TOXIC REDUCTION PLAN

COPPER

Prepared For:
Spinic Manufacturing

Prepared by:
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1.0 INTRODUCTION

1.1 BASIC FACILITY INFORMATION

Example Table of basic facility information:

Name & CAS # of Substance	Copper	7440-50-8
Facility Identification and Site Address		
Company Name	Linamar Corporation	
Facility Name	Spinic Manufacturing	
Facility Address	**Physical Address:**	**Mailing Address: (if different)**
	285 Massey Road Guelph, Ontario N1K 1B2	
Spatial Coordination of Facility	Easting: 5556132.65 Northing: 4820873.31	
Number of Employees	350	
NPRI ID	4738	
Ontario MOE ID Number		
Parent Company (PC) Information		
PC Name & Address **Percent Ownership for each PC**	Linamar Corporation, 287 Speedvale Avenue West, Guelph, Ontario N1H 1C5 100%	
Business Number for PC	103333662	
Primary North American Industrial Classification System Code (NAICS)		
2 Digit NAICS Code	33 Manufacturing	
4 Digit NAICS Code	3363 - Motor Vehicle Parts Manufacturing	
6 Digit NAICS Code	336350 - Motor Vehicle Transmission and Power Train Parts Manufacturing	
Company Contact Information		
Facility Public Contact	Mr. Kevin Radbourne, Operations Manager	
	kevin.radbourne@linamar.com	
	Phone: (519) 763-0704 ext. 607	Same address as facility
	Fax: (519) 763-2972	
Facility Technical Contact	Mr. Laslo Retek, Environmental Coordinator	
	laslo.retek@linamar.com	
	Phone: (519) 836-7554	Same address as facility
	Fax: (519) 836-5353	

Company Coordinator	Mr. Laslo Retek, Environmental Coordinator	
Contact	laslo.retek@linamar.com	
	Phone: (519) 836-7554	Same address as facility
	Fax: (519) 836-5353	
Person who Prepared the Plan: (if different from the Coordinator)	Ms. Dana Lauder, Consultant	Conestoga-Rovers & Associates
	dlauder@craworld.com	651 Colby Drive
	Phone: (519) 884-0510 ext. 2299	Waterloo, Ontario
	Fax: (519) 884-0525	N2V 1C2
Highest Ranking Employee	Mr. Kevin Radbourne, Operations Manager	
	kevin.radbourne@linamar.com	
	Phone: (519) 763-0704 ext. 607	Same address as facility
	Fax: (519) 763-2972	
Planner Information:		
Planner Responsible for Making Recommendations	Ms. Dana Lauder, Consultant	Conestoga-Rovers & Associates
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1.2 STATEMENT OF INTENT

Spinic Manufacturing (Spinic) is committed to playing a leadership role in protecting the environment. Whenever feasible, we will reduce the use of Copper in compliance with all Federal and Provincial Regulations.

1.3 OBJECTIVES

Spinic prides itself on technological innovation in order to produce high quality automotive parts in an environmentally responsible manner. Through this plan, Spinic will determine the technical and economic feasibility of each option to determine which, if any, are viable for implementation at this time.

1.4 FACILITY DESCRIPTION

Spinic Manufacturing produces automotive parts from steel forgings. Raw materials (steel parts) are brought to the facility where they are machined into automotive parts, then washed and packaged for shipment. These raw materials contain the compound copper as a constituent material.

2.0 IDENTIFICATION AND DESCRIPTION

2.1 STAGES AND PROCESSES

Copper is present in the raw steel materials used in the process as a constituent compound. The stages and processes that involve Copper are as follows:

- Copper, as a constituent of the raw steel material, is received in the Receiving Process in the Receiving Stage, where it is stored as required by customers. It is then transferred into the Manufacturing Stage on a First In-First Out Basis. This stage and the quantification methods for Copper are further described in Section 3.1.
- In the Manufacturing Stage, the raw materials are sent through a variety of separate processes which produce the various automotive parts. The different processes which are involved in this stage are listed in the Process Flow Diagram in Section 2.2. Of these processes, Copper is used in the Machining Process.
- In the Packaging and Packaging and Shipping Process of the Packaging and Packaging and Shipping Stage, the finished products are inspected and then packaged for shipment to the various customers. Copper is contained in the final product.

In 2011, the facility operated 24 hours a day, seven days a week.

