2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summaries Phase 2 Substances

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

Version	Date Issued	Modifications
1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

Petro-Canada Lubricants Inc. (PCLI), a Suncor Energy business, is a global supplier of products ranging from automobile lubricants to white oils for the pharmaceutical market. Finished goods are shipped nationally and internationally to customers familiar with our growing reputation for high quality, environment-friendly fluids.

Located at 385 Southdown Road, the Lubricants Centre is situated on the shore of Lake Ontario beside a residential community in Mississauga, Ontario. Like our residential neighbours, we want a clean and safe environment, and a prosperous lifestyle.

Protection of the environment is a fundamental value of both PCLI and Suncor Energy. It is our responsibility to determine and manage the impacts of our business through programs like the *Toxics Reduction Act* (the Act).

We respect the important balance between economic growth and environmental stewardship and work diligently to:

- Conduct our activities with sound environmental management and conservation practices;
- Prevent risk to community health and safety from our operations or our products; and
- Transfer expertise in environmental protection to host communities.

In keeping with our commitment to meet the latest quality standards and practices, PCLI is ISO 14001 registered.

As part of our environmental stewardship, PCLI will:

- Demonstrate our commitment by maintaining our ISO 9001, ISO 14001 and ISO/TS 16949 registrations;
- Ensure our operations comply with customer requirements, specific performance standards, government legislation, corporate policy and applicable industry standards;
- Monitor the environmental impacts of our business during the start-up, normal operation and shutdown of our facilities, and through project planning, implementation and decommissioning to minimize any impact on the environment;
- Ensure all employees and affiliates are informed, trained and authorized to meet our quality and environmental performance requirements;
- Continually improve our products through design, manufacturing, delivery and service processes, achieved through our Quality and Environmental Management Systems utilizing Total Loss Management philosophies; and
- Continue to strive to establish quality and environmental objectives and targets, and periodically review performance through the Management Review Process.

To learn more about our business please visit our website at http://lubricants.petro-canada.ca/default.aspx.

These toxics substance reduction plan summaries have been prepared to meet the regulatory obligations specified in Section 8 of the Act and has been prepared in accordance with the requirements of s. 24 of Ontario Regulation (O. Reg.) 455/09, as amended from time to time. It meets the relevant reporting requirements and will be updated, as required by the Act and O. Reg. 455/09.

For more information on the Toxics Reduction Act and O. Reg. 455/09 visit: http://www.ene.gov.on.ca/environment/en/legislation/toxics_reduction_act/index.htm.

1.1 Toxic Substances

Toxic substance reduction plan summaries have been developed for the following substances and are provided in the appendices:

- 1,2,4-Trimethylbenzene, CAS No. 95-63-6
- Butane and its Isomers, CAS No. N/A
- Carbon Monoxide, CAS No. 630-08-0
- Cyclohexane, CAS No. 110-82-7
- Diethanolamine, CAS No. 111-42-2
- Hydrogen Sulphide and Total Reduced Sulphur, CAS No. 7783-06-4 and N/A
- Isopropyl Alcohol, CAS No. 67-63-0
- Methyl Ethyl Ketone, CAS No. 78-93-3
- Molybdenum Trioxide, CAS No. 1313-27-5
- N-Hexane, CAS No. 110-54-3
- Oxides of Nitrogen, CAS No. 11104-93-1
- Particulates, CAS No. N/A
  - Total Particulate Matter
  - Particulate Matter <10 microns
  - Particulate Matter <2.5 microns
- Pentane and its Isomers, CAS No. N/A
- Propane, CAS No. 74-98-6
- Propylene, CAS No. 115-07-1
- Sulphur Dioxide, CAS No. 7446-09-5

2.0 GENERAL FACILITY INFORMATION

Table 1 summarizes the general facility information with reference to the Act and/or O. Reg. 455/09.

