



Single Window Reporting
NPRI and Partners

Plan Summary Preview

Company Details

Company Legal Name:

GreenField Ethanol Inc.

Company Address:

98 Walker Drive, Brampton (Ontario)

Report Details

Facility:

Chatham Plant

Facility Address:

275 Bloomfield Road, Chatham (Ontario)

Update Comments:

Activities

Facility Contacts

Facility Contacts

Please assign the appropriate contact under each category below.

Public Contact:*

Dianne Schenk

Highest Ranking Employee:

Angelo Ligori

Person responsible for preparing the toxic substance reduction plan:

Dianne Schenk

Organization Validation

The information in this section was extracted from the Single Window Information Manager (SWIM) at the time that this report was created. To load up-to-date SWIM information, click "**Refresh from SWIM**".

Changes made here will be reflected in this report only and not in SWIM.

Company and Parent Company Information

Company Details

Company Legal Name:*

GreenField Ethanol Inc.

Company Trade Name:*

Greenfield Ethanol Inc.

Business Number:*

130336852

Mailing Address

Delivery Mode:

PO Box

Rural Route Number

Address Line 1

98 Walker Drive

City*

Brampton

Province/Territory**

Ontario

Postal Code:**

L6T 4H6

Physical Address

Address Line 1

98 Walker Drive

City

Brampton

Province/Territory

Ontario

Postal Code

L6T4H6

Additional Information

Land Survey Description

National Topographical Description

Parent Companies

Empty

Facility Validation

The information in this section was extracted from the Single Window Information Manager (SWIM) at the time that this report was created. To load up-to-date SWIM information, click "**Refresh from SWIM**".

Changes made here will be reflected in this report only and not in SWIM.

Facility Information

Facility:*

Chatham Plant

NAICS Id:*

325190

NPRI Id:*

5739

ON Reg 127/01 Id:

Mailing Address

Delivery Mode:

PO Box

Rural Route Number

Address Line 1

98 - Walker Drive

City*

Brampton

Province/Territory**

Ontario

Postal Code:**

L6T 4H6

Physical Address

Address Line 1

275 - Bloomfield Road

City

Chatham

Province/Territory

Ontario

Postal Code

N7M5J5

Additional Information

Land Survey Description

National Topographical Description

Geographical Address

Latitude

42.38390

Longitude

-82.22180
UTM Zone**
17
UTM Easting**
399423.1935960233
UTM Northing**
4693124.570649816

Contact Validation

The Information in this section was extracted from the Single Window Information Manager (SWIM) at the time that this report was created. To load up-to-date SWIM Information, click "**Refresh from SWIM**".

Changes made here will be reflected in this report only and not in SWIM.

Contacts

Public Contact:

First Name:*
Dianne
Last Name:*
Schenk
Position:*
EH&S Coordinator
Telephone:*
5193687723
Ext:
7928
Fax:
5193687016
Email:*
d.schenk@comalc.com

Mailing Address

Delivery Mode:
Rural Route
PO Box
Rural Route Number
3
Address Line 1
99 - Farrell Drive
City*
Tiverton
Province/Territory**

Ontario

Postal Code: **

N0G 2T0

Highest Ranking Employee:

First Name: *

Angelo

Last Name: *

Ligori

Position: *

Plant Manager - Chatham

Telephone: *

5194361130

Ext:

8123

Fax:

5194361595

Email: *

a.ligori@greenfieldethanol.com

Mailing Address

Delivery Mode:

PO Box

Rural Route Number

Address Line 1

275 - Bloomfield Road

City*

Chatham

Province/Territory**

Ontario

Postal Code:**

N7M5J5

Person responsible for the Toxic Substance Reduction Plan preparation:

First Name: *

Dianne

Last Name: *

Schenk

Position:*

EH&S Coordinator

Telephone:*

5193687723

Ext:

7928

Fax:

5193687016

Email:*

d.schenk@comalco.com

Mailing Address

Delivery Mode:

Rural Route

PO Box

Rural Route Number

3

Address Line 1

99 - Farrell Drive

City*

Tiverton

Province/Territory**

Ontario

Postal Code:**

N0G 2T0

Employees

Employees

Number of Full-time Employees:*

65

Substances

110-54-3, n-Hexane

110-54-3, n-Hexane

Substances Section Data

Statement of Intent:

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?:**

It has been determined that it is not technically and economically feasible at this time to reduce the use of n-Hexane. Even though GFSA, Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

This substance is not created at this facility.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

It has been determined that it is not technically and economically feasible at this time to reduce the use of n-Hexane. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Toxic Substance Use Targets

Reduction target:*

	Quantity	Unit
<input checked="" type="checkbox"/> No target	or	

Timeframe target:*

<input checked="" type="checkbox"/> No target	or	
		years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

	Quantity	Unit
<input checked="" type="checkbox"/> No target	or	

Timeframe target:

No target or years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

As a formulation component

Summarize why this substance is used at the facility:**

Gasoline is used for denaturing fuel grade ethyl alcohol per Canada Revenue Agency (Excise) criteria, for those bulk customers who wish to purchase denatured fuel grade ethyl alcohol. The gasoline contains n-hexane as a component. Bulk gasoline (containing n-hexane as a component) is received at the Chatham plant into the gasoline storage tank. The gasoline (containing n-hexane) is pumped from the gasoline storage tank, into tanker trucks and railcars, together with undenatured ethyl alcohol product, in order to denature the ethyl alcohol in accordance with Canada Revenue Agency (Excise) criteria. The tanker truck or railcar containing the ethyl alcohol which has been denatured with gasoline (containing n-hexane as a component), is then sealed and shipped to the customer.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

This substance is not created at the facility

Summarize why this substance is created at the facility:**

This substance is not created at this facility.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

Yes

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

It has been determined that it is not technically and economically feasible at this time to reduce the use of n-Hexane. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

A fuel stream vapour recovery system is in place to capture vapours that could potentially be released. Gasoline usage as a denaturant in ethyl alcohol is a requirement from the Canada Revenue Agency (Excise).

