



REPORT

Written Summary of Implemented Process Improvement Actions for Benzo(a)Pyrene and Benzene

As Required by Site-Specific Standard Approvals for Ruetgers Canada Inc.

Submitted to:

Ruetgers Canada Inc.

Submitted by:

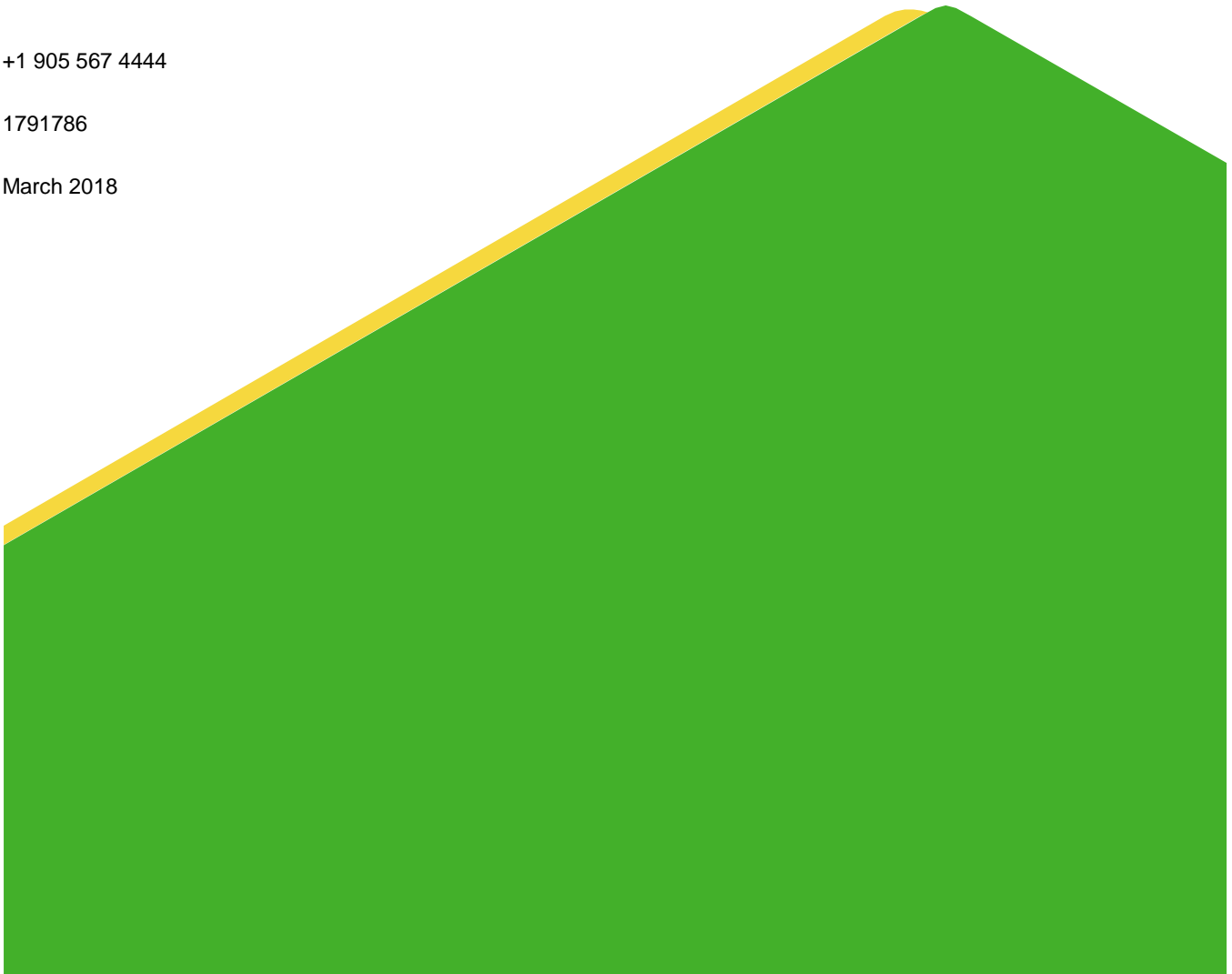
Golder Associates Ltd.

