Control Point

☒ Reduce Supplied O₂

Baseline Operating Dissolved O₂ (DO)

4.5 mg/L

Modification Operating Dissolved O₂ (DO)

2.93

mg

Optimize DO

☒ Modify Aerator Performance

Baseline Operating Hours

24 hr/day

Modification Operating Hours

24

hr/day

Optimize Operating Hours

Baseline Operating Power

150 hp

Modification Operating Power

100

hp

Optimize Operating Power

Baseline Aerator Speed

100 %

Modification Aerator Speed

100

%

Optimize Aerator Speed

☐ Upgrade Aerator

RESULTS

Baseline

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

HELP

Percent Savings (%)

33.3%

Total Average Daily Flow Rate (MGD)	1.00	1.00
Recycle Flow Rate (MGD)	0.43	0.43
RAS Recycle Percentage (%)	42.9 %	42.9 %
WAS Flow Rate (MGD)	0.010	0.010
Total Sludge Production (lb/day)	893.5	893.5
Field O ₂ Transfer Rate (lb O ₂ /hp-hr)	0.94	1.33
VOLR (lb BOD/kft ³ -day)	12.48	12.48
Total O ₂ Requirements (lb/day)	3,121.4	3,121.4
Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Effluent TSS (mg/L)	8	8
Effluent Ammonia-N (mg/L)	0.38	0.38
Effluent NO ₃ -N (mg/L)	26	26
MLSS (mg/L)	3,000	3,000
Solids Retention Time (Days)	28	28
Mixing Intensity in Reactor (hp/Mgal)	150	100
Electricity Demand (kWh/day)	2,250	1,500
Electricity Demand (\$/yr)	\$1,016	\$694
Annual CO ₂ (tonne CO ₂)	363	242
Annual CO ₂ Savings (tonne CO ₂)	—	121
Annual Energy Savings (\$/yr)	—	\$5,272
Energy Savings (MWh/yr)	—	233.8

Assessment

Add Scenarios to explore energy savings via Explore Opportunities (Novice view) or Modify All Conditions (Expert View).

Waste Water Example

Last modified: Jan 25, 2022

System Basics

Assessment

Analysis

Diagram

Report

Explore Opportunities

Novice View

Modify All Conditions

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Reduce Aeration Operating Power

☐ Modify Plant Control Point

☒ Reduce Supplied O₂

Baseline Operating Dissolved O₂ (DO)

4.5 mg/L

Modification Operating Dissolved O₂ (DO)

2.93

mg/L

Optimize DO

☒ Modify Aerator Performance

Baseline Operating Hours

24 hr/day

Modification Operating Hours

24

hr/day

Optimize Operating Hours

Baseline Operating Power

150 hp

Modification Operating Power

100

hp

Baseline Aerator Speed

100 %

Modification Aerator Speed

100

%

Optimize Speed

☐ Upgrade Aerator

RESULTS

HELP

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

— —

33.3%

Total Average Daily Flow Rate (MGD)	1.00	1.00
RAS Flow Rate (MGD)	0.43	0.43
RAS Recycle Percentage (%)	42.9 %	42.9 %
WAS Flow Rate (MGD)	0.010	0.010
Total Sludge Production (lb/day)	893.5	893.5
Field O ₂ Transfer Rate (lb O ₂ /hp-hr)	0.94	1.33
VOLR (lb BOD/kft ³ -day)	12.48	12.48
Total O ₂ Requirements (lb/day)	3,121.4	3,121.4
Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Effluent TSS (mg/L)	8	8
Effluent Ammonia-N (mg/L)	0.38	0.38
Effluent NO ₃ -N (mg/L)	26	26
MLSS (mg/L)	3,000	3,000
Solids Retention Time (Days)	28	28
Mixing Intensity in Reactor (hp/Mgal)	150	100
Aerator Energy Use (MWh/yr)	842.4	561.6
Aerator Energy Cost (\$/yr)	75,816	50,544
Annual CO ₂ (tonne CO ₂)	363	242
Annual CO ₂ Savings (tonne CO ₂)	—	121
Cost Savings (\$/yr)	—	25,272
Energy Savings (MWh/yr)	—	280.8

In Explore Opportunities, there are fewer data entry fields, to highlight what you are likely to try to improve.

