# Canadä

# Single Window Reporting NPRI and Partners

Plan Summary Preview Company Details	,
Company Legal Name:	
GreenField Ethanol Inc.	
Greenreid Edianol Inc.	
Company Address:	
98 Walker Drive, Brampton (Ontario)	
Report Details	
Facility:	
Chatham Plant	
	2
Facility Address:	
275 Bloomfield Road, Chatham (Ontario)	
Update Comments:	
opute confinents.	
Activities	
Facility Contacts	2.
Facility Contacts	
Please assign the appropriate contact under each category below.  Public Contact:*  Dianne Schenk	
Highest Banking Company	
Highest RankIng Employee:  Angelo Ligori	
Angelo Egon	
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 (SWII created. To load up-to-date SWIM information, click "Refresh from SWIM".	M) at the time that this report was
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.	
2 W	
Company Trade Name:*	
Greenfield Ethanol Inc.	
Business Number:*	
130336852	

Mailing Add	iress		
Deliver	ry Mode:		Q.
PO Box	<b>(</b>		
Rural F	Route Number		
Addres	ss Line 1		
98 \	Walker Drive		
Clty*			
Bram	pton		
Provinc	ce/Territory**		
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Facility:*			
Chatham Pl	ant		

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325190			
NPRI Id:*			
5739			
ON Reg 127/01 Id:			
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Mailing Address			
Delivery Mode:			
PO Box			
Rural Route Number			
Address Line 1			
98 - Walker Drive			
City*			
Brampton			
Province/Territory**			
Ontario			
Postal Code: **			
L6T 4H6			
107 1110			
Physical Address			
Address Une 1			
275 - Bloomfield Road			
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Chatham			
Province/Territory			
Ontario			
Postal Code			
N7M5J5			
Additional Information			
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Land Survey Description			
National Topographical Description			
Geographical Address			
Latitude			
42.38390			×
Longitude			

-82,22180				
UTM Zone**				
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UTM Easting**				
399423.1935960233				
UTM Northing**	ř.			
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".

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ОП	tacts	,				
P	ublic Contact:					
	First Name:*					
	Dianne					
3)	Last Name:*		Pr			
	Schenk					
	Position:*					
	EH&S Coordinator					
	Telephone:*					
	5193687723					
	Ext:					
	7928				54	
	Fax:			*1		
	5193687016					
	Emall:*					
	d.schenk@comaic.com					
	Mailing Address					
	Delivery Mode:					
	Rural Route					
	PO Box					
	Rural Route Number					
	3					
	Address Line 1					
	99 - Farrell Drive					
	City*					
	Tiverton					
	Province/Territory**		9			

Postal Code: ** NOG 2TO  ghest Ranking Employee: First Name: * Angelo Last Name: * Ligori Poskiton: * Plant Manager - Chatham Telephone: * 5194361130 Ext: 8123 Fax: 5194361395 Email: * a.ligori@greenfieldethanol.com Mailling Address Delivery Mode:  PO Box Rural Route Number  Address Line 1 275 - Bloomfield Road City* Chatham Province/Territory** Ontario Postal Code: * N7/M515  rson responsible for the Toxic Substance Reduction Plan preparation: First Name: * Name: *	Ontario		
phest Ranking Employee: First Name: * Angelo Last Name: * Ligori Position: * Plant Manager - Chatham  Telephone: * 5194361130  Ext: 8123  Fax: \$194361595  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: ** N7/M515  reson responsible for the Toxic Substance Reduction Plan preparation: First Name: *	Postal Code: **		
First Name: * Angelo Last Name: * Ligori Position: * Plant Manager - Chatham Telephone: * 5194361130 Ext: 8123 Fax: 5194361595 Email: * a.ligori@greenfieldethanol.com Mailling Address Delivery Mode:  PO Box  Rural Route Number  Address Line 1 275 - Bloomfield Road City * Chatham Province/Territory ** Ontario Postal Code: ** N7/M515  rson responsible for the Toxic Substance Reduction Plan preparation: First Name: *	NOG 2T0		
First Name: * Angelo Last Name: * Ligori Position: * Plant Manager - Chatharm Telephone: * 519436130 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 * Chatharm Province/Territory ** Ontario Postal Code: ** N7/M515  rson responsible for the Toxic Substance Reduction Plan preparation: First Name: *			
Angelo  Last Name: * Ligori  Position: * Plant Manager - Chatham  Telephone: * 5194361130  Ext: 8123  Fax: 5194361595  Email: * a. ligori@greenfieldethanol.com  Malling Address  Delivery Mode:  PO Box  Rural Route Number  Address Line 1 275 - Bloomfield Road  City* Chatham  Province/Territory** Ontario  Postal Code: ** N7/M515  **son responsible for the Toxic Substance Reduction Plan preparation:  First Name: *	hest Ranking Employee:	182	
Last Name:* Ligori  Position:* Plant Manager - Chatham  Telephone:* 5194361130  Ext: 8123  Fax: 5194361595  Email:* a.ligori@greenfieldethanol.com  Mailing Address  Delivery Mode:  PO 8ox  Rural Route Number  Address Line 1 275 - Bloomfield Road  City* Chatham  Province/Territory** Ontario  Postal Code: ** N7/M515  **Son responsible for the Toxic Substance Reduction Plan preparation:  First Name: *	First 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 - Bioomfield Road City* Chatham Province/Territory** Ontario  Postal Code:** N7M5J5  rson responsible for the Toxic Substance Reduction Plan preparation: First Name:*	Angelo	*	
Position:* Plant Manager - Chatham Telephone:* 5194361130  Ext: 8123  Fax: 5194361595  Email:* a.ligori@greenfleldethanol.com Malling Address  Delivery Mode:  PO Box  Rural Route Number  Address Line 1 275 - Bloomfleld Road  City* Chatham  Province/Territory** Ontario  Postal Code:** N7M5J5  Ison responsible for the Toxic Substance Reduction Plan preparation: First Name:*	Last Name: "		
Plant Manager - Chatham  Telephone:* 5194361130  Ext: 8123  Fax: 5194361595  Email:* a.ligorl@greenfieldethanol.com  Malling Address  Delivery Mode:  PO Box  Rural Route Number  Address Line 1 275 - Bloomfield Road  City* Chatham  Province/Territory** Ontario  Postal Code:** N7M515  Ison responsible for the Toxic Substance Reduction Plan preparation:  First Name:*	Ligori		
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### 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     Province     Test Name: **     Te	DESCRIPTION OF THE PROPERTY OF		
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rson responsible for the Toxic Substance Reduction Plan preparation:	Postal Code: **		
First Name:*	N7M5J5		
First Name:*			
First Name:*	rson responsible for the Toxic Substance Reduction Plan preparation:		
Diamo	Linear Control of the		
Digitie	Dianne		
Last Name:*	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*
	Province/Territory** Ontario
	Postal Code: *** NOG 2T0
	NOG 210
Employ	/ <del>06</del> 8
Empi	loyees
Mari	umber of Full-time Employees:*
	65
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ubstand	
	3, n-Hexane
	54-3; n-Hexane stances Section Data
St	atement of Intent
	Usa
	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

