

## Appendix A      TRA Plan Summary – Propylene

Basic Facility Information		
<b>Name &amp; CAS # of Substance</b>	Propylene	115-07-1
<b>Substances for which other Plans have been prepared</b>	N/A	N/A

Facility Identification and Site Address		
<b>Company Name</b>	GreenMantra Recycling Technologies	
<b>Facility Name</b>	GreenMantra Recycling Technologies	
<b>Facility Address</b>	<b>Physical Address:</b>	<b>Mailing Address: (if different)</b>
	81 Elgin Street Brantford, Ontario N3S 5A1	
<b>Spatial Coordination of Facility</b>	560645 E 4777634 N; Zone 17	
<b>Number of Employees</b>	35	
<b>NPRI ID</b>		
<b>Ontario MOECC ID Number</b>		

Parent Company (PC) Information	
<b>PC Name &amp; Address</b>	GreenMantra Recycling Technologies 81 Elgin Street Brantford, Ontario N3S 5A1
<b>Percent Ownership for each PC</b>	100 percent
<b>Business Number for PC</b>	831657853
<b>Primary North American Industrial Classification System Code (NAICS)</b>	
<b>2 Digit NAICS Code</b>	33 – Manufacturing
<b>4 Digit NAICS Code</b>	3359 – Other Chemical Product Manufacturing
<b>6 Digit NAICS Code</b>	325999 – All Other Miscellaneous Chemical Product Manufacturing

Company Contact Information			
<b>Facility Public Contact</b>	Ryan L'Abbe V.P. – Operation <a href="mailto:ryan.labbe@greenmantra.com">ryan.labbe@greenmantra.com</a> Phone: 519 512-2015 Fax: 519 800-5510	Same address as facility	
	<b>Facility Technical Contact</b>		Same address as facility
	Amit Parekh Process Engineer <a href="mailto:amit.parekh@greenmantra.com">amit.parekh@greenmantra.com</a> Phone: 519 512-2015 ext. 118 Fax: 519 800-5510		

Company Contact Information		
<b>Company Coordinator Contact</b>	David Irvine Plant Manager <a href="mailto:david.irvine@greenmantra.com">david.irvine@greenmantra.com</a> Phone: 519 512-2015 ext. 117 Fax: 519 800-5510	Same address as facility
<b>Person who Prepared the Plan: (if different from the Coordinator)</b>	Robert Morgan, M.A.Sc., B.Eng. Environmental Consultant <a href="mailto:robert.morgan@ghd.com">robert.morgan@ghd.com</a> Phone: 519- 884-0510 ext. 2342	GHD Limited 651 Colby Drive Waterloo, ON N2V 1C2
<b>Highest Ranking Employee</b>	Same as Public Contact	Same as facility address

Planner Information:		
<b>Planner Responsible for Making Recommendations</b>	Erik Martinez, P.Eng. Environmental Consultant Planner License No. TSRP0005 <a href="mailto:erik.martinez@ghd.com">erik.martinez@ghd.com</a> Phone: 519- 884-0510 ext. 2342	GHD Limited 651 Colby Drive Waterloo, ON N2V 1C2
<b>Planner Responsible for Certification</b>	(same as planner responsible for making recommendations)	

**Toxic Reduction Policy Statement of Intent**

GreenMantra Recycling Technologies (GreenMantra) does not intend to reduce the use or creation of propylene. GreenMantra is committed to playing a leadership role in protecting the environment. Whenever feasible, we will reduce the use and releases of propylene in compliance with all Federal and Provincial Regulations.

**Reduction Objectives**

GreenMantra was unable to identify any reduction options; therefore, there is no reduction objective in this plan.

**Description of Facility**

GreenMantra processes polypropylene (PP), high-density polyethylene (HDPE), linear low-density polyethylene (LLDPE), and low-density polyethylene (LDPE) to produce wax and fuel oil.