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

141-78-6, Ethyl acetate

141-78-6, Ethyl acetate

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?*

It is a requirement of Canada Revenue Agency (Excise) to use a specified amount of ethyl acetate to denature ethyl alcohol being shipped to our customers.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

It has been determined that it is not technically and economically feasible at this time to reduce the creation of ethyl acetate. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

It has been determined that it is not technically and economically feasible at this time to reduce the creation of ethyl acetate. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Toxic Substance Use Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

As a formulation component

Summarize why this substance is used at the facility:**

Ethyl acetate is used as a denaturant in ethyl alcohol as specified by Canada Revenue Agency (Excise) and shipped to our customers.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

The Chatham facility produces ethanol, carbon dioxide, and distillers grains products. The above products are produced at the Chatham facility using corn raw material. Corn is first milled, then slurried by mixing with water, then the slurry is cooked in the mashing stage. The slurry is then saccharified, and fermented, to produce ethanol. The fermented beer is then sent through distillation columns to separate the ethanol and solids and water. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. The purified distilled ethanol is then sent to receiver tanks and meters, which determine the quantity of ethanol produced. The recovered ethanol is then pumped to bulk ethanol storage tanks. Ethanol from the bulk ethanol storage tanks is denatured with ethyl acetate in accordance with Canada Revenue Agency (Excise) criteria and pumped into tanker trucks destined for shipments to customers. VOC's are vented from the ethyl acetate storage tank, CO2 scrubber, distillation vent and evaporator vent.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

Yes

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

It has been determined that it is not technically and economically feasible at this time to reduce the creation of ethyl acetate. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site

reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for Implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX).*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX).*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

64-17-5, Ethyl Alcohol

64-17-5, Ethyl Alcohol

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?***

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

GFSA, Chatham Facility does not intend to reduce its creation of ethyl alcohol as it is our main product.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

While GFSA, Chatham Facility does not intend to reduce the creation of ethyl alcohol, any opportunities for improved efficiencies and optimization will be reviewed and considered.

Toxic Substance Use Targets

Reduction target:*



No target

or

Quantity

Unit

Timeframe target:*



No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*



No target

or

Quantity

Unit

Timeframe target:



No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

This substance is created at the facility, not used.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

Other

Summarize why this substance is created at the facility:**

This substance is created as our main product.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

Yes

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

While GFSMA, Chatham Facility does not intend to reduce the creation of ethyl alcohol as it our main product, any opportunities for improved efficiencies and optimization will be reviewed and considered.

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

NA - 16, Ammonia (total)

NA - 16, Ammonia (total)

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substance at their facility?*

Yes

If 'yes', provide the exact statement of intent:**

GfSA, Chatham Facility Intends to reduce its use of ammonia.

If 'no', what rationale is specified in the plan for not using less of this substance?***

Creation

Does the plan include a statement that stipulates the owner or operator's Intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of Intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

This substance is not created at this facility.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

GfSA, Chatham Facility Intends to reduce the use of ammonia through product design and equipment or process modification.

Toxic Substance Use Targets

Reduction target:*



No target

or

Quantity

Unit

Timeframe target:*



No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

Quantity

Unit

or

Timeframe target:

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

As a physical or chemical processing aid

Summarize why this substance is used at the facility:**

Bulk ammonia is received at the Chatham plant in the bulk ammonia tank. Ammonia is transferred from the ammonia tank, to the corn mash cook stage, for pH control and as well to the fermenters, for supply of fermenter nutrients. All the ammonia that enters into the Chatham plant process (into the cook and fermentation stages), is destroyed when it is mixed into the process. It is dissolved in the mash stream in the above stages, and forms salts.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

This substance is not created at the facility

Summarize why this substance is created at the facility:**

This substance is not created at the facility.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

No

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

Materials or feedstock substitution

Empty

Product design or reformulation

Modified design or composition

Which activities will be undertaken to implement these reduction options?

Select an option:*

Modified design or composition

Describe the option:*

Utilization of an Improved enzyme requiring lower amount of ammonia.

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the use of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 4.7 tonnes

0.5 %

Estimate of the amount by which the creation of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the toxic substance contained in the product leaving the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total releases to air of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 0.02 tonnes

0.5 %

Estimate of the amount by which the total releases to water of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total releases to land of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the disposals on-site (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result of implementing this option:

N/A tonnes

%

Estimate of the amount by which the disposals off-site of the toxic substance at the facility will be reduced as a result of implementing this option:

N/A tonnes

%
Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result on implementing this option: _____

N/A tonnes

%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

2 years
 N/A

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

N/A years

Equipment or process modifications

Other

Which activities will be undertaken to implement these reduction options?

Select an option:*

Other

Describe the option:*

Computerized monitoring system to maintain process within tight operating tolerances.

