BAUSCH Health

100 Life Sciences Parkway • Steinbach, MB R5G 1Z7
(204) 326-9000 / 4239
Fax: (204) 326-9800

May 13, 2024

Project/File: Licence No.1364 R8

Agnes Wittmann
Director
Environmental Approvals Branch
Environment and Climate Change
EABDirector@gov.mb.ca
14 Fultz Boulevard
Winnipeg MB R3Y 0L6

Dear Agnes Wittmann,

Reference: NOA Request for Thermal Oxidizer Replacement

Please find attached the application and supporting information requesting approval for a Notice of Alteration (NOA) to the above-referenced licence. This is submitted in accordance with Section 14(1) of *The Environment Act*, on behalf of Bausch Health Companies Inc. for a proposed alteration to the licence for its pharmaceutical manufacturing facility at 100 Life Sciences Parkway in Steinbach, Manitoba.

Bausch Health Companies Inc. seeks approval to proceed with installation of two new thermal oxidizer units to replace the existing single thermal oxidizer at the Facility to address reliability and efficiency issues. The proposed alteration would not increase product throughput but would reduce operating costs and improve operations within the facility.

As indicated in the attached report, the proposed alteration would be completed entirely within the paved area north of the existing building. Based on the environmental assessment documented in the attached report, potential environmental effects of the alteration are considered negligible and limited to incremental increases in exhaust emissions during operation and incremental increases to greenhouse gas emissions and noise during the construction period.

As per the guidance in the Information Bulletin – Alterations to Developments with Environment Act Licences, this NOA request consists of an electronic copy (PDF file) of the NOA report and the completed NOA form. A $500 application fee, to be provided by Bausch Health Companies Inc, will follow the submission to Manitoba Environment and Climate Change.

Should you require any additional information or clarifications, please do not hesitate to contact the undersigned.

Regards,

[redacted]

cc: Eshetu Beshada, MECC
Johanna Theroux, Stantec Consulting Ltd.

Stantec

Bausch Health Notice of Alteration Report for Thermal Oxidizer Replacement

May 13, 2024

Prepared for:
Bausch Health Companies Inc.

Prepared by:
Stantec Consulting Ltd.

Project Number:
115423024

Limitations and Sign-off

This document entitled Bausch Health Notice of Alteration Report for Thermal Oxidizer Replacement was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Bausch Health Companies Inc. (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: [redacted]

Signature

Johanna Theroux, B.Env.Sc., M.Sc.

Printed Name

Reviewed by: [redacted]

Signature

Stephen Biswanger, P.Eng.

Printed Name

Approved by: [redacted]

Signature

Karen Mathers, P.Geo. FGC, PMP

Printed Name

Notice of Alteration Form

Notice of Alteration Form

Manitoba

File No. :	Environment Act Licence No. : 1364 R8

Legal name of the Licensee: Bausch Health Companies, Inc.

Name of the development: Bausch Health Companies Inc.

Category and Type of development per Classes of Development Regulation:

Manufacturing <SELECT>

Licensee Contact Person: Betty Harrylal

Mailing address of the Licensee: 100 Life Sciences Parkway

City: Steinbach Province: MB Postal Code: R5G 1Z7

Phone Number: (204) 326-9000 Fax: (204) 346-1596 Email: Betty.Harrylal@bauschhealth.com

Name of proponent contact person for purposes of the environmental assessment (e.g. consultant):

Thelma Chikwinya

Phone: (204) 326-9000 Fax: (204) 346-1596	Mailing address: 100 Life Sciences Parkway

Email address: Thelma.Chikwinya@bauschhealth.com

Short Description of Alteration *(max 90 characters)*:

Approval to replace the sites existing Thermal Oxidizer (TOX) with 2 new efficient TOX's.

Alteration fee attached: Yes: ☐ No: ☑

If No, please explain:

Date: May 23, 2024

Signature: [redacted]

Printed name: THELMA CHIKWINYA

A complete Notice of Alteration **(NoA)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Notice of Alteration Form**
- ☑ **1 electronic copy of the NoA detailed report** (see "Information Bulletin - Alteration to Developments with Environment Act Licences")
- ☐ **$500 Application fee, if applicable** (Cheque, payable to the Minister of Finance)

Submit the complete NoA to:
Director, Environmental Approvals Branch
Environment and Climate Change
Box 35, 14 Fultz Blvd
Winnipeg MB R3Y 0L6
EABDirector@gov.mb.ca

For more information:
Toll-Free: 1-800-282-8069
Phone: 204-945-8321 Fax: 204-945-5229
https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

Note: Per Section 14(3) of the Environment Act, Major Notices of Alteration must be filed through submission of an Environment Act Proposal Form (see "Information Bulletin – Environment Act Proposal Report Guidelines")

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Acronyms / Abbreviations

Bausch	Bausch Health Companies Inc.
CCOHS	Canadian Centre for Occupational Health and Safety
CFM	cubic feet per minute
CO_2e	CO_2 equivalent
ECCC	Environment and Climate Change Canada
GHG	greenhouse gas
LAA	Local Assessment Area
masl	metres above sea level
MECP	Manitoba Environment Climate and Parks
MMBTU	million British thermal units
NOA	Notice of Alteration
NRCAN	Natural Resources Canada
PS	Project Site
PSIG	per square inch gauge
PTH	Provincial Trunk Highway
RAA	Regional Assessment Area
RCMP	Royal Canadian Mounted Police
Stantec	Stantec Consulting Ltd.
the proponent	Bausch Health Companies Incorporated
TOX units	thermal oxidizers
VCs	valued components
VOCs	volatile organic compounds
WSC	Water Survey of Canada

1 Introduction

1.1 Project Overview

Bausch Health Companies Incorporated (the proponent) operates a pharmaceutical manufacturing facility located at 100 Life Sciences Parkway in Steinbach, Manitoba ('the Site' or 'the Facility') (Figure 1-1; Appendix A). The Facility operates under Environment Act Licence No. 1364 R8, issued on May 28, 2020, as part of approvals under *The Environment Act*. The existing Facility is considered a Class 2 Development under the Classes of Development Regulation (MR 164/88) of this Act.

The proponent seeks approval for a Notice of Alteration (NOA) to proceed with a planned installation of two thermal oxidizers (TOX units) to replace the existing single TOX at the Facility to address reliability and efficiency issues (the Project). The Project, as proposed, would reduce operating costs and improve operations within the Facility but no increased production of pharmaceuticals is proposed at this time.

Section 14(1) of *The Environment Act* requires a proponent to notify the Director (for Class 1 and 2 developments) if the proponent intends to alter a licensed development so that it no longer conforms to licence conditions or has the potential to change the environmental effects (Manitoba Environment Climate and Parks [MECP] 2022). The key consideration for assessing a NOA request is the significance of the environmental and human health effects generated as a result of the alteration and whether there is sufficient detail to allow the Director to determine whether the effects of the alteration are significant, insignificant, or nonexistent (MECP 2022).

This report documents the altered components of the development in terms of installation and operation of the new TOX units, the potential resultant environmental effects and planned mitigation measures.

1.2 The Proponent

For the purposes of development licensing, the proponent is Bausch Health Companies Inc. (hereinafter 'Bausch'). For further information regarding the Facility please contact the following:

Mrs. Thelma Paidamoyo Chikwinya
Safety and Environmental Engineer
100 Life Sciences Parkway
Steinbach, MB R5G 1Z7
Telephone: (204) 326-9000 ext 4327
E-mail: Thelma.chikwinya@bauschhealth.com

This NOA request was prepared by Stantec Consulting Ltd. ('Stantec') on behalf of the proponent. The local Stantec contact is:

Johanna Theroux B.Env.Sc., M.Sc.
Environmental Scientist
Stantec Consulting Ltd.
500-311 Portage Avenue
Winnipeg, MB R3B 2B9
Telephone: (204) 479-8874
Email: johanna.theroux@stantec.com

1.3 Land Ownership and Property Rights

The existing Facility is located at 100 Life Sciences Parkway in Steinbach, Manitoba on an 11.7 ha property owned by Bausch zoned M2 Industrial-Heavy by the City of Steinbach Zoning By-law 2100. The Site is located on part northwest and southwest Section 36, Township 6, Range 6 EPM. The legal description for the Site is described as 1-25539, PT Southwest 36-6-6E, 1-1-33248, 2-1-33248, 3-44271 ORG (Certificate of Title # 2981735; see Appendix B).

2 Project Description

2.1 Existing Licensed Development

Bausch has been in operation at the Steinbach location since 1992 (32 years) and is located on a site zoned "M2 Industrial-Heavy" under City of Steinbach zoning by-law 2100. The Facility (including the main building and parking areas) occupies approximately 6.9 ha on the 11.7 ha Site (Figure 1-2; Appendix A). The Facility annually produces and packages approximately 1.2 billion tablets or capsules of 12 different kinds of medications, which are sold worldwide to treat conditions such as pain, high blood pressure and depression.

For the production process, pharmaceutical ingredients are shipped to the Facility, where they are received and stored in warehouse spaces. Ingredients are tested for quality control purposes in the Facility laboratories. Once cleared by quality control, ingredients are transported by forklift from storage to production areas where ingredients undergo steps such as granulation, drying, milling, sizing, blending, compression, coating and printing, on a product-specific basis. The products are then moved to the packaging areas where they are dispensed, packaged and boxed. Products are then taken to storage for outgoing shipping. Processes vary depending on the product produced. The Facility also includes office spaces and a full cafeteria.

The Facility operates 24 hours per day, Monday to Friday (approximately 260 days per year), with limited shifts on weekends. The Facility employs approximately 402 people full-time, covering various shifts, and approximately 19 contracted employees. With some employees working on a hybrid remote schedule, it is estimated that approximately 350 employee vehicles travel to the Site per day and approximately 12 trucks per day visit the Site for shipping and receiving.

Based on 2019-2020 data, the Facility uses approximately 964,883 kwh of electricity per month and 62,643 m^3 of natural gas per week.

2.1.1 Existing Thermal Oxidizer

The existing TOX is approximately 24 years old (installed in 1999) and is reaching the end-of-life (Figure 2–1). The existing TOX requires replacement as it can generate fugitive emissions (presenting potential worker health and safety risks) and is considered by Bausch to operate inefficiently, resulting in increased operating costs.

Figure 2–1 Existing Thermal Oxidizer

The existing TOX is located on the north side of the Facility, north of the processing and utilities area (Appendix A; Drawing M-101). The existing TOX uses natural gas along with compressed air to create high temperatures to incinerate volatile organic compounds (VOCs) that are produced in the Facility's production process (i.e., isopropyl alcohol 99%, Ethyl-alcohol 200 Proof, Ethyl-alcohol 95%, Methanol, Denatured Ethyl-alcohol, Acetone). VOCs enter the TOX via the process exhaust system, with a process flow rate of 4,500-10,000 cubic feet per minute (CFM) depending on the product/process. The process gases pass through a filter bank before entering the combustion chamber for oxidation, creating carbon dioxide and water vapor, and reducing the VOC content. The emissions are exhausted to the atmosphere via a stack in the same area that extends approximately 6 m above the roof (approximately 15 m in total height). The TOX uses approximately 275 CFM of natural gas (mixed with approximately 0.3 CFM #1 diesel) and 2,700 CFM of clean air flow, to facilitate a total processing capacity of approximately 16,200 CFM at 1,300-1,400°F (704-760°C). Waste filters for the TOX are replaced approximately every six months and are disposed of by a licensed pharmaceutical waste processor. The existing TOX is operated approximately 24 hours per day, 5 days per week. While the majority of the Facility's emissions are treated through the existing TOX, some processes at the Facility release emissions directly to the atmosphere (bypassing the TOX), in accordance with the Facility's Environment Act license conditions.

2.2 Proposed Alteration

The proposed Project will replace the existing TOX with two new dual model 150 regenerative TOX units manufactured by Anguil Environmental Systems Inc., each working in a lead-lag configuration and discharging to a new common exhaust stack. The Project also involves the construction of a 14.6 m x 20.4 m building extension on the paved area on the north side of the Facility to house the new system. The Project will convert hazardous VOCs from Bausch's production process to primarily carbon dioxide and water vapor through high temperature thermal oxidation, re-using the thermal energy generated to create efficiencies/reduce TOX operating costs. The proposed TOX units will convert approximately 99% of the VOCs in the process air prior to release, and will re-use up to 95% of the thermal energy in their operation.

The VOCs from the production process will be directed into energy recovery chambers for pre-heating and then to a combustion chamber for oxidization. Once heated, the thermal energy will be released into an outlet media bed, cooling the gas. The alternating airflow in the media beds will provide energy recovery within each TOX unit, thereby reducing fuel usage. The treated, cooled gas will then be filtered prior to release to the atmosphere via the new exhaust stack. Existing production processes that allow for the direct release of emissions to the atmosphere in accordance with the Facility's Environment Act License will not be affected.

The proposed Project involves the construction of a building extension, the construction/installation of the new TOX units and exhaust system, and the re-configuration of associated utilities and equipment including:

- Relocation of an existing underground natural gas line to the west of the proposed location of the building extension to accommodate the new building foundation, and connecting to the existing natural gas meter assembly.
- Relocation of the existing fire water line, valves and fire hydrant to the east of the new building extension, with final location to be approved by the local fire department.
- Relocation of the existing fire department connection to the exterior of new building extension (east wall), with final location to be approved by the local fire department.
- Installation of new fire water piping and fire sprinkler system to protect the new building extension and connection of the piping to the existing system.
- Upgrade of the existing natural gas meter assembly and 10 lbs per square inch gauge (PSIG) gas service to a 10 million British thermal units (MMBTU) per hour service and connection of a new natural gas line from the existing assembly into the new building extension.
- Installation of two new (5 PSIG) natural gas lines and gas trains (for each TOX unit) and a new compressed air line (80-100 PSIG) to feed each TOX unit.
- Provision of power to the new building extension by connecting to the existing building power.

- Construction of new process ducts connecting to the existing process ductwork to feed VOCs into the TOX system, and installation of a new filter bank; connecting ducts to the fan and exhaust stack.
- Construction of a new 50 ft (15.2 m) tall, 56 inch (1.32 m) diameter stack (approximately 6 m above roof height) on a 3 m x 3 m concrete pad, located on the east side of the new building extension venting via forced draft fan.

As part of the Project, and following the successful commissioning of the new TOX system. the existing TOX will be decommissioned and removed along with the following components:

- Disconnection, removal and decommissioning of previous TOX equipment such as compressed air feed, fuel lines, piping, fan, flame arrestors, ductwork, and filter bank.
- Decomissioning and removal of the existing stack.

2.3 Project Schedule

The proposed Project is anticipated to start construction in the spring-summer of 2024. It is conservatively estimated that Project construction will take approximately 6 months (26 weeks) and Project operation will begin immediately upon the completion of installation and commissioning, pending regulatory approval, with an expected 20-year service life.