Table 1: General Facility Information

Reporting Requirement	Facility Information	Reference to Act and/or O. Reg. 455/09
Parent Company Name	Suncor Energy Inc.	O. Reg. 455/09 s.18(2) subparagraph 14
Parent Company Address	150 6th Avenue Southwest Calgary, Alberta T2P 3E3	O. Reg. 455/09 s.18(2) subparagraph 14
Facility Name	Mississauga Lubricants Centre	O. Reg. 455/09 s.18(2) subparagraph 4
Facility Address	385 Southdown Road Mississauga, Ontario L5J 2Y3	O. Reg. 455/09 s.18(2) subparagraph 4
Universal Transverse Mercator (UTM) in North American Datum (NAD83)	X [m] 612417.51 Y [m] 4817383.76	O. Reg. 455/09 s.18(2) subparagraph 13
National Pollutant Release Inventory Identification Number	3899	O. Reg. 455/09 s.18(2) subparagraph 2
Ontario Regulation 127/01 Identification Number	5119	O. Reg. 455/09 s.18(2) subparagraph 3
Two Digit North American Industry Classification System (NAICS) Code	32 – Manufacturing	O. Reg. 455/09 s.18(2) subparagraph 6
Four Digit North American Industry Classification System (NAICS) Code	3241 – Petroleum and Coal Product Manufacturing	O. Reg. 455/09 s.18(2) subparagraph 6
Six Digit North American Industry Classification System (NAICS) Code	324190 – Other Petroleum and Coal Product Manufacturing CAN	O. Reg. 455/09 s.18(2) subparagraph 6
Number of Full-time Employee Equivalents at the Facility	395 (as of December 31, 2012)	O. Reg. 455/09 s.18(2) subparagraph 5
Facility Public Contact	Joel Thompson Director, Corporate Communications 150 6th Avenue Southwest Calgary, Alberta T2P 3E3 Tel: 403-296-6637 Email: jjthompson@suncor.com	O. Reg. 455/09 s.18(2) subparagraph 7

3.0 PLAN CERTIFICATION STATEMENT

Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Attachment 1: Copies of the Plan Certifications

Certification by Highest Ranking Employee

As of ***December 1, 2013***, I, ***Gord Pinard***, certify that I have read the toxic substance reduction plans for the toxic substances referred to below and am familiar with their contents, and to my knowledge the plans are factually accurate and comply with the *Toxics Reduction Act, 2009* and Ontario Regulation 455/09 (General) made under that Act.

Toxic Substance	Date of the Plan to which the Certification Applies
1,2,4-Trimethylbenzene, CAS No. 95-63-6	December 1, 2013
Butane and its Isomers, CAS No. N/A	December 1, 2013
Carbon Monoxide, CAS No. 630-08-0	December 1, 2013
Cyclohexane, CAS No. 110-82-7	December 1, 2013
Diethanolamine, CAS No. 111-42-2	December 1, 2013
Hydrogen Sulphide and Total Reduced Sulphur, CAS No. 7783-06-4 and N/A	December 1, 2013
Isopropyl Alcohol, CAS No. 67-63-0	December 1, 2013
Methyl Ethyl Ketone, CAS No. 78-93-3	December 1, 2013
Molybdenum Trioxide, CAS No. 1313-27-5	December 1, 2013
N-Hexane, CAS No. 110-54-3	December 1, 2013
Oxides of Nitrogen, CAS No. 11104-93-1	December 1, 2013
Pentane and its Isomers, CAS No. N/A	December 1, 2013
Particulates, CAS No. N/A including: TPM, PM10 and PM2.5	December 1, 2013
Propane, CAS No. 74-98-6	December 1, 2013
Propylene, CAS No. 115-07-1	December 1, 2013
Sulphur Dioxide, CAS No. 7446-09-5	December 1, 2013

Gord Pinard

2013-12-03
Date

General Manager, Production and Logistics

Certification by Licensed Planner

As of ***December 1, 2013***, I, ***Mark Roehler*** certify that I am familiar with the processes at the Petro-Canada Lubricants Inc. Lubricants Centre that use or create the toxic substances 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 toxic substance reduction plans referred to below for the toxic substances and that the plans comply with that Act and Ontario Regulation 455/09 (General) made under that Act.

Toxic Substance	Date of the Plan to which the Certification Applies
1,2,4-Trimethylbenzene, CAS No. 95-63-6	December 1, 2013
Butane and its Isomers, CAS No. N/A	December 1, 2013
Carbon Monoxide, CAS No. 630-08-0	December 1, 2013
Cyclohexane, CAS No. 110-82-7	December 1, 2013
Diethanolamine, CAS No. 111-42-2	December 1, 2013
Hydrogen Sulphide and Total Reduced Sulphur, CAS No. 7783-06-4 and N/A	December 1, 2013
Isopropyl Alcohol, CAS No. 67-63-0	December 1, 2013
Methyl Ethyl Ketone, CAS No. 78-93-3	December 1, 2013
Molybdenum Trioxide, CAS No. 1313-27-5	December 1, 2013
N-Hexane, CAS No. 110-54-3	December 1, 2013
Oxides of Nitrogen, CAS No. 11104-93-1	December 1, 2013
Pentane and its Isomers, CAS No. N/A	December 1, 2013
Particulates, CAS No. N/A including: TPM, PM10 and PM2.5	December 1, 2013
Propane, CAS No. 74-98-6	December 1, 2013
Propylene, CAS No. 115-07-1	December 1, 2013
Sulphur Dioxide, CAS No. 7446-09-5	December 1, 2013