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the **use** of the toxic substance at the facility will be reduced as a result of implementing the option:

4.7 tonnes
 N/A

0.5

%

Estimate of the amount by which the **creation** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the toxic substance **contained in the product** leaving the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total **releases to air** of the toxic substance at the facility will be reduced as a result of implementing the option:

0.02

N/A tonnes
0.5
%

Estimate of the amount by which the total **releases to water** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes
%

Estimate of the amount by which the total **releases to land** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes
%

Estimate of the amount by which the **disposals on-site** (Including tailing and waste rock) of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes
%

Estimate of the amount by which the **disposals off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes
%

Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes
%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

2 years
N/A

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

N/A years

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

630-08-0, Carbon monoxide

630-08-0, Carbon monoxide

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?***

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of Intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

It has been determined that it is not technically and economically feasible at this time to reduce the creation of carbon monoxide. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

It has been determined that it is not technically and economically feasible at this time to reduce the creation of carbon monoxide. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Toxic Substance Use Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

Ethanol is produced at the Chatham facility using corn raw material. Corn is first milled, then slurred by mixing with water, then the slurry is cooked in the mashing stage. Enzymes and chemicals are added at the mashing stage to convert the corn starch to glucose polymer chains (dextrose molecules). The

mashed/ cooked corn is then sent to the saccharification stage, in which the mash is cooled, and glucoamylase enzyme is added to break down the dextrose chains to individual glucose molecules. The saccharified corn mash is then pumped into fermenters, where yeast is present. The yeast metabolizes the glucose, and grows and propagates. The yeast produces ethanol and carbon dioxide during its propagation stage. The fermented mash containing ethanol, is then pumped to the distillation system, wherein ethanol is separated from the solids and water and impurities in a number of distillation stages. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. The purified distilled ethanol is then sent to the receiver tanks which weigh the quantity of ethanol produced, which is then transferred to bulk storage tanks. Ethanol from the bulk ethanol storage tanks, is then pumped into tanker trucks and railcars destined for shipments to customers. The boilers create steam to supply to the process. The boiler stacks are sources of acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx. The wastewater ponds located within the facility, emit acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx vapors. The Boithane flare located within the facility (associated with the anaerobic digester that treats wastewater), emits acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx vapors. The gas turbines are part of the cogeneration plant which produces both steam and electricity for the facility and are sources of carbon monoxide, NOx and SOx.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

Yes

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

It has been determined that it is not technically and economically feasible at this time to reduce the creation of carbon monoxide. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for Implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

11104-93-1, Nitrogen oxides (expressed as NO2)

11104-93-1, Nitrogen oxides (expressed as NO2)

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?*

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?*

It has been determined that it is not technically and economically feasible at this time to reduce the creation of nitrogen oxides. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

It has been determined that it is not technically and economically feasible at this time to reduce the creation of nitrogen oxides. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Toxic Substance Use Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

This substance is not used at the facility.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

Ethanol is produced at the Chatham facility using corn raw material. Corn is first milled, then slurried by mixing with water, then the slurry is cooked in the mashing stage. Enzymes and chemicals are added at the mashing stage to convert the corn starch to glucose polymer chains (dextrose molecules). The mashed/ cooked corn is then sent to the saccharification stage, in which the mash is cooled, and glucoamylase enzyme is added to break down the dextrose chains to individual glucose molecules. The saccharified corn mash is then pumped into fermenters, where yeast is present. The yeast metabolizes the glucose, and grows and propagates. The yeast produces ethanol and carbon dioxide during its propagation stage. The fermented mash containing ethanol, is then pumped to the distillation system, wherein ethanol is separated from the solids and water and impurities in a number of distillation stages. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. The purified distilled ethanol is then sent to the receiver tanks which weigh the quantity of ethanol produced, which is then transferred to bulk storage tanks. Ethanol from the bulk ethanol storage tanks, is then pumped into tanker trucks and railcars destined for shipments to customers. The boilers create steam to supply to the process. The boiler stacks are sources of acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx. The wastewater ponds located within the facility, emit acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx vapors. The Bolthane flare located within the facility (associated with the anaerobic digester that treats wastewater), emits acrolein, carbon monoxide, Hydrogen sulfide, NOx, SOx vapors. The gas turbines are part of the cogeneration plant which produces both steam and electricity for the facility and are sources of carbon monoxide and NOx.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

Yes

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented: **

It has been determined that it is not technically and economically feasible at this time to reduce the creation of nitrogen oxides. Even though GFSA Chatham facility has decided not to implement any reduction options at this time it will revisit it in the future.

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

NA - M09, PM10 - Particulate Matter <= 10 Microns

NA - M09, PM10 - Particulate Matter <= 10 Microns

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?*

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

Yes

If 'yes', provide the exact statement of intent:**

GFSA, Chatham Facility intends to reduce the creation of Particulate Matter 10 microns through a new leak detection program.

If 'no', what rationale is specified in the plan for not creating less of this substance?*

Objectives, Targets and Description

Plan Objectives

Objectives In plan:*

GfSA, Chatham Facility Intends to reduce the creation of Particulate Matter 10 microns through a new leak detection program.

Toxic Substance Use Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

This substance is not used at this facility.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

The Chatham facility produces ethanol, carbon dioxide, and distillers grains products. The above products are produced at the Chatham facility using corn raw material. Corn is first milled, then slurried by mixing with water, then the slurry is cooked in the mashing stage. The slurry is then saccharified, and fermented, to produce ethanol. The fermented beer is then sent through distillation columns to separate the ethanol and solids and water. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. Steam for the mashing and distillation and other sections in the process, is produced in steam boilers in the facility. Water cooling towers provide cooling to the sections within the process that require cooling and are a source of PM10. Particulate Matter 10 is created during the corn receiving, handling and cleaning process and through the corn storage bin vents. PM10 is created during the distillers grains drying process and the loading process. PM10 is also created during combustion of natural gas in the boilers and from the cooling towers.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

No

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Implemented inspection or monitoring program of potential spill or leak sources

Which activities will be undertaken to implement these reduction options?