Reduction target:*				
	14			
ic Substance Creation Targets				
sessification use differs.				
Description of use targets:				
No target		years		
P.	or			
∏meframe target:*				
ार. No target	or			
_		Quantity	Unit	
Reduction target:*				
Objectives in plan:*  It has been determined that it is not to economically feasible at this time to re n-Hexane. Even though GFSA Chathan decided not to implement any reduction time it will revisit it in the future.	duce the	use of las		
Objectives				
This substance is not created at this fa	cility.			
(f 'no', what rationale is specified in the p	lan for no	t creating less of t	nis substance?;**	
f 'yes', provide the exact statement of in	tent:**			
No				
Does the plan include a statement that st substance at their facility?*	ipulates ti	ne owner or operat	or's intent to create less of this toxic	
ntion				
economically feasible at this time to re n-Hexane. Even though GFSA, Chathan decided not to implement any reductio time it will revisit it in the future.	duce the one facility h	use of las		
f 'no', what rationale is specified in the p  It has been determined that it is not to	lan for no	t using less of this	substance?**	

escription of creation targets:  ons for Using this Toxic Substance  his substance is used at the facility:*  As a formulation component  ummarize 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	
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denatured with gasoline (containing n-hexane as a component), is then sealed and shipped to the customer.	
ons for Creating this Toxic Substance  nls substance is created at the facility:*  This substance is not created at the facility	
ummarize why this substance is created at the facility:**  This substance is not created at this facility.	
eduction Options for Implementation	
substance reduction option(s) to be implemented:	*
oes the plan specify that no toxic reduction option will be imple	nented?*
Yes	
'No', record the option(s) under the appropriate categories belo roduct design or reformulation).	w (e.g., Materials or feedstock substitution;
'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.	
aterials or feedstock substitution	
Empty	
roduct design or reformulation	:
Empty	
quipment or process modifications	*

	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 facility:	at the
	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 substan (format TSRPXXXX):*	ce
	TSRP0190	
	License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX).*	
	License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXX):*  TSRP0190	
	TSRPXXXX):*	
	TSRPXXXX):*	
	TSRP0190	
	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?*	
-6.	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan	
	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate	
78	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan	
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78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate nces Section Data ement of Intent  Does the plan Include a statement that stipulates the owner or operator's intent to use less of this toxic su	
78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate nces Section Data ement of Intent  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic su at their facility?*	
78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate nces Section Data ement of Intent  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic su at their facility?*	
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78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate nces Section Data ement of Intent  Be  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic su at their facility?*  No	
78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate nces Section Data  ement of Intent  Be  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic stat 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	
78 sta tat	TSRPXXXX):* TSRP0190  Which version of the plan is reflected in this summary?* New Plan  Ethyl acetate 6, Ethyl acetate mees Section Data ement of Intent  Be  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic stat 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?**	

Does the plan include a statement substance at their facility?*	nt that stipulates the owner or opera	itor's Intent to create less of this toxic
No		
f 'yes', provide the exact statem	ent of intent:**	
f 'no' what rationale is enerifled	in the plan for not creating less of i	this substance? **
It has been determined that if		tins substance:
economically feasible at this t creation of ethyl acetate. Eve facility has decided not to imp options at this time it will revi	lme to reduce the n though GFSA Chatham lement any reduction	
ives, Targets and Description		
Objectives		
Objectives in plan:*		
It has been determined that it economically feasible at this to creation of ethyl acetate. Ever facility has decided not to Important at this time it will review.	ime to reduce the n though GFSA Chatham plement any reduction	
c Substance Use Targets		
Reduction target:*		
_	Quantity	Unit
ভ়ে No target	or _ = =	
Fimeframe target:*		8
M	or	
No target	years	ē
	,	
Description of use targets:		
ic Substance Creation Targets		
Reduction target:*		
	Quantity	Unit
<b>₽</b> ;	or	
No target	OI .	
Timeframe target:	_	
F <sup>1</sup>	or	
No target	years	
Description of creation targets:		

This substance is used at the facility:\*

As a formulation component

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

Ethyl aceatate 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 sachharified, 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 receivered 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** 

Splll or leak prevention

Substances Section Data Statement of Intent Use		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 (for mat TSRPXXXXX).*  TSRP0190  License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXXX):*  TSRP0190  Which version of the plan is reflected in this summary?*  New Plan  17-5, Ethyl Alcohol  3-17-5, Ethyl Alcohol  3-18-18-18, Ethyl Alcohol  4-17-5, Ethyl Alcohol  5-18-18-18 (Inches 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?*		reuse, recycling or recovery
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 TSRPXXXXX); *  TSRP0190  License number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXXX); *  TSRP0190  Which version of the plan is reflected in this summary?*  New Plan  177-5, 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?*		Empty
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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?*	64-17-	New Plan  Ethyl Alcohol  5, Ethyl Alcohol  ances Section Data
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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?*	64-17- Substa	Ethyl Alcohol  5, Ethyl Alcohol  ances Section Data  mement of Intent  Use  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substate at their facility?*
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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?*	64-17- Substa	Ethyl Alcohol  5, Ethyl Alcohol  ances Section Data  mement of Intent  Use  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substate at their facility?*  No
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?*	64-17- Substa	Ethyl Alcohol  5, Ethyl Alcohol  ances Section Data  mement of Intent  Jse  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substant their facility?*  No  If 'yes', provide the exact statement of intent:**
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substance at their facility?*	64-17- Substa	Ethyl Alcohol  5, Ethyl Alcohol  ances Section Data  sement of Intent  Use  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substated 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?**
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tives, Targets and Description				
n Objectives		=		
Objectives in plan:*	= =			
While GFSA, Chatham Facility does reduce the creation of ethyl alcoho for Improved efficiencies and optim reviewed and considered.	l, any opporti	unities		
Ic Substance Use Targets				
Reduction target:*				
		Quantity	Unit	
₹!		1		
No target	or			
Timeframe target:*				
<b>國</b>	or			
No target		years		
Description of use targets:				
Reduction target:*				
_		Quantity	Unit	
I™. No target	or			
Timeframe target: -				
<b>v</b>	ог			
No target		years		
Description of creation targets:				
sons for Using this Toxic Substance				
This substance is used at the facility:	*			
This substance is not used at the f				
Summarize why this substance is use	d at the facili	tv:**		
	cility, not use			