Mark Roehler — December 1, 2013

Mark Roehler
LEHDER Environmental Services Limited

Date

Toxic Substance Reduction Planner

TSRP0128

Appendix A: Toxics Substance Reduction Plan for 1,2,4-Trimethylbenzene

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for 1,2,4-Trimethylbenzene

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

Version	Date Issued	Modifications
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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for 1,2,4-trimethylbenzene.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

1,2,4-trimethylbenzene is a component of feedstocks and is contained in some final products.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of 1,2,4-trimethylbenzene associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Material and Feedstock Substitution

In response to past legislation, most additives containing volatile organic compounds have been removed from the formulations of manufactured greases and blended lubricants. No further material substitutions have been identified at this time; however, it is noted that PCLI's Research and Development group reviews the raw materials on a regular basis and when feasible, materials are substituted.

4.2 Equipment or Process Modification

In response to past legislation, the Lubricants Centre optimized a process more than 15 years ago limiting the creation of benzene pre-cursors, in order to reduce the amount of benzene created.

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.3 Spill and Leak Prevention

Where possible, proper sampling points have been installed to reduce spills and leaks during sample collection.

The Lubricants Centre identified hazardous sampling points and installed closed-loop sampling points using industry-wide accepted DOPAK sample systems.

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.4 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.5 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.6 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

Employees and contractors undergo training on benzene. Much of the training is transferrable to 1,2,4-trimethylbenzene, as benzene and 1,2,4-trimethylbenzene travel in the same process streams (refer to Section 4.6 of Appendix B in the 2011 "*Toxics Reduction Act Toxic Substance Reduction Plan Summaries Version 1.0"* dated December 3, 2012).

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce 1,2,4-trimethylbenzene) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of 1,2,4-trimethylbenzene, as no technically or economically feasible options were identified at this time. 1,2,4-trimethylbenzene use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation, and content in products of 1,2,4-trimethylbenzene in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for 1,2,4-trimethylbenzene, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix B: Toxics Substance Reduction Plan for Butane and its Isomers

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Butane and its Isomers

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

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1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for butane and its isomers (butane).

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Butane is a component of feedstocks, created in the process and contained in some final products. Butane is also a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of butane associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.2 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.5 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented at the Lubricants Centre and in some cases, may reduce butane emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that

comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce butane) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of butane, as no technically or economically feasible options were identified at this time. Butane use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation and content in products of butane in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for butane, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix C: Toxics Substance Reduction Plan for Carbon Monoxide

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Carbon Monoxide

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

Version	Date Issued	Modifications
1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for carbon monoxide.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Carbon monoxide is a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

4.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

4.1 Statement of Intent

The Lubricants Centre does not intend to reduce the creation of carbon monoxide, as no technically or economically feasible options were identified at this time.

4.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the creation of carbon monoxide in full compliance with all federal and provincial regulations.

5.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for carbon monoxide, prepared for the Lubricants Centre, dated December 1, 2013.

6.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix D: Toxics Substance Reduction Plan for Cyclohexane

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Cyclohexane

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Version	Date Issued	Modifications
1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for cyclohexane.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Cyclohexane is a component of feedstocks, created in the process and contained in some final products.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of cyclohexane associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.2 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.5 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented and in some cases, may reduce cyclohexane emissions to atmosphere:

- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce cyclohexane) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of cyclohexane, as no technically or economically feasible options were identified at this time. Cyclohexane use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation and content in products of cyclohexane in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for cyclohexane, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix E: Toxics Substance Reduction Plan for Diethanolamine

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Diethanolamine

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

Version	Date Issued	Modifications
1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for diethanolamine (DEA).

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

DEA is a purchased product used to removes impurities from process streams. Its use significantly reduces emissions of sulphur dioxide to the environment.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use of DEA associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 On-Site Reuse or Recycling

DEA is recovered from the process and reused.