Waste Water Example

Last modified: Jan 25, 2022

System Basics

Assessment

Analysis

Diagram

Report

Explore Opportunities

Novice View

Modify All Conditions

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Reduce Aeration Operating Power

☐ Modify Plant Control Point

☒ Reduce Supplied O₂

Baseline Operating Dissolved O₂ (DO)

4.5 mg/L

Modification Operating Dissolved O₂ (DO)

mg/L

Optimize DO

☒ Modify Aerator Performance

Baseline Operating Hours

24 hr/day

Modification Operating Hours

24

hr/day

Optimize Operating Hours

Baseline Operating Power

150 hp

Modification Operating Power

100

hp

Baseline Aerator Speed

100 %

Modification Aerator Speed

100

%

Optimize Speed

☐ Upgrade Aerator

RESULTS

HELP

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

-- --

33.3%

Total Average Daily Flow Rate (MGD)	1.00	1.00
RAS Flow Rate (MGD)	0.43	0.43
RAS Recycle Percentage (%)	42.9 %	42.9 %
WAS Flow Rate (MGD)	0.010	0.010
Total Sludge Production (lb/day)	893.5	893.5
Field O ₂ Transfer Rate (lb O ₂ /hp-hr)	0.94	1.33
VOLR (lb BOD/kt ³ -day)	12.48	12.48
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Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Effluent TSS (mg/L)	8	8
Effluent Ammonia-N (mg/L)	0.38	0.38
Effluent NO ₃ -N (mg/L)	26	26
MLSS (mg/L)	3,000	3,000
Solids Retention Time (Days)	28	28
Mixing Intensity in Reactor (hp/Mgal)	150	100
Aerator Energy Use (MWh/yr)	842.4	561.6
Aerator Energy Cost (\$/yr)	75,816	50,544
Annual CO ₂ (tonne CO ₂)	363	242
Annual CO ₂ Savings (tonne CO ₂)	--	121
Cost Savings (\$/yr)	--	25,272
Energy Savings (MWh/yr)	--	280.8

On the right can view Results, or Field Help Text

In Explore Opportunities, there are fewer data entry fields, to highlight what you are likely to try to improve.



BASELINE

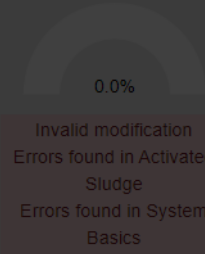
Operating Dissolved O ₂ (DO)	<input type="text" value="4.5"/>	mg/L
O ₂ Transfer Coefficient Ratio (α)	<input type="text" value="0.84"/>	
Saturation DO Concentration Ratio (β)	<input type="text" value="0.92"/>	
Aerator	<input type="text" value="Surface high speed"/>	
Standard O ₂ Transfer Rate (SOTR)	<input type="text" value="2.7"/>	lb O ₂ /(hp-hr)
Aeration Operating Power	<input type="text" value="150"/>	hp
Site Elevation	<input type="text" value="200"/>	ft
Aerator Operating Time	<input type="text" value="24"/>	hr/day
Type of Aerator	<input type="text" value="Mechanical Aerator"/>	
Aerator Speed	<input type="text" value="100"/>	%
Do you have an anoxic zone with returned mixed liquor from the aerobic zone?	<input type="text" value="No"/>	

REDUCE AERATION OPERATING POWER

Operating Dissolved O ₂ (DO)	<input type="text" value="2.93"/>	mg/L
Optimize DO		
O ₂ Transfer Coefficient Ratio (α)	<input type="text" value="0.84"/>	
Saturation DO Concentration Ratio (β)	<input type="text" value="0.92"/>	
Aerator	<input type="text" value="Surface high speed"/>	
Standard O ₂ Transfer Rate (SOTR)	<input type="text" value="2.7"/>	lb O ₂ /(hp-hr)
Aeration Operating Power	<input type="text" value="100"/>	hp
Site Elevation	<input type="text" value="200"/>	ft
Aerator Operating Time	<input type="text" value="24"/>	hr/day
Optimize Operating Time		
Type of Aerator	<input type="text" value="Mechanical Aerator"/>	
Aerator Speed	<input type="text" value="100"/>	%
Optimize Speed		
Do you have an anoxic zone with returned mixed liquor from the aerobic zone?	<input type="text" value="No"/>	