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

dstock substitution;
dstock substitution;
v
Y
Y
s toxic substance at th
s for this substance
ubstance (format

	New Plan
A - 16	, Ammonia (total)
NA -	16, Ammonia (total)
Subs	stances Section Data
St	atement 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?**
	If the , 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.
90	
OI	bjectives, 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:*
,	Quantity Unit
	ਭ No target or
	Timeframe target:*
	™ Or No target
	years
	Description of use targets:

Reduction target:*		
	Quantity	Unit
<b>120</b>		
No target	r	
Timeframe target:		
্যুক No target		
No target	years	
Description of creation targets:		
		T .
asons for Using this Toxic Substance		
This substance is used at the facility:*  As a physical or chemical processing aid		
As a physical of chemical processing aid		
Summarize why this substance is used at the fa	cility:**	
Bulk ammonla is received at the Chatham pla bulk ammonla tank. Ammonia is transferred ammonia tank, to the corn mash cook stage, control and as well to the fermenters, for sup fermenter nutrients. All the ammonia that er the Chatham plant process (into the cook an fermentation stages), is destroyed when it is into the process. It is dissolved in the mash s the above stages, and forms salts.	from the for pH oply of ters Into d mixed	
asons 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.		
Reduction Options for Implementation		
ric substance reduction option(s) to be implemented:		
Does the plan specify that no toxic reduction or	otion will be implemen	nted?*
No		
		8
If 'No', record the option(s) under the appropria Product design or reformulation).	ate categories below (	(e.g., Materials or feedstock substitution;
If 'Yes', explain why no option will be implement	ted:**	
Materials or feedstock substitution		

Diffication of an improved enzyme requiring ower amount of ammonia.  Stimates  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 reasonable as a result of implementing the option:  A.7  N/A  tonnes  Stimate of the amount by which the creation of the toxic substance at the facility will reduced as a result of implementing the option:  N/A  tonnes  N/A  tonnes  Stimate of the amount by which the toxic substance contained in the product leaving a callity will be reduced as a result of implementing the option:  N/A  tonnes  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the product leaving the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the toxic substance at the facility will be reduced as a result of implementing the option:  Total contained in the facility will be reduced as a result of implementing the option:  Total contained in the facility will be reduced as a result of implementing the option:  Total contained in the facility will be reduced as a result of implementing the option:	
Additional design or composition  Acribe the option:*  Utilization of an improved enzyme requiring ower amount of ammonia.  Attimates  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 reasonable as a result of implementing the option:  A.7  N/A  tonnes  4.7  N/A  tonnes	
Select All  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 ras a result of implementing the option:  \[ \begin{align*} \limits \limit	
Delization of an Improved enzyme requiring ower amount of ammonia.  Select All  Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:	
Estimated reduction in the toxic substance attributed to the implementation of this options:  Select All  Estimate of the amount by which the use of the toxic substance at the facility will be rise as a result of implementing the option:  A 7	
Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:    3	
Select All  Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:	
Select All  Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:    J	
Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:    3	lon:
Estimate of the amount by which the use of the toxic substance at the facility will be ras a result of implementing the option:    3	
as a result of implementing the option:	oducad
Solution	educeu
tonnes  0.5 % Estimate of the amount by which the creation of the toxic substance at the facility will reduced as a result of implementing the option:    N/A	
Estimate of the amount by which the <b>creation</b> of the toxic substance at the facility will reduced as a result of implementing the option:    N/A	
Estimate of the amount by which the <b>creation</b> of the toxic substance at the facility will reduced as a result of implementing the option:    N/A	
reduced as a result of Implementing the option:    N/A   tonnes	l be
N/A tonnes  %  Estimate of the amount by which the toxic substance contained in the product leaver facility will be reduced as a result of implementing the option:    N/A tonnes   N/A ton	
Estimate of the amount by which the toxic substance contained in the product leaving facility will be reduced as a result of implementing the option:  N/A  **Tonnes**  **Section**  **Section**  **Section**  **Section**  **Output	
% Estimate of the amount by which the toxic substance contained in the product leaving facility will be reduced as a result of implementing the option:  N/A  N/A  N/A  Tonnes  Setimate of the amount by which the total releases to air of the toxic substance at the will be reduced as a result of implementing the option:  N/A  Tonnes  0.02  N/A  Tonnes  0.5  %  Estimate of the amount by which the total releases to water of the toxic substance of facility will be reduced as a result of implementing the option:  N/A  Tonnes  Setimate of the amount by which the total releases to land of the toxic substance of facility will be reduced as a result of implementing the option:  N/A	
facility will be reduced as a result of implementing the option:	
N/A tonnes	ng the
Estimate of the amount by which the total releases to air of the toxic substance at the will be reduced as a result of implementing the option:	
%  Estimate of the amount by which the total releases to air of the toxic substance at the will be reduced as a result of implementing the option:	
will be reduced as a result of Implementing the option:	
N/A tonnes  0.5 %  Estimate of the amount by which the total releases to water of the toxic substance of 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 facility will be reduced as a result of implementing the option:	ne facility
N/A tonnes  0.5 %  Estimate of the amount by which the total releases to water of the toxic substance of facility will be reduced as a result of implementing the option:	
tonnes  0.5 %  Estimate of the amount by which the total releases to water of the toxic substance of facility will be reduced as a result of implementing the option:	
% Estimate of the amount by which the total releases to water of the toxic substance of facility will be reduced as a result of implementing the option:  N/A  **Tonnes**  **Stimate of the amount by which the total releases to land of the toxic substance at facility will be reduced as a result of implementing the option:    File   N/A	
Estimate of the amount by which the total releases to water of the toxic substance of facility will be reduced as a result of implementing the option:  N/A  tonnes  **  **  **  **  **  **  **  **  **	
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 facility will be reduced as a result of implementing the option:    P    N/A	str teles c
N/A tonnes % Estimate of the amount by which the total <b>releases to land</b> of the toxic substance at facility will be reduced as a result of implementing the option:  IF: N/A	ic tile
*************************************	
Estimate of the amount by which the total <b>releases to land</b> of the toxic substance at facility will be reduced as a result of implementing the option: 당 N/A	
Estimate of the amount by which the total <b>releases to land</b> of the toxic substance at facility will be reduced as a result of implementing the option:	
facility will be reduced as a result of implemen <u>ting the option:</u> ਓ: N/A	the
N/A	une
tonnes	
l	
<b>%</b>	
Estimate of the amount by which the <b>disposals on-site</b> (including tailing and waster the toxic substance at the facility will be reduced as a result on implementing this option.	
N/A tonnes	

₽.	
N/A	toward and the same of the sam
	tonnes
%	
· <del>-</del>	total recycling off-site of the toxic substance at the facility
will be reduced as a result on imp	elementing this option:
N/A	
	tonnes
%	
Timelines	
Anticipated timeline for achieving	the estimated reduction
Select All	
Anticipated timelines for achieving	g the estimated reduction of the <b>use</b> of the toxic substance:
N/A	2
.47.	years
	g the estimated reduction of the <b>creation</b> of the toxic
substance;	2
N/A	
	years
nent or process modifications	
ner	
Which activities will be undertaken to in	pularment these reduction enting?
Which activities will be undertaken to life	spiement triese reduction options?
ielect an option:*	
Other	-9
Other	
	2
Pescribe the option:*	
Computerized monitoring system	
process within tight operating tole	erances.
Estimates	
Estimated reduction in the toylor	substance attributed to the implementation of this option:
Estimated reduction in the toxic s	abstance attributed to the implementation of this option.
Select All	
	the use of the toxic substance at the facility will be reduced
as a result of implementing the o	ption:
I≅ N/A	4.7
N/ A	tonnes
0.5	
%	
Estimate of the amount by which reduced as a result of implementi	the <b>creation</b> of the toxic substance at the facility will be ing the <b>option</b> :
F	Pro St. Anti-consumer and the second
N/A	tonnes
	Connes
%	
	the toxic substance <b>contained</b> in the <b>product</b> leaving the
facility will be reduced as a result	
N/A	
-	tonnes
%	
	the total <b>releases to air</b> of the toxic substance at the facility
will be reduced as a result of imp	lementing the option:
	0.02

	N/A		tonnes	
	0.5	40		
8	%			
	Estimate of the	amount by which the total <b>rel</b> educed as a result of implemen	leases to water of the toxic substance at the nting the option:	
	N/A		tonnes	
	%			
	Estimate of the	amount by which the total <b>rel</b> educed as a result of implemen	leases to land of the toxic substance at the nting the option:	
	N/A		tonnes	
			25/11/25	
	%			
	Estimate of the the toxic substa	amount by which the <b>disposa</b> nce at the facility will be reduc	als on-site (including tailing and waste rock) of ced as a result on implementing this option:	
	N/A		***************************************	
			tonnes	
	%			
	Estimate of the	amount by which the <b>disposa</b> as a result on implementing th	als off-site of the toxic substance at the facility	
	N/A		gu	
			tonnes	
	0/			
	%	,	In a see that the basic as between a ships facilities	
	will be reduced	amount by which total <b>recycle</b> as a result on implementing th		
	N/A		tonnes	
	%			
-	Fimelines			
	Select All	eline for achieving the estimate		
	Anticipated time	elines for achieving the estimat	ited reduction of the use of the toxic substance:	
	N/A		. 2	
	·		years `	
	Anticipated time substance:	elines for achieving the estimat	ated reduction of the <b>creation</b> of the toxic	
	₹			
	N/A		years	
			,	
		2		
Spill or	leak prevention			
Empt	У			
On-site	reuse, recycling or	recovery		
Empt	cy .			
Improve	ed inventory manag	gement or purchasing techniques		
Empl	Ty .		91	
Good o	perator practice or	training		
Empl	iv	and the second of the second and advantagement for the		
-iiip0	''			

Rationale for choosing these options for implementation:

Ucerse number of the toxic substance reduction planner who made the recommendations for this substance (format TSRP2XXX).*  TSRP0190  License number of the toxic substance reduction planner who certified the plan for this substance (format TSRP2XXXX).*  TSRP0190  Which version of the plan is reflected in this summary?*  New Plan  P-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?**  Trils 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?:**  If has been determined that it is not technically and economically feasible at this time to create the creation of carbon monoxide. Even though GFSA or creating plans of this substance?:**  It has been determined that it is not technically and economically feasible at this time to creating have reduction options at this time to reduce the creation of carbon monoxide. Even though GFSA or creating plans at this time to reduce the creation of carbon monoxide. Even though GFSA or creating plans at this time to reduce the creation of carbon monoxide. Even though GFSA or creating plans at this time to reduce the creation of carbon monoxide. Even though GFSA or creating plans at this time to reduce the creation of carbon monoxide. Even though GFSA or creating plans at this time to reduce the creating plans at this time to reduce the creating plans at the state of the plan for not creating less of this substance?**		Summary of actions undertaken outside of the plan to reduce the use and creation of this toxic substance at the facility:
(format TSRPXXXX):* TSRP0190  Ucense 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  -08-0, Carbon monoxide  330-08-0, Carbon monoxide  300-08-0, 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 'nor', 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 'nor', 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		
Ucense number of the toxic substance reduction planner who certified the plan for this substance (format TSRPXXXXX):*  TSRPXXXXX TSRPXXXXI TSRPXXXXI New Plan  Which version of the plan is reflected in this summary?*  New Plan  -08-0, Carbon monoxide 330-08-0, 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 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		
TSRPXXXXX):* TSRPXXXXX  New Plan  Which version of the plan is reflected in this summary?*  New Plan  P-08-0, Carbon monoxide  330-08-0, Carbon monoxide  330-08-0, Carbon monoxide  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		
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New Plan  -08-0, Carbon monoxide  30-08-0, Carbon monoxide  30-08-0, Carbon monoxide  substances Saction 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?:**  If 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		TSRP0190
20-08-0, Carbon monoxide 30-08-0, 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?:**  If 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		Which version of the plan is reflected in this summary?*
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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		If 'no', what rationale is specified in the plan for not using less of this substance?**
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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		Creation
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		
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		No No
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		If 'yes', provide the exact statement of Intent:**
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		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
Plan Objectives	c	Objectives, Targets and Description
		Plan Objectives
		Objectives in plan:*

Toxic Substance Use Targets

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.

		Quantity	Unit	
C.				
No target	or	·		
Imeframe target:*				
B	or	Lee-		-
No target		years		
<b>)</b>		,		
Description of use targets:				
ic Substance Creation Targets			<u> </u>	
Reduction target:*	_			
_		Quantity	Unit	
M No target	ог			
No target				
Timeframe target:				
·				
<b>原</b> No target	or			
No target		years		
Description of creation targets:				
sons for Using this Toxic Substance				
This substance is used at the facility:*				
This substance is not used at the fa	cility			
Summarize why this substance is used	at the facilit	:y:**		
asons for Creating this Toxic Substance				
This substance is created at the facility	v:*			
As a by-product				12
Summarize why this substance is crea				
Ethanol is produced at the Chathan raw material. Corn is first milled, the mixing with water, then the slurry it mashing stage. Enzymes and chem the mashing stage to convert the o	nen slurried t is cooked in t icals are add	ny the ed at		

mashed/ cooked corn is then sent to the sacharrification stage, in which the mash is cooled, and glucoamylase enzyme is added to break down the dextrose chains to individual glucose molecules. The sacharrified 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 dloxide during its propagation stage. The fermented mash containing ethanol, is then pumped to the distillation system, wherein ethanol is separated from the sollds 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 boller 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**

cic substance reduction option(s) to be implemented:	
Does the plan specify that no toxic reduction option will b	e implemented?*
Yes	
If 'No', record the option(s) under the appropriate catego Product design or reformulation).	ries below (e.g., Materials or feedstock substitution;
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	
Emply	

	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
	4 Mr. and 21 Garages des NOO
	-1, Nitrogen oxides (expressed as NO2)
1104-	93-1, Nitrogen oxides (expressed as NO2)
ubsta	inces Section Data
Stat	ement of Intent
	58
	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 substanc is not used at this facility.
c	reation
	Description of the second seco
	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 yes, provide the exact statement of medici
	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

n Objectives		. 2		2
Objectives in plan:*				
It has been determined that it is economically feasible at this time creation of nitrogen oxides. Even Chatham facility has decided not reduction options at this time it w future.	to reduce the though GFSA to implement a	iny		
ula Cubatanas Ilas Taineti				
klc Substance Use Targets  Reduction target:*				
		Quantity	Unit	
ं स्थ				
No target	ОГ			
Timeframe target:*				
<b>©</b>				
No target	or	years		
Description of use targets:				
kic Substance Creation Targets				
Reduction target:*				
		Quantity	Unit	
<b>.</b>		•		
No target	or			
			30	
Timeframe target:				
•				
	or			
No target		years		
Description of greation targets:				
Description of creation targets:				8
Description of creation targets:				E.
				*
	/:*			*
asons for Using this Toxic Substance			91	*
asons for Using this Toxic Substance This substance is used at the facility			9:	*
asons for Using this Toxic Substance This substance is used at the facility	facility	ty:**	25	*
asons for Using this Toxic Substance  This substance is used at the facility  This substance is not used at the	e facility sed at the facili	ty:**	21	*
asons for Using this Toxic Substance  This substance is used at the facility  This substance is not used at the  Summarize why this substance is us	e facility sed at the facili	ty:**	8	*
asons for Using this Toxic Substance  This substance is used at the facility  This substance is not used at the  Summarize why this substance is us	e facility sed at the facili	ty:**		*
asons for Using this Toxic Substance  This substance is used at the facility This substance is not used at the  Summarize why this substance is used.  This substance is not used at the	e facility sed at the facili e facility,	ty:**	8	*

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 sacharrification stage, in which the mash is cooled, and glucoamylase enzyme is added to break down the dextrose chains to individual glucose molecules. The sacharrified 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
10	PM10 - Particulate Matter <= 10 Microns  9, PM10 - Particulate Matter <= 10 Microns
10! tar	9, PM10 - Particulate Matter <= 10 Microns nces Section Data
10! tar	9, PM10 - Particulate Matter <= 10 Microns nces Section Data ment of Intent
10! tar	9, PM10 - Particulate Matter <= 10 Microns nces Section Data ment of Intent
10! ar	9, PM10 - Particulate Matter <= 10 Microns  meet of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar at their facility?*
10! ar	9, PM10 - Particulate Matter <= 10 Microns  nces Section Data  ment of Intent  se  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar
10! tar	9, PM10 - Particulate Matter <= 10 Microns  meet of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar at their facility?*
io: ar	9, PM10 - Particulate Matter <= 10 Microns nces Section Data ment of Intent se  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar at their facility?*  No
10! ar	9, PM10 - Particulate Matter <= 10 Microns  ment of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar at their facility?*  No  If 'yes', provide the exact statement of intent:**
10! ar	9, PM10 - Particulate Matter <= 10 Microns  meet of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar 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?**
io: ar	9, PM10 - Particulate Matter <= 10 Microns  ment of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar at their facility?*  No  If 'yes', provide the exact statement of intent:**
10! tar	9, PM10 - Particulate Matter <= 10 Microns  meet of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar 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?**
10! arte	P, PM10 - Particulate Matter <= 10 Microns Inces Section Data Imment of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar 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.
10! arte	9, PM10 - Particulate Matter <= 10 Microns  ment of Intent  B  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substant 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.
io:	P, PM10 - Particulate Matter <= 10 Microns  Inces Section Data  Imment of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substar 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.  Does the plan include a statement that stipulates the owner or operator's intent to create less of this toxic
ar te	p, PM10 - Particulate Matter <= 10 Microns  meet Section Data  ment of Intent  Does the plan include a statement that stipulates the owner or operator's Intent to use less of this toxic substant 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.  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
io:	9, PM10 - Particulate Matter <= 10 Microns  ment of Intent  Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substar 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,  eation  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

https://inrp-npri.ss.ec.gc.ca/onmoetra\_meolrt/V013

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

n Objectives			
Öbjectives in plan:*			
GFSA, Chatham Facility Intend of Particulate Matter 10 micro detection program.			
cic Substance Use Targets			
Reduction target:*		9	
	Quantity	Unit	
No target	or		
Timeframe target:*			
厨	ог		
No target	years		
Description of use targets:			
kic Substance Creation Targets		17	
Reduction target:*			
	Quantity	Unit	
<b>泛</b>	<sup>(1)</sup>		
No target	or		
Timeframe target:	UP1		
•			
P	or		
লে No target	<b>or</b> years		
-			
No target			
No target  Description of creation targets:	years		
No target  Description of creation targets: asons for Using this Toxic Substance	years	<i>I</i>	
No target  Description of creation targets: asons for Using this Toxic Substance	years		
No target  Description of creation targets: asons for Using this Toxic Substance This substance is used at the fac This substance is not used at	years  cility:*  the facility		
No target  Description of creation targets: asons for Using this Toxic Substance This substance is used at the fac	years  cility:*  the facility  s used at the facility:**		627
No target  Description of creation targets: asons for Using this Toxic Substance This substance is used at the fac This substance is not used at Summarize why this substance i This substance is not used at	years  cility:*  the facility  s used at the facility:**  this facility.		
No target  Description of creation targets: asons for Using this Toxic Substance This substance is used at the fac This substance is not used at Summarize why this substance i	years  cility:*  the facility  s used at the facility:**  this facility.		

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 sacharlfied, 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 bollers 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?\* 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. Estimated reduction in the toxic substance attributed to the implementation of this option:

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:

<b>▽</b>	147
N/A	tonnes
	Connes
%	
	which the <b>creation</b> of the toxic substance at the facility will be menting the option:
П	0.39
N/A	tonnes
0.5	
%	
	which the toxic substance <b>contained in the product</b> leaving the esult of implementing the option:
N/A	tanac
	tonnes
%	
· ·	which the total <b>releases to air</b> of the toxic substance at the facility
I be reduced as a result of	implementing the option:
F.	0.39
N/A	tonnes
0.5	
%	
	which the total <b>releases to water</b> of the toxic substance at the esult of implementing the option:
N/A	toppes
	tonnes
0/0	
·-	
	which the total <b>releases to land</b> of the toxic substance at the esult of implementing the option:
N/A	tonnes
	\$1
%	
Alamaka afikha ( )	
	which the <b>disposals on-site</b> (including tailing and waste rock) of clifty will be reduced as a result on implementing this option:
e toxic substance at the fac	cllity will be reduced as a result on implementing this option:
e toxic substance at the factor of the facto	
e toxic substance at the fac V N/A	cllity will be reduced as a result on implementing this option:
e toxic substance at the factor of the factor of the amount by will be reduced as a result or the factor of the fa	cllity will be reduced as a result on implementing this option:
e toxic substance at the factor in N/A % timate of the amount by will be reduced as a result or	tonnes the disposals off-site of the toxic substance at the facility
e toxic substance at the factor of the factor of the amount by will be reduced as a result or the factor of the fa	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in Implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result or of the amount by will be reduced as a result or	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in Implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result or of the amount by will be reduced as a result or of the amount by will be reduced as a result or the amount by will be red	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in Implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result or of the amount by will be reduced as a result or of the amount by will be reduced as a result or of the amount by will be reduced as a result or or or	tonnes  which the disposals off-site of the toxic substance at the facility implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility
e toxic substance at the factor of the amount by will be reduced as a result or of the amount by will be reduced as a result or of the amount by will be reduced as a result or the amount by will be reduced as a result or	tonnes  which the disposals off-site of the toxic substance at the facility implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility
when the amount by well be reduced as a result or property.  When the amount by well be reduced as a result or property.  When the amount by well be reduced as a result or property.	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in implementing this option:  tonnes  which total <b>recycling off-site</b> of the toxic substance at the facility in implementing this option:
we toxic substance at the factor in N/A  % timate of the amount by will be reduced as a result or in N/A  % timate of the amount by will be reduced as a result or in N/A	tonnes  which the disposals off-site of the toxic substance at the facility in implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result o	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in implementing this option:  tonnes  which total <b>recycling off-site</b> of the toxic substance at the facility in implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result o	tonnes  which the disposals off-site of the toxic substance at the facility in implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result o	tonnes  which the <b>disposals off-site</b> of the toxic substance at the facility in implementing this option:  tonnes  which total <b>recycling off-site</b> of the toxic substance at the facility in implementing this option:
e toxic substance at the factor of the amount by will be reduced as a result o	tonnes  which the disposals off-site of the toxic substance at the facility in implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in implementing this option:
e toxic substance at the fact of the amount by will be reduced as a result or the amount by will be reduced as a result or the amount by will be reduced as a result or the amount by will be reduced as a result or the amount by will be reduced as a result or the amount by will be reduced as a result or the	tonnes  which the disposals off-site of the toxic substance at the facility in Implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in Implementing this option:  tonnes  which total recycling off-site of the toxic substance at the facility in Implementing this option:  tonnes

NA - M1

d'

years

	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
0,	
	New Plan
11(	New Plan PM2.5 - Particulate Matter <= 2.5 Microns
ıı(	PM2.5 - Particulate Matter <= 2.5 Microns  0, PM2.5 - Particulate Matter <= 2.5 Microns
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  PM2.5 - Particulate Matter <= 2.5 Microns  Description Data  The ment of Intent
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  PM2.5 - Particulate Matter <= 2.5 Microns  Description Data  The ment of Intent
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  0, PM2.5 - Particulate Matter <= 2.5 Microns  1, pces Section Data  1, peech of Intent  2  Does the plan Include a statement that stipulates the owner or operator's Intent to use less of this toxic substance
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  0, PM2.5 - Particulate Matter <= 2.5 Microns  10 ces Section Data  10 ment of Intent  2
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  0, PM2.5 - Particulate Matter <= 2.5 Microns  10
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  7, PM2.5 - Particulate Matter <= 2.5 Microns  9 ces Section Data  ment of Intent  9 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:**
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  PM2.5 - Particulate Matte
ar te	PM2.5 - Particulate Matter <= 2.5 Microns  7, PM2.5 - Particulate Matter <= 2.5 Microns  9 ces Section Data  ment of Intent  9 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:**
11( ar ter Us	PM2.5 - Particulate Matter <= 2.5 Microns  PM2.5 - Particulate Matte

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

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

ctives, Targets and Description			
an Objectives			
Objectives in plan:*		Ĭ.	
GFSA, Chatham Facility Inter of Particulate Matter <= 2.5 leak detection program.	nds to reduce the creation microns through a new		
oxic Substance Use Targets			
Reduction target:			
	Quantity	Unit	
<u>ত্</u> ব			
No target	or _		
Timeframe target;*			
<b>?</b>	or		
No target	years		
Description of use targets:			
oxic Substance Creation Targets			
	Quantity	Unit	
oxic Substance Creation Targets  Reduction target:*	Quantity	Unit	
oxic Substance Creation Targets	<b>Quantity</b> or	Unit	
exic Substance Creation Targets  Reduction target:*  Reduction target:  No target		Unit	
oxic Substance Creation Targets  Reduction target:*		Unit	
exic Substance Creation Targets  Reduction target:*  No target  Timeframe target:	or !	Unit	
exic Substance Creation Targets  Reduction target:*  Reduction target:  No target		Unit	
exic Substance Creation Targets  Reduction target:*  No target  Timeframe target:  *	or vears	Unit	
Reduction target:*  Reduction target:*  No target  Timeframe target:  No target	or vears	Unit	
Reduction target:*  Reduction target:*  No target  Timeframe target:  No target  Description of creation targets:	or years	Unit	

#### 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 dloxide, and distillers grains products. The above products are produced at the Chatham facility using corn raw material. Corn is first milled, then slurrled by mixing with water, then the slurry is cooked in the mashing stage. The slurry is then sacharified, and fermented, to produce of thems. produce ethanol. The fermented beer is then sent through distillation columns to separate the ethanol and sollds 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**

ic substance reducțio	n option(s) to be implemented:		
Does the plan speci	fy that no toxic reduction option will be Implemente	d?*	
No	-		
If 'No', record the o Product design or n	ptlon(s) under the appropriate categories below (e. eformulation).	g., Materials or feedstock substi	tution;
If 'Yes', explain why	no option will be implemented:**		
Materials or feedstock	substitution		
Empty			
Product design or refe	ormulation		
Empty		W	
Equipment or process	modifications		
Empty			
Spill or leak preventlo	n		
Implemented inspe	action or monitoring program of potential spill or leak sour	rces	
Which activitie	s will be undertaken to Implement these reduction options	?	
Select an optic	n:*		
Implemente sources	ed Inspection or monitoring program of potential spi	ll or leak	

Describe the option:\*

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

Estimates	
8	
Estimated reduc	tion in the toxic substance attributed to the implementation of this option:
Select All	
	amount by which the <b>use</b> of the toxic substance at the facility will be reduced
as a result of Im	plementing the option:
N/A	tonnes
<del></del>	
%	
	amount by which the greation of the toyle cubstance at the facility will be
	amount by which the <b>creation</b> of the toxic substance at the facility will be suit of implementing the option:
N/A	0.12
	tonnes
0.5	
%	
	amount by which the toxic substance <b>contained in the product</b> leaving the duced as a result of implementing the option:
N/A	
	tonnes
%	
will be reduced a	amount by which the total <b>releases to air</b> of the toxic substance at the facilities a result of implementing the option:
Ma N∕A	0.07
II/A	tonnes
0.5	
%	
	amount by which the total <b>releases to water</b> of the toxic substance at the educed as a result of implementing the option:
· N/A	
	tonnes
%	
	amount by which the total <b>releases to land</b> of the toxic substance at the educed as a result of implementing the option:
N/A	
	tonnes
%	
	amount by which the <b>disposals on-site</b> (including talling and waste rock) of nce at the facility will be reduce <u>d as a</u> result on implementing this option:
N/A	tonnes
	tolnics
%	
	amount by which the <b>disposals off-site</b> of the toxic substance at the facility as a result on implementing this option:
N/A	tonnes
	NAME OF THOSE
0/	8
%	
Estimate of the will be reduced	amount by which total <b>recycling off-site</b> of the toxic substance at the facilities as a result on implementing this option:
N/A	
	tonnes

% Timelines Anticipated timeline for achieving the estimated reduction 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 N/A 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?\*

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

No

ation				
Does the plan include a stateme substance at their facility?*	nt that stipulates the	e owner or operat	or's intent to create less of this to	xic
Yes		19		
If 'yes', provide the exact stater	nent of Intent: **			
<ul> <li>GFSA, Chatham Facility inte of Total Particulate Matter.</li> </ul>	ends to reduce its cre	eation		
If 'no', what rationale is specifie	d in the plan for not	creating less of t	nis substance?:**	
Sives Torrets and Departation				
tives, Targets and Description  Objectives				
Objectives in plan:*				
GFSA, Chatham Facility Inter of Total Particulate Matter th detection program.	ds to reduce the cre rough a new leak	ation		
Ic Substance Use Targets				
Reduction target:*		- ii		
		Quantity	Unit	
ল No target	or			
Timeframe target:*	_			
(S)	* or			
No target		years		
Description of use targets:				
ic Substance Creation Targets				
Reduction target:*		_		
		Quantity	Unit	
<b>⊠</b>	or			
No target	OI .			
Timeframe target:				
•)				
<b>्र</b>	or			
No target		years		

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

#### 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 sachharified, 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 sp	ecify that no toxic	c 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?

elect an option:*	
Modified equipment, layout or	piping
escribe the option:*	
Installation of equipment to co from the dried distillers grain s energy to a greenhouse develo	stack and transfer
Estimates	
Estimated reduction in the toxi	ic substance attributed to the Implementation of this option:
Select All	
as a result of implementing the	ich the <b>use</b> of the toxic substance at the facility will be reduced e option:
I≅ N/A	
19/4	tonnes
%	8
reduced as a result of impleme	ich the <b>creation</b> of the toxic substance at the facility will be enting the option:
F≅ N/A	1.13
	tonnes
0.5	
%	
Estimate of the amount by white facility will be reduced as a res	ich the toxic substance <b>contained in the product</b> leaving the sult of implementing the option:
N/A	tonnes
	comes
04	
% Estimate of the amount by whi will be reduced as a result of in	ich the total <b>releases to air</b> of the toxic substance at the facility
厚	1.08
N/A	tonnes
0.5	
%	
facility will be reduced as a res	lich the total <b>releases to water</b> of the toxic substance at the sult of implementing the option:
I⊽: N/A	
N/A	tonnes
%	
	olch the total <b>releases to land</b> of the toxic substance at the sult of implementing the option:
N/A	
	tonnes
%	
Estimate of the amount by wh the toxic substance at the facility.	nich the <b>disposals on-site</b> (Including talling and waste rock) of lity will be reduced as a result on Implementing this option:
N/A	tonnes
	tonnes
0/	**
% 	the the standard asset as a state and a to the second state of the
will be reduced as a result on	nich the <b>disposals off-site</b> of the toxic substance at the facility implementing this option:
N/A	
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		ertaken outside	of the plan to reduce	the use and c	reation of this	toxic substance at th

	License number of the toxic substance reduction planner who made the recommendations for this substance (format TSRPXXXX):*
	TSRP0190
(4	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
8-82-8, C	cumene
98-82-8	, Cumene
Substa	nces Section Data
State	ement of Intent
Us	se
	Does the plan include a statement that stipulates the owner or operator's intent to use less of this toxic substance
	at their facility?*
(8)	Yes
	If 'yes', provide the exact statement of intent:**
	GFSA, Chatham Facility Intends to reduce its use of Cumene.
С	reation
	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: **
	2. 100 / P. 0.1. 2. 3. 3. 3. 2. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
	If 'no', what rationale is specified in the plan for not creating less of this substance?:**
	This substance is not created at this facility.
Obje	ectives, Targets and Description
P	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
7	Foxic Substance Use Targets
- 2	
	Reduction target:
	Quantity Unit

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substance reduction option(s) to be implement	nented:	
oes the plan specify that no toxic redu	ction option will be implemented?*	
No		
'No', record the option(s) under the a oduct design or reformulation).	ppropriate categories below (e.g., Materials	or feedstock substitutio
'Yes', explain why no option will be in	plemented:**	
afarials 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 Intenduse of Cumene by substituting	is to reduce its	
with natural gasoline, containing toxic substances	g lower levels of	30
Estimates		
Fellowated reduction in the tayle	substance attributed to the implementation	of this option:
10	. substance attributed to the implementation	
Select All	ch the use of the toxic substance at the facil	ity will be reduced
as a result of Implementing the	option:	14, 1111 00 1000
<b>B</b>	2.86	
N/A	tonnes	
25 %		
	ch the <b>creation</b> of the toxic substance at the enting the option:	e facility will be
<b>18</b>		
N/A	tonnes	
%	S	aduct leaving the
facility will be reduced as a res	ich the toxic substance contained in the pr suit of implementing the option:	Ouder leaving the
N/A	2.73	
	tonnes	
25		
% Estimate of the amount by wh will be reduced as a result of i	ich the total <b>releases to air</b> of the toxic sub	estance at the facility
<u> </u>	0.05	
N/A	tonnes	
25 %		
Estimate of the amount by wh	ich the total <b>releases to water</b> of the toxic sult of implemen <u>ting the option:</u>	: substance at the
N/A	tonnes	
4.		
%		
EX.		

	which the total <b>releases to land</b> of the toxic substance at the result of implementing the option:
	tonnes
%	
the toxic substance at the f	which the <b>disposals on-site</b> (including tailing and waste rock) of facility will be reduced as a result on implementing this option:
N/A	tonnes
%	
	which the <b>disposals off-site</b> of the toxic substance at the facility on implementing this option:
N/A	Assessed to the second
	tonnes
%	
Estimate of the amount by	which total <b>recycling off-site</b> of the toxic substance at the facility on Implementing this option:
N/A	tonnes
	Connect
%	
Timelines	•
Select All	nieving the estimated reduction
Anticipated timelines for ac	chieving the estimated reduction of the <b>use</b> of the toxic substance:
N/A	1 years
substance:	chieving the estimated reduction of the <b>creation</b> of the toxic
	years
roduct design or reformulation	
Empty	
quipment or process modifications	
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pill or leak prevention	
Empty	
On-site reuse, recycling or recovery	
Empty	- 12
mproved inventory management or pur	rchasing techniques
Empty	
Good operator practice or training	
Empty	
Rationale for choosing these option	ns for implementation:
and the same appear	0
Summary of actions undertaken ou	utside 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

Chemical Abstracts Service Registry  NPRI Identification Number  573  ID Number Assigned to Facility by the Ministry of the Environment for purposes of Reg 127/01  Legal and Trade names of the Owner and the Operator of the Facility, Street address of the Facility  Ont  Business Number  The number of Full –time Employee Equivalents at the Facility  Two Digit North American Industry Classification System (NAICS)  Four Digit NAICS  Six Digit NAICS  Six Digit NAICS  325  Mai  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.  The Licence number of the toxic substance reduction planner  TSR	huric Acid 4-93-9 9 enField Ethanol
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·	
	P0190
who is responsible signing a certification plan.	
The Spatial coordinates of the facility expressed in Universal	
Transverse Mercator (UTM) within a North American Datum 42.3	
83 (NAD83) datum -82.	88390

### **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 1<sup>st</sup> 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
<b>Equipment Maintenance</b>	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 (tonnes	Releases /year)		Disposal (tonnes/y	ear)	Off-site Recycli ng
		=		Air	Water	Land	On-site	Off-site	(tonnes
							-		/year)
Baseline	2461.5	0	0	0	0	0	0	0	0
Estimated	2338.4	0	0	0	0	0	0	0	0
Reduced	· ·								
Total									
Reduction	123.1	0	0	0	0	0	0	0	0
%	5%	0	0	0	0	0	0	0	0
Reduction									

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

Option	Step	Target Completion Date
Product Design or	Test enzyme	2014 – 2020
Reformulation	Dadina na afanlah ni aaid	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			
X)	Facility			
Name of Substance				
(9)	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	Greenfield Specialty Alcohols			
Facility, Street address of the Facility	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	32			
(NAICS)				
Four Digit NAICS	3251			
Six Digit NAICS	<sup>3</sup> #			
9	325190 Other Basic Organic Chemical			
	Manufacturing			
Name and Position and Telephone number of the individual	Angelo Ligori Plant Manager			
who is the contact at the facility for the public.	519-436-1130 Ext 8123			
The License number of the toxic substance reduction planner	TSRP0190			
who is responsible for making recommendations in the plan.				
The License number of the toxic substance reduction planner	TSRP0190			
who is responsible signing a certification plan.				
The Spatial coordinates of the facility expressed in Universal	UTM Easting: 399423.1935960233			
Transverse Mercator (UTM)within a North American Datum	UTM Northing: 4693124.570649816			
83 (NAD83) datum				

### **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: GFSA Chatham Facility

Substance: Ammonia

CAS#: NA-16

**Reduction Option: Product Design or Reformulation** 

	Used (tonnes/ year)	Create d (tonne	Contained in Product (tonnes/year)	On-site Releases (tonnes/year)		Disposal (tonnes/year)		Off-site Recycli ng	
		s /year)		Air	Water	Land	On-site	Off-site	(tonnes /year)
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	Test enzyme	2014 (ongoing)
Reformulation		
	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