2.4 Inputs and Outputs

2.4.1 Construction Phase

During the estimated 6-month period for Project construction, approximately 15 contractors with crews of 3 to 6 personnel will be required, resulting in an estimated 75 contractor staff on the Site. Contractors will be working on a full-time basis, for an estimated average of 8 weeks each for the construction. Project inputs include the contractor labour, materials/supplies (such as steel, concrete, wood, aggregate, and other raw inputs), and additional utility-provided resources (power, water, natural gas). Project outputs during construction are anticipated from the incremental emissions from contractor vehicular and delivery traffic (approximately 40 contractor vehicles per day, up to 5 contracted deliveries, and 7 pieces of heavy equipment moving around the Site) and additional solid waste (such as packaging for equipment and supplies and building materials), and sanitary wastewater generation from the additional personnel occupying the Site.

2.4.2 Operation Phase

During the Project operation (anticipated to be 20 years), Project inputs will primarily be:

- Energy (power) required for the operation of each TOX unit (575 V/60 Hz/3 phase)
- VOCs in influent process air (isopropyl alcohol, ethyl-alcohol, methanol, denatured ethyl-alcohol, acetone) with process flow rates between 4,500-15,000 CFM per process (up to 34,000 total) to the TOX units
- Compressed air with a flow rate of approximately 10 CFM and 80 PSIG
- Natural gas with a flow rate of 67 CFM each unit, for 133 CFM (8 MMBTU/hour) total, using a standard conversion factor of 1,001 BTU per CF
- New filters for filtering particulate matter
- Maintenance parts and labour, as needed.

The Project is expected to be operated up to 24 hours per day, approximately 5 days per week, processing a total capacity of 10.3 MMBTU/hour for each TOX unit and reaching a total processing capacity of approximately 34,000 CFM in peak operation (17,000 CFM each unit). VOC generation from the Facility's typical operations will often be accommodated with the use of one TOX unit at 17,000 CFM; however, in times of higher production, the second TOX unit will provide emission treatment, accommodating addtional VOC processing capacity during peak operations.

Project outputs include the exhaust emissions with a maximum flow rate of 34,000 CFM consisting of VOC emissions: a maximum of 1.63 g/s of VOC emissions from isopropyl alcohol and ethyl alcohol estimated with 99% destruction efficiency (Appendix C), along with water vapor, and carbon dioxide. Thermal energy will also be produced at approximately 1,550-1,700°F (843-927°C), which will be largely recycled within the TOX units. The Facility's production processes will be limited by the capacity of the TOX units (34,000 CFM) with online process monitoring, limiting the potential for excess VOCs to be generated and reducing the risks of the system operating over-capacity.

In terms of solid waste production, the approximate doubling of processing capacity during peak operation (from the existing 16,200 CFM to a potential 34,000 CFM) is not anticipated to increase spent particulate matter filters – which are currently replaced every six months and sent to pharmaceutical waste processing – given that the processes that generate particulates are not anticipated to change as a result of the Project. Employment as part of the Project operation is not anticipated to notably increase from pre-construction numbers since no changes are proposed to product throughput and since the Project activities are limited to the existing Facility footprint.

3 Scope of the Assessment

3.1 Spatial and Temporal Boundaries

The Site comprises the lands occupied by the existing manufacturing building, which includes offices, laboratories, production areas, packaging areas, shipping and receiving areas, and warehouse space. For the purposes of this environmental assessment the spatial and temporal boundaries are as described in Table 3–1.

Table 3–1 Spatial and Temporal Boundaries

Spatial Boundaries	Temporal Boundaries
Project Site (PS) – the occupied property (approx. 11.7 ha; (Appendix A; Figure 1-2)	Construction phase – a period of up to 6 months over which the building expansion and equipment installation and decommissioning activities are to take place.
Local Assessment Area (LAA) – area up to a 1-km radius from the Site where direct effects to the Project would be expected to occur (Appendix A; Figure 1-3)	Operation phase – the period over which the Project will be in operation, anticipated to be at least 20 years.
Regional Assessment Area (RAA) – area up to a 10-km radius from the Site (area over which direct effects that act on the LAA are compared to determine significance of residual effects; (Appendix A; Figure 1-4).	Decommissioning phase – it is anticipated that the new TOX units will have a lifespan of at least 20 years after which it may be repaired or replaced. There are currently no identified decommissioning activities or plans in place for the Project; however, decommissioning is anticipated to consist of removal from the Site for disposal/recycling or refurbishment in accordance with applicable regulatory requirements.

4 Existing Environment

4.1 Biophysical Setting

The RAA is located in southeastern Manitoba within the Winnipeg Ecodistrict of the Lake Manitoba Plain Ecoregion, in Manitoba's Prairie Ecozone (Smith et al. 1998). The local relief in the Steinbach area varies from fairly level to gently sloping, with a mean elevation of approximately 236 metres above sea level (masl) (Smith et al. 1998). Soils in the area consist of clay and till on underlying bedrock from the Winnipeg and Red River formations (Smith et al. 1998).

4.1.1 Climate and Air Quality

The climate of the Winnipeg Ecodistrict, including the City of Steinbach, is characterized by short, warm summers and long, cold winters. The mean annual temperature is about 2.4°C. The mean annual precipitation is approximately 504 mm, of which approximately 28% falls as snow.

The nearest meteorological station to the Project is located near the City of Steinbach, Manitoba approximately 7 km from the Site (Government of Canada 2024). Monthly climate normals are provided below in Table 4–1.

Table 4–1 Climate Normals for Steinbach, Manitoba (1981-2010)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr
Temperature (°C)													
Daily Avg.	-16.6	-12.6	-5.4	4.1	11.5	16.4	19.0	18.2	12.3	5.0	-4.9	-13.4	2.8
Daily Max.	-11.1	-7.0	0.0	10.7	18.7	22.9	25.4	25.0	18.6	10.5	-0.5	-8.5	8.7
Daily Min.	-22.0	-18.1	-10.7	-2.6	4.2	9.8	12.5	11.4	6.0	-0.5	-9.3	-18.3	-3.1
Precipitation													
Rainfall (mm)	0.0	1.8	9.5	20.2	67.5	100.1	93.2	73.8	56.9	40.3	9.2	1.07	473.4
Snowfall (cm)	22.2	12.6	12.1	10.7	1.7	0.0	0.0	0.0	0.1	5.6	18.9	23.2	107.1
Total (mm)	22.2	14.5	21.5	30.9	69.2	100.1	93.2	73.8	57.0	45.9	28.1	24.2	580.5
Source: Environment Canada 2024													

4.1.1.1 Greenhouse Gas Emissions

According to Canada's National Inventory Report 1990-2021, Manitoba emitted a total of 20,700,000 tonnes of carbon dioxide equivalent (CO_2e) in 2021, down 2.4% from 21,200,000 tonnes in 2020 (ECCC 2023b). Manitoba's 2021 greenhouse gas (GHG) emissions were composed of the following sources: fossil fuel burning (61%) – involving the transportation of goods and people, stationary combustion (e.g., commercial heating) and fugitive sources (e.g., flaring); agriculture (29%); waste disposal (6%); and industrial processes (4%). Manitoba's fossil fuel burning category was much lower proportionally than that of Canada as a whole, largely due to Manitoba's use of hydro power to produce

electricity. For the Facility, total natural gas consumption was recorded as 3.2 million m^3 in 2020 and diesel consumption was recorded as 14,000 L, resulting in 6,270 and 38 tonnes of CO_2 equivalent (CO2e), respectively.

4.1.2 Hydrogeology and Groundwater

The Steinbach area is located within the eastern fringes of the Western Canadian Sedimentary Basin, of which the basal geologic unit is Precambrian igneous and metamorphic rocks. Overlying the Precambrian bedrock is the Winnipeg Formation sandstone aquifer, underlying the Red River Formation (Betcher 1986). The Red River Formation carbonate aquifer is known to be a water supply resource throughout the central portion of Manitoba, being developed for municipal, commercial, and private water supply systems (Betcher et al. 1995). Groundwater flow is from east to west in both aquifers in the Steinbach area (Friesen Drillers 2015). The City of Steinbach provides potable water to the Facility, which originates from groundwater in the limestone aquifer (City of Steinbach 2022). The nearest groundwater well (domestic use) is located approximately 800 m north of the Site (GWDrill 2018).

4.1.3 Surface Water

The RAA is part of the Manning Canal sub-watershed, located within the Seine River watershed, which is part of the Nelson River system draining into Hudson Bay (Smith et al. 1998). The principal sources of water are the Manning Canal and streams/creeks that occur within the area. The nearest waterway to the Site is the Manning Canal, located approximately 2.1 km north and connected to the Site via drainage ditching. The nearest hydrometric monitoring station for the Manning Canal is located approximately 28 km northwest of the Project Site (05OE006) reporting a mean monthly flow ranging from 0.7 to 4.8 m^3/s (WSC 2023).

4.1.4 Vegetation and Wildlife

The natural vegetation in the ecodistrict, including the City of Steinbach was originally tall grass prairie and meadow prairie grass, which has largely been reduced due to cultivation and development. Some tree cover, including bur oak and aspen along with an undercover of snow berry, hazelnut and red-osier dogwood, remains near stream channels (Smith et al. 1998). Characteristic wildlife in the region include coyote, white-tailed deer, white-tailed jack rabbit, Richardson's ground squirrel, ferruginous hawk, sage grouse, black-billed magpie, and northern pocket gopher (Smith et al. 1998). Wildlife on the Site is anticipated to be limited to those species that have grown accustomed to the disturbed/urbanized development in the LAA, with a lack of habitat availability in the proposed area of the Site to be occupied by the Project.

4.1.5 Aquatic Environment

As indicated in Section 4.1.3, the nearest water body to the Site is the Manning Canal. The Manning Canal is a man-made surface water drainage channel known to be suitable for aquatic life including fish species like white sucker, pearl dace, fathead minnow, and brook stickleback (Friesen Drillers 2015). The Manning Canal discharges into the Seine River Diversion, approximately 30 km northwest of the Site near the town of Ile des Chênes.

4.2 Socio-Economic Setting

4.2.1 Land Use and Property Ownership

The parcel of land for the Project, part of Southwest 36-6-6E and Northwest-36-06-06-E is privately owned and has been occupied by Bausch for pharmaceutical manufacturing since 1992. The land adjacent to the Site comprises a mix of industrial and residential land use. Neighboring properties include:

- Canadian Guide Rail Corporation and vacant property approximately 100 m to the north
- Nature's Farm (commercial groceries) and EECOL Electric approximately 100 m to the east
- Vacant property and Main Street right of way approximately 50 m to the south.

Notable sites that may be sensitive receptors to the Project include (Appendix A; Figure 1-5):

- Residential housing approximately 70 m to the west
- Clearspring Middle School approximately 500 m north.

4.2.1.1 Land Development Controls

Municipal jurisdictions may adopt development plans and zoning by-laws to guide land use decisions within their respective boundaries (Manitoba Municipal Government 2015). The following municipal development controls are applicable in the RAA:

- City of Steinbach Zoning By-law 2100; City of Steinbach Building By-Law No. 2105; The Rural Municipality of La Broquerie Zoning By-Law No. 07-2018; The Rural Municipality of Hanover Zoning By-Law 2418-18
- Hanover Development Plan By-Law No. 2417-18; Rural Municipality of La Broquerie By-Law No 06-2018 (Development Plan)

Land use at the Site in the City of Steinbach is subject to the City of Steinbach Zoning By-Law No. 2100. The Site within the LAA is zoned "M2 – Industrial Heavy" (City of Steinbach 2018). The existing development and activities are compatible with all permitted land use and zoning restrictions for the property.

4.2.2 Population and Economy

The population within the Project RAA is principally represented by the City of Steinbach and portions of two rural municipalities (the Rural Municipality of Hanover and the Rural Municipality of La Broquerie). The City of Steinbach had an estimated population of 17,806 in 2021, an 11.1% increase from the 2016 population of 15,829 (Statistics Canada 2023). The RM of Hanover and the RM of La Broquerie reported populations of 17,216 and 6,725 in 2021, respectively (Statistics Canada 2023), representing increases of 10.8% and 10.7% from 2016.

Economic activity within the Steinbach area is principally related to manufacturing, automobile sales, tourism, retail, and financial services (Winnipeg Regional Real Estate News 2021). The City of Steinbach also serves as a major shopping, service, and agriculture supply centre for many producers (City of Steinbach 2024).

4.2.3 Infrastructure and Services

The Site is accessible from paved, all-season roads via Hespeler Street, Life Sciences Parkway, and Main Street (Provincial Trunk Highway 52). Provincial Trunk Highway (PTH) 52 is classified as a secondary arterial under the Provincial Road Functional Classification System (MB Highways and Transportation 1997). The nearest major highway to the Site is PTH 12 to the west, classified as an Expressway 4-lane (MB Highways and Transportation 1997). The nearest railway (Canadian National Railway) is located approximately 9 km northeast of the Site in the RM of La Broquerie. There is no direct rail service at the Site.

Services provided in the City of Steinbach include a fire department, and a Royal Canadian Mounted Police (RCMP) detachment. The town has 911 emergency services and is served by full-time ambulance staff provided by the Southern Health Regional Health Authority. Healthcare facilities include: the Bethesda Regional Health Center, four medical clinics, and two personal care homes (Southern Health n.d.).

Recycling and solid waste services are provided in the City of Steinbach with a local waste management facility located at 104 Hanover Road East which accepts regular waste as well as used oil, household hazardous waste, wood waste, appliances, and tires. Solid waste at the Site (regular waste and recycling) are sent to the City of Steinbach landfill while other divertible materials (tanks, e-waste, plastic drums and hazardous waste) are sent for off-site processing/recycling. Spent filters from the TOX are sent along with pharmaceutical destructions to a pharmaceutical waste processor (currently GFL Environmental) for disposal.

The Steinbach North Airport (CJB3) is a federally licensed airport located approximately 3.5 km north of the Site and is owned and maintained by the City of Steinbach with services provided by the Steinbach Flying Club (City of Steinbach 2024a).

Potable water services are provided by the City of Steinbach with a water treatment plant, including wells, reservoirs, and distribution lines. A multi-cell lagoon located northwest of the City (approximately 6.2 km northwest of the Site) provides wastewater treatment for the City (City of Steinbach 2024b), including the Facility.

Power is provided by Manitoba Hydro via overhead utility lines located adjacent to the north, south, and west boundaries of the Site. Underground utilities, including gas, wastewater sewer and water, are also present at the Site.

Approximately 362 vehicles access the Site daily, with personal staff traffic accounting for approximately 350 vehicles per day. There are sufficient parking spaces to accommodate all personal vehicle traffic flows. Approximately 12 trucks per day on average are involved in shipping raw materials into and product/waste materials out of the Facility.

4.2.4 Protected Areas, Parks and Recreation

There are no designated provincial parks or protected areas located within the RAA. There are numerous recreational attractions in the RAA. Recreational activities near the Site include Steinbach Golf Course and Aquatic Centre and A.D. Penner Park, approximately 3.6 km to the northwest of the Site; the KR Barkman Park, located approximately 600 m northwest of the Site; a local playground located 400 m east of the Site, and the T.G. Smith Centre arena, located approximately 1.2 km northwest of the Site (City of Steinbach 2024c).