2.2 PROCESS FLOW DIAGRAM

A process flow diagram of the stages as described above is presented below (the processes which involve the use of Copper are highlighted):

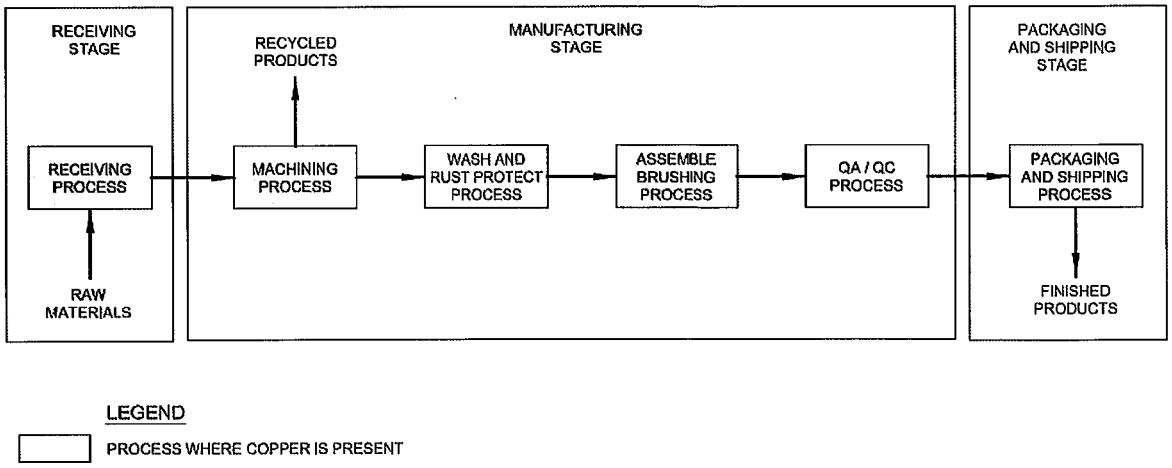

Figure 1: Main Process Flow Diagram

3.0 TRACKING AND QUANTIFICATION

3.1 RECEIVING PROCESS DESCRIPTION

The Receiving Stage consists of the Receiving Process. Copper is delivered to the facility as a constituent of the raw materials (the composition of Copper is dependent on the material) - these deliveries (U1) are tracked by Spinic's internal accounting systems. As required by the customer, the raw materials are stored on-site for about 3 days. Once the materials are ready to be used, they are transferred (P1) to the first process in the Manufacturing Stage.

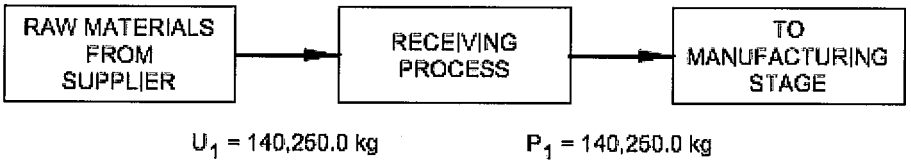

Figure 2: Receiving Stage Process Flow Diagram

3.1.1 RECEIVING PROCESS (USE)

3.1.1.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - based on inventory records and concentrations of Copper as presented on Material Specifications sheets (see below).

3.1.1.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

The Copper which is present in each raw material used in the Receiving Process is calculated based on the total amount of Copper present in each raw material from the Materials Specifications sheet. Material Specifications information showing constituent compositions are sources of data that are highly reliable. In considering other methods, it was determined that this method would yield the highest quality data.

Raw Material Quantities

The total amount of the each raw material used in the process was determined based on a material balance on the amount of raw material recycled (described in Section 3.2) and the material contained in the final product (described in Section 3.3).

3.1.1.3 QUANTIFICATION OF TOXIC SUBSTANCE

U1 = Copper used in receiving process in 2011:= 140,250.0 kg.

3.1.2 RECEIVING PROCESS (CONTAINED IN PRODUCT)

3.1.2.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - see Section 3.1.1.1.

3.1.2.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

See Section 3.1.1.2.

Raw Material Quantities

See Section 3.1.1.2.

3.1.2.3 QUANTIFICATION OF TOXIC SUBSTANCE

The quantification of the amount contained in product was assumed to be equal to the amount that was delivered to the facility, as all material delivered to the site entered the Manufacturing Stage.

P1 = Copper contained in product in Receiving Stage: 140,250.0 kg.

3.1.3 INPUT/OUTPUT BALANCE

Use + Creation = Transformed + Destroyed + Contained in Product + On-Site or Off-Site Release (to Air, Land, Water) +Offsite Transfers (for treatment, recycling) + Disposals

Note: This stage only contains materials used and material contained in product (to next stage)

U1 = P1

140,250.0 kg = 140,250.0 kg

Unaccounted Material = 0 kg

3.2 MACHINING PROCESS DESCRIPTION

The raw materials, after being processed in the Receiving Stage, are transferred into the Manufacturing Stage (U2), where the first process is the Machining Process. In the Machining Process, the raw materials are then sent through a variety of equipment which cut and shape the materials into the general configurations, as dependent on the final product(s). The waste materials from this process are collected from the process in bins and transferred off-site to Metro Recycling (Metro) for recycling (R1). The finished products from this process are then transferred to the Wash and Rust Protect process (P2). Once the materials leave this process, they go through a variety of process (as shown in Figure 1) - there is no change in the quantity of copper through any of these processes.