The manufacturing process may be summarized as follows:

1. Raw material, consisting of virgin resins, off-spec resins, post-industrial plastics, and post-consumer plastics in regrind, pellets, prills and flakes, and other forms that have been cleaned is conveyed to an extruder at a temperature of 250-350°C.
2. Plastic exits the extruder and pours directly into the reactor under an inert nitrogen blanket.
3. The reactor heats the plastic to a temperature of 375°C under nitrogen in the presence of a metal catalyst. The reaction begins at this temperature where the catalyst breaks down the plastic into liquid wax and gaseous components made up of lower molecular weight hydrocarbons/VOCs. These gaseous components are vented throughout the reaction. The reaction continues for certain contact time with the catalyst, all dependent on the type of wax to be made. The wax reaches a temperature of approximately 410°C during the process prior to draining.

4. The wax is drained into a cooling tank, where the wax is cooled from 410°C to 180-250°C.
5. The wax is then de-oiled, oil is collected, and refined wax is sent for processing.
6. The cooled wax is prepared for processing by either:
  - a) Cooling in a slab press to produce blocks of wax
  - b) Cooling on steel belt to produce pastilles
  - c) Placed in bulk liquid tanks to be taken by bulk liquid trucks
7. The light organic fractions that are vented from the reaction and other parts of the process are collected, condensed, and pumped into storage tanks and barrels for shipping.

### **Toxic Substance Reduction Options**

After looking into the seven categories of toxic substance reduction options, no options were identified. Explanations are provided in the table below to detail why an option could not be identified in each category.

Toxic Substance Reduction Category	Option: Identification and Description
1) Materials or feedstock substitution	<b>No option identified:</b> GreenMantra is no longer purchasing plastic from the supplier which yielded high propylene creation. GreenMantra accepts raw materials from two suppliers for 80% of their material (which does not use the supplier which yielded high propylene creation), the remaining 20% of incoming raw materials will be other offspec materials from several other suppliers. Since this purchasing system is already in place, no further possible reduction options were identified in this category that would result in the reduction in the use or creation of propylene.
2) Product design or reformulation	<b>No option identified:</b> The product design is not dependent on the plastic used. The formulation of the wax cannot be changed and therefore is not within GreenMantra's control. Therefore, no possible options were identified in this category that would result in a reduction in the use or creation of propylene.
3) Equipment or Process Modification	<b>No option identified:</b> GreenMantra has altered their condensing process to add new condensing lines and add a thermal oxidizer to burn VOCs. The new condensing steps and thermal oxidizer will reduce the VOCs (including propylene) from being emitted at the Facility, however it will not have an effect on the amount of propylene created or used. Therefore, no possible options were identified in this category that would result in a reduction in the use or creation of propylene.
4) Spill and Leak prevention	<b>No option identified:</b> To ensure propylene does not leak through vent piping, preventative maintenance is carried out periodically to test for spills or leaks. Therefore, no possible reduction options were identified in this category that would result in a reduction in the use or creation of propylene.

Toxic Substance Reduction Category	Option: Identification and Description
5) On-site reuse or recycling	<b>No option identified:</b> All material is chemically changed to wax and therefore cannot be recycled. Therefore, no possible options were identified in this category that would result in a reduction in the use or creation of propylene.
6) Improve inventory management or purchasing techniques	<b>No option identified:</b> GreenMantra currently ensures that the type of plastic that yields high propylene creation is not the main source of raw materials used. Therefore, no possible reduction options were identified in this category that would result in a reduction in the use or creation of propylene.
7) Training or improved operating practices	<b>No option identified:</b> Employees are trained on each piece of machinery, and the requirements for every part that the Facility produces. Work instruction and quality control documents are posted at every work station. Employees are trained on any changes or updates to the production process.  GreenMantra conducts continuous improvement meetings and production meetings to ensure issues are dealt with and communicated as soon as possible to ensure the quality of the product is in conformance with the customer demands.

***Plan Summary Statement***

This plan summary accurately reflects the content of the toxic substance reduction plan for the use of propylene.

***Certification by Highest Ranking Employee***

Attached.

***Certification by Licensed Planner***

Attached.