## TOXIC REDUCTION POLICY STATEMENT OF INTENT

BioAmber does not intend to reduce the use of ammonia (as ammonium hydroxide) for the production of Succinic acid as is it required to provide the biomass with nitrogen. However, BioAmber is committed to playing a leadership role in protecting the environment. Wherever feasible, BioAmber will strive forward to eliminate or reduce the use and discharge of ammonia in full compliance with all federal and provincial regulations. Our employees are encouraged to participate in all types of toxic substance reduction activities. Toxic substance reduction will be an ongoing effort at BioAmber, and we will continue to monitor advancements in succinic acid production to ensure that options that are both technologically and financially viable are implemented at our facility.

## REDUCTION OBJECTIVES

All employees at BioAmber Sarnia Inc. will be involved in the reduction of toxic substance use, creation and releases.

No current options were identified that are technically feasible or economically feasible.

## PLAN SUMMARY STATEMENT

This plan summary accurately reflects the content of the toxic substance reduction plan for ammonia, prepared on behalf of BioAmber Sarnia Inc. dated December 20, 2017.

## DESCRIPTION OF SUBSTANCE

Ammonia is a Phase II toxic compound under TRA and is used as a nutrient additive and base to both the fermenter and the bioconverter.

# BASIC FACILITY INFORMATION

Company Name: BioAmber Sarnia Inc.

Contact Information:

Highest Ranking Employee: Trevor MacLeod
Plant Manager
(519) 344-0065
Trevor.macleod@sarniajv.bio-amber.com

Technical Contact: Daniela Orecchioni
Director, Corporate QHSE
(519) 344-0065
Daniela.Orecchioni@bio-amber.com

Certified Planner: Beth Rhyno, P.Eng.
License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler
519- 650-7104
beth.rhyno@amecfw.com

Facility Address: 1265 Vidal Street
Sarnia, Ontario
N7T 7V8

Business Number: 813019858

NPRI ID: 29205

Location (of main gate) Zone – 17
383930 m E
4755300 m N

In 2016, BioAmber Inc. employed about 59 full time employees (equivalent).

The NAICS codes applicable to the facility are: 325199

| | |
|---|---|
| 32 | – Manufacturing |
| 3251 | – Basic Chemical Manufacturing |
| 325199 | – Other Basic Organic Chemical Manufacturing |

The site uses 2 Phase I MOECC Toxic Compounds and 2 Phase II MOECC Toxic Compounds for which TRA planning is required:

| **MOECC Phase I Toxic Compound** | **CAS Number** |
|---|---|
| Hydrochloric Acid | 7647-01-0 |
| Sulphuric Acid | 7664-93-9 |
| **MOECC Phase II Toxic Compound** | **CAS Number** |
| Ammonia | 7664-41-7 |
| Phosphorus | NA - 22 |

This plan is specific to Ammonia as a Phase II Toxic Compound as per the O.Reg.455 definition.

## CERTIFICATION OF HIGHEST RANKING EMPLOYEE

As of December 20, 2017, I, Trevor MacLeod, certify that I have read the toxic substance reduction plan for the toxic substances referred to below and am familiar with its contents, and to my knowledge the plan is factually accurate and complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

**Ammonia** CAS# 7664-41-7

Trevor MacLeod
Plant Manager
BioAmber Sarnia Inc.

## CERTIFICATION OF LICENSED PLANNER

As of December 20, 2017, I, Beth Rhyno, certify that I am familiar with the processes at BioAmber Sarnia Inc. that use or create the toxic substance referred to below, that I agree with the estimates referred to in subparagraphs 7 iii, iv and v of subsection 4 (1) of the Toxics Reduction Act, 2009 that are set out in the plan dated December 20, 2017 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

**Ammonia** CAS# 7664-41-7

Beth Rhyno, P.Eng.
Licensed Toxic Reduction Planner (MOECC): License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler

## TOXIC REDUCTION POLICY STATEMENT OF INTENT

BioAmber does not intend to reduce the use of HCl from the production of Succinic acid as there are no technically viable options available. However, BioAmber is committed to playing a leadership role in protecting the environment. Wherever feasible, BioAmber will strive forward to eliminate or reduce the usage of HCl in full compliance with all federal and provincial regulations. Our employees are encouraged to participate in all types of toxic substance reduction activities. Toxic substance reduction will be an ongoing effort at BioAmber, and we will continue to monitor advancements in Succinic acid production to ensure that options that are both technologically and financially viable are implemented at our facility.

## REDUCTION OBJECTIVES

All employees at BioAmber Sarnia Inc. will be involved in the reduction of toxic substance use, creation and releases.

No current options were identified that are technically feasible or economically feasible.

## PLAN SUMMARY STATEMENT

This plan summary accurately reflects the content of the toxic substance reduction plan for phosphorus, prepared on behalf of BioAmber Sarnia Inc. dated December 20, 2017.

## DESCRIPTION OF SUBSTANCE

HCl is a Phase I toxic compound under TRA and is used to regenerate the ion exchange.

# BASIC FACILITY INFORMATION

Company Name: BioAmber Sarnia Inc.