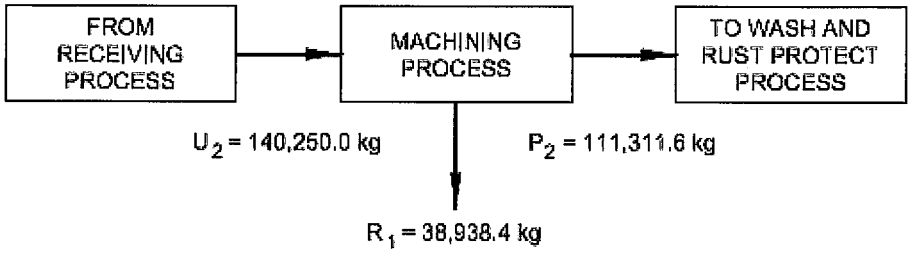

Figure 3: Machining Process Flow Diagram

3.2.1 MACHINING PROCESS (USE)

3.2.1.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - The amount of Copper used in the Machining process was assumed to be the same as the amount contained in product following the Receiving Process (see Section 3.1.1.1).

3.2.1.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

See Section 3.1.1.2.

Raw Material Quantities

See Section 3.1.1.2.

3.2.1.3 QUANTIFICATION OF TOXIC SUBSTANCE

The quantification of the amount used in process was assumed to be equal to the amount that was delivered to the facility, as all material delivered to the site entered the Manufacturing Stage.

U2 = Copper used in Machining Process: 140,250.0 kg.

3.2.2 MACHINING PROCESS (OFF-SITE TRANSFERS)

3.2.2.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - based on records of the materials transferred off-site. It is assumed that the materials transferred off-site consist of the same materials as enters the process.

3.2.2.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Recycled Quantities

The Copper which is present in the recycled materials is based on concentrations of materials as displayed on the MSDS for each metal type (see below). Material Specifications information showing constituent compositions are sources of data that are highly reliable. In considering other methods, it was determined that this method would yield the highest quality data.

Raw Material Quantities

The total quantity of material transferred off-site from all processes is tracked by Metro and this information is provided to Spinic, so this information is considered to have high reliability. The recycled material is tracked under three separate metal types: Steel, Cast Iron and Aluminum, with each metal type divided into solids, borings, and/or turnings.

To calculate the total amount of Copper recycled for all products and processes, the total quantity of each recycled metal was multiplied by its concentration as per the MSDS (as per above) and then summed. The calculation of the total amount of Copper recycled is displayed in the Table below:

Table 1: Calculation of Total Copper Recycled

Recycled Metal	Total Amount Recycled (kg)	Copper Weight Percent (off MSDS) (%)	Total Copper Recycled (kg)
Steel Solids	150,743	0	0
Steel Turnings	1,003,414		0
Cast Iron Solids	9,353	0.8	74.82
Cast Iron Borings	313,569		2,509.0
Aluminum Turnings	669,8120	4.5	30,141.9
Aluminum Borings	138,069		6,213.1
Total	**2,284,967**		**38,938.4**

This calculation methodology is highly reliable as the total amount of material recycled and the total concentration of Copper is based on reliable sources (Metro recycling information and MSDSs).

3.2.2.3 QUANTIFICATION OF TOXIC SUBSTANCE

R1 = Copper transferred off-site in Machining process in 2011: 38,938.4 kg

3.2.3 MACHINING PROCESS (CONTAINED IN PRODUCT)

3.2.3.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - based on balance of materials used in process and amount sent to recycling.

3.2.3.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

See Section 3.1.1.2.

Raw Material Quantities

See Section 3.2.1.2 and 3.2.2.2.

3.2.3.3 QUANTIFICATION OF TOXIC SUBSTANCE

The quantification of the amount contained in product was calculated based on a mass balance of the amount used in the process (U2) and the amount transferred off-site from this process (R1).

P2 = Copper contained in product in Machining process in 2011: 111,311.6 kg.