Select an option:*

Implemented inspection or monitoring program of potential spill or leak sources

Describe the option:*

Leak detection monitoring system.

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the use of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%
Estimate of the amount by which the **creation** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 0.39 tonnes

0.5 %

Estimate of the amount by which the toxic substance **contained in the product** leaving the facility will be reduced as a result of implementing the option:

N/A tonnes

%
Estimate of the amount by which the total **releases to air** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 0.39 tonnes

0.5 %

Estimate of the amount by which the total **releases to water** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%
Estimate of the amount by which the total **releases to land** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%
Estimate of the amount by which the **disposals on-site** (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%
Estimate of the amount by which the **disposals off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%
Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

N/A years

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

N/A

2
years

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

- Hammermill upgrades have reduced the amount of PM.
- Dust collector bags are changed annually.

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

NA - M10, PM2.5 - Particulate Matter <= 2.5 Microns

NA - M10, PM2.5 - Particulate Matter <= 2.5 Microns

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of Intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?***

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

Yes

If 'yes', provide the exact statement of intent:**

- GFSA, Chatham Facility Intends to reduce its creation of Particulate Matter <= 2.5 microns.

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

GfSA, Chatham Facility Intends to reduce the creation of Particulate Matter <= 2.5 microns through a new leak detection program.

Toxic Substance Use Targets

Reduction target:*

<input checked="" type="checkbox"/>		Quantity	Unit
<input type="checkbox"/>	No target	or	

Timeframe target:*

<input checked="" type="checkbox"/>		or	
<input type="checkbox"/>	No target		years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

<input checked="" type="checkbox"/>		Quantity	Unit
<input type="checkbox"/>	No target	or	

Timeframe target:

<input checked="" type="checkbox"/>		or	
<input type="checkbox"/>	No target		years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

The Chatham facility produces ethanol, carbon dioxide, and distillers grains products. The above products are produced at the Chatham facility using corn raw material. Corn is first milled, then slurried by mixing with water, then the slurry is cooked in the mashing stage. The slurry is then saccharified, and fermented, to produce ethanol. The fermented beer is then sent through distillation columns to separate the ethanol and solids and water. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. Steam for the mashing and distillation and other sections in the process, is produced in steam boilers in the facility. Water cooling towers provide cooling to the sections within the process that require cooling. Particulate Matter 2.5 is created during the corn receiving, handling and cleaning process and through the corn storage bin vents. PM2.5 is also created in the grain unloading baghouse and milling baghouse. PM2.5 is created during the distillers grains drying process and the loading process. PM2.5 is also created during combustion of natural gas in the boilers.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

No

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Implemented inspection or monitoring program of potential spill or leak sources

Which activities will be undertaken to implement these reduction options?

Select an option:*

Implemented inspection or monitoring program of potential spill or leak sources

Describe the option:*

GFSa, Chatham Facility Intends to reduce the creation of Particulate Matter <= 2.5 microns through a new leak detection program.

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the **use** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the **creation** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the toxic substance **contained in the product** leaving the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total **releases to air** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total **releases to water** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total **releases to land** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the **disposals on-site** (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result of implementing this option:

N/A tonnes

%

Estimate of the amount by which the **disposals off-site** of the toxic substance at the facility will be reduced as a result of implementing this option:

N/A tonnes

%

Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result of implementing this option:

N/A tonnes

%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

N/A

years

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

N/A

2

years

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

Hammer mill upgrades have reduced the amount of PM. Dust collector bags are changed annually.

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

NA - M08, Total Particulate Matter

NA - M08, Total Particulate Matter

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not using less of this substance?*

This substance is not used at this facility.

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

Yes

If 'yes', provide the exact statement of intent:**

- GFSA, Chatham Facility intends to reduce its creation of Total Particulate Matter.

If 'no', what rationale is specified in the plan for not creating less of this substance?:**

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

GFSA, Chatham Facility intends to reduce the creation of Total Particulate Matter through a new leak detection program.

Toxic Substance Use Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

No target

or

Quantity

Unit

Timeframe target:*

No target

or

years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

This substance is not used at the facility

Summarize why this substance is used at the facility:**

This substance is not used at this facility.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

As a by-product

Summarize why this substance is created at the facility:**

The Chatham facility produces ethanol, carbon dioxide, and distillers grains products. The above products are produced at the Chatham facility using corn raw material. Corn is first milled, then slurried by mixing with water, then the slurry is cooked in the mashing stage. The slurry is then saccharified, and fermented, to produce ethanol. The fermented beer is then sent through distillation columns to separate the ethanol and solids and water. The solids thus recovered, are dried, and sold as distillers grains products. Drying of the recovered solids to produce dried distillers grains, is performed in distillers grains dryers in the facility. Steam for the mashing and distillation and other sections in the process, is produced in steam boilers in the facility. Water cooling towers provide cooling to the sections within the process that require cooling. Diesel fire protection pumps, provide fire water to the facility. Total Particulate Matter is created during the corn receiving, handling and cleaning process and through the corn storage bin vents. TPM is also created in the grain unloading baghouse and milling baghouse. TPM is created during the distillers grains drying process and the loading process. TPM is created during combustion of natural gas in the boilers, the diesel fire pump and from the cooling towers.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

No

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

Materials or feedstock substitution

Empty

Product design or reformulation

Empty

Equipment or process modifications

Modified equipment, layout or piping

Which activities will be undertaken to implement these reduction options?