4.2 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials are purchased based on unit throughput, sales forecasts and availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use of DEA, as no technically or economically feasible options were identified at this time. DEA has a beneficial use in the process, as it significantly reduces sulphur dioxide emissions to the atmosphere.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use of DEA in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for DEA, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix F: Toxics Substance Reduction Plan for Hydrogen Sulphide and Total Reduced Sulphur

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Hydrogen Sulphide and Total Reduced Sulphur

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for hydrogen sulphide. Total reduce sulphur (TRS) includes the summation of sulphur compounds, as prescribed by the National Pollutant Release Inventory (NPRI). At the Lubricants Centre, TRS is the same as hydrogen sulphide and as such, this document also represents the Plan Summary for TRS.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Hydrogen sulphide is created in the process due to the presence of sulphur in the feedstock and fuel used at the Lubricants Centre. Hydrogen sulphide is also present in some purchased additives used in grease manufacturing.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation, and content in products of hydrogen sulphide associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility installed a vapour recovery unit to capture hydrogen sulphur emissions associated with liquid sulphur storage and loading.

The facility also has an amine system, which destroys hydrogen sulphide present in process streams.

The facility is in the process of decommissioning a tank and replacing it with better technology, which could reduce hydrogen sulphide emissions.

4.2 Spill and Leak Prevention

Where possible, proper sampling points have been installed to reduce spills and leaks during sample collection.

The Lubricants Centre has a project in place to have closed-loop sampling points installed using industry-wide accepted DOPAK sample systems.

4.3 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.4 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The Lubricants Centre has a work instruction regarding the *"Designated Substance Control Program for Hydrogen Sulphide"*, so that compliance with the *"R.R.O. 1990, Regulation 839 Designated Substance – Hydrogen Sulphide"* can be demonstrated. The Regulation states that "every precaution reasonable in the circumstances be taken to ensure that every worker exposed to hydrogen sulphide whose health is likely to be affected thereby is protected".

Employees and contractors undergo training on hydrogen sulphide as follows:

A. Contractor Orientation (Contractors Only) – Contractors will receive training (Employee Orientation – hydrogen sulphide Module) on hydrogen sulphide hazards and respiratory protection only if they have the potential for a hydrogen sulphide exposure.

B. Employee Orientation (New Hires, Students, Transfers) – This training includes materials on hydrogen sulphide hazards and respiratory protection.

C. Refresher Training (Operations, Salary and Maintenance) – Safety talks and refresher training modules should include information on site specific hydrogen sulphide sources, hazards, appropriate personal protective equipment (PPE), contacts for information, etc.

The following engineering controls have been implemented at the facility to reduce hydrogen sulphide exposure and in some cases, reduce hydrogen sulphide emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.

- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use, creation or content in products of hydrogen sulphide, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use, creation or content in products of hydrogen sulphide in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for hydrogen sulphide and TRS, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix G: Toxics Substance Reduction Plan for Isopropyl Alcohol

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Isopropyl Alcohol

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for isopropyl alcohol.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Isopropyl alcohol is created when manufacturing certain types of grease.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken an initiative that would control and could reduce the future use of isopropyl alcohol associated with the Lubricants Centre operations. Specifically, the facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

5.0 OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the creation of isopropyl alcohol, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the creation of isopropyl alcohol in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for isopropyl alcohol, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix H: Toxics Substance Reduction Plan for Methyl Ethyl Ketone

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Methyl Ethyl Ketone

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for methyl ethyl ketone (MEK).

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

MEK is a purchased product used in the dewax process.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use of MEK associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.2 On-Site Reuse or Recycling

MEK is recovered from the process and reused.

4.3 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.4 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use of MEK, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use of MEK in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for MEK, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix I: Toxics Substance Reduction Plan for Molybdenum Trioxide

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Molybdenum Trioxide

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for molybdenum trioxide.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Molybdenum trioxide is present in catalyst used at the Lubricants Centre.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use of molybdenum oxide associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use of molybdenum trioxide, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use of molybdenum trioxide in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for molybdenum trioxide, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix J: Toxics Substance Reduction Plan for N-Hexane

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for N-Hexane

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for n-hexane.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

N-hexane is a component of feedstocks, created in the process and contained in some final products.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of n-hexane associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.2 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.5 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented at the Lubricants Centre and in some cases, may reduce n-hexane emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce n-hexane) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of n-hexane, as no technically or economically feasible options were identified at this time. N-hexane use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation and content in products of n-hexane in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for n-hexane, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix K: Toxics Substance Reduction Plan for Oxides of Nitrogen

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Oxides of Nitrogen

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for oxides of nitrogen.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Oxides of nitrogen are a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

4.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

4.1 Statement of Intent

The Lubricants Centre does not intend to reduce the creation of oxides of nitrogen, as no technically or economically feasible options were identified at this time.