6925 Century Avenue, Suite #100 Mississauga, Ontario, L5N 7K2 Canada

+1 905 567 4444

1791786

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Distribution List

1 e-copy: District Manager

1 e-copy: SDB Director

1 e-copy: Ruetgers Canada Inc.

1 e-copy: Golder Associates Ltd.

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1.0 INTRODUCTION

Ruetgers Canada Inc. (Ruetgers) operates a coal tar and petroleum-based material processing facility located at 725 Strathearne Avenue N. in Hamilton, Ontario (the Facility). The Facility takes by-products from the steel manufacturing sector and produces high value products used in the aluminum, chemical, construction, pavement sealer and wood preservation industries.

Ruetgers has implemented an air emissions control program to reduce benzene and benzo(a)pyrene [B(a)P] emissions from the Facility since in the 1990's. This program was completed successfully in 2013, resulting in the reduction of benzene and B(a)P emissions by over 99% from historical levels. However, updates to the emission estimating calculation methods completed in 2014 and the introduction of the Ontario Ministry of the Environment and Climate Change (MOECC) annual standards for both benzene and B(a)P in 2016 required the Facility to submit Site-Specific Standard (SSS) Applications to demonstrate compliance with O. Reg. 419/05. The SSS Applications were submitted in February 2016. Updated documentation requested by the MOECC was submitted subsequently as needed (e.g., updated Action Plans).

The SSS for benzene and B(a)P were approved on November 21, 2017 (Reference Number 7856-9VDPSR) as summarized in Table 1.

Table 1: Summary of Benzene and B(a)P Site-Specific Standards

Contaminant, CAS Number	Applicable Dates	Annual Site-Specific Standard [$\mu\text{g}/\text{m}^3$]
B(a)P, 50-32-8	November 21, 2017 – December 31, 2017	0.062
	January 1, 2018 – June 30, 2018	0.0613
	July 1, 2018 – Expiry Date	0.0008
Benzene, 71-43-2	November 21, 2017 – June 30, 2018	27.7
	July 1, 2018 – Expiry Date	12.7

The following sections associated with the Facility's SSS Approvals or Orders require Ruetgers to prepare a Written Summary of the actions taken each calendar year to implement the Action Plans for B(a)P and benzene:

- B(a)P: Condition 5 in Site-Specific Standard Approval Number 201-17-rv0 issued November 21, 2017
- Benzene: Item 4.19 in Order Number 202-17-order-rv0 issued November 21, 2017

This Written Summary of the B(a)P and benzene Action Plans implementation summarizes the calendar years of 2016 and 2017. This Written Summary presents descriptions of each action taken, date of implementation of each action taken, and dates for the implementation of actions yet to be taken. This Written Summary was submitted electronically to the MOECC District Manager as well as the MOECC Standards Development Branch (SDB) Director by March 31, 2018.

2.0 B(A)P AND BENZENE ACTION PLANS AND IMPLEMENTATION

The Action Plans for B(a)P and benzene were submitted to the MOECC as part of the SSS Application in February 2016. Following review and discussions with the MOECC, the Action Plans for B(a)P and benzene were updated and resubmitted in September and November 2016, respectively. The SSS Approvals define the Action Plans as those “submitted by the Company as part of its Request, including but not limited to the items summarized in Appendix 1 of this Approval.” Appendix 1 of each SSS Approval includes further actions that were not included in the originally submitted Action Plans.

Section 2.1 – 2016 Calendar Year Implemented Actions summarizes the actions taken in 2016 based on the original Action Plans (February 2016). Section 2.2 – 2017 Calendar Year Implemented Actions summarizes the actions taken in 2017 based on both the originally submitted Action Plans (February 2016) and the actions listed in Appendix 1 of each SSS Approval (November 2017).

2.1 2016 Calendar Year Implemented Actions

In 2016, Ruetgers implemented several Process Improvement Actions that were approved in the B(a)P and benzene Action Plans. These actions focused on the product handling sources at the Facility, including tanker truck loading sources (LS2 and LS4) and rail car loading source (LS3). These actions are intended to improve the capture efficiency of the Fume Scrubbing System (FSS) as the Action Plans continue to be implemented. Details of the implemented actions, dates they were implemented in 2016, actions that have not been implemented yet and their planned implementation dates are summarized in Table 2.