3.2.4 INPUT/OUTPUT BALANCE

Use + Creation = Transformed + Destroyed + Contained in Product + On-Site or Off-Site Release (to Air, Land, Water) + Offsite Transfers (for treatment, recycling) + Disposals

U2 = P2 + R1

140,250.0 kg = 111,311.6 kg + 38,938.4 kg

140,250.0 kg = 140,250.0 kg

Unaccounted Material = 0 kg

3.3 PACKAGING AND SHIPPING PROCESS DESCRIPTION

The Packaging and Shipping Stage consists of the Packaging and Shipping Process. After completing the Manufacturing Stage, the finished products are transferred (U3) to the Packaging and Shipping area, where the parts are packaged and stored on-site before being shipped onto customers (P3).

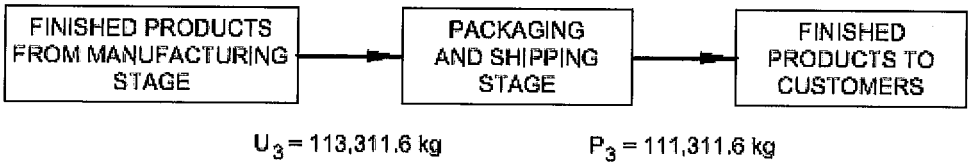

Figure 4: Packaging and Shipping Process Flow Diagram

3.3.1 PACKAGING AND SHIPPING PROCESS (USE)

3.3.1.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - The amount of Copper used in the Packaging and Shipping process was assumed to be the same as the amount contained in product following the Machining Process (see Section 3.2.3.1).

3.3.1.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

See Section 3.1.1.2.

Raw Material Quantities

See Section 3.2.3.2.

3.3.1.3 QUANTIFICATION OF TOXIC SUBSTANCE

U3 = Copper used in Packaging and Shipping process in 2011: 111,311.6 kg.

3.3.2 PACKAGING AND SHIPPING PROCESS (CONTAINED IN PRODUCT)

3.3.2.1 TRACKING AND QUANTIFICATION METHOD

Quantification Method: Mass Balance - based on inventory records and concentrations of Copper as presented on Material Specifications sheets (see below).

3.3.2.2 BEST AVAILABLE METHOD RATIONALE

Copper Concentration in Raw Materials

See Section 3.1.1.2.

Raw Material Quantities

The total amount of each raw material used in the process was determined based on the total number of parts made per year from purchasing and inventory records which are tracked by Spinic's accounting system as well as the raw weight of each part produced (in kilograms), as described by the following formula:

$U = N \times FW$

Where:
U = The total amount of each raw material used in the process (kg/year)
N = Number of each part produced (# of parts/year)
FW = Finished weight of each part produced (kg/part)

Quantities of raw materials that are used in the process are recorded through purchasing and inventory records. This data is therefore considered to be very reliable.

3.3.2.3 QUANTIFICATION OF TOXIC SUBSTANCE

Table 2: Calculation of Amount of Copper Contained in Product

Product	Copper Composition (%)	Number of Parts Made (#/year)	Finished weight of part (kg/part)	Quantity Contained in Product in 2011 (kg/year)	Total Copper Contained in Product (kg/year)
Chrysler -Reaction Shaft	1.20	360,000	3.00	1,080,000	12,960.0
MSM, GM – Grey Iron	0.50	521,300	2.727	1,421,584	7,107.9
LPP Manufacturing - B390	4.50	1,086,520	1.00	1,086,520	48,893.4
LPP Manufacturing - A32900	4.50	718,896	1.00	718,896	32,350.3

P3 = Copper contained in product in Packaging and Shipping Process: 111,311.6 kg.

3.3.3 INPUT/OUTPUT BALANCE

Use + Creation = Transformed + Destroyed + Contained in Product + On-Site or Off-Site Release (to Air, Land, Water) +Offsite Transfers (for treatment, recycling) + Disposals

Note: This stage only contains materials used and material contained in product (to next stage)

U3 = P3

111,311.6 kg = 111,311.6 kg

Unaccounted Material = 0 kg

4.0 FACILITY-WIDE ACCOUNTING INFORMATION

4.1 USE

The total facility wide use is equal to the amount of Copper which is contained in the raw materials which is received from the suppliers in 2011.

Facility Wide Use = U1 = 140,250.0 kg

4.2 CREATION

There were zero creations of Copper on-site in 2011.

4.3 TRANSFORMATION

There were zero transformations of Copper on-site in 2011.

4.4 DESTRUCTION

There were zero destructions of Copper on-site in 2011.

4.5 CONTAINED IN PRODUCT

The total facility wide amount of Copper contained in product in 2011 is equal to the amount contained in the each product which is shipped off-site.

Facility Wide Contained in Product = P3 = 111,311.6 kg.

4.6 RELEASES TO AIR

There were zero releases to air of Copper on-site in 2011.