4.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the creation of oxides of nitrogen in full compliance with all federal and provincial regulations.

5.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for oxides of nitrogen, prepared for the Lubricants Centre, dated December 1, 2013.

6.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix L: Toxics Substance Reduction Plan for Particulates

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Particulates

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Version	Date Issued	Modifications
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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for particulates including: total particulate matter, particulate matter <10 microns and particulate matter <2.5 microns (herein after referred to as “particulates”).

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Particulates are a by-product of combustion; a process necessary to provide heat and steam to the Lubricants Centre operations. They are also associated with cooling tower drift, road dust and powder additives handling.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use and creation of particulates associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Product Redesign or Reformulation

The Lubricants Centre has made significant reductions in the use of powered additives.

PCLI’s Research and Development group reviews the industry performance standards on a regular basis and when feasible, products are reformulated.

4.2 Equipment or Process Modification

The facility is planning the installation of a higher efficiency dust collector in Lubeplex, which will reduce releases of particulates to the atmosphere.

4.3 Spill and Leak Protection

Additives are received on pallets that are shrink-wrapped to prevent spillage.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials are purchased based on unit throughput, sales forecasts. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use or creation of particulates, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use or creation of particulates in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for particulates, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix M: Toxics Substance Reduction Plan for Pentane and its Isomers

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Pentane and its Isomers

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

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Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for pentane and its isomers (pentane).

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Pentane is a component of feedstocks, created in the process and contained in some final products. Pentane is also a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of pentane associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.2 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.5 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented at the Lubricants Centre and in some cases, may reduce pentane emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that

comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce pentane) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of pentane, as no technically or economically feasible options were identified at this time. Pentane use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation and content in products of pentane in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for pentane, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix N: Toxics Substance Reduction Plan for Propane

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Propane

VERSION 1.0

Petro-Canada Lubricants Inc.
385 Southdown Road
Mississauga, Ontario
L5J 2Y3

December 1, 2013

Version Control

Version	Date Issued	Modifications
1.0	December 1, 2013	Original version made available to the public and employees

Table of Contents

1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for propane.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Propane is a component of feedstocks, created in the process and contained in some final products. Propane is also a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

4.0 ACTIONS TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use, creation and content in products of propane associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

The facility has upgraded all tanks that contain lighter materials/products to meet the specifications outlined in the Canadian Council of Ministers of the Environment's publication (CCME) *"Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks, (PN 1180)".*

4.2 Spill and Leak Prevention

Where possible, proper sampling points have been installed to reduce spills and leaks during sample collection.

The Lubricants Centre identified hazardous sampling points and installed closed-loop sampling points using industry-wide accepted DOPAK sample systems.

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance

department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 On-Site Reuse or Recycling

Whenever feasible, off-spec material is captured and reworked into other process inputs.

4.4 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.5 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented at the Lubricants Centre and in some cases, may reduce propane emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time. However, it is important to note that the Ontario Ministry of the Environment introduced a new annual standard for benzene that comes into effect on July 1, 2016 and as such, the Lubricants Centre is reviewing opportunities to reduce benzene (which could also reduce propane) releases to air.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

PCLI does not intend to reduce the use, creation or content in products of propane, as no technically or economically feasible options were identified at this time. Propane use and creation is inherent in the manufacturing of some final products.

5.2 Objective

PCLI is committed to producing high quality products and operating its business in an environmentally responsible manner. Wherever feasible, the Lubricants Centre will endeavour to reduce the use, creation and content in products of propane in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for propane, prepared for Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix O: Toxics Substance Reduction Plan for Propylene

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Propylene

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2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Propylene is a purchased product used the process. It can also be created in the process.

4.0 ACTION TAKEN TO-DATE

As part of our environmental stewardship, Petro-Canada Lubricants Inc. (PCLI) has already undertaken and/or completed a number of initiatives and actions that have reduced the use and creation of propylene associated with the Lubricants Centre operations. Some of these initiatives and actions are highlighted in the following sections.

4.1 Equipment or Process Modification

A majority of the propylene handled on-site is contained in a closed-loop system, which reduces the potential for releases to the natural environment.