Table 2: Summary of Process Improvement Actions Implemented in 2016 as Part of the B(a)P and Benzene Action Plans

Process Improvement Action	Source ID	Process Improvement Action Detail	Action Implemented in 2016?	Notes
B(A)P				
Sandvik Building – Dust Collector	PS19	90% Control Efficiency of Dust Collector	—	No upgrades made to Sandvik Unit flaking step; same dust collector efficiency at end 2016 as before. Source to be eliminated in Q3 2017.
Loading Building	VS6B	90% Control Efficiency of Enclosure	—	
Benzene				
LDAR Program	LS1, VS2, VS3, VS8	No action until 2017	—	—
B(a)P and Benzene				
Product Handling	LS2-LS4	98% FSS Capture Efficiency	—	Current FSS Capture Efficiency is 98%
■ Improve scrubber oil replenishment frequency, temperature control, & type	LS2-LS4	Lower viscosity scrubber oil now being used that allows for lower temperature of scrubber oil and improved fume condensing ability. Frequency of scrubber oil refresh now at one load every two months	Yes, Q1 and Q2 of 2016	—
■ Automate and improve draw of fumes	LS2-LS4	Complete engineering design	Yes, Q3 of 2016	Construction starting Q2 2017
■ Add new control system on pressure control TK-77 (exhaust drawn by TK-49)	LS2-LS4	Complete engineering design	Yes, Q3 of 2016	Construction starting Q2 2017
■ Reduce impact of post loading steam blowouts through use of orifice reducers	LS2-LS4	—	Yes, Q1 and Q2 of 2016	—
■ Design closure plate over dip rod hole	LS3	Engineer/design new loading arm with complete seal (Q3 2016)	No	Target completion is Q1 2018
		New design for enclosing dip rod enclosure was successful, however, complete RC loading seal was still an issue (Q3 2016)		Starting project in Q1 2017
		Plan to replace the entire loading arm assembly to ensure tight fitting enclosure can be guaranteed (Q3 2016)		First trial arm installation to be Spot 4 Track 1 in Q4 2017
		Replace loading arms (Q4 2016)		—
■ Improve seal on loading equipment	LS3	Engineer/design new loading arm with complete seal	No	Target completion is Q1 2018
		Several designs for new enclosure lid to trial		Trials were not as successful as hoped Q1 & Q2 2016

Process Improvement Action	Source ID	Process Improvement Action Detail	Action Implemented in 2016?	Notes
		Plan to replace the entire loading arm assembly to ensure tight fitting enclosure can be guaranteed		First trial arm installation to be Spot 4 Track 1 in Q4 2017
■ Improve seal on loading equipment	LS2, LS4	Engineer/design new sealing application on loading arm cone	No	—
		Install high temperature sealing rubber to ensure tight fitting enclosure can be guaranteed		
■ Improve seal on rinsing station	LS3	Preliminary Engineering design complete in Q1&Q2; Final design in Q4	Yes	To start fume hose improvements in Q2 2017
■ Improve seal on RC unloading stations	LS2-LS4	Preliminary Engineering design complete in Q1&Q2; Design trial was a success (1/4 spots complete); Install remaining unloading covers (4/4) in Q4	No	Completed trial seal on one spot. Others will be completed in Q2 2017
■ Update SOPs (BMPP) - throttle pumps without speed control upon startup	LS2-LS4	Review and optimize all variable speed drives (VSDs) on-site; this is an on-going process until all actions above are implemented. Design changes on loading arms will change how VSDs are programmed. As changes are made to throttling/VSDs, the SOPs will be altered accordingly. Changes will begin in September 2016 and will continue to March 2018.	No	Ongoing

2.2 2017 Calendar Year Implemented Actions

In 2017, Ruetgers implemented several Process Improvement Actions that were approved in the B(a)P and benzene Action Plans and included in the SSS Approvals. Ruetgers continued to focus on the actions related to product handling sources at the Facility, including tanker truck loading sources (LS2 and LS4) and the rail car loading source (LS3). These actions are intended to improve the capture efficiency of the FSS as the Action Plans continue to be implemented. Details of the implemented actions, dates they were implemented in 2017, actions that have not yet been implemented and their planned implementation dates are summarized in Table 3.