4.2.5 Aesthetics and Noise

The principal viewshed for the LAA is urban, developed and industrial in nature. Existing ambient noise levels are expected to be typical of an industrial area. Ambient noise levels may be intermittently high, particularly near main highways. Existing sources of noise in the Project RAA are primarily man-made noise such as road traffic, noise from agricultural operations (heavy equipment and animals), related large truck and vehicle movements, and heavy and light manufacturing facilities. The criteria for maximum noise level for eight hours of steady state exposure is 90 dBa (CCOHS 2023). Noise sources from the Facility operation are not likely to exceed the maximum exposure level at the Site boundary. Noise sources external to the Facility are principally truck traffic on-site. These noises are regular in nature but are less than the traffic on the adjacent highways and activities on adjacent industrial properties.

4.2.6 Heritage Resources

The proposed alteration is occurring on an already developed site; therefore, heritage resources are not anticipated to be found during Project construction.

- The closest cemetery to the Site is the Steinbach Sommerfeld Mennonite Church approximately 250 m southwest of the Site and the nearest historic site is the Steinbach Water Tower, located approximately 200 m west of the Site. There are two Centennial Farms in the RAA located approximately 9.6 km and 7.8 km south of the Site (Manitoba Historical Society 2006).

5 Assessment Approach

This assessment was completed to meet the requirements of a request for NOA as generally described in MECP' Information Bulletin – Alterations to Developments with Environment Act Licences (MECP 2022), and includes assessing Project-specific environmental effects. The assessment focuses on valued components (VCs), which are environmental components of certain value or interest to regulators and other parties and are identified based on the potentially affected biophysical and socio-economic elements as described in Section 4.

Biophysical and socio-economic VCs that could be affected through interactions of the Project (i.e., construction and operation of the new TOX units) and the environment are identified to scope the assessment. Following the identification of VCs, an analytical framework is used to evaluate and characterize the potential Project effects on those VCs identified as having potential Project interactions, based on standardized criteria to facilitate quantitative (where possible) and qualitative assessment of residual environmental effects. Project-related effects on potentially affected VCs (if applicable) are then assessed sequentially in terms of direction, magnitude, geographic extent, frequency, duration, reversibility and ecological/social context as summarized in Table 5–1.

Table 5–1 Characterization of Residual Environmental Effects

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect.	**Positive**— an improvement in the valued component compared with existing conditions and trends. **Adverse**— a decline in the valued component compared with existing conditions and trends. **Neutral**— no change in the valued component from existing conditions and trends.
Magnitude	The amount of change in the VC relative to existing conditions.	**Negligible**—no measurable change **Low**— a change that falls within the level of natural variability. **Moderate**— a measurable change which is unlikely to affect the valued component. **High**— a measurable change which is likely to affect the valued component.
Geographic Extent	The geographic area in which an environmental effect occurs.	**PS**—residual effects are restricted to the Project Site. **LAA**—residual effects extend into adjacent areas to the property (5 km radius). **RAA**—residual effects extend to other adjacent areas to the property (10 km radius).

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Frequency	Identifies when the residual effect occurs and how often during the Project or in a specific phase.	**Single event**— residual effect occurs once throughout the life of the Project. **Multiple irregular event**— residual effect occurs sporadically and intermittently (no set schedule) throughout. **Multiple regular event**— residual effect occurs repeatedly and regularly throughout. **Continuous**—residual effect occurs continuously throughout the life of the Project.
Duration	The period of time required until the VC returns to its existing condition, or the effect can no longer be measured or otherwise perceived.	**Short-term**— residual effect restricted to the duration of the construction phase (up to 6 months). **Medium-term**— residual effect extends up to 5 years. **Long-term**— residual effect extends for longer than 5 years.
Reversibility	Pertains to whether the VC can return to its existing condition after the Project activity ceases.	**Reversible**—the effect is likely to be reversed after activity completion and decommissioning. **Irreversible**—the effect is unlikely to be reversed even after decommissioning.
Ecological and Socio-economic Context	Existing condition and trends in the area where environmental effects occur.	**Undisturbed**—area is relatively undisturbed or not adversely affected by human activity. **Disturbed**—area has been substantially previously disturbed by human development or human development is still present. **Note:** all effects for the Project are considered to take place within a disturbed context.

5.1 Public Engagement

The existing Facility is located on a privately-owned parcel of land within an appropriately zoned area for manufacturing land use. Bausch began operations at the Site in 1992, with manufacturing activities occurring on the Site since 1992. No formal public engagement is planned beyond the placement of the NOA on the Public Registry for public review and comment, if required by MECC.

5.2 Funding

Bausch will provide funding for all undertakings related to the Project.

6 Environmental Effects and Mitigation

Biophysical and socio-economic VCs that could potentially be affected through interactions of the environment and the Project were identified to scope the assessment. The rationale for exclusion or inclusion for further assessment of each VC is explained, and potential general interactions between the Project and VCs are identified in Table 6–1.

Table 6–1 Designation of Valued Components

Valued Component	Potential Project/ Environment Interaction	Rationale for Exclusion or Inclusion and Project Potential Effect
Air quality/ Greenhouse gas emissions	✓	Air emissions (exhausted air) and greenhouse gases are anticipated to increase from the operation of the Project.
Soils/terrain	x	Soil disturbance/excavation is anticipated to occur within areas that are already paved/disturbed. Soils/terrain are therefore excluded from further assessment of environmental effects.
Surface water/ groundwater	x	There are no substantial changes in water quantity or quality from consumption, discharges or changes to local drainage associated with the Project and therefore, surface water/groundwater is excluded from further assessment of environmental effects.
Vegetation	x	The Project will be located on a pre-disturbed area that is currently paved, and its construction/operation is not anticipated to affect vegetation at the Project Site since all activities are anticipated to take place on the existing Facility footprint. Vegetation is therefore excluded from further assessment of environmental effects.
Wildlife and wildlife habitat	x	The Project will be located on a pre-disturbed area that is currently paved, and its construction/operation is not anticipated to affect wildlife or wildlife habitat at the Project Site since all activities are anticipated to take place on the existing Facility footprint. Wildlife is therefore excluded from further assessment of environmental effects.
Property and land use	x	The construction and operation of the Project will not change the use of the Project Site and will occur within the existing developed Facility footprint. The location and stack height is well within the City of Steinbach zoning by-law No. 2055 restrictions for airports. Property and land use is therefore excluded from further assessment of environmental effects.
Infrastructure and services	✓	The operation of the Project will increase electricity usage; however, there will be no need for changes in the provision of municipal services to the Project Site (i.e., external roads, sewer, water, power) for its installation or use. An incremental increase in traffic to the Project Site is anticipated during construction.
Employment and economy	✓	The construction workforce for the Project will be provided by temporary, contracted employment. No changes in product throughput are proposed during the Project operation.
Heritage resources	x	The construction and operation of the Project is located within the existing Facility footprint, on areas that have been previously paved/disturbed; therefore, heritage resources are not anticipated to be encountered and are excluded from further assessment of environmental effects.

Valued Component	Potential Project/ Environment Interaction	Rationale for Exclusion or Inclusion and Project Potential Effect
Aesthetics and noise	✓	Some noise and visual changes to the Project Site are expected to be generated through the construction/operation of the Project; however, this effect is anticipated to be similar to existing conditions.
Health and safety	✓	The construction of the Project will change worker health and safety risks and exposures. The TOX units will be exhausted via a new stack and operational safety risks are anticipated to be similar to existing conditions.
Notes: x – no anticipated potential Project/environment interaction P – potential Project/environment interaction		

6.1 VC Assessment and Summary of Mitigation Measures

6.1.1 Air Quality Assessment

6.1.1.1 Greenhouse Gas Emissions

During the approximately 6-month construction phase of the Project, approximately 35 Project-related vehicles (contractor vehicles) will be accessing the Site for an average of 8 weeks each, covering various portions of the construction and generating an increase in vehicle and GHG emissions. It is estimated that approximately 20% of contractors will be travelling daily from Winnipeg and 80% travelling weekly. Increased local vehicle emissions in the RAA from the construction traffic is expected to be negligible in comparison with emissions from existing vehicle traffic in the LAA and RAA. With respect to GHG emissions during the construction phase, the following gross assumptions were made:

- An estimated 17,376 L of gasoline fuel would be consumed in travel during the 6-month construction period from additional construction traffic. This estimate is based on 20% travelling from Winnipeg daily, and 80% staying in Steinbach and travelling from Winnipeg weekly, with an average fuel economy of 15 L/100 km for a typical pickup truck, and assuming that the average contractor is working on the Site for 8 weeks (not all contractors are accessing the Site at one time).This gasoline use would produce approximately 40.8 tonnes of CO_2e using standard emission factors (NRCAN n.d.).
- An estimated 118,300 L of gasoline fuel would be consumed in travel during the 6-month construction period for the existing operational employee traffic, based on 350 staff with an average round trip commute of 20 km/day (or less) and with an average fuel economy of 13 L/100 km. This fuel use would produce 277.7 tonnes CO_2e, based on standard emission factors (NRCAN n.d.).
- An estimated 66,924 L of diesel fuel would be consumed during the 6-month construction period for the existing shipping/receiving traffic, based on approximately 12 trucks per day, round-trip from Winnipeg 5 days per week (Bausch Health 2024, pers. comm.), with an assumed average fuel economy of 33 L/100 km for a semi-truck (NRCAN 2019). This fuel use would produce 180.0 tonnes CO_2e, based on standard emission factors (NRCAN n.d.).

- An estimated 29,400 L of diesel fuel would be consumed for heavy equipment use during the construction period, based on an estimated fuel consumption of 35 L/hour (Gov BC 2024) for 7 pieces of equipment working 8-hours/day and being used for approximately 3 weeks each. This fuel use would produce 79.1 tonnes of CO_2e, based on standard emission factors (NRCAN n.d.).
- An estimated 1,628,718 m^3 of natural gas would be consumed during the 6-month construction period for the existing manufacturing activities, based on typical weekly natural gas consumption data for 2023 (Bausch Health 2024, pers. comm.). This fuel use for the Facility would generate approximately 3,134.9 tonnes CO_2e, based on standard emission factors (Manitoba Hydro 2023).

The Facility GHG emissions over the 6-month construction period (3,592.5 tonnes CO_2e), are estimated to increase by 119.8 tonnes CO_2e during the construction of the Project, representing a 3.3% increase during the construction phase and less than 2% in a year at the Project Site. The increase contributes a negligible amount to the province of Manitoba's annual GHG emissions of approximately 21 Mt CO_2e (ECCC 2023b). The increase in GHG emissions during construction is expected to be an adverse effect that is negligible irreversible, short-term, and a multiple-regular event occurring in the RAA in a disturbed context.

During the approximately 20-year operation phase, the Project is expected to use natural gas at a maximum rate of 67 CFM each unit (133 CFM; 8 MMBTU/hour) total, estimated using a standard conversion rate of 1 CF of natural gas producing 1,001 BTU. The natural gas use from the Project operation represents a decrease of 142 CFM relative to the existing TOX which uses natural gas at 275 CFM. The effects on GHG emissions from natural gas use are therefore positive. The improved operational efficiency of the proposed Project, relative to the existing TOX, will allow continued treatment of process emissions with lower natural gas use.

6.1.1.2 TOX Process Emissions

During operation, Facility air emissions are expected to be similar in composition compared with existing operations, since no changes are anticipated to product throughput and since the use of the new TOX units is not anticipated to change the chemical characteristics of existing exhaust.

- A single TOX unit with an exhaust rate of 17,000 CFM is expected to operate for 24 hours per day, 5 days per week, and the secondary TOX unit is expected to operate on standby mode, for a maximum total exhaust rate of 34,000 CFM should both TOX units be operating at capacity, representing an approximate doubling of exhaust emissions relative to the existing operation of 16,200 CFM. Maximum estimated emissions were modelled (Appendix C) and all ground-level concentrations are predicted to be below the applicable air quality criteria. The maximum ground-level concentration for each contaminant occurred 156 m from the proposed stack location at 150 degrees from north (southeast of the TOX stack) which falls within the boundaries of the Project Site.

The operation of the Project is not anticipated to result in off-site air quality conditions that are discernible from existing conditions. The dedicated exhaust and the elevated stack is expected to adequately disperse odours and reduce air quality effects on nearby off-site receptors. Changes to air quality are therefore expected to be an adverse effect that is negligible relative to existing conditions, reversible, long-term, and a multiple-regular event that is expected to be limited to the Project Site and occurring in a disturbed context.

6.1.2 Infrastructure and Services

During the construction period of the Project, there will be an increase in Site traffic associated with the additional contractor vehicles accessing the Site and deliveries of supplies. The additional traffic is estimated to be approximately 40 contractor vehicles and 5 deliveries accessing the Site 5 days per week, for various periods of time, depending on the contractor (assumed an average of 8 weeks each out the 6-month construction period or 31% of the time). The increase relative to the existing Site traffic (approximately 350 staff vehicles per day and 12 shipping vehicles per day) is 3.8% increase. The increase is expected to be low relative to existing Site traffic, and it is expected that the roads to the Site can accommodate the increase. The annual average daily traffic on Main Street east of PTH 12, representing the east access to the Site was estimated to be between 7,020-14,280 vehicles based on 2018 traffic estimates (MI 2020). The increase from the Project is anticipated to be <1%, relative to this traffic volume. The adverse effect on traffic services will therefore be negligible, short-term, reversible and of a multiple-regular frequency limited to the LAA. During the operation of the Project, no increase is anticipated in Site traffic since the Project will not increase product throughput or require additional personnel accessing the Site.

Electricity use for the operation of the Project is expected to increase the Facility's power demand by a maximum of approximately 35%, given that the existing TOX operates with a 150 hp motor and the new TOX units are expected to operate with one-100 hp motor each (200 hp total). This increase in electricity use will only be observed at peak demand, when both TOX units are running simultaneously. An incremental increase in electricity use is also associated with the building extension (additional lighting). No upgrades are required to the Site's power services to accommodate the Project and therefore, the increase is expected to be negligible relative to the total Facility electricity use, reversible, short-term, and a multiple-regular event that is expected to be limited to the Project Site and occurring in a disturbed context.

Construction materials will be recycled to the extent practical and non-hazardous solid waste will be disposed of at a licensed waste disposal ground capable of accepting the material. Hazardous solid waste such as spent filters from Project operation will be sent to a hazardous waste processor (currently GFL), similar to existing operations. No measurable effects on waste services are anticipated.

6.1.3 Employment and Economy

There will be approximately 75 contracted personnel required for the Project for approximately 8 hours per day, 5 days per week working on the Project for an estimated 8 weeks out of the total 6 month construction phase (not all contractors will be on the Site at the same time). Current employment for the

Facility is approximately 402 full time employees. The contracted employment results in a small temporary increase to the total Site employment and an increase in goods purchased in the region (gas, accommodation, food) but no adverse effects to the workforce in the RAA are anticipated. The Project is anticipated to have a negligible adverse effect on employment in the RAA, as most of the contracted workforce is expected to originate beyond the RAA, likely in the Winnipeg region. The effect of the increased on-site personnel during construction is anticipated to be a positive effect for the local economy while but a negative effect on local employment. These effects are likely to be negligible in the RAA, reversible, short-term, and continuous during construction, occurring in a disturbed context.