Contact Information:

Highest Ranking Employee: Trevor MacLeod
Plant Manager
(519) 344-0065
Trevor.macleod@sarniajv.bio-amber.com

Technical Contact: Daniela Orecchioni
Director, Corporate QHSE
(519) 344-0065
Daniela.Orecchioni@bio-amber.com

Certified Planner: Beth Rhyno, P.Eng.
License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler
519- 650-7104
beth.rhyno@amecfw.com

Facility Address: 1265 Vidal Street
Sarnia, Ontario
N7T 7V8

Business Number: 813019858

NPRI ID: 29205

Location (of main gate) Zone – 17
383930 m E
4755300 m N

In 2016, BioAmber Inc. employed about 59 full time employees (equivalent).

The NAICS codes applicable to the facility are: 325199

| | |
|---|---|
| 32 | – Manufacturing |
| 3251 | – Basic Chemical Manufacturing |
| 325199 | – Other Basic Organic Chemical Manufacturing |

The site uses 2 Phase I MOECC Toxic Compounds and 2 Phase II MOECC Toxic Compounds for which TRA planning is required:

| **MOECC Phase I Toxic Compound** | **CAS Number** |
|---|---|
| Hydrochloric Acid | 7647-01-0 |
| Sulphuric Acid | 7664-93-9 |
| **MOECC Phase II Toxic Compound** | **CAS Number** |
| Ammonia | 7664-41-7 |
| Phosphorus | NA - 22 |

This plan is specific to Hydrochloric Acid as a Phase I Toxic Compound as per the O.Reg.455 definition.

## CERTIFICATION OF HIGHEST RANKING EMPLOYEE

As of December 20, 2017, I, Trevor MacLeod, certify that I have read the toxic substance reduction plan for the toxic substances referred to below and am familiar with its contents, and to my knowledge the plan is factually accurate and complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

**Hydrochloric Acid** CAS# 7647-01-0

Trevor MacLeod
Plant Manager
BioAmber Sarnia Inc.

## CERTIFICATION OF LICENSED PLANNER

As of December 20, 2017, I, Beth Rhyno, certify that I am familiar with the processes at BioAmber Sarnia Inc. that use or create the toxic substance referred to below, that I agree with the estimates referred to in subparagraphs 7 iii, iv and v of subsection 4 (1) of the Toxics Reduction Act, 2009 that are set out in the plan dated December 20, 2017 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

**Hydrochloric Acid** CAS# 7647-01-0

Beth Rhyno, P.Eng.
Licensed Toxic Reduction Planner (MOECC): License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler

## TOXIC REDUCTION POLICY STATEMENT OF INTENT

BioAmber does not intend to reduce the use of $H_2SO_4$ from the production of succinic acid as there are no technically viable options available. However, BioAmber is committed to playing a leadership role in protecting the environment. Wherever feasible, BioAmber will strive forward to eliminate or reduce the usage of $H_2SO_4$ in full compliance with all federal and provincial regulations. Our employees are encouraged to participate in all types of toxic substance reduction activities. Toxic substance reduction will be an ongoing effort at BioAmber, and we will continue to monitor advancements in succinic acid production to ensure that options that are both technologically and financially viable are implemented at our facility.

## REDUCTION OBJECTIVES

All employees at BioAmber Sarnia Inc. will be involved in the reduction of toxic substance use, creation and releases.

No current options were identified that are technically feasible or economically feasible.

## PLAN SUMMARY STATEMENT

This plan summary accurately reflects the content of the toxic substance reduction plan for $H_2SO_4$, prepared on behalf of BioAmber Sarnia Inc. dated December 20, 2017.

## DESCRIPTION OF SUBSTANCE

$H_2SO_4$ is a Phase I toxic used on-site is to control contamination and promote deflocculation of the yeast.

# BASIC FACILITY INFORMATION

Company Name: BioAmber Sarnia Inc.

Contact Information:

Highest Ranking Employee: Trevor MacLeod
Plant Manager
(519) 344-0065
Trevor.macleod@sarniajv.bio-amber.com

Technical Contact: Daniela Orecchioni
Director, Corporate QHSE
(519) 344-0065
Daniela.Orecchioni@bio-amber.com

Certified Planner: Beth Rhyno, P.Eng.
License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler
519- 650-7104
beth.rhyno@amecfw.com

Facility Address: 1265 Vidal Street
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Business Number: 813019858

NPRI ID: 29205

Location (of main gate) Zone – 17
383930 m E
4755300 m N

In 2016, BioAmber Inc. employed about 59 full time employees (equivalent).

The NAICS codes applicable to the facility are: 325199

| | |
|---|---|
| 32 | – Manufacturing |
| 3251 | – Basic Chemical Manufacturing |
| 325199 | – Other Basic Organic Chemical Manufacturing |

The site uses 2 Phase I MOECC Toxic Compounds and 2 Phase II MOECC Toxic Compounds for which TRA planning is required:

| **MOECC Phase I Toxic Compound** | **CAS Number** |
|---|---|
| Hydrochloric Acid | 7647-01-0 |
| Sulphuric Acid | 7664-93-9 |
| **MOECC Phase II Toxic Compound** | **CAS Number** |
| Ammonia | 7664-41-7 |
| Phosphorus | NA - 22 |

This plan is specific to sulphuric acid as a Phase I Toxic Compound as per the O.Reg.455 definition.