Table 3: Summary of Implemented Action Plan in 2017 for B(a)P and Benzene as per Site-Specific Standard Approvals

Action	Expected Date of Completion	Action Included in Action Plans	Action Implemented in 2017?	Notes
B(a)P				
Implement door closure practices on pitch flaking operation	Dec. 21, 2017	No	No - Unit was closed as of Aug. 10, 2017	—
Solid(flakes) Coal tar pitch production line closing	Oct. 1, 2017	Yes	Yes – Closed as of Aug. 10, 2017	—
Engineering Report of the FSS, including: <ul style="list-style-type: none"> ■ Engineering Calculations (mass, heat/energy balance) to clarify the system capacity and actual operating parameters, to determine whether or not the existing system has sufficient capacity to handle the volatile organic compounds (VOC) loading at the projected efficiency. ■ Engineering Calculations (mass, heat/energy balance) to clarify the system capacity to determine whether or not the existing system has sufficient capacity for additional VOCs loading. ■ To assess situations when the system is overwhelmed and excess vapours are not captured. ■ To determine additional methods that would be used to direct volatile organic compounds if the system capacity is not sufficient. To assess further methods to address system efficiency and optimize operations.	Dec. 31, 2018	No	N/A (2018 date of completion)	—
Benzene				
Fume Gathering and Incineration System (FGI): Install equipment, implement and maintain a program to continuously monitor and record the temperature, flow rate and residence time of the gaseous stream into the incineration system, as detailed in the steps below:	—	—	—	—
<ul style="list-style-type: none"> ■ Plan and arrange for necessary equipment 	Dec. 21, 2017	No	No (see interim solution in Notes section)	<ul style="list-style-type: none"> ■ Interim solution is to estimate gas stream flow rate and residence time along with known temperature by week of April 16 ■ Permanent solution is delayed due to complexity of finding appropriate equipment due to congested piping/ducting space. Working with a vendor. Need to conduct gas stream sampling to confirm technical feasibility of measuring equipment. Success of this approach avoids major existing equipment modifications and boiler shutdown. Timeline for installation/commissioning which follows gas stream sampling/testing, confirmation that the measuring equipment will work and delivery is week of June 4, 2018.
<ul style="list-style-type: none"> ■ Install the equipment 	Jan. 21, 2018	No	N/A (2018 date of completion)	
<ul style="list-style-type: none"> ■ Start to operate the installed equipment to continuously monitor and record the temperature, flow rate and residence time of the gaseous stream into the incineration system 	Feb. 21, 2018	No	N/A (2018 date of completion)	
Engineering Report of the FGI System, including: <ul style="list-style-type: none"> ■ Engineering Calculations (mass, heat/energy balance) to clarify the system capacity and actual operating parameters, to determine whether or not the existing system has sufficient capacity to handle the VOCs loading at the projected efficiency. ■ Engineering Calculations (mass, heat/energy balance) to clarify the system capacity to determine whether the existing system has sufficient capacity for additional VOCs loading. ■ To assess situations when the system is overwhelmed and excess vapours are not captured. ■ To determine additional methods that would be used to direct volatile organic compounds if the system capacity is not sufficient. To assess further methods to address system efficiency and optimize operations.	Dec. 31, 2018	No	N/A (2018 date of completion)	—