Similarly, the purchase, installation and operation of the materials, equipment and supplies for the Project during the operation phase will be negligible in the RAA and no increase in operational production throughput or staffing at the Facility is proposed; therefore, no changes to employment and economy are anticipated.

6.1.4 Aesthetics and Noise

An increase in noise and changes to aesthetics are anticipated in the LAA during the construction phase of the Project from the operation of heavy equipment, including backup alarms, and from construction activities (i.e., jackhammers, air compressors, pile drivers) and demolition/removal work. The adverse effect of the construction activities on Site aesthetics is anticipated to be limited to the Site, and negligible relative to the existing aesthetics in the LAA, given that Project takes place in an industrial area with neighboring manufacturing operations. Effects on noise are anticipated to be moderate in the LAA, given that the noisiest anticipated activity (pile driving) is expected to be below the guideline of 90 dBa at 100 m from the Site but above the annoyance level of 50 dBa 300 m away from the Site (Marr 2015). Sensitive receptors (residences) exist within 300 m and may experience annoyance; therefore, mitigation measures will be required. Proposed mitigation measures include limiting the duration of noisy activities to <8 hours and during daytime hours and, if complaints are received, additional noise barriers will be used such as noise shrouds or curtains. It is anticipated that residual noise effects will be low, short-term, reversible, and multiple-irregular during construction relative to the existing disturbed Site conditions and noise levels.

During Project operation, noise associated with the Project is anticipated to be similar to existing operations given that the new TOX units are enclosed and will operate similarly to the existing TOX. Effects on Site aesthetics include the building extension and new exhaust stack, as well as the new visible plume. This effect is anticipated to be negligible relative to the existing Site viewscape, given that the Project is in an industrial area with neighboring industrial activities and given that the Facility has existing exhaust stacks. A requirement of the new TOX units is that any visible plume emitted from the stack shall have an opacity of less than 5% at any point beyond the Project Site. Noise associated with the operation of the Project (motors, fans) is anticipated to increase; however, the increase is anticipated to be indiscernible from existing noise on the Project Site and limited to within the Facility. The overall adverse effects on aesthetics and noise during operation are anticipated to be negligible, short-term, continuous in the LAA and occurring in a disturbed context.

6.1.5 Health and Safety

During construction, increases to workplace health and safety risks are associated with operation of heavy equipment and machinery for the building extension/demolition and for the removal of structures for the decommissioning of the existing TOX. The effect is anticipated to be mitigated through health and safety planning, hazard controls and personal protective equipment. Effects such as repetitive strain and ergonomic hazards will be limited to the Project Site, short-term, reversible, continuous and negligible compared with the existing risks of Facility operations.

The Project is expected to result in a net reduction to worker health and safety risks and exposures during operation. The existing TOX requires replacement due to wear, which has been shown to result in inefficient operation and safety risks associated with fugitive emissions, requiring periodic shut down and repair. The Project is expected to resolve the existing safety risks associated with the fugitive emissions of the existing TOX, resulting in a positive effect to worker health and safety.

The existing exhaust will be increased from 16,200 CFM to approximately 34,000 CFM (17,000 CFM for each TOX unit) should the two TOX units be running together, representing a maximum increase of approximately 110% during worst-case conditions. The exhaust exposures are not anticipated to result in a net adverse effect on air quality in the LAA given that ground level concentrations of fugitive emissions are anticipated to be below applicable air quality guidelines (see Appendix C).

The operation of the Project will be similar to existing conditions, and no additional ergonomic or noise exposure hazards are anticipated. With regular maintenance and inspection, and provision of personal protective equipment and adequate training, effects to workplace health and safety from the Project are anticipated to be adverse, long-term, multiple-regular events, limited to the Project Site but negligible relative to the existing health and safety risks of the Facility operations.

7 Mitigation Measures

As the Project is limited to replacement of the existing TOX with a dual TOX system (two units), the mitigation measures incorporated in the Project are primarily related to safety risks during construction of the building extension such as heavy equipment use, and operating exhaust systems to reduce workplace health and safety risks and accidents. Mitigation measures for noise emissions are also required including limiting the duration of noisy activities to <8 hours and during daytime hours and, if complaints are received, additional noise barriers will be used such as noise shrouds or curtains.

8 Accidents and Malfunctions

Accidents and malfunctions can potentially result in harm to on-site personnel, damage to equipment, the release of contaminants and/or hazardous materials from equipment, and degradation of the environment and human health and safety. Due to the limited nature of the Project, the effects of accidents and malfunctions are anticipated to be negligible and primarily related to the potential for operational failure of exhaust systems or the TOX units, which could lead to exposure to VOCs, a risk of fire/melting of equipment, or similar event that would and present a risk to human health and safety. The production of VOCs being sent for destruction are monitored through online processes, reducing the risk of the TOX units running over capacity. In the event of an operational failure to the system, operations will be suspended until the issue is repaired, similar to existing procedures. The Project is equipped with temperature and heat sensors, alarms, and emergency stop features and will only be operated under the care of trained Site personnel, limiting the risks of adverse effects from equipment failures.

During operation, maintenance is expected to include routine checks performed twice a year and "spot" maintenance performed throughout each year as required as components fail, similar to existing operations. The regular monitoring and maintenance of the Project is expected to mitigate potential effects related to accidents and malfunctions and will serve to reduce the likelihood of an operational failure occurring. The system will be equipped with safety features such as predictive maintenance alarms, programmable safety controller, and lower explosive limit monitoring. The manufacturer will also provide personnel for operator training and an operation and maintenance manual. In addition, the Standard Operating Procedure (EN-4024) for the operation of the TOX units will be updated prior to operation and reviewed/followed by those responsible for its operation.

Fire extinguishers will continue to be inspected and maintained in the Facility to reduce adverse effects from an operational failure. The new building extension includes upgrade/extension of the existing fire sprinkler system in in the event of a fire and an emergency response plan is in place at the Facility to reduce adverse effects in the event of an emergency, such as a gas leak.

9 Conclusion

Stantec has prepared this environmental assessment report on behalf Bausch in support of the NOA application for the replacement of the TOX. The NOA application is filed in accordance with Section 14(1) of *The Environment Act* that requires a proponent to notify the Director (for Class 1 and 2 developments) if the proponent intends to alter a licensed development (MECP 2022). Potential interactions of the Project and the environment were evaluated with likely interactions examined to assess residual effects on the assumption of typical mitigation measures representative of best practices. On the basis of information available to date and as presented in this report, adverse effects of the proposed Project to the biophysical and socio-economic environment are expected to be not significant. It is anticipated that the proposed alteration will be considered as a minor alteration to the Facility.

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10.2 Personal Communications

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Appendices

Appendix A Figures

G:_GIS_Project_Folder\115423024_Bausch_Health_NOA\figures\115423024_001_SiteLocation_20240311.mxd Revised: 2024-03-11 By: ACampigotto

Legend

- Site Location
- Major Road
- Minor Road
- Local Road
- Watercourse
- Waterbody

0 400 800 Metres

(At original document size of 8.5x11)
1:40,000

N

Stantec

Project Location
Steinbach, Manitoba

Prepared by ACampigotto on 2024-03-11
Reviewed by JTheroux on 2024-03-11

Client/Project 115423024
Bausch Health Canada
Thermal Oxidizer NOA
100 Life Sciences Parkway, Steinbach, Manitoba

Figure No.
1-1

Title
Project Site

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base Data Sources: Government of Manitoba.
3. Aerial Imagery Source: Microsoft product screenshot reprinted with permission from Microsoft Corporation

Stantec

Legend
- Site Location
- Property Boundaries

N

0 50 100 Metres

1:3,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features produced under license with the Government of Manitoba and the Government of Canada.
3. Orthoimagery: © 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS

Project Location
Steinbach, Manitoba

Prepared by ADC on 2024-03-11
Technical Review by JT on 2024-03-11

Client/Project
Bausch Health Canada
Thermal Oxidizer NOA
100 Life Sciences Parkway, Steinbach, Manitoba

115423024

Figure No.
1-2

Title
Property Location

Stantec

Legend
- Site Location
- Local Assessment Area (LAA)
- Major Road
- Minor Road

N

0 200 400 Metres

1:10,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
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3. Orthoimagery © 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS

Project Location
Steinbach, Manitoba

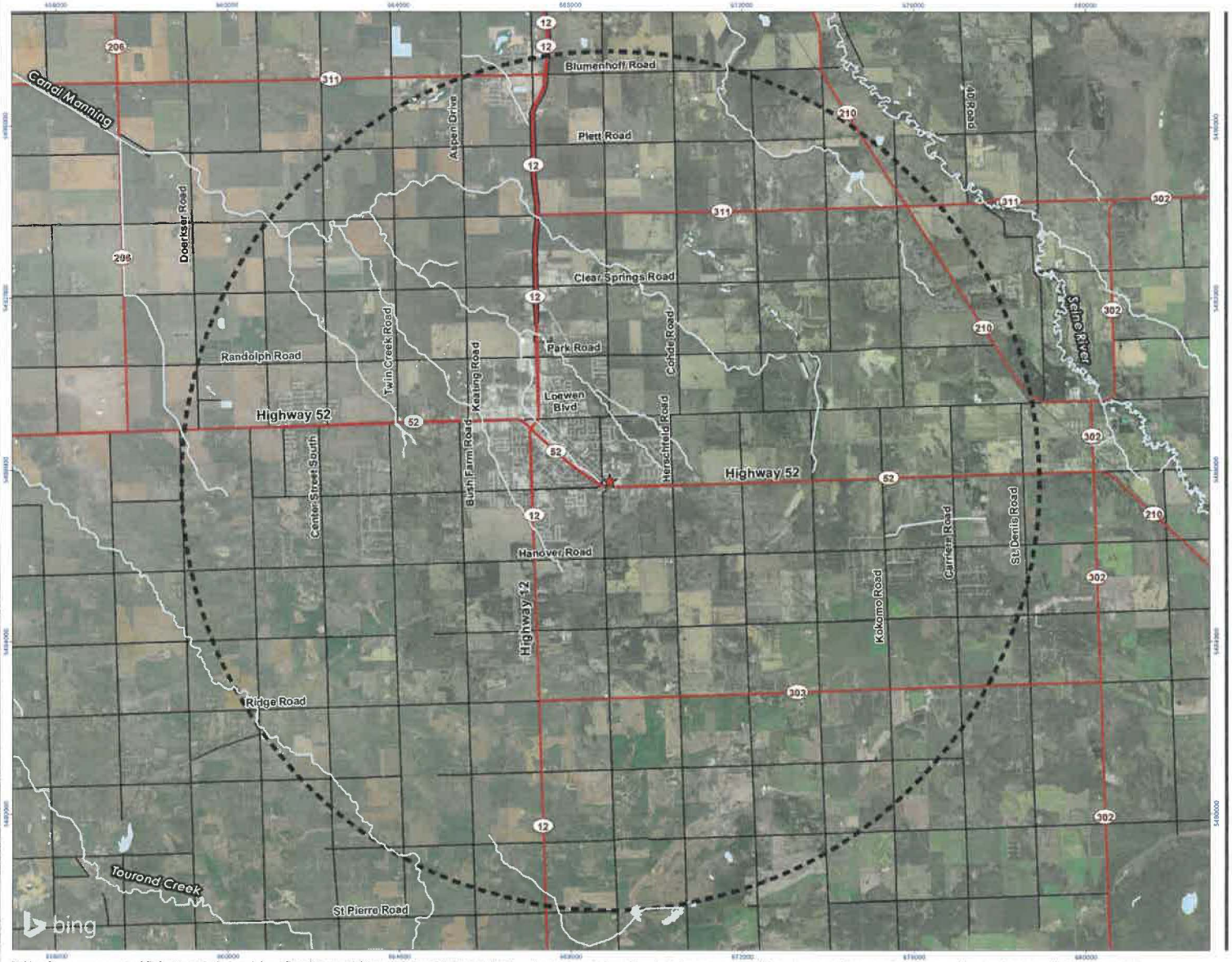
Prepared by ADC on 2024-03-11
Technical Review by JT on 2024-03-11

Client/Project
Bausch Health Canada
Thermal Oxidizer NOA
100 Life Sciences Parkway, Steinbach, Manitoba

115423024

Figure No.
1-3

Title
Local Assessment Area - 1 km Radius



Stantec

Legend

- Site Location
- Regional Assessment Area (RAA)
- Major Road
- Minor Road
- Watercourse
- Waterbody

N

0 1 2 Kilometres

1:90,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features produced under license with the Government of Manitoba and the Government of Canada.
3. Orthoimagery: © 2024 Microsoft Corporation Earthstar Geographics SIO

Project Location
Steinbach, Manitoba

Prepared by ADC on 2024-03-11
Technical Review by JT on 2024-03-11

Client/Project
Bausch Health Canada
Thermal Oxidizer NOA
100 Life Sciences Parkway, Steinbach, Manitoba

115423024

Figure No.
1-4

Title
Regional Assessment Area - 10 km Radius

Bausch Health TOX Replacement Project

COMMENTS:

COMPANY NAME:

Bausch Health Inc.

MODELER:

DATE:

3/22/2024

SCALE: 1:16,142

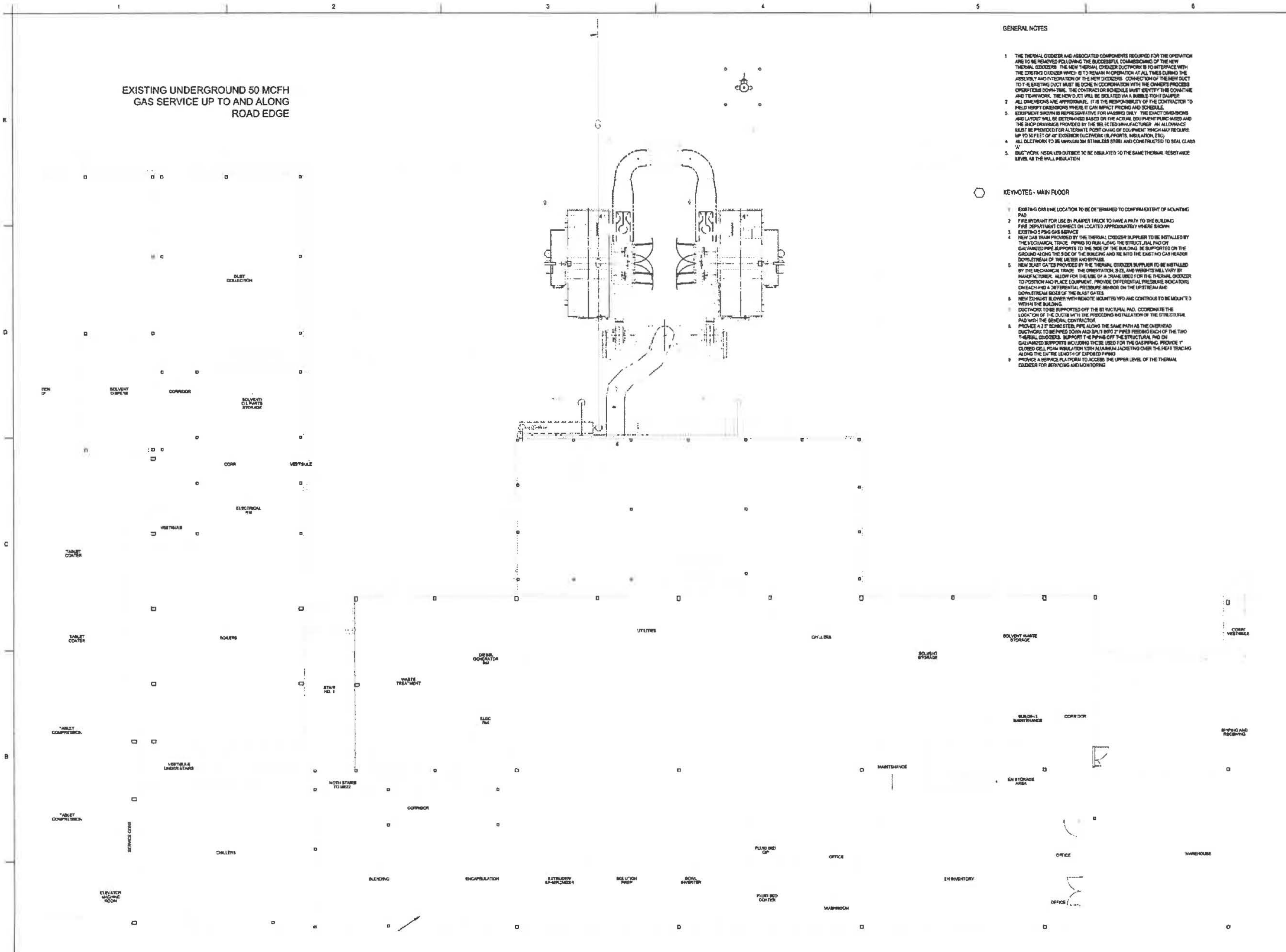
0 0.5 km

Figure No. 1-5

Discrete Sensitive Receptors

PROJECT NO.:

115423024



1 MAIN FLOOR - TWO THERMAL OXIDIZERS

M-101

1/8" = 1'-0"

GENERAL NOTES

1. THE THERMAL OXIDIZER AND ASSOCIATED COMPONENTS REQUIRED FOR THE OPERATION ARE TO BE REMOVED FOLLOWING THE SUCCESSFUL COMMISSIONING OF THE NEW THERMAL OXIDIZERS. THE NEW THERMAL OXIDIZER DUCTWORK IS TO INTERFACE WITH THE EXISTING OXIDIZER WHICH IS TO REMAIN IN OPERATION AT ALL TIMES DURING THE ASSEMBLY AND INTEGRATION OF THE NEW OXIDIZERS. CONNECTION OF THE NEW DUCT TO THE EXISTING DUCT MUST BE DONE IN COORDINATION WITH THE OWNER'S PROCESS OPERATIONS DOWN-TIME. THE CONTRACTOR SCHEDULE MUST IDENTIFY THIS DOWNTIME AND TIE-IN WORK. THE NEW DUCT WILL BE ISOLATED VIA A BUBBLE-TIGHT DAMPER.
2. ALL DIMENSIONS ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY DIMENSIONS WHERE IT CAN IMPACT PRICING AND SCHEDULE.
3. EQUIPMENT SHOWN IS REPRESENTATIVE FOR MASSING ONLY. THE EXACT DIMENSIONS AND LAYOUT WILL BE DETERMINED BASED ON THE ACTUAL EQUIPMENT PURCHASED AND THE SHOP DRAWINGS PROVIDED BY THE SELECTED MANUFACTURER. AN ALLOWANCE MUST BE PROVIDED FOR ALTERNATE POSITIONING OF EQUIPMENT WHICH MAY REQUIRE UP TO 30 FEET OF 48" EXTERIOR DUCTWORK (SUPPORTS, INSULATION, ETC).
4. ALL DUCTWORK TO BE MINIMUM 304 STAINLESS STEEL AND CONSTRUCTED TO SEAL CLASS 'A'.
5. DUCTWORK INSTALLED OUTSIDE TO BE INSULATED TO THE SAME THERMAL RESISTANCE LEVEL AS THE WALL INSULATION.

KEYNOTES - MAIN FLOOR

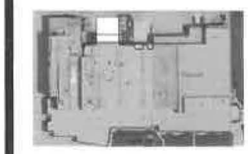
1. EXISTING GAS LINE LOCATION TO BE DETERMINED TO CONFIRM EXTENT OF MOUNTING PAD.
2. FIRE HYDRANT FOR USE BY PUMPER TRUCK TO HAVE A PATH TO THE BUILDING FIRE DEPARTMENT CONNECTION LOCATED APPROXIMATELY WHERE SHOWN.
3. EXISTING 5 PSIG GAS SERVICE.
4. NEW GAS TRAIN PROVIDED BY THE THERMAL OXIDIZER SUPPLIER TO BE INSTALLED BY THE MECHANICAL TRADE. PIPING TO RUN ALONG THE STRUCTURAL PAD ON GALVANIZED PIPE SUPPORTS TO THE SIDE OF THE BUILDING, BE SUPPORTED ON THE GROUND ALONG THE SIDE OF THE BUILDING AND TIE INTO THE EXISTING GAS HEADER DOWNSTREAM OF THE METER AND BYPASS.
5. NEW BLAST GATES PROVIDED BY THE THERMAL OXIDIZER SUPPLIER TO BE INSTALLED BY THE MECHANICAL TRADE. THE ORIENTATION, SIZE, AND WEIGHTS WILL VARY BY MANUFACTURER. ALLOW FOR THE USE OF A CRANE USED FOR THE THERMAL OXIDIZER TO POSITION AND PLACE EQUIPMENT. PROVIDE DIFFERENTIAL PRESSURE INDICATORS ON EACH AND A DIFFERENTIAL PRESSURE SENSOR ON THE UPSTREAM AND DOWNSTREAM SIDES OF THE BLAST GATES.
6. NEW EXHAUST BLOWER WITH REMOTE MOUNTED VFD AND CONTROLS TO BE MOUNTED WITHIN THE BUILDING.
7. DUCTWORK TO BE SUPPORTED OFF THE STRUCTURAL PAD. COORDINATE THE LOCATION OF THE DUCTS WITH THE PRECEDING INSTALLATION OF THE STRUCTURAL PAD WITH THE GENERAL CONTRACTOR.
8. PROVIDE A 2.5" SCH80 STEEL PIPE ALONG THE SAME PATH AS THE OVERHEAD DUCTWORK TO BE PIPED DOWN AND SPLIT INTO 2" PIPES FEEDING EACH OF THE TWO THERMAL OXIDIZERS. SUPPORT THE PIPING OFF THE STRUCTURAL PAD ON GALVANIZED SUPPORTS INCLUDING THOSE USED FOR THE GAS PIPING. PROVIDE 1" CLOSED CELL FOAM INSULATION WITH ALUMINUM JACKETING OVER THE HEAT TRACING ALONG THE ENTIRE LENGTH OF EXPOSED PIPING.
9. PROVIDE A SERVICE PLATFORM TO ACCESS THE UPPER LEVEL OF THE THERMAL OXIDIZER FOR SERVICING AND MONITORING.

Stantec

Stantec Consulting Ltd.
300-311 Portage Avenue
Winnipeg, R3B 2B9
Tel. (204) 489-5900 • www.stantec.com

Consultant

Notes



KEY PLAN

Issued/Revision	By	Appd	YYYY.MM.DD

File Name: N/A	Author	Designer	Checker	2022.09.06
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION
Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project Logo

Client/Project
BAUSCH HEALTH

THERMAL OXIDIZER REPLACEMENT
100 LIFE SCIENCES PARKWAY, STEINBACH, MB, R5G 1Z7

Title
MAIN FLOOR PLAN
THERMAL OXIDIZER LAYOUT

Project No.	Scale
115423024	As indicated

Revision	Drawing No.
A	M-101

Appendix B Certificates of Title

STATUS OF TITLE

Title Number **2981735/1**
Title Status **Accepted**
Client File

Manitoba Land Titles Registry

1. REGISTERED OWNERS, TENANCY AND LAND DESCRIPTION

BAUSCH HEALTH COMPANIES INC.

IS REGISTERED OWNER SUBJECT TO SUCH ENTRIES RECORDED HEREON IN THE FOLLOWING DESCRIBED LAND:

PARCEL ONE: LOT 1 PLAN 25539 WLTO
IN SW 1/4 36-6-6 EPM

PARCEL TWO: LOT 1 BLOCK 1 PLAN 33248 WLTO
IN SW 1/4 36-6-6 EPM

PARCEL THREE: LOT 2 BLOCK 1 PLAN 33248 WLTO
IN SW 1/4 36-6-6 EPM

PARCEL FOUR: LOT 3 PLAN 44271
IN SW 1/4 36-6-6 EPM

The land in this title is, unless the contrary is expressly declared, deemed to be subject to the reservations and restrictions set out in section 58 of *The Real Property Act*.

2. ACTIVE INSTRUMENTS

Instrument Type:	**Caveat**
Registration Number:	**172635/1**
Instrument Status:	**Accepted**
Registration Date:	1958-10-14
From/By:	MANITOBA TELEPHONE SYSTEM
To:	
Amount:	
Notes:	AFF PART OF PARCEL ONE
Description:	No description

Instrument Type:	**Caveat**
Registration Number:	**239269/1**
Instrument Status:	**Accepted**
Registration Date:	1976-05-25
From/By:	MANITOBA TELEPHONE SYSTEM
To:	
Amount:	
Notes:	AFF PART OF PARCEL ONE
Description:	No description

Instrument Type:	**Caveat**
Registration Number:	**86-87160/1**
Instrument Status:	**Accepted**
Registration Date:	1986-08-28
From/By:	MAN. HYDRO ELECTRIC BOARD/MAN. TEL SYSTEM
To:	
Amount:	
Notes:	AFF PART OF PARCEL ONE
Description:	No description

Instrument Type:	**Caveat**
Registration Number:	**1382561/1**
Instrument Status:	**Accepted**
Registration Date:	1991-01-18
From/By:	MANITOBA HYDRO-ELECTRIC AND MANITOBA TELEPHONE SYSTEM
To:	
Amount:	
Notes:	AFF: WTN LTS R/W PL 26275
Description:	EASEMENT

Instrument Type:	**Caveat**
Registration Number:	**2128706/1**
Instrument Status:	**Accepted**
Registration Date:	1997-04-03
From/By:	MTS NETCOM INC.
To:	
Amount:	
Notes:	AFF: WTN LTS R/W PL 34549
Description:	EASEMENT

Instrument Type:	**Caveat**
Registration Number:	**3121447/1**
Instrument Status:	**Accepted**
Registration Date:	2005-04-21
From/By:	MTS ALLSTREAM INC.
To:	WILLIAM F. JOHNSTONE AS AGENT
Amount:	
Notes:	PART LOT'S 1 & 2
Description:	EASEMENT AGREEMENT

Instrument Type:	**Caveat**
Registration Number:	**3253765/1**
Instrument Status:	**Accepted**
Registration Date:	2006-02-15
From/By:	MANITOBA HYDRO-ELECTRIC BOARD, MTS ALLSTREAM INC., ETAL
To:	
Amount:	
Notes:	AFF PCL4 WTN R/W PL44732
Description:	EASEMENT

Instrument Type:	**Mortgage**
Registration Number:	**4095193/1**
Instrument Status:	**Accepted**
Registration Date:	2011-07-08
From/By:	VALEANT PHARMACEUTICALS INTERNATIONAL INC.
To:	GOLDMAN SACHS LENDING PARTNERS LLC
Amount:	$300,000,000.00
Notes:	No notes
Description:	PRINCIPAL AMOUNT IN US DOLLARS

INSTRUMENTS THAT AFFECT THIS INSTRUMENT

Registration Number	Instrument Type	Status
4568153/1	Transfer Of Mortgage	Accepted

Instrument Type:	**Transfer Of Mortgage**
Registration Number:	**4568153/1**
Instrument Status:	**Accepted**
Registration Date:	2015-01-12
From/By:	GOLDMAN SACHS LENDING PARTNERS LLC
To:	BARCLAYS BANK PLC
Amount:	$1.00
Notes:	No notes
Description:	CERT. OF STATUS AS TO GOLDMAN SACHS & BARCLAYS ATTACHED

Instrument Type:	**Mortgage**
Registration Number:	**4897352/1**
Instrument Status:	**Accepted**
Registration Date:	2017-10-19
From/By:	VALEANT PHARMACEUTICALS INTERNATIONAL, INC.
To:	THE BANK OF NEW YORK MELLON
Amount:	$300,000,000.00
Notes:	No notes
Description:	PRINCIPAL AMOUNT IN US DOLLARS

Instrument Type:	**Mortgage**
Registration Number:	**5049003/1**
Instrument Status:	**Accepted**
Registration Date:	2019-03-12
From/By:	Bausch Health Companies Inc.
To:	The Bank of New York Mellon
Amount:	$300,000,000.00
Notes:	No notes
Description:	Principal Amount in US Dollars

Instrument Type:	**Mortgage**
Registration Number:	**5305135/1**
Instrument Status:	**Accepted**
Registration Date:	2021-06-11
From/By:	BAUSCH HEALTH COMPANIES INC.
To:	The Bank of New York Mellon
Amount:	$300,000,000.00
Notes:	No notes
Description:	In US dollars

Instrument Type:	**Mortgage**
Registration Number:	**5397418/1**
Instrument Status:	**Accepted**
Registration Date:	2022-02-14
From/By:	Bausch Health Companies Inc.
To:	The Bank of New York Mellon
Amount:	$300,000,000.00
Notes:	No notes
Description:	Debenture in US dollars

Instrument Type:	**Mortgage**
Registration Number:	**5479961/1**
Instrument Status:	**Accepted**
Registration Date:	2022-10-17
From/By:	Bausch Health Companies Inc.
To:	The Bank of New York Mellon
Amount:	$300,000,000.00
Notes:	No notes
Description:	Debenture in US Dollars

Instrument Type:	**Mortgage**
Registration Number:	**5479962/1**
Instrument Status:	**Accepted**
Registration Date:	2022-10-17
From/By:	Bausch Health Companies Inc.
To:	The Bank of New York Mellon
Amount:	$300,000,000.00
Notes:	No notes
Description:	Debenture in US Dollars

3. ADDRESSES FOR SERVICE

BAUSCH HEALTH COMPANIES INC.
2150 St. Elzéar Blvd. West
Laval QC
H7L 4A8

4. TITLE NOTES

No title notes

5. LAND TITLES DISTRICT

Winnipeg

6. DUPLICATE TITLE INFORMATION

Duplicate not produced

7. FROM TITLE NUMBERS

2482355/1 All

8. REAL PROPERTY APPLICATION / CROWN GRANT NUMBERS

No real property application or grant information

9. ORIGINATING INSTRUMENTS

Instrument Type:	**Request To Issue Title**
Registration Number:	**5016215/1**
Registration Date:	2018-11-07
From/By:	Bausch Health Companies Inc.
To:	
Amount:	

10. LAND INDEX

Lot 1 Plan 25539

Lot 1 Block 1 Plan 33248

Lot 2 Block 1 Plan 33248

Lot 3 Plan 44271

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA STORAGE SYSTEM OF TITLE NUMBER 2981735/1

Appendix C Air Quality Memorandum

Stantec

Memo

To:	Thelma Chikwinya, Safety & Environmental Engineer Bausch Health Canada	From:	Lauren Campbell and Wade Gieni Stantec Consulting Ltd.
Project/File:	115423024	Date:	May 8, 2024

Reference: Screening Assessment for the Proposed Regenerative Thermal Oxidizer at the Bausch Health Steinbach Facility

1 Introduction

Bausch Health Canada (Bausch Health) is planning to install two Regenerative Thermal Oxidizer (RTO) units at the Bausch Health Steinbach Facility located at 100 Life Sciences Parkway in Steinbach, Manitoba. The new RTOs would replace the existing thermal oxidizer unit to address reliability issues, reduce operating costs and improve plant operation.

Stantec Consulting Ltd. (Stantec) was retained by Bausch Health to conduct an air quality dispersion modelling assessment to determine any potential effects on the ambient air quality from the emissions from the new RTOs. The assessment followed the guidance in the Draft Guidelines for Air Dispersion Modelling in Manitoba dated November 2006 (Manitoba Guidance Document).

This memo summarizes the methodology and results for the assessment of the potential effects on ambient air quality from the emissions from the proposed RTOs. The report provides the supporting figures in Attachment A, summary table in Attachment B, supporting calculations in Attachment C, manufacturer specifications in Attachment D, and the model output files in Attachment E.

The following provides an overview of the project and a description of the facility and process as required by Section III of the Manitoba Guidance Document.

1.1 Project Overview and Facility Description

The Bausch Health Steinbach Facility is located at 100 Life Sciences Parkway in Steinbach, Manitoba. The site location (Figure A-1), zoning designation (Figure A-2) and screening model plans (Figures A-3 to A-4) are provided in Attachment A.

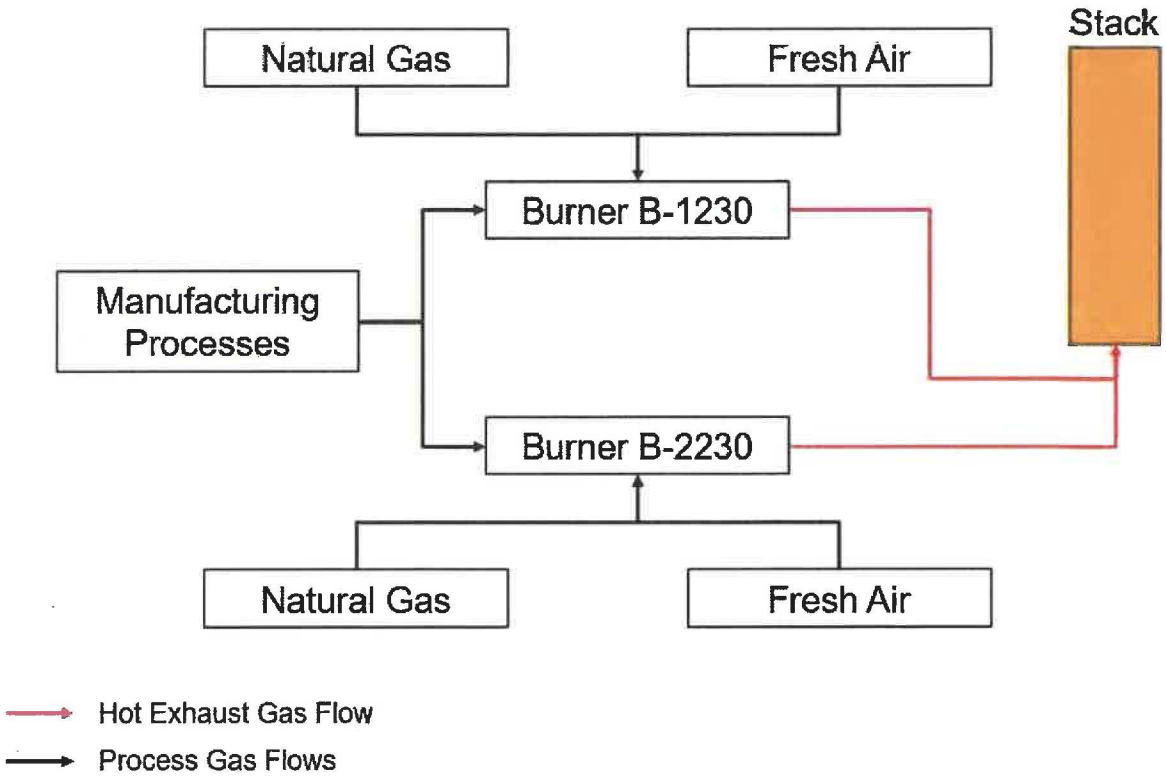
The property is zoned as Heavy Industrial and the surrounding land use zoning includes Light Industrial to the north, Residential to the east and west, with Development Reserves to the south.

The Steinbach Facility produces pharmaceutical products for which the North American Industry Classification System (NAICS) code is 325410 – Pharmaceutical and medicine manufacturing.

1.2 Process Description

The new RTOs will treat process gases containing volatile organic carbons (VOC) through the process of high temperature thermal oxidation, which converts the VOC to carbon dioxide and water. The RTOs will utilize natural gas to facilitate the incineration of the VOC through two burner units and maintain the temperature and residence time to achieve a combustion efficiency of 99%. The emissions from the two burners would be released to the atmosphere from a single 15.2 m (50 ft) stack with an inside tip diameter of 1.32 m (4.3 ft). A simplified process diagram is presented in Figure 1-1 below. A detailed process flow diagram is provided in Attachment D.

Figure 1-1 Simplified Process Flow Diagram for the RTO



2 Emission Estimates

Emissions from the RTOs include emissions from the thermal oxidation of VOC and emissions from the combustion of natural gas to generate the heat. Manufacturer specifications and operational data provided by Bausch Health were used to estimate the maximum worst-case emission rates for the Contaminants of Potential Concern (CoPC). The CoPC included in this assessment are provided in Table 2-1.

Table 2-1 Source and Contaminant Identification Table

Source Information		Expected Contaminant		Included in Modelling?
Source ID	Source Description	Contaminant	CAS No.	
RTO	Regenerative Thermal Oxidizer	Isopropyl Alcohol	67-63-0	Yes
		Ethyl Alcohol	64-17-5	Yes
		Methanol	67-56-1	No
		Acetone	67-64-1	No
		Nitrogen Oxides (NO_x)	10102-44-0	Yes
		Fine Particulate Matter ($PM_{2.5}$)	<<PM2.5>>	Yes
		Methane (CH_4)	74-82-8	Yes
		Carbon Monoxide (CO)	630-08-0	Yes

2.1 Thermal Oxidation of VOC

The RTOs will have a destruction efficiency of 99%, as such only 1% of the VOC will be emitted to the atmosphere. Emissions were estimated using the maximum worst-case VOC flow rate, the destruction efficiency, and the worst-case operating time of 24-hours per day for 365-days of the year. The expected flow rates for Methanol and Acetone are both zero, as such they were not included in the assessment. Detailed emission calculations are provided in Attachment C.

2.2 Natural Gas Combustion

The RTO systems consist of two processing streams, with a rating of 10.9 GJ/h (10.3 MMBTU/hr) for each unit, connected to a single stack. The nitrogen oxides (NO_x), carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$) emission rates are estimated using a combination of combustion emission factors provided by the manufacturer and the United States Environmental Protection Agency (U.S. EPA) AP42 Chapter 1.4 – Natural Gas Combustion. Detailed emission calculations are provided in Attachment C.

3 Air Dispersion Model Inputs

A screening-level assessment of the Facility was conducted to predict the maximum downwind ground-level concentrations. The modelling was completed in accordance with the Manitoba Guidance Document. A general description of the input data used in the screening model is provided below.

The Manitoba Guidance Document lists SCREEN3 as the approved model for screening level assessment. However, since the Manitoba Guidance Document was last updated in November 2006, the U.S. EPA delisted the SCREEN3 model and most Canadian provinces have adopted the AERSCREEN model as their approved screening-model.

AERSCREEN is a screening level version of the AERMOD dispersion model that is used for regulatory applications in Canada and the United States. The AERSCREEN model uses a meteorological matrix to determine the downwind dispersion of emissions based on the range of wind speeds, ambient temperatures, and stability parameters typical to the location and accounts for seasonal changes. The AERSCREEN model also incorporates the potential effects of terrain and structures on the dispersion of the emissions. As such, it can provide a quick evaluation of single emission sources to determine the potential effects of downwind predicted concentrations on ambient air quality.

AERSCREEN (version 21112) was used to conduct the screening-level assessment using the Lakes Environmental Software AERSCREEN View Software.

3.1 Source Data

The source data for the Regenerative Thermal Oxidizers (RTOs) is shown in Table 3-1. This is the only source that was modelled in the screening assessment. A source summary table showing the emission rates for the CoPC, is provided in Attachment B.

Table 3-1 Source Data

Source ID	Description	Source Data					
		Stack Gas Velocity (m/s)	Stack Flow Rate (m3/s)	Stack Exit Gas Temp. (K)	Stack Diameter (m)	Stack Height Above Grade (m)	Stack Height above Roof (m)
RTO	Regenerative Thermal Oxidizer	11.74	16.09	533.7	1.32	15.24	6.10

3.2 Receptors

A 10 km by 10 km assessment domain centered on the Facility was used in AERSCREEN. A receptor grid with a maximum grid spacing of 25 m was generated from the property boundary (20 m from the source) to 5,000 m in accordance with the Manitoba guidance document. Discrete receptors were placed at the at the nearest residence (180 m west of the stack) and at the Clearspring Middle School (600 m north of the stack). Figure A-4 in Attachment A shows the locations for the discrete receptors.

3.3 Meteorological Data

In the screening assessment, the default AERSCREEN meteorological parameters for minimum and maximum temperature, the minimum wind speed and anemometer height were used. For the surface characteristics the AERMET seasonal tables for Urban Land Use and Average Moisture were used.

3.4 Terrain Data

Terrain Data for the modelling domain was obtained through the Lakes Environmental WebGIS tool in AERMAP. The Canadian Digital Elevation Model (CDEM) 15-minnute data was downloaded and used in this assessment. The CDEM files were processed with AERMAP version 18081 to generate the base elevations for sources and buildings for use in the screening model.

4 Assessment of Air Quality Modelling Results

4.1 Assessment Criteria

The maximum off-property ground-level concentrations (GLC) were compared to the following criteria:

- The Manitoba Ambient Air Quality Criteria (July 2005)
- The Ontario Ministry of the Environment, Conservation and Parks (MECP) document "Air Contaminants Benchmarks (ACB) List - Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants" (Version 3, April 2023)
- The Canadian Council of Ministers of the Environment (CCME) Canadian Ambient Air Quality Standards (CAAQS). It should be noted that the CAAQS are not fence line criteria but a regional air quality management tool for managing air quality on an Air Shed level. As such comparisons to the CAAQS are presented for informational purposes only, and not to assess compliance.

To make direct comparisons to the applicable criteria, the maximum 1-hour concentrations predicted by the model were converted to the relevant averaging period (8-hour, 24-hour and annual) using the factors in the AERSCREEN user guide.

4.2 Results

The maximum off-property GLC for each contaminant is predicted to be below the applicable criteria. The maximum GLC for each contaminant occurred 156 m at 150 degrees from North (Southeast of the Stack) which falls within the Bausch Health property. As such the predicted concentrations at the nearest residence (west of the stack) and the Middle School (north of the stack) are well below the applicable criteria for each contaminant. The Emission Summary Table, showing the model predictions, relevant criteria, and the percentage of the criteria, is provided in Attachment B. The maximum 1-hour concentration flow sector analysis for Ethyl Alcohol is provided as Figure A-5 in Attachment A. All of the contaminants have the same flow sector pattern, the only thing that changes are the maximum 1-hour concentrations. The model output files and graphs are provided in Attachment E.

5 Closure

The conclusions in this Memo are Stantec's professional opinion, as of the time of the Memo, and concerning the scope described in the Memo. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Memo relates solely to the specific project for which Stantec was retained and the stated purpose for which the Memo was prepared. The Memo is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Bausch Health Canada (the "Client") and third parties in the preparation of the Memo to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Memo is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Memo may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The memo may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Sincerely,

STANTEC CONSULTING LTD.

[redacted]

Lauren Campbell M.Eng., P.Eng. (ON & AB)
Air Quality Engineer
[redacted]

[redacted]

Wade Gieni B.Sc., QEP
Associate Air Quality Specialist
[redacted]

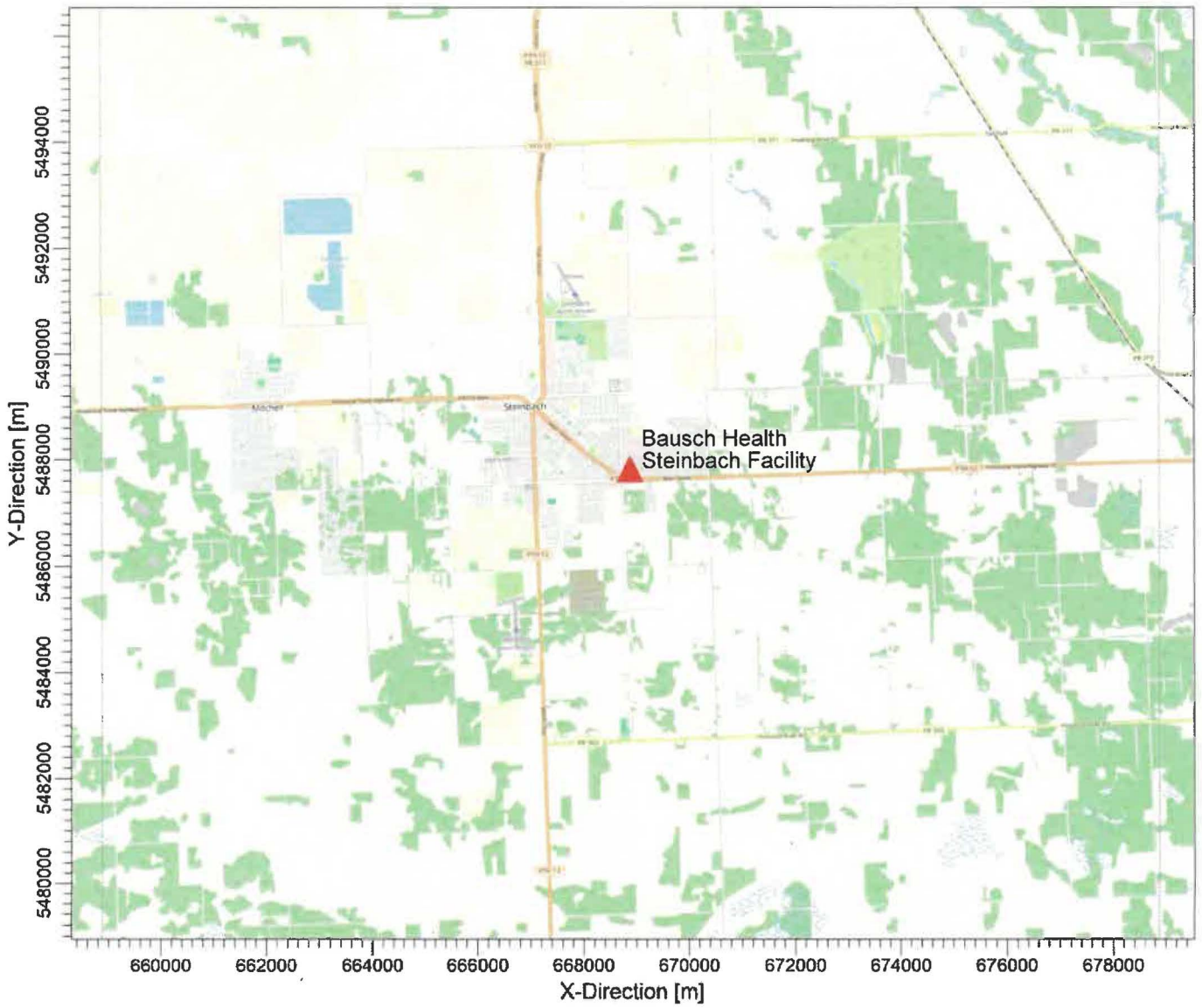
Attachments:
Attachment A – Figures
Attachment B – Tables
Attachment C – Supporting Calculations
Attachment D – Manufacturer Specifications
Attachment E – Model Output Files

Reference: Screening Assessment for the Proposed Regenerative Thermal Oxidizer at the Bausch Health Steinbach Facility

Attachment A Figures

PROJECT TITLE:

Bausch Health Steinbach Facility
Fig. A-1 Site Location Map



COMMENTS:

Red Trangle - Bausch Health Steinbach Facility

COMPANY NAME:

Stantec Consulting Ltd.

MODELER:

LC

DATE:

4/5/2024

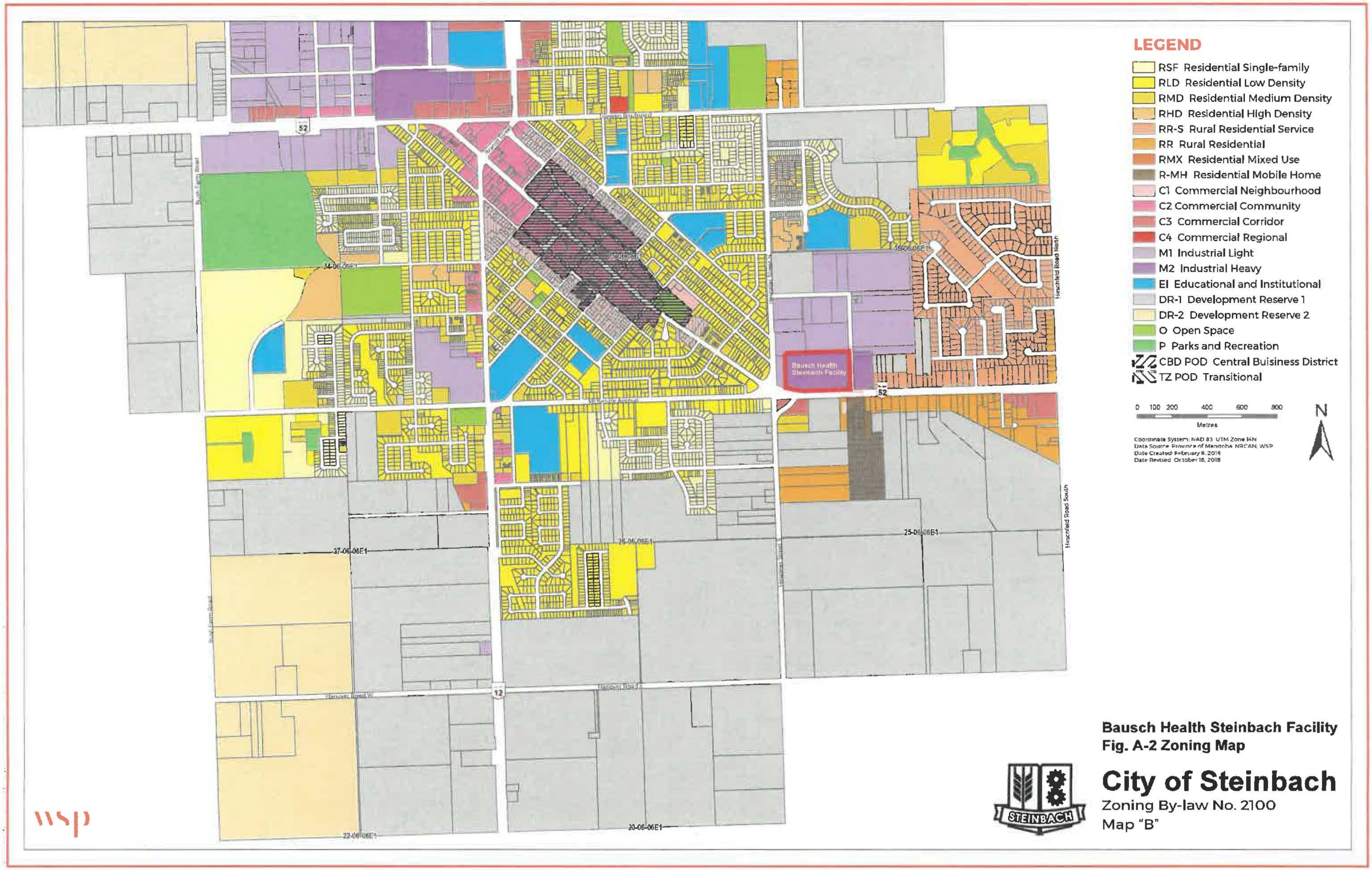
SCALE: 1:119,730

0 4 km

Stantec

PROJECT NO.:

115423024


LEGEND
RSF Residential Single-family
RLD Residential Low Density
RMD Residential Medium Density
RHD Residential High Density
RR-S Rural Residential Service
RR Rural Residential
RMX Residential Mixed Use
R-MH Residential Mobile Home
C1 Commercial Neighbourhood
C2 Commercial Community
C3 Commercial Corridor
C4 Commercial Regional
M1 Industrial Light
M2 Industrial Heavy
EI Educational and Institutional
DR-1 Development Reserve 1
DR-2 Development Reserve 2
O Open Space
P Parks and Recreation
CBD POD Central Buisiness District
TZ POD Transitional
0 100 200 400 600 800
Metres
Coordinate System: NAD 83 UTM Zone 14N
Data Source: Province of Manitoba, NRCAN, WSP
Date Created: February 8, 2018
Date Revised: October 16, 2018
N
Bausch Health Steinbach Facility
52
12
34-06-06E1
27-06-06E1
26-06-06E1
25-06-06E1
22-06-06E1
23-06-06E1
Bausch Health Steinbach Facility
Fig. A-2 Zoning Map
City of Steinbach
Zoning By-law No. 2100
Map "B"
STEINBACH
wsp

PROJECT TITLE:

Bausch Health Steinbach Facility
Fig. A-3 Site Layout

COMMENTS:

Blue outline - Bausch Health Steinbach Facility building enevelope.

Red dot - RTO Stack location

COMPANY NAME:

Stantec Consulting Ltd.

MODELER:

LC

DATE:

4/5/2024

SCALE: 1:5,174

0 0.1 km

Stantec

PROJECT NO.:

115423024

PROJECT TITLE:

Bausch Health Steinbach Facility
Fig. A-4 Discrete Receptors

COMMENTS:

Orange dots - discrete receptor locations

COMPANY NAME:

Stantec Consulting Ltd.

MODELER:

LC

DATE:

5/8/2024

SCALE: 1:18,458

0 0.5 km

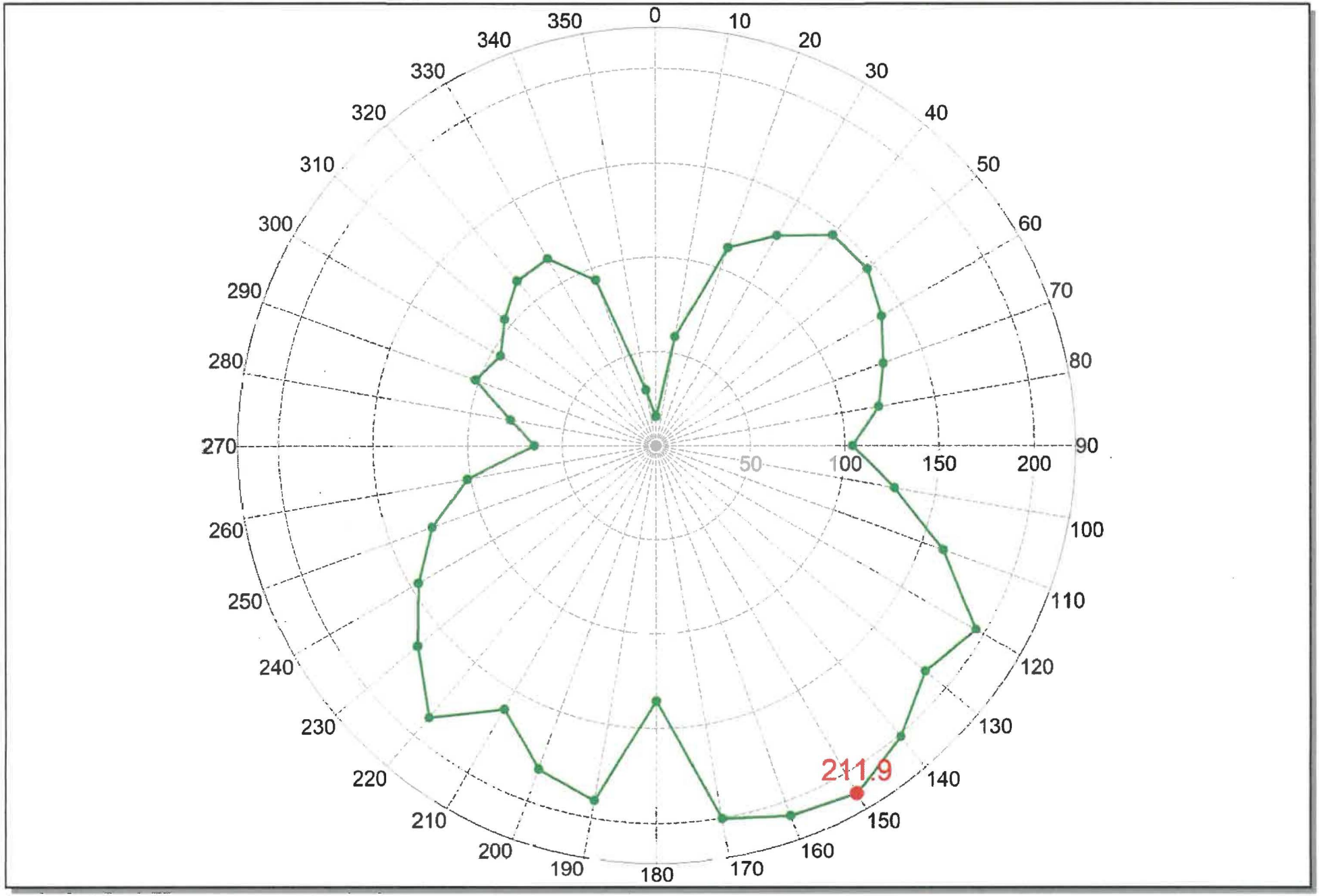
Stantec

PROJECT NO.:

115423024

Fig. A-5: Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_Ethyl_Alcohol - Bausch Health - Ethyl Alcohol



Max Conc: 211.9 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

Attachment B Tables

Project #: 115423024
Facility Name: Bausch Health Companies Inc
Facility Address: 100 Life Sciences Pkwy, Steinbach, Manitoba

Table B1 - Source Summary Table

Source ID	Description	Stack Data						Contaminant	CAS	Maximum Emission Rate (g/s) [1]	Averaging Period (hrs)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions
		Stack Gas Velocity (m/s)	Stack Flow Rate (m3/s)	Stack Exit Gas Temp. (K)	Stack Diameter (m)	Stack Height Above Grade (m)	Stack Height above Roof (m)							
RTO	Regenerative Thermal Oxidizer	11.74	16.09	533.7	1.32	15.24	6.10	Isopropyl Alcohol	67-63-0	0.589	1	MB	Average	100%
								Ethyl Alcohol	64-17-5	1.037	1	MB	Average	100%
								Nitrogen Oxides (NOx)	10102-44-0	0.104	1	EF	Average	100%
								$PM_{2.5}$	<<PM2.5>>	0.005	1	EF	Above Average	100%
								Methane (CH4)	74-82-8	0.118	1	MB	Average	100%
								Carbon Monoxide (CO)	630-08-0	0.514	1	MB	Average	100%

Notes:
1) Detailed emission rate calculations are provided in Attachment C
2) MB - Mass Balance; EF - Emission Factor
3) the Data Quality calssification provides an indication of the accuracy of the emission rate estimating method used in this air quality assessment

Project #: 115423024
Facility Name: Bausch Health Companies Inc
Facility Address: 100 Life Sciences Pkwy, Steinbach, Manitoba

Table B2: Emission Summary Table

Contaminant	CAS	Total Emission Rate (g/s)	Air Dispersion Model	Maximum POI Concentration (µg/m3) [1]	Averaging Period (hrs)	POI Limit (µg/m3)	Regulation Schedule	Percent of Criteria (%)
Isopropyl Alcohol	67-63-0	0.589	AERSCREEN (v 21112)	120.35	1	-	-	-
				72.2	24	7,300	Standard [2]	<1%
Ethyl Alcohol	64-17-5	1.037		212	1	19,000	Guideline [2]	1%
Nitrogen Dioxide (NO_2)	10102-44-0	0.104		21.25	1	400	Objective [3]	5%
				12.75	24	200	Objective [3]	6%
				2.13	8760	100	Objective [3]	2%
$PM_{2.5}$	<<PM2.5>>	0.005		0.97	1	-	-	-
				0.58	24	27	CAAQS [4]	2%
				0.10	8760	8.8	CAAQS [5]	1%
Methane (CH_4)	74-82-8	0.118		24.1	1	-	-	-
				14.5	24	37,330	Screening Level [2]	<1%
Carbon Monoxide (CO)	630-08-0	0.514		105	1	35,000	Objective [3]	<1%
				94.5	8	15000	Objective [3]	<1%

Notes:

1) 1-hour concentrations were converted to the required averaging period using the factors provided in the AERSCREEN user guide

2) From the Ontario Ministry of the Environment, Conservation and Parks (MECP) document "Air Contaminants Benchmarks (ACB) List - Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants" (Version 3, April 2023)

3) From the Manitoba Ambient Air Quality Criteria (July 2005)

4) Canadian Ambient Air Quality Standards (CAAQS) for Respirable Particulate Matter and Ozone, effective by 2020 (CCME, 2012). The Respirable Particulate Matter Objective is referenced to the 98th percentile daily average concentration averaged over 3 consecutive years. It should be noted that the CAAQS are not fence line criteria but a regional air quality management tool for managing air quality on an Air Shed level. As such comparisons to the CAAQS are presented for informational purposes only, and not to assess compliance.

5) CAAQS for Respirable Particulate Matter, effective by 2020. The Respirable Particulate Matter Objective is referenced to the 3-year average of the annual average concentrations. It should be noted that the CAAQS are not fence line criteria but a regional air quality management tool for managing air quality on an Air Shed level. As such comparisons to the CAAQS are presented for informational purposes only, and not to assess compliance.

Attachment C Supporting Calculations

Project #: 115423024
Facility Name: Bausch Health Companies Inc
Facility Address: 100 Life Sciences Pkwy, Steinbach, Manitoba

Emissions from the Regenerative Thermal Oxidizer include the following:
1) Emissions from thermal oxidation of VOC (RTO1)
2) Emissions from the combustion of Natural Gas (RTO 2)

Source: Thermal Oxidation of VOC (RTO1)

Description:
The destruction of VOC through the process of high temperature oxidation. Destruction Efficiency of 99%

Contaminants of Potential Concern:
Isopropyl Alcohol (IPA), Ethyl Alcohols (200 Proof, 95% and Denatured) and Acetone

Methodology:

Maximum worst case VOC flow rates to the thermal oxidizer were provided by Bausch Health. Using the mass balance method, emission rates from the stack were determined.

Table 1: Input Parameters

Parameter	Value	Unit	Comment
Isopropyl Alcohol (IPA 99%) Flow Rate	211.90	kg/hr	maximum worst-case VOC flow rate provided by Bausch Health
Ethyl 200 Proof Flow Rate	33.08	kg/hr	
Ethyl 95% Flow Rate	220.95	kg/hr	
Denatured Ethyl Flow Rate	119.33	kg/hr	
Methanol Flow Rate[1]	0.00	kg/hr	
Acetone Flow Rate[1]	0.00	kg/hr	
Destruction Efficiency	99%	%	provided by manufacturer
Operating Time	365	days/year	worst-case assumption
	24	hours/day	

Notes:
1) Methane and Acetone were removed from the evaluation due to no flow rates for the products

Table 2: Emissions Calculations

Contaminant	CAS	Emission Rate	Unit
Isopropyl Alcohol	67-63-0	0.589	g/s
Ethyl Alcohol [1]	64-17-5	1.037	g/s

Notes:
1. Ethyl Alcohol emission rate is based on the sum of the ethyl 200 proof, the 95% ethyl and the denatured ethyl alcohol

Sample Calculation - Isopropyl Alcohol

Emission Rate (g/s) = Flow Rate (kg/hr) x (1 - Destruction Efficiency) x 1000 g/1 kg x 1hr/3600s
= 211.90 kg/hr x (1 - 0.99) x 1000 g/1 kg x 1 hr/3600 s
= 0.589 g/s

Data Quality: Average
The destruction efficiency provided by the manufacturer is considered to have a data quality of "Average"

Operating Condition, Individual Maximum Rates of Production:

The emission rate calculation for this source is based on the worst-case VOC flow rate to the RTO. The calculated emission rate should be conservative

Source: Natural Gas Combustion (RTO2)

Description:
Natural gas is burned in the RTO to generate the heat required by the thermal oxidation process

Contaminants of Potential Concern:
NOx, Methane (CH_4), Carbon Monoxide and $PM_{2.5}$

Methodology:
Emission Factors for NOx provided by the manufacturer
Emission Factor for $PM_{2.5}$ was calculated using the U.S. EPA AP-42 document Chapter 1.4 (Natural Gas Combustion)
Exit concentrations for Methane (CH_4) and Carbon Monoxide (CO) were provided by the manufacturer and converted to emission rates

Table 3: Combustion Emissions

Parameter	Value	Unit	Comment
Maximum Processing Capacity per unit	10.3	MMBTU/hr	provided by manufacturer
No. of units	2	-	provided by manufacturer
Unit Flow Rate	16.09	m3/s	
Natural Gas HHV	1,001	BTU/scf	provided by Stantec PM
NOx EF	0.04	lb/MMBTU	provided by manufacturer
$PM_{2.5}$ EF [1]	1.83E-03	lb/MMBTU	US EPA AP-41 Table 1.4.2
Methane (CH_4) EF	20	ppmv	provided by manufacturer
Carbon monoxide (CO) EF	50	ppmv	provided by manufacturer
NOx emission rate	1.04E-01	g/s	
$PM_{2.5}$ emission rate	4.75E-03	g/s	
Methane (CH_4) emission rate	1.18E-01	g/s	
Carbon monoxide (CO) emission rate	5.14E-01	g/s	

Notes
1. The emission factor for PM2.5 was converted using the natural gas heating value provided by the PM team.
AP-42 High Heating Value of Natural Gas 1,020 BTU/scf at 60 F and 1 atm

Sample Calculation - Nitrogen Oxides (NO_x)

Emission Rate (g/s) = Emission Factor (lb/MMBTU) x Processing Capacity (MMBTU/hr) x Number of Units x 453.59237 g/ 1 lb x 1 hr/3600 s
= 0.04 lb/MMBTU x 10.3 MMBTU/hr x 2 x 453.59237 g/ 1 lb x 1 hr/3600 s
= 1.04E-01 g/s

Data Quality: Average
The NO_X emission factor provided by the manufacturer is considered to have a data quality of "Average"
The CH_4 and CO emission concentrations provided by the manufacturer is considered to have a data quality of "Average"
The $PM_{2.5}$ emission factor has a U.S. EPA data rating of "B" based on the AP-42 chapter. This gives a data quality of "Above-Average Data Quality".

Operating Condition, Individual Maximum Rates of Production:
The emission rate calculation for this source is based on the maximum processing capacity of the RTO. The calculated emission rate should be conservative

Summary of 1-hr Emission Rates

Table 4: Summary of RTO Emission Rates

Contaminant	CAS	1-hr Emission Rate (g/s) [1]
Isopropyl Alcohol	67-63-0	0.589
Ethyl Alcohol	64-17-5	1.037
Nitrogen Oxides (NOx)	10102-44-0	0.104
$PM_{2.5}$	<<PM2.5>>	0.005
Methane (CH4)	74-82-8	0.118
Carbon Monoxide (CO)	630-08-0	0.514

Notes:
1) for a worst-case scenario, it is assumed that the RTO will be operational 24-hours/day

Convert µg/m3 to ppm & ppm to µg/m3

$$ppm = \frac{\mu g/m^3 \times 22.4136 \times (Temp\,^{\circ}C + 273.15K) \times Press\ (mm\ Hg)}{MW \times 273.15K \times Press\ (mmHg)} \times \frac{1}{1{,}000}$$

$$\mu g/m^3 = \frac{ppm \times MW \times 273.15K \times Press\ (mm\ Hg) \times 1{,}000}{22.4136 \times (273.15K + Temp\ ^{\circ}C) \times Press\ (mm\ Hg)}$$

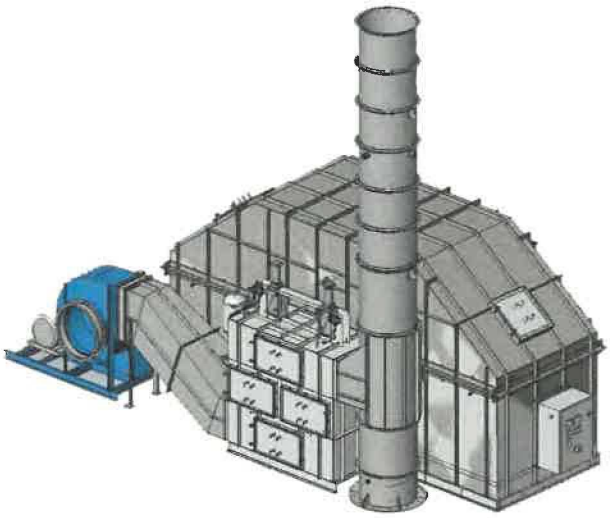
Input Cell
Calculated Cell

Compound	CAS Number	MW	Temperature		Pressure		Concentration		Concentration	
			°F	°C	Atmospheres	mm Hg	µg/m³	ppm	ppm	µg/m³
Methane		16.043	501	260.56	1.00	760.00	-	-	20.00	7,326.62
Carbon Monoxide		28.01	501	260.56	1.00	760.00	-	-	50.00	31,979.45

Attachment D Manufacturer Specifications

Anguil Environmental Systems, Inc.
Regenerative Thermal Oxidizer

Date: March 29, 2023
Proposal #: AES-04714G



Prepared for:

Mike Rogal
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Submitted by:

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Director of Sales
[redacted]

Jeff Kudronowicz
Application Engineering Manager
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Jacob Allen
Application Engineering
[redacted]

Local Representative:

Derek Ramlu
DSR Environmental
[redacted]

ANGUIL

Anguil Environmental Systems, Inc.
8855 N 55th St Milwaukee, WI 53223
Phone: 414-365-6400 | Fax: 414-365-6410
www.anguil.com

Environmental and Energy Solutions that Ensure Cleaner Air and Water for Future Generations.

Founded in 1978, Anguil Environmental Systems is a second generation family owned and operated environmental technology supplier headquartered in Milwaukee, WI USA with offices in Asia and Europe. With annual sales in excess of $50 million globally, Anguil has been a trusted air and water solutions supplier for over 40 years.

The Anguil Advantage

- Business stability and unparalleled expertise with over 40 years in business.
- Single source provider of fully integrated air and water pollution control systems for lowest cost of ownership.
- Over half of Anguil staff are degreed engineers.
- Regulatory compliance is guaranteed.
- Broad range of technology solutions ensure an unbiased equipment selection.
- Comprehensive Quality Assurance program and procedures.
- An established safety program with continuous training for Anguil field service engineers.
- Custom solutions developed specific to your application that maximize efficiency and minimize system life operation costs.

40 **Years in Clean Air and Water**

AIR TECHNOLOGIES

Air pollution control systems for VOC, HAP, and odor abatement—capable of 99+% destruction efficiency.

- Regenerative thermal oxidizers (RTO)
- Catalytic, recuperative, and direct-fired thermal oxidizers and vapor combustors
- Emission concentrator systems

Over 1,900 oxidizers installed on six continents in a wide variety of applications!

ENERGY RECOVERY

Heat and energy recovery systems for improved efficiency and reduced operating costs.

- Air-to-air heat exchangers
- Air-to-liquid heat exchangers
- Heat to power
- Energy evaluations

WASTEWATER TREATMENT

Wastewater treatment technologies for industrial and remediation applications.

- Fully integrated and turnkey systems
- Single source provider
- Engineering assistance, rentals, and pilot programs available
- Technology agnostic approach
- Advanced instrumentation, controls, and automation

AFTERMARKET & SERVICE

Service and maintenance on any make or model, regardless of original manufacturer.

- 24/7 emergency service response
- Operating cost reviews
- System upgrades and retrofits
- Spare parts and component packages
- Preventive Maintenance Evaluations

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Equipment Description	Bausch Health has requested options for a new Anguil Regenerative Thermal Oxidizer (RTO) to process emissions from their Steinbach facility. Two (2) smaller units will be working in a "lead-lag configuration". An interlock condition can be put in place should only (1) of the dual RTOs need to operate.
Facility to be Controlled	The Steinbach Facility
Processes Controlled	Pharmaceutical manufacturing
RTO Energy Recovery	95% Nominal Thermal Energy Recovery to minimize gas usage
Proposed Equipment	Dual Model 150 (17,000 SCFM each) Regenerative Thermal Oxidizer (RTO)
Results	Anguil guarantees a destruction efficiency of 99% or an outlet concentration of 20 ppmv as C1 (methane), whichever is less stringent per EPA Method 25A, over the entire range of RTO flows. The RTO is design for 50 ppmv CO emissions at the stack, assuming no CO is at RTO inlet.

Benefits of an Anguil Partnership

- **Seamless Integration** with the current process
- **Fully automated** PLC-based controls
- Ethernet communications for **Remote Diagnostics**
- **Field Tested** and proven technologies
- Full equipment **Warranty**
- **Factory tested** prior to shipment
- **24-hour** service support

CUSTOMER PROCESS SPECIFICATIONS

Process Flow	35,000 SCFM
Process Temperature	80°F
VOC Concentration	Desired: 778.2 lb/hr (Assumed 12.97 lb/min) Worst case: 1,290.5 lb/hr (Assumed 21.51 lb/min)
VOCs* *Assumed no halogenated, silicones, phosphorus, sulfur, or sodium bearing compounds are present	IPA (99%), Ethyl 200 Proof, Ethyl (95%), Methanol, Denatured Ethyl, Acetone
Facility Altitude	832 FASL
Facility Operating Schedule	24/7
Facility Power	575V / 60 Hz / 3 Ph
Fuel Source	Natural gas
Site Electrical Classification	Assumed General / Unclassified
Process Water Content	Assumed to be no more than 0.01 lb water / lb air
Process Oxygen Content	Assumed to be at least 18%
Process Particulate	Present, but loading unknown at this time
Performance Requirements	99% VOC Destruction
Oxidizer Location Onsite	Outdoors
Desired Operational Date	TBD

Note: Equipment has been designed and sized based on these customer parameters.

EQUIPMENT DESIGN SPECIFICATIONS: DUAL RTO 150

SIZE AND WEIGHT	
Maximum Airflow	34,000 SCFM (Total)
Approximate Footprint/Weight	61' x 45' / 175,000 lbs. (Total dual unit system)
Preliminary Foundation Size	71' x 55'
Stack Height / Diameter	30' / Ø52"
Oxidizer Control Panel Location	Indoors within 50' of oxidizer
UTILITIES REQUIRED	
Installed Fuel Capacity	4.0 MMBTU/hr at 5 psig, **per unit**
Electrical Power	575 V / 60 Hz / 3 Ph
Required Compressed Air	80-100 psig (-40°F dewpoint)
OPERATION INFORMATION	
Destruction Efficiency	99% or an outlet concentration of 20 ppmv as C1 (methane), whichever is less stringent per EPA Method 25A
Maximum Processing Capacity	10.3 MMBTU/hr (11 lbs/min @ 14,244 BTU/lb) each RTO, with Hot Gas Bypass, **per unit**
Nominal Thermal Efficiency (TE)	Calculated using the mass corrected heat loss method per ICAC
System Process Fan Draft Design	Forced draft (FD)
System Process Fan HP	100 HP, Each
Combustion Fan HP	7.5 HP, Each
Operating Set Point	1,550-1,700°F

Note: All weights, dimensions, horsepower ratings, burner sizing, and specific engineering details within the proposal are approximate and will be confirmed by Anguil Environmental following order placement.

EQUIPMENT SPECIFICATIONS