RESULTS

	Baseline	Reduce Aeration Operating Power
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)	363	
Annual CO ₂ Savings (tonne CO ₂)	—	
Cost Savings (\$/yr)	—	0
Energy Savings (MWh/yr)	—	0



Waste Water Example

Last modified: Jan 25, 2022

System Basics

Assessment

Analysis

Diagram

Report

Explore Opportunities

Novice View

Modify All Conditions

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

Operations

Activated Sludge

Aerator Performance

BASELINE

Operating Dissolved O₂ (DO)

4.5

mg/L

O₂ Transfer Coefficient Ratio (α)

0.84

Saturation DO Concentration Ratio (β)

0.92

Aerator

Surface high speed

Standard O₂ Transfer Rate (SOTR)

2.7

lb O₂/(hp-hr)

Aeration Operating Power

150

hp

Site Elevation

200

ft

Aerator Operating Time

24

hr/day

Type of Aerator

Mechanical Aerator

Aerator Speed

100

%

Do you have an anoxic zone with returned mixed liquor from the aerobic zone?

No

REDUCE AERATION OPERATING POWER

Operating Dissolved O₂ (DO)

2.93

mg/L

Optimize DO

O₂ Transfer Coefficient Ratio (α)

0.84

Saturation DO Concentration Ratio (β)

0.92

Aerator

Surface high speed

Standard O₂ Transfer Rate (SOTR)

2.7

lb O₂/(hp-hr)

Aeration Operating Power

100

hp

Site Elevation

200

ft

Aerator Operating Time

24

hr/day

Optimize Operating Time

Type of Aerator

Mechanical Aerator

Aerator Speed

100

%

Optimize Speed

Do you have an anoxic zone with returned mixed liquor from the aerobic zone?

No

RESULTS

HELP

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

0.0%

Total Average Daily Flow Rate (MGD)

1.01

Raw Sewer Flow Rate (MGD)

0.01

RAS Recycle Percentage (%)

42.9 %

WAS Flow Rate (MGD)

0.010

Total Sludge Production (lb/day)

893.5

Field O₂ Transfer Rate (lb O₂/hp-hr)

0.94

VOLR (lb BOD/kft³-day)

12.48

Total O₂ Requirements (lb/day)

3,121.4

O₂ Supplied (lb/day)

3,394.2

Effluent TSS (mg/L)

8

Effluent Ammonia-N (mg/L)

0.38

Effluent NO₃-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 CO₂ (tonne CO₂)

363

Annual CO₂ Savings (tonne CO₂)

—

Cost Savings (\$/yr)

0

Energy Savings (MWh/yr)

0

Invalid modification

Errors found in Activated Sludge

Errors found in System Basics

On the far right can view Results, Field Help Text, Or take Notes on your modifications

Modify All Conditions copies over all your data, to allow you more control over what you adjust.

Waste Water Example

Last modified: Jan 25, 2022

System Basics

Assessment

Analysis

Diagram

Report

Explore Opportunities

Novice View

Modify All Conditions

Expert View

Reduce Aeration Operating Power

Selected Scenario

View / Add Scenario

Operations

Activated Sludge

Aerator Performance

BASELINE

Operating Dissolved O₂ (DO)

O₂ Transfer Coefficient Ratio (α)

Saturation DO Concentration Ratio (β)

Aerator

Standard O₂ Transfer Rate (S₀R)

Aeration Operating Power

Site Elevation

Aerator Operating Time

Type of Aerator

Aerator Speed

Do you have mixed liquor

REDUCE AERATION OPERATING POWER

Operating Dissolved O₂ (DO)

O₂ Transfer Coefficient Ratio (α)

Saturation DO Concentration Ratio (β)