Action	Expected Date of Completion	Action Included in Action Plans	Action Implemented in 2017?	Notes
Engineering Report: Assess Wastewater Plant operations and options to increase benzene removal efficiency and decrease benzene emissions to the atmosphere.	Dec. 31, 2018	No	N/A (2018 date of completion)	—
B(a)P and Benzene				
Update and implement Standard Operating Procedures (SOP) for the Coal tar pitch production line	Dec. 21, 2017	No	No – Unit was closed as of Aug. 10, 2017	—
Improve cleaning practices at the Facility to minimize emissions	Dec. 21, 2017	No	No – Unit was closed as of Aug. 10, 2017	—
Fume Scrubbing System (FSS): <ul style="list-style-type: none"> ■ Increase frequency of adding new scrubber oil ■ Increase temperature control ■ Use appropriate quality scrubbing oil 	Dec. 21, 2017	Yes	Yes – Complete as of Q1-Q2 2016	—
Liquid (product) Coal tar pitch handling improvements:	—	—	—	—
<ul style="list-style-type: none"> ■ Improving seal on unloading stations 	Dec. 21, 2017	Yes	Yes – Complete as of Dec 20, 2017 for tar unloading; Mar 28, 2018 for pitch unloading	—
<ul style="list-style-type: none"> ■ Automate and improve draw of fumes 	Dec. 21, 2017	Yes	Yes – Complete as of Jan 20, 2018	Delay was due to the need to complete all equipment modifications before connecting/configuring to the process control system all at the same time.
<ul style="list-style-type: none"> ■ Add new control system to control pressure on tank TK-77 	Dec. 21, 2017	Yes	Yes – Complete as of Jan 20, 2018	Delay was due to the need to complete all equipment modifications before connecting/configuring to the process control system all at the same time.
<ul style="list-style-type: none"> ■ Improving seal on rinsing stations 	Dec. 21, 2017	Yes	Yes – Complete as of Jan 28, 2018	Delay was due the need for a new vacuum control arm.
<ul style="list-style-type: none"> ■ Improve seal on loading equipment for tanker trucks 	Jan. 1, 2018	Yes	Yes – Complete as of Mar. 16, 2018	—
<ul style="list-style-type: none"> ■ Replacing loading arms for rail cars 	Mar. 31, 2018	Yes	N/A (2018 date of completion)	First new loading arm commissioned Q4 2017 at Spot 4 Track 1; Second new arm installed Q1 2018 at Spot 6 Track 1 and to be commissioned; Other 6 arms are onsite; Target installation of remaining 6 arms by May 31, 2018.
<ul style="list-style-type: none"> ■ Update SOPs for ventilation, pumps 	Mar. 31, 2018	Yes	Yes – Complete as of Q4 2017 for completed equipment upgrades	Further updates to be completed once all equipment upgrades are in place.

2.2.1 LDAR Program

As part of the Action Plan for benzene submitted in November 2016, Ruetgers proposed to submit a LDAR plan to the MOECC for approval during the second quarter of 2017 and begin its implementation following its approval. As per the benzene Order, the LDAR plan (referred to as the Component Leak Survey Plan) does not require MOECC approval and its compliance date is April 1, 2018 (second quarter of 2018).

The LDAR program, as part of the benzene Order, includes the requirement of Component Identification, which has the compliance date of January 21, 2017 (two months after the benzene Order was issued). The Component Identification was prepared on January 21, 2018 and revised on March 16, 2018. Although not a requirement of the benzene Order, Ruetgers submitted the Component Identification to the MOECC, so that any recommendations could be incorporated into the document.

Ruetgers will provide the Director and District Manager with a summary of the dates on which the Component Leak Surveys are planned to take place in 2018. Ruetgers intends on implementing the first Component Leak Survey in April 2018 to meet the compliance date in the benzene Order.

3.0 CONCLUSION

This Written Summary was prepared for the exclusive use of Ruetgers and is intended to fulfil MOECC reporting requirements for a Written Summary as outlined in the B(a)P SSS Approval and benzene Order. The contents of the Written Summary are based on discussions with Ruetgers regarding Facility changes throughout 2016 and 2017 and review of documentation provided by Ruetgers. Any changes in Facility conditions and operational practices completed subsequent to this period are not accounted for. Persons other than Ruetgers and the previously mentioned Ontario regulatory authorities using this document or the observations, conclusions or recommendations stated within, will do so at their own risk.

When evaluating the Facility and developing this Written Summary, Golder has relied on information provided by Ruetgers and the regulatory authorities. Golder has acted in good faith and accepts no responsibility for any deficiencies, misstatements, or inaccuracies contained in this Written Summary resulting from omissions, misinterpretations or falsifications by those who provided Golder with information.

Golder prepared this Written Summary using its commercially reasonable best efforts consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions.

A site inspection and physical sampling of atmospheric emission sources were not completed as part of the scope of work.

Signature Page

Golder Associates Ltd.



Kate Liubansky, M.Env.Sc.
Air Quality Specialist



Sean Capstick, P.Eng.
Principal/Senior Air Quality Specialist

KL/EKL/FSC/ng

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