4.7 RELEASES TO LAND

There were zero releases to land of Copper on-site in 2011.

4.8 RELEASES TO WATER

There were zero releases to water of Copper on-site in 2011.

4.9 DISPOSALS (ON-SITE)

There were zero on-site disposals of Copper in 2011.

4.10 DISPOSALS (OFF-SITE)

There were zero off-site disposals of Copper in 2011.

4.11 OFF-SITE TRANSFERS (TREATMENT OR RECYCLING)

The total amount transferred off-site is equal to the amount contained in the material sent for recycling, as documented in Section 3.2.

Facility Wide Offsite Transfers (Recycling) = R1

= 38,938.4 kg

5.0 DIRECT AND INDIRECT COST ANALYSIS

Below is a summary of all direct costs associated specifically with the use, release, transfer, disposal, and amounts contained in product of Copper.

Table 3: Direct Costs Associated with Copper

Item	*Description*	*Total*
Materials	Total cost of Copper entering Facility*	$ 315,906
Equipment Maintenance	Includes parts, repairs, contractors, etc.	$ 1,440,111
Utilities/Energy	Costs associated with the energy related to equipment use	$ 402,659
Labour	Yearly wages for shop floor employees	$ 2,731,894
Consumables and Shop Supplies	Consumable Tooling	$ 1,668,684
Depreciation	Depreciation of materials	$ 1,110,676
TOTAL		**$ 7,669,930**

Notes:

* Calculated: $13,429,908 (total cost of raw materials) × 2.35 percent (average Copper concentration in raw materials) = $ 315,906

The majority of the costs associated with Copper are directly associated with the operations of the machines involved in the process.

Table 4: Indirect Costs Associated with Copper

Item	*Description*	*Total ($)*
Support Staff	Yearly wages for Management, Accounting, Human Resources, etc.	$ 267,001
General Facility Operations	Includes costs associated with water and electricity	$ 68,839
Indirect Labour, production support		$ 6,252,616
Indirect Costs		$ 1,733,158
TOTAL		**$ 8,321,613**

In total the direct and indirect costs associated with the use, release, transfer, disposal and amount contained in product of Copper in 2011 were $15,991,543. Estimates were made based on the total number of employees involved in the work in the Facility.

These values were obtained from the accounting department at the close of the month of December in 2011.

6.0 TOXIC SUBSTANCE USE AND CREATION REDUCTION OPTIONS

6.1 MATERIAL OR FEEDSTOCK SUBSTITUTION OPTIONS

6.1.1 IDENTIFICATION OF OPTIONS

It was identified that the amount of raw materials entering the process could be reduced by eliminating the amount of foundry defects on the 6F Housing production line (which corresponds to the material LPP Manufacturing - B390 as per Table 2 above) which are received in the process. Foundry Defects consist of raw materials supplied to Spinic which are defective or otherwise unusable in the process. As a result, these materials are immediately scrapped (generally in the Machining process) and transferred off-site for recycling. To eliminate the use of these materials, Spinic will work with the suppliers to devise possible solutions.

6.1.2 ESTIMATED REDUCTIONS

Spinic has calculated that approximately 12-15 percent of the total amount of material recycled on the 6F Housing production lines consists of foundry defective material. Spinic therefore has targeted reducing this value to 10 percent of their total recycled material, or a 5 percent reduction.

In 2011, 168,889 parts produced in this production line were recycled as foundry defects - 5 percent of this value equals 8,444 parts being sent back. Based on an average copper concentration of 4.50 percent and an average part weight of 1.0 kg, this will result in a reduction of 380.0 kg/year.

6.1.3 TECHNICAL FEASIBILITY

As these materials would not be used in the process in any case and would just be recycled, this potential change is technically feasible. By working with the suppliers to reduce and eliminate foundry defects, Spinic is able to ensure that these reductions are implemented by the suppliers as much as reasonably possible.

6.1.4 ECONOMIC FEASIBILITY

Spinic has determined that there would be no cost to implementing this procedures, as it does not require any changes to the existing process or associated equipment. The

savings associated with this option are due to a reduction in the value of scrap which is sent due to foundry defects. In 2011, the total value of scrap which was defective equaled $1,301,043. By reducing this amount by 5 percent, there would be an annual savings of $65,052. This corresponds to an immediate payback period. Therefore, it has been determined that implementing this reduction option is economically feasible.

6.2 PRODUCT REDESIGN OR REFORMULATION

6.2.1 IDENTIFICATION OF OPTIONS

The specifications of the final products are determined Spinic's customers. The customer specifies product configurations. Spinic does not have any control over the design of the products. Therefore, no possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.2.2 ESTIMATED REDUCTIONS

Not applicable.