Select an option:*

Modified equipment, layout or piping

Describe the option:*

Installation of equipment to condense exhaust from the dried distillers grain stack and transfer energy to a greenhouse development.

Estimates

Estimated reduction in the toxic substance attributed to the Implementation of this option:

Select All

Estimate of the amount by which the use of the toxic substance at the facility will be reduced as a result of implementing the option:

Input field with N/A, tonnes, and %

Estimate of the amount by which the creation of the toxic substance at the facility will be reduced as a result of implementing the option:

Input field with 1.13, tonnes, 0.5, and %

Estimate of the amount by which the toxic substance contained in the product leaving the facility will be reduced as a result of implementing the option:

Input field with N/A, tonnes, and %

Estimate of the amount by which the total releases to air of the toxic substance at the facility will be reduced as a result of implementing the option:

Input field with 1.08, tonnes, 0.5, and %

Estimate of the amount by which the total releases to water of the toxic substance at the facility will be reduced as a result of implementing the option:

Input field with N/A, tonnes, and %

Estimate of the amount by which the total releases to land of the toxic substance at the facility will be reduced as a result of implementing the option:

Input field with N/A, tonnes, and %

Estimate of the amount by which the disposals on-site (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result on implementing this option:

Input field with N/A, tonnes, and %

Estimate of the amount by which the disposals off-site of the toxic substance at the facility will be reduced as a result on implementing this option:

Input field with N/A, tonnes, and %

Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes
 %

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

N/A years

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

2 years
 N/A

Spill or leak prevention

Implemented inspection or monitoring program of potential spill or leak sources

Which activities will be undertaken to implement these reduction options?

Select an option:*

Implemented Inspection or monitoring program of potential spill or leak sources

Describe the option:*

GFSA, Chatham Facility intends to reduce the creation of Total Particulate Matter through a new leak detection program.

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the **use** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes
 %

Estimate of the amount by which the **creation** of the toxic substance at the facility will be reduced as a result of implementing the option:

1.13 tonnes
 N/A
 0.5 %

Estimate of the amount by which the toxic substance **contained in the product** leaving the facility will be reduced as a result of implementing the option:

N/A tonnes
 %

Estimate of the amount by which the total **releases to air** of the toxic substance at the facility will be reduced as a result of implementing the option:

1.08 tonnes
 N/A
 0.5 %

Estimate of the amount by which the total **releases to water** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the total **releases to land** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes

%

Estimate of the amount by which the **disposals on-site** (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%

Estimate of the amount by which the **disposals off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%

Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result on implementing this option:

N/A tonnes

%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

N/A years

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

2 years

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

Hammer mill upgrades have reduced the amount of PM. Dust collector bags are changed annually.

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

98-82-8, Cumene

98-82-8, Cumene

Substances Section Data

Statement of Intent

Use

Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance at their facility?*

Yes

If 'yes', provide the exact statement of intent:**

GfSA, Chatham Facility Intends to reduce its use of Cumene.

If 'no', what rationale is specified in the plan for not using less of this substance?***

Creation

Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic substance at their facility?*

No

If 'yes', provide the exact statement of intent:**

If 'no', what rationale is specified in the plan for not creating less of this substance?***

This substance is not created at this facility.

Objectives, Targets and Description

Plan Objectives

Objectives in plan:*

- GfSA, Chatham Facility intends to reduce its use of Cumene by substituting regular gasoline with natural gasoline, containing lower levels of toxic substances

Toxic Substance Use Targets

Reduction target:*

Quantity

Unit

No target or _____

Timeframe target:*

No target or _____ years

Description of use targets:

Toxic Substance Creation Targets

Reduction target:*

	Quantity	Unit
<input checked="" type="checkbox"/> No target	or _____	_____

Timeframe target:

No target or _____ years

Description of creation targets:

Reasons for Using this Toxic Substance

This substance is used at the facility:*

As a formulation component

Summarize why this substance is used at the facility:**

Gasoline is used for denaturing fuel grade ethyl alcohol per Canada Revenue Agency (Excise) criteria, for those bulk customers who wish to purchase denatured fuel grade ethyl alcohol. The gasoline contains cumene as a component. Bulk gasoline (containing cumene as a component) is received at the Chatham plant into the gasoline storage tank. The gasoline (containing cumene as a component) is pumped from the storage tank into tanker trucks and railcars, together with undenatured ethyl alcohol product, in order to denature the ethyl alcohol in accordance with Canada Revenue Agency (Excise) criteria. The tanker truck or railcar containing the ethyl alcohol which has been denatured with gasoline (containing cumene as a component) is then sealed and shipped to the customer.

Reasons for Creating this Toxic Substance

This substance is created at the facility:*

This substance is not created at the facility

Summarize why this substance is created at the facility:**

This substance is not created at this facility.

Toxic Reduction Options for Implementation

Toxic substance reduction option(s) to be implemented:

Does the plan specify that no toxic reduction option will be implemented?*

No

If 'No', record the option(s) under the appropriate categories below (e.g., Materials or feedstock substitution; Product design or reformulation).

If 'Yes', explain why no option will be implemented:**

Materials or feedstock substitution

Substituted materials

Which activities will be undertaken to implement these reduction options?