Aerator

Standard O₂ Transfer Rate (S₀R)

Aeration Operating Power

Site Elevation

Aerator Operating Time

Type of Aerator

Aerator Speed

Do you have mixed liquor

RESULTS

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

Total Average Daily Flow Rate (MGD)

RAS Flow Rate (MGD)

RAS Recycle Percentage (%)

WAS Flow Rate (MGD)

Total Sludge Production (lb/day)

Field O₂ Transfer Rate (lb O₂/hp-hr)

VOLR (lb BOD/kft³-day)

Total O₂ Requirements (lb/day)

Total O₂ Supplied (lb/day)

Effluent TSS (mg/L)

Effluent Ammonia-N (mg/L)

Effluent NO₃-N (mg/L)

MLSS (mg/L)

Solids Retention Time (Days)

Mixing Intensity in Reactor (hp/Mgal)

Aerator Energy Use (MWh/yr)

Aerator Energy Cost (\$/yr)

Annual CO₂ (tonne CO₂)

Annual CO₂ Savings (tonne CO₂)

Cost Savings (\$/yr)

Energy Savings (MWh/yr)

HELP

Invalid modification

Errors found in Activated Sludge

Errors found in System Basics

Everything is okay and the same as the Baseline

Everything is okay, something is different from the Baseline

Blank or Invalid Field

Badges help you identify any problems or changes in your assessment

Wastewater

- Report



Examples /

Waste Water Example

Last Modified 1/25/22, 2:34 PM

Print

Export to CSV

Result Data

Report Graphs

Input Summary

Facility Info

Baseline

Reduce Aeration Operating Power

Percent Savings (%)

— —

33.3%

Influent

Total Average Daily Flow Rate (MGD)	1	1
Aeration Volume in Service (Mgal)	1	1
Influent BOD ₅ Concentration (mg/L)	200	200
Influent BOD ₅ Mass Loading (lb/day)	1,668	1,668
SEC WW Oxid N Load (lb/day)	291.9	291.9
SEC WW TSS Load (lb/day)	1,668	1,668

Activated Sludge Process

F/M Ratio (1/day)	0.089	0.089
Solids Retention Time (day)	28	28
MLSS Concentration (mg/L)	2,999.9	2,999.9
MLVSS Concentration (mg/L)	2,241.9	2,241.9
TSS Sludge Production (lb/day)	826.8	826.8
TSS in Activated Sludge Effluent (lb/day)	66.7	66.7
Total O ₂ Requirements (lb/day)	3,121.4	3,121.4
Total O ₂ Required - Denitrification (lb/day)	2,686.9	2,686.9
Total O ₂ Supplied (lb/day)	3,394.2	3,194.7
Mixing Intensity in Reactor (hp/Mgal)	150	100
RAS Flow Rate (MGD)	0.43	0.43
RAS Recycle Percentage (%)	42.9	42.9
WAS Flow Rate (MGD)	0.010	0.010
RAS TSS Concentration (MGD)	10,000	10,000
Total Sludge Production (lb/day)	893.5	893.5
Reactor Detention Time (hr)	24	24
VOLR (lb BOD/kt ³ -day)	12.5	12.5

Effluent

Total Effluent CBOD ₅ (mg/L)	4	4
Effluent TSS (mg/L)	8	8
Effluent Ammonia-N (mg/L)	0.38	0.38
Effluent NO ₃ -N (mg/L)	26	26



Examples /

Waste Water Example

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Baseline

Reduce Aeration Operating Power

Percent Savings (%)

33.3%

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The report allows you to compare
Scenarios side-by-side



Examples /
Waste Water Example
Last Modified 1/25/22, 2:34 PM

Result Data Report Graphs Input Summary Facility Info



Print

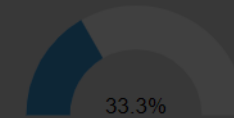
Export to CSV

You can also print it!

Baseline

Reduce Aeration Operating Power

Percent Savings (%)



Influent

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*The report allows you to compare
Scenarios side-by-side*

*It includes
Side-by-side results
Graphs
Side-by-side list of all input data
Any Facility Info added in the folder*