6.2.3 TECHNICAL FEASIBILITY

Not applicable.

6.2.4 ECONOMIC FEASIBILITY

Not applicable.

6.3 EQUIPMENT OR PROCESS MODIFICATIONS

6.3.1 IDENTIFICATION OF OPTIONS

The equipment used at the facility optimized to ensure that a minimum amount of scrap is produced. Therefore, no possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.3.2 ESTIMATED REDUCTIONS

Not applicable.

6.3.3 TECHNICAL FEASIBILITY

Not applicable.

6.3.4 ECOMONIC FEASIBILITY

Not applicable.

6.4 SPILL AND LEAK PREVENTION

6.4.1 IDENTIFICATION OF OPTIONS

All Copper used in the raw materials at the Facility is contained in metals. Spill and leak prevention is not a concern and no possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.4.2 ESTIMATED REDUCTIONS

Not applicable.

6.4.3 TECHNICAL FEASIBILITY

Not applicable.

6.4.4 ECONOMIC FEASIBILITY

Not applicable.

6.5 ON-SITE REUSE AND RECYCLING

6.5.1 IDENTIFICATION OF OPTIONS

All metal scrap generated at the Facility is recycled. The metal scrap cannot be reused in the process as it is not in a form which would allow it to be used (i.e. it is too small or it is misshaped). Therefore, no possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.5.2 ESTIMATED REDUCTIONS

Not applicable.

6.5.3 TECHNICAL FEASIBILITY

Not applicable.

6.5.4 ECONOMIC FEASIBILITY

Not applicable.

6.6 IMPROVED INVENTORY MANAGEMENT/ PURCHASING TECHNIQUES

6.6.1 IDENTIFICATION OF OPTIONS

Spinic's inventory is controlled by customer demand. The Facility only has enough inventory for at minimum three days of production at any given time. In addition, the metal products do not have an expiry date, so no materials will be disposed as a result of expired inventory. Therefore, no possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.6.2 ESTIMATED REDUCTIONS

Not applicable.

6.6.3 TECHNICAL FEASIBILITY

Not applicable.

6.6.4 ECONOMIC FEASIBILITY

Not applicable.

6.7 TRAINING OR IMPROVED OPERATING PRACTICES

6.7.1 IDENTIFICATION OF OPTIONS

Employees are trained on each piece of machinery, and the requirements for each part that the Facility produces. Employees are trained on any changes or updates to the production of parts and a quality system document is used to document the training and entered on each employee's file. Spinic conducts continuous improvement meetings and production meetings daily to ensure issues are dealt with and communicated as soon as possible to ensure the quality of parts are in conformance with the customer demands. Therefore, no further possible reduction options were identified in this category that would result in a reduction in the use of Copper.

6.7.2 ESTIMATED REDUCTIONS

Not applicable.

6.7.3 TECHNICAL FEASIBILITY

Not applicable.

6.7.4 ECONOMIC FEASIBILITY

Not applicable.

7.0 OPTIONS TO BE IMPLEMENTED

The following options have been identified for implementation to reduce the use and/or amount of Copper transferred:

- Reduce the amount of foundry defects in the process

This option is will be implemented at Spinic starting in 2013. This will then be an ongoing option, with annual reduction targets that will change from year to year. The schedule for this reduction option is given below:

Step	Description	Estimated Timelines
1	Discussions with Foundry Suppliers	January 2013-Ongoing
2	Implement improvements to materials receiving procedure	
3	Timeline for reductions of Copper	December 2013 - Ongoing

Spinic has carefully reviewed the toxic substance use reduction options to ensure that there is no net negative impact to the environment or public health. The selected options will serve to reduce the amount of Copper used in the process, and will not create any toxic by-products.

8.0 PLANNER RECOMMENDATIONS AND RATIONALE

The planner's recommendations and rationale for those recommendations are to be appended to the plan. Please refer to Section 18.2 of the regulation for an outline of the requirements for the planner's recommendations.

If the planners feels that recommendations cannot be made in any of the categories listed, he or she must explain the reasons why in writing and append them to the plan. Guidance on the requirements for planners recommendations will be available as part of the training program to license toxic substance reduction planners.

9.0 PLAN CERTIFICATIONS

CERTIFICATION BY HIGHEST RANKING EMPLOYEE

As of December 17, 2012, I, Kevin Radbourne, certify that I have read the toxic substance reduction plan for the toxic substance 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.