Select an option:*

Substituted materials

Describe the option:*

- GFSA, Chatham Facility Intends to reduce its use of Cumene by substituting regular gasoline with natural gasoline, containing lower levels of toxic substances

Estimates

Estimated reduction in the toxic substance attributed to the implementation of this option:

Select All

Estimate of the amount by which the **use** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 2.86 tonnes
 25 %

Estimate of the amount by which the **creation** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes
 %

Estimate of the amount by which the toxic substance **contained in the product** leaving the facility will be reduced as a result of implementing the option:

N/A 2.73 tonnes
 25 %

Estimate of the amount by which the total **releases to air** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A 0.05 tonnes
 25 %

Estimate of the amount by which the total **releases to water** of the toxic substance at the facility will be reduced as a result of implementing the option:

N/A tonnes
 %

Estimate of the amount by which the total **releases to land** of the toxic substance at the facility will be reduced as a result of implementing the option: _____

N/A

tonnes

%

Estimate of the amount by which the **disposals on-site** (including tailing and waste rock) of the toxic substance at the facility will be reduced as a result of implementing this option: _____

N/A

tonnes

%

Estimate of the amount by which the **disposals off-site** of the toxic substance at the facility will be reduced as a result of implementing this option: _____

N/A

tonnes

%

Estimate of the amount by which total **recycling off-site** of the toxic substance at the facility will be reduced as a result of implementing this option: _____

N/A

tonnes

%

Timelines

Anticipated timeline for achieving the estimated reduction

Select All

Anticipated timelines for achieving the estimated reduction of the **use** of the toxic substance:

N/A

1

years

Anticipated timelines for achieving the estimated reduction of the **creation** of the toxic substance:

N/A

years

Product design or reformulation

Empty

Equipment or process modifications

Empty

Spill or leak prevention

Empty

On-site reuse, recycling or recovery

Empty

Improved inventory management or purchasing techniques

Empty

Good operator practice or training

Empty

Rationale for choosing these options for implementation:

Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:

License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*

TSRP0190

License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*

TSRP0190

Which version of the plan is reflected in this summary?*

New Plan

Version: 2.6.1.3

Company Name	Greenfield Chatham Facility
Name of Substance	Sulphuric Acid
Chemical Abstracts Service Registry	7664-93-9
NPRI Identification Number	5739
ID Number Assigned to Facility by the Ministry of the Environment for purposes of Reg 127/01	NA
Legal and Trade names of the Owner and the Operator of the Facility, Street address of the Facility	GreenField Ethanol 275 Bloomfield Road, Chatham Ontario N7M 5J5
Business Number	13033 6852
The number of Full –time Employee Equivalents at the Facility	66
Two Digit North American Industry Classification System (NAICS)	32
Four Digit NAICS	3251
Six Digit NAICS	325190 Other Basic Organic Chemical Manufacturing
Name and Position and Telephone number of the individual who is the contact at the facility for the public.	
The Licence number of the toxic substance reduction planner who is responsible for making recommendations in the plan.	TSRP0190
The Licence number of the toxic substance reduction planner who is responsible signing a certification plan.	TSRP0190
The Spatial coordinates of the facility expressed in Universal Transverse Mercator (UTM) within a North American Datum 83 (NAD83) datum	42.38390 -82.22180

Plan Summary Statement

This plan summary accurately reflects the content of the toxic substance reduction plan for sulphuric acid, prepared by Greenfield Ethanol Chatham, dated December 18, 2012.

Statement – Intent to reduce:

GFE, Chatham Facility is currently using Sulphuric acid for pH control in the Fermentation Process as well as to control mash fouling and prevent vessel plugging in the Distillation Process. GFE, Chatham Facility intends to reduce its use of sulphuric acid, therefore this plan will not address reducing its creation.

Objectives and Targets:

GFE, Chatham Facility intends to reduce the use of sulphuric acid by 123.1t (approximately 5%) over a 6 year period.

Facility Description:

GFE, Chatham Facility produces industrial-grade and fuel-grade ethanol from its plant utilizing corn, yeast, water and enzymes.

The Facility's North American Industrial Classification Service (NAICS) Codes that apply to this Facility are 312140 – "Distilleries" for the industrial-grade ethanol manufacturing process and 325190 – "Other Basic Organic Chemical Manufacturing" for the fuel-grade ethanol manufacturing process.

Toxic Substance Description:

Sulphuric acid (93 percent) is received in bulk at the GFE Chatham facility. The sulphuric acid is then metered from the storage tanks to the following points in the manufacturing process:

- into the cooling water basins for pH control
- into the mash feed line to the fermenters for pH control
- into the yeast propagation tanks for pH control
- into the outlet line from the beerwell routed to the plant distillation system for control of fouling in the beer column.
- to the evaporator 1st effect vessels to control mash fouling and plugging in the evaporator vessels.

All the sulphuric acid that enters into the plant is destroyed when it is mixed in the above processes. It is dissolved in the above streams and forms salts.

See attached process flow diagram and tracking and quantification.

Receiving and Storage (Use)

Tracking and Quantification Method

Quantification Method: Mass Balance

The quantity of sulphuric acid is based on purchase records and the concentration of sulphuric acid in the received product as presented in the Material Safety Data Sheets (MSDS).

Direct and Indirect Cost Analysis

Below is a summary of all direct cost associated specifically with the use, release, transfer and disposal of sulphuric acid.