4.2 Spill and Leak Prevention

The Lubricants Centre implemented a Leak Detection and Repair (LDAR) program in 1996. Components (e.g., valves, flanges, open-ended lines, etc.) are tested on an annual basis with pumps and compressors tested on a quarterly basis. In accordance with the Lubricants Centre Comprehensive Certificate of Approval (CofA) (Air), the LDAR program follows the CCME publication *"Environmental Code of Practice for the Measurement and Control of Fugitive Emission from Equipment Leaks, October 1993"*. When leaks are detected, the Maintenance department determines the best option for repair, which may include replacement of components with better (less leak-prone) equipment.

4.3 Improved Inventory Management or Purchasing Techniques

The facility employs a just in time delivery inventory management process; raw materials and feedstocks are purchased based on unit throughput, sales forecasts and feedstock availability in the market. This minimizes the inventory stored on-site.

The facility employs a Material Safety Data Sheet approval process. All new materials are screened; where possible materials can be rejected if they contain toxic substances and suitable alternatives are available.

4.4 Training or Improved Operating Practices

The Lubricants Centre has documented procedures regarding the proper preparation of equipment for maintenance. This reduces the amount of material that is drained to the sewer, which is subsequently treated at the on-site Wastewater Treatment Plant (WWTP).

Prior to commencing shutdowns, Operators are reminded to review and follow proper procedures to minimize discharges to sewer.

The Lubricants Centre has an internal reporting system, which is used to document losses of containment (i.e., spills) and action plans are developed to prevent a reoccurrence.

The following engineering controls have been implemented at the Lubricants Centre and in some cases, may reduce propylene emissions to atmosphere:

- Closed-loop sampling points for routine sample collection.
- Tie-ins to flare line for enclosed venting of equipment and instruments.
- Fume hoods and local exhaust systems in the laboratories.
- Covered American Petroleum Institute separator at WWTP to reduce fugitive emissions.
- Exhaust fans to reduce emissions during tank cleaning.
- Control rooms are under positive pressure with elevated HVAC intakes to protect the occupants in emergency situations.

5.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation, above and beyond the actions the Lubricants Centre has already taken (as detailed above), at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

5.1 Statement of Intent

The Lubricants Centre does not intend to reduce the use or creation of propylene, as no technically or economically feasible options were identified at this time.

5.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the use or creation of propylene in full compliance with all federal and provincial regulations.

6.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for propylene, prepared for the Lubricants Centre, dated December 1, 2013.

7.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.

Appendix P: Toxics Substance Reduction Plan for Sulphur Dioxide

2012 TOXICS REDUCTION ACT

Toxic Substance Reduction Plan Summary for Sulphur Dioxide

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1.0 INTRODUCTION

This appendix contains the Toxic Substance Reduction Plan Summary for sulphur dioxide.

2.0 BASIC FACILITY INFORMATION

Section 2.0 of the main report summarizes the information, as required by the *Toxics Reduction Act* (the Act) and Ontario Regulation 455/09 (O. Reg. 455/09).

3.0 DESCRIPTION OF SUBSTANCE

Sulphur dioxide is a by-product of fuel combustion; a process necessary to provide heat and steam to the Lubricants Centre operations.

Sulphur dioxide is also a by-product of the sulphur recovery process.

4.0 TOXIC SUBSTANCE REDUCTION PLAN OPTIONS TO BE IMPLEMENTED

There were no options identified for implementation at this time.

The Plan will be reviewed in accordance with the Act and regulation, at which time, new options may be identified and considered for implementation.

4.1 Statement of Intent

The Lubricants Centre does not intend to reduce the creation of sulphur dioxide, as no technically or economically feasible options were identified at this time.

4.2 Objective

PCLI is committed to operating the business in an environmentally responsible manner. Wherever feasible, PCLI will endeavour to reduce the creation of sulphur dioxide in full compliance with all federal and provincial regulations.

5.0 PLAN SUMMARY STATEMENT

This Toxic Substance Reduction Plan Summary reflects the content of the Toxic Substance Reduction Plan for sulphur dioxide, prepared for the Lubricants Centre, dated December 1, 2013.

6.0 CERTIFICATION BY THE HIGHEST RANKING EMPLOYEE

As described in Section 3.0 of the main report for the Toxic Substance Reduction Plan Summaries, Attachment 1 contains the copies of the certifications required by the Highest Ranking Employee and Licensed Planner, as required by the Act and regulation.