Copper

Kevin Radbourne
Operations Manager
Spinic Manufacturing

CERTIFICATION BY LICENSED PLANNER

As of December 17, 2012, I, Dana Lauder, certify that I am familiar with the processes at Spinic 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 November 26, 2012 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

Copper

Dana Lauder [Planner License # TSRP00014]
Consultant
Conestoga-Rovers & Associates Ltd.

APPENDIX A

COPPER PLANNER RECOMMENDATIONS

CONESTOGA-ROVERS
& ASSOCIATES

651 Colby Drive, Waterloo, Ontario, N2V 1C2
Telephone: (519) 884-0510 Fax: (519) 884-0525
www.CRAworld.com

December 17, 2012

Reference No. 007640

Mr. Laslo Retek
Spinic Manufacturing
285 Massey Road
Guelph, Ontario
N1K 1B2

Dear Mr. Retek:

Re: Toxics Reduction Plan - Copper – Planner Recommendations

1.0 INTRODUCTION

The Toxics Reduction Act and Ontario Regulation (O. Reg.) 455/09 require that each toxic substance reduction plan be reviewed and certified by a Certified Toxic Substance Reduction Planner (Planner). Section 18 of O. Reg. 455/09 also requires the Planner to provide recommendations, with supporting rationale, for the purposes of improving all aspects of the plan including the potential for reducing the use and creation of the toxic substance at the facility and the business rationale for implementing the plan.

The Planner is required to provide recommendations for any of the following relevant issues, or a written explanation of why a recommendation is not necessary:

1. Whether improvements could be made in the expertise relied on in preparing the plan
2. Whether improvements could be made in:
   - i. The data and methods used for accounting purposes
   - ii. The process flow diagrams
   - iii. Reasons why the input and output balances are not approximately equal
   - iv. A description of how, when, where and why the substance is used or created
3. Whether there are technically and economically feasible options for reducing the use and creation of the substance at the facility that have not been identified in the plan that would result in reductions that are equal to or greater than those already identified in the plan
4. Whether improvements could be made in:
   - i. The estimates of anticipated reduction of use or creation, releases to environment and contained in product of the substance
   - ii. In determination of the technical feasibility of options

iii. In determination of the economic feasibility of options

5. Whether improvements could be made to the estimates of the direct and indirect costs
6. Whether the steps and timetable set out in the implementation plan are likely to be achieved.

2.0 EXPERTISE RELIED ON IN PREPARING THE PLAN

This Toxic Substance Reduction Plan (Plan) was developed by a planning team that included Laslo Retek, the Environmental Coordinator at Spinic, Dana Lauder, a Licensed Certified Toxics Reduction Planner, and Sean Williams, an environmental consultant.

Laslo Retek has intimate knowledge of all aspects of the production processes at Spinic and was the lead for developing the plan and providing input. Sean Williams was responsible for preparing the plan through consultation with the necessary personnel at Spinic and with advice from the Licensed Planner. All relevant data was collected from the appropriate departments.

Since Spinic has very little control over the product specs or production process, it is recommended that Spinic work with their customer to devise viable reduction options.

3.0 ACCOUNTING

Data and Methods Used

The total amount of copper used at the facility is obtained from purchasing and inventory records from Spinic's purchasing department.

The copper content of each material is determined using the material specifications. The accuracy of the calculated amount of copper contained in the products entering the process varies depending on the product and the level of detail provided on the material specification for each raw material. In the cases where a concentration range is provided, the accuracy of the accounting could be increased with obtaining actual copper content directly from the supplier.

The accuracy of the accounting could also be improved by separating the materials sent off site for recycling and tracking the materials individually. Currently the recycled quantities are grouped together, and the recycled quantity of each material is estimated using a ratio of raw materials.

All quantities calculated for accounting purposes are based on mass balance calculations. Based on the data available and the type of processes involved at Spinic, this is the most accurate and appropriate method for accounting purposes.

Process Flow Diagrams

Spinic keeps process flow charts at the Facility for all stages of production. The process flow diagrams provided for the purposes of this Plan are considered to be comprehensive and accurate; therefore there are no recommendations for this section.

Input/Output Balance

The input and output balances were calculated using a mass balances. Therefore, the inputs are equal to the outputs, and a recommendation is not necessary.

Description of how, when, where, and why the substance is used or created

The Plan satisfies this condition of the Regulation and I have no recommendations to improve the Plan regarding this requirement.

4.0 TOXIC SUBSTANCE REDUCTION OPTIONS

Spinic has identified one technically and economically feasible option to reduce the use of copper. This option has an estimated 380 kg annual reduction in the use of copper. While this is a relatively small amount, copper is a component of the raw materials used at the facility and Spinic does not have control over the raw materials. Spinic's customers have very stringent requirements, which do not allow for changes in raw materials or products. There are no releases of copper, and no disposals. All material not contained in the final product is sent off-site for recycling.