Direct Costs Associated with Sulphuric Acid

Item	Description	Total
Material	Total cost of sulphuric acid	\$650,000
Equipment Maintenance	Includes parts, repair	\$5,000
Waste Removal		\$500
Cleanup Material		\$500
Total		\$656,000

Indirect Costs Associated with Sulphuric Acid

Item	Description	Total
Personal Protective Equipment	Eye, face, body, hand	\$500
Total		\$500

Toxic Substance Reduction Option to be Implemented

Product Redesign or Reformulation

The following options have been identified for implementation to reduce the use of sulphuric acid:

- ☐ Trial a new phytase enzyme to reduce requirement of sulphuric acid for pH control

Sulphuric Acid reductions due to implementing the options above are:

Company Name: Greenfield Ethanol Chatham Facility

Substance: Sulphuric acid

CAS#: 7664-93-9

Reduction Option: Product Design or Reformulation

	Used (tonnes /year)	Created (tonnes /year)	Contained in Product (tonnes/year)	On-site Releases (tonnes/year)			Disposal (tonnes/year)		Off-site Recycling (tonnes /year)
				Air	Water	Land	On-site	Off-site	
Baseline	2461.5	0	0	0	0	0	0	0	0
Estimated Reduced Total	2338.4	0	0	0	0	0	0	0	0
Reduction	123.1	0	0	0	0	0	0	0	0
% Reduction	5%	0	0	0	0	0	0	0	0

It is expected that this reduction will occur over a 6 year period.

Option	Step	Target Completion Date
Product Design or Reformulation	Test enzyme	2014 – 2020
	Reduce use of sulphuric acid	2014 – 2020

Technical Feasibility

Usage of sulphuric acid is expected to diminish over time as enzyme manufacturers continue the trend of manufacturing enzymes whose operating pH ranges become wider. Trials with the phytase enzyme will determine the feasibility of being able to reduce the use of sulphuric acid.

Economic Feasibility

A savings of \$45,000 is expected with a payback period of approximately 6 years should the sulphuric acid usage be reduced.

Toxic Reduction Plan – Sulphuric Acid

Planner Recommendations

Expertise Relied on in Preparing the Plan

This plan was developed by Dianne Schenk, EH&S Coordinator at GFE, a Licensed Certified Toxics Reduction Planner.

Dianne Schenk has intimate knowledge in all aspects of the production processes at GFE Chatham, having been the Quality Manager at that facility for a number of years, and was able to obtain all necessary information required to develop the Plan through the Chatham engineering group, GFE Regulatory Officer and the site EH&S Coordinator.

This level of expertise relied on for the preparation of the Plan was sufficient to review all options for reduction of sulphuric acid.

Accounting

The total amount of raw materials used at the facility were calculated on purchasing records and internal inventory records.

The flow of sulphuric acid has been shown on the process flow diagram.

The input and outputs balances were calculated using a combination of inventory and purchasing records and mass balances and the inputs equal the outputs, therefore a recommendation is not necessary.

Toxic Substance Reduction Options

GFE is engaged in a detailed review of each reduction category. There is one possible reduction option for sulphuric acid at this time.

No recommendations necessary.

Direct and Indirect Costs

The plan satisfies this condition of the Regulation that all direct and indirect costs associated with the toxic substance have been accounted for.

No recommendations necessary.

Implementation Plan

There is one reduction option identified and an implementation plan provided.

Dianne Schenk

Certified Toxic Reduction Planner – License #TSRP0190

Company Name	Greenfield Specialty Alcohols Chatham Facility
Name of Substance	Ammonia
CAS.	NA-16
NPRI Identification Number	5739
ID Number Assigned to Facility by the Ministry of the Environment for purposes of Reg 127/01	NA
Legal and Trade names of the Owner and the Operator of the Facility, Street address of the Facility	Greenfield Specialty Alcohols 275 Bloomfield Road, Chatham Ontario N7M 5J5
Business Number	13033 6852
The number of Full –time Employee Equivalents at the Facility	65
Two Digit North American Industry Classification System (NAICS)	32
Four Digit NAICS	3251
Six Digit NAICS	325190 Other Basic Organic Chemical Manufacturing
Name and Position and Telephone number of the individual who is the contact at the facility for the public.	Angelo Ligori Plant Manager 519-436-1130 Ext 8123
The License number of the toxic substance reduction planner who is responsible for making recommendations in the plan.	TSRP0190
The License number of the toxic substance reduction planner who is responsible signing a certification plan.	TSRP0190
The Spatial coordinates of the facility expressed in Universal Transverse Mercator (UTM)within a North American Datum 83 (NAD83) datum	UTM Easting: 399423.1935960233 UTM Northing: 4693124.570649816

Plan Summary Statement

The Greenfield Specialty Alcohols Inc. (GFSA) Chatham Facility is currently using ammonia for pH control in the Mashing and Fermentation Process. This plan summary accurately reflects the content of the toxic substance reduction plan for ammonia, prepared by Greenfield Specialty Alcohols Chatham, dated December 16, 2013.

Statement – Intent to reduce:

GFSA, Chatham Facility intends to reduce its use and release of ammonia by 1%.

Objectives and Targets:

GFSA, Chatham Facility intends to reduce the use of ammonia by 13t (approximately 1%) through product design or reformulation.

GFSA, Chatham operates an ethanol production facility. GFSA is committed to protect the environment through continual improvement of its manufacturing processes and the prevention of pollution. The objective of this facility is to reduce the use of ammonia through the implementation of enzyme replacement with an enzyme more efficient and equipment monitoring for efficiency of operation.

Facility Description:

GFSA, Chatham Facility produces industrial-grade and fuel-grade ethanol from its plant utilizing corn, yeast, water and enzymes.