## CERTIFICATION OF HIGHEST RANKING EMPLOYEE

As of December 20, 2017, I, Trevor MacLeod, certify that I have read the toxic substance reduction plan for the toxic substances referred to below and am familiar with its contents, and to my knowledge the plan is factually accurate and complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

**Sulphuric Acid** CAS# 7664-93-9

Trevor MacLeod
Plant Manager
BioAmber Sarnia Inc.

## CERTIFICATION OF LICENSED PLANNER

As of December 20, 2017, I, Beth Rhyno, certify that I am familiar with the processes at BioAmber Sarnia Inc. that use or create the toxic substance referred to below, that I agree with the estimates referred to in subparagraphs 7 iii, iv and v of subsection 4 (1) of the Toxics Reduction Act, 2009 that are set out in the plan dated December 20, 2017 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

**Sulphuric Acid** CAS# 7664-93-9

Beth Rhyno, P.Eng.
Licensed Toxic Reduction Planner (MOECC): License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler

## TOXIC REDUCTION POLICY STATEMENT OF INTENT

BioAmber does not intend to reduce the use of phosphorus from the production of Succinic acid as there are no technically viable options available. However, BioAmber is committed to playing a leadership role in protecting the environment. Wherever feasible, BioAmber will strive forward to eliminate or reduce the usage of phosphorus in full compliance with all federal and provincial regulations. Our employees are encouraged to participate in all types of toxic substance reduction activities. Toxic substance reduction will be an ongoing effort at BioAmber, and we will continue to monitor advancements in Succinic acid production to ensure that options that are both technologically and financially viable are implemented at our facility.

## REDUCTION OBJECTIVES

All employees at BioAmber Sarnia Inc. will be involved in the reduction of toxic substance use, creation and releases.

No current options were identified that are technically feasible or economically feasible.

## PLAN SUMMARY STATEMENT

This plan summary accurately reflects the content of the toxic substance reduction plan for phosphorus, prepared on behalf of BioAmber Sarnia Inc. dated December 20, 2017.

## DESCRIPTION OF SUBSTANCE

Phosphorus is a Phase II toxic compound under TRA and is used as a nutrient additive to the fermenter.

# BASIC FACILITY INFORMATION

Company Name: BioAmber Sarnia Inc.

Contact Information:

Highest Ranking Employee: Trevor MacLeod
Plant Manager
(519) 344-0065
Trevor.macleod@sarniajv.bio-amber.com

Technical Contact: Daniela Orecchioni
Director, Corporate QHSE
(519) 344-0065
Daniela.Orecchioni@bio-amber.com

Certified Planner: Beth Rhyno, P.Eng.
License Number TSRP0273
Senior Environmental Engineer
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Facility Address: 1265 Vidal Street
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Business Number: 813019858

NPRI ID: 29205

Location (of main gate) Zone – 17
383930 m E
4755300 m N

In 2016, BioAmber Inc. employed about 59 full time employees (equivalent).

The NAICS codes applicable to the facility are: 325199

| | |
|---|---|
| 32 | – Manufacturing |
| 3251 | – Basic Chemical Manufacturing |
| 325199 | – Other Basic Organic Chemical Manufacturing |

The site uses 2 Phase I MOECC Toxic Compounds and 2 Phase II MOECC Toxic Compounds for which TRA planning is required:

| **MOECC Phase I Toxic Compound** | **CAS Number** |
|---|---|
| Hydrochloric Acid | 7647-01-0 |
| Sulphuric Acid | 7664-93-9 |
| **MOECC Phase II Toxic Compound** | **CAS Number** |
| Ammonia | 7664-41-7 |
| Phosphorus | NA - 22 |

This plan is specific to Phosphorus as a Phase II Toxic Compound as per the O.Reg.455 definition.

## CERTIFICATION OF HIGHEST RANKING EMPLOYEE

As of December 20, 2017, I, Trevor MacLeod, certify that I have read the toxic substance reduction plan for the toxic substances referred to below and am familiar with its contents, and to my knowledge the plan is factually accurate and complies with the Toxics Reduction Act, 2009 and Ontario Regulation 455/09 (General) made under that Act.

**Phosphorus** CAS# NA - 22

Trevor MacLeod
Plant Manager
BioAmber Sarnia Inc.

## CERTIFICATION OF LICENSED PLANNER

As of December 20, 2017, I, Beth Rhyno, certify that I am familiar with the processes at BioAmber Sarnia Inc. that use or create the toxic substance referred to below, that I agree with the estimates referred to in subparagraphs 7 iii, iv and v of subsection 4 (1) of the Toxics Reduction Act, 2009 that are set out in the plan dated December 20, 2017 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

**Phosphorus** CAS# NA - 22

Beth Rhyno, P.Eng.
Licensed Toxic Reduction Planner (MOECC): License Number TSRP0273
Senior Environmental Engineer
Amec Foster Wheeler