Since off-site transfers for recycling make up 38,938 kg of 140,250 kg brought into the facility, it is recommended that Spinic investigate ways to bring material into the facility closer to their final dimensions so that less material is machined off and less material is transferred off-site for recycling.

Many of the costs used throughout the Plan to determine economic feasibility appear to be estimated or assumed costs. Obtaining quotes or providing references to where the costs were

obtained would help in assessing the accuracy of the economic feasibility analysis to ensure Spinic meets the goals set out in the Plan.

5.0 DIRECT AND INDIRECT COSTS

All costs associated with the use of copper were obtained from the accounting department. All costs associated with the use of copper have been accounted for and no additional recommendations can be made at this time.

6.0 IMPLEMENTATION PLAN

An implementation schedule with steps has been provided by Spinic. There are no further recommendations for this section.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Dana Lauder, P. Eng.
Certified Toxics Reduction Planner - Licence #TSRP0014

SW/mg/6

APPENDIX B

SPINIC PLAN SUMMARY

PLAN SUMMARY
SPINIC MANUFACTURING
GUELPH, ONTARIO

Name & CAS # of Substance	Copper	7440-50-8
Substances for which other plans have been prepared	Nickel	7440-02-0
Facility Identification and Site Address		
Company Name	Linamar Corporation	
Facility Name	Spinic Manufacturing	
Facility Address	**Physical Address:**	**Mailing Address: (if different)**
	285 Massey Road Guelph, Ontario N1K 1B2	
Spatial Coordination of Facility	Easting: 5556132.65 Northing: 4820873.31	
Number of Employees	350	
NPRI ID	4738	
Ontario MOE ID Number		
Parent Company (PC) Information		
PC Name & Address **Percent Ownership for each PC**	Linamar Corporation, 287 Speedvale Avenue West, Guelph, Ontario N1H 1C5 100%	
Business Number for PC	103333662	
Primary North American Industrial Classification System Code (NAICS)		
2 Digit NAICS Code	33 Manufacturing	
4 Digit NAICS Code	3363 - Motor Vehicle Parts Manufacturing	
6 Digit NAICS Code	336350 - Motor Vehicle Transmission and Power Train Parts Manufacturing	
Company Contact Information		
Facility Public Contact	Mr. Kevin Radbourne, Operations Manager	
	kevin.radbourne@linamar.com	
	Phone: (519) 763-0704 ext. 607	Same address as facility
	Fax: (519) 763-2972	

PLAN SUMMARY STATEMENT

This plan summary reflects the content of the toxic substance reduction plan for Spinic Manufacturing (Spinic) for Copper, prepared by Conestoga-Rovers & Associates.

STATEMENT OF INTENT

Spinic Manufacturing (Spinic) is committed to playing a leadership role in protecting the environment. Whenever feasible, we will reduce the use of Copper in compliance with all Federal and Provincial Regulations.

REDUCTION OBJECTIVES

Spinic prides itself on technological innovation in order to produce high quality automotive parts in an environmentally responsible manner. Through this plan, Spinic will determine the technical and economic feasibility of each option to determine which, if any, are viable for implementation at this time.

REDUCTION OPTIONS TO BE IMPLEMENTED

The following options have been identified for implementation to reduce the use and/or amount of Copper transferred:

- Reduce the amount of foundry defects in the process

This option is will be implemented at Spinic starting in 2013. This will then be an ongoing option, with annual reduction targets that will change from year to year. The schedule for this reduction option is given below:

Step	Description	Estimated Timelines
1	Discussions with Foundry Suppliers	January 2013-Ongoing
2	Implement improvements to materials receiving procedure	
3	Timeline for reductions of Copper	December 2013 - Ongoing

Spinic has carefully reviewed the toxic substance use reduction options to ensure that there is no net negative impact to the environment or public health. The selected options will serve to reduce the amount of Copper used in the process, and will not create any toxic by-products.

CERTIFICATION BY HIGHEST RANKING EMPLOYEE

As of December 17, 2012, I, Kevin Radbourne, certify that I have read the toxic substance reduction plan for the toxic substance 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.

Copper

Kevin Radbourne
Operations Manager
Spinic Manufacturing

CERTIFICATION BY LICENSED PLANNER

As of December 17, 2012, I, Dana Lauder, certify that I am familiar with the processes at Spinic 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 November 26, 2012 and that the plan complies with that Act and Ontario Regulation 455/09 (General) made under that Act.

Copper

Dana Lauder
Conestoga-Rovers & Associates
Planner License #TSRP00014
dlauder@craworld.com