The Facility's North American Industrial Classification Service (NAICS) Codes that apply to this Facility are 312140 – "Distilleries" for the industrial-grade ethanol manufacturing process and 325190 – "Other Basic Organic Chemical Manufacturing" for the fuel-grade ethanol manufacturing process.

Toxic Substance Description:

Bulk ammonia (30 percent) is received by tanker truck from the supplier at the Chatham plant and pumped into the bulk ammonia tank. Ammonia is transferred from the ammonia tank, to the corn mash cook stage, for pH control and as well to the fermenters, for supply of fermenter nutrients. All the ammonia that enters into the Chatham plant process (into the cook and fermentation stages), is destroyed when it is mixed into the process. It is dissolved in the mash stream in the above stages, and forms salts. Ammonia is created and released in the dryer stack and boilers.

See attached process flow and tracking and quantification.

Receiving and Storage (Use)

Tracking and Quantification Method

Quantification Method: Mass Balance

The quantity of ammonia is based on purchase records and the concentration of ammonia in the received product as presented in the Material Safety Data Sheets (MSDS).

Facility-Wide Accounting Information

Use

The total facility wide use is equal to the amount of ammonia which is contained in the raw materials received from the suppliers and the difference in storage tank year start and year end in 2012.

Creation

Ammonia was created and released from the dryer stack and boilers.

Transformation

The total facility wide amount of ammonia transformed on site in 2012 is equal to the amount of ammonia used in the Mashing and Fermentation Process.

Destruction

There was zero destruction of ammonia on site in 2012.

Contained in Product

There was zero amount of ammonia contained in product in 2012.

Releases to Air

Ammonia was released to the air from the dryer stack and boilers.

Released to Land

There was zero releases to land of ammonia on site in 2012.

Releases to Water

There were zero releases to water of ammonia on site in 2012.

Disposals (On-Site)

There were zero on- site disposals in 2012.

Disposals (Off-Site)

There were zero off-site disposals of ammonia in 2012.

Off-Site Discharge (Treatment)

There were zero off-site discharges of ammonia in 2012.

Direct and Indirect Cost Analysis

Below is a summary of all direct cost associated specifically with the use, release, transfer and disposal of ammonia.

Direct Costs Associated with Ammonia

Item	Description	Total
Materials	Total cost of ammonia	\$330,000
Equipment Maintenance	Includes parts, repairs	\$4,000
Training	Employee training, drills	\$1000
Total		\$335,000

Indirect Costs Associated with Ammonia

Item	Description	Total
Personal Protective Equipment	Eye, face, body, hand	\$500
Total		\$500

Toxic Substance Reduction Option to be Implemented

The following options have been identified for implementation to reduce the use of Ammonia:

- Utilization of a new enzyme that allows for a reduced amount of ammonia to be used.
- Improved control of process by utilizing a software system that manages all set points to ensure all production parameters are within tolerance and maintained.

Ammonia reductions due to implementing the options above are:

Company Name: GFS Chatham Facility

Substance: Ammonia

CAS#: NA-16

Reduction Option: Product Design or Reformulation

	Used (tonnes/year)	Created (tonnes/year)	Contained in Product (tonnes/year)	On-site Releases (tonnes/year)			Disposal (tonnes/year)		Off-site Recycling (tonnes/year)
				Air	Water	Land	On-site	Off-site	
Baseline	940.299	0	0	3.808	0	0	0	0	0
Estimated Reduced Total	930.9	0	0	.04	0	0	0	0	0
Reduction	9.40	0	0	3.768	0	0	0	0	0
% Reduction	0.5%	0	0	0.5%	0	0	0	0	0

Toxic Reduction Option Implementation Schedule

Option	Step	Target Completion Date
Product Design or Reformulation	Test enzyme	2014 (ongoing)
	Reduce use of ammonia	2014/2015
	Software monitoring system	2015
	Reduce use of ammonia	2016

Technical Feasibility

Trials with new enzymes will be ongoing to determine the feasibility of being able to reduce the use of ammonia. Industry continues to develop new enzymes that will be trialed as appropriate.

Economic Feasibility

A savings of \$5,000 is expected with a payback period of approximately 7 years should the ammonia usage be reduced.

Toxic Reduction Plan – Ammonia

Planner Recommendations

Expertise Relied on in Preparing the Plan

This plan was developed by Dianne Schenk, EH&S Coordinator at GFSA, a Licensed Certified Toxics Reduction Planner.

Dianne Schenk has intimate knowledge in all aspects of the production processes at GFSA Chatham, having been the Quality Manager at that facility for a number of years, and was able to obtain all necessary information required to develop the Plan through the Chatham engineering group, GFE Regulatory Officer and the site EH&S Coordinator.

This level of expertise relied on for the preparation of the Plan was sufficient to review all options for the reduction of ammonia.

Accounting

The total amount of raw materials used at the facility were calculated on purchasing records and internal inventory records.

The flow and quantifications of ammonia has been shown on the process flow diagram.

The input and outputs balances were calculated using a combination of inventory and purchasing records and mass balances and the inputs equal the outputs, therefore a recommendation is not necessary.

Toxic Substance Reduction Options

GFSA is engaged in a detailed review of each reduction category. There is one possible reduction option with two actions for ammonia at this time.

No recommendations necessary.

Direct and Indirect Costs

The plan satisfies this condition of the Regulation that all direct and indirect costs associated with the toxic substance have been accounted for.

No recommendations necessary.

Implementation Plan

There is one reduction option identified with two actions and an implementation plan provided.

Dianne Schenk

Certified Toxic Reduction Planner – License #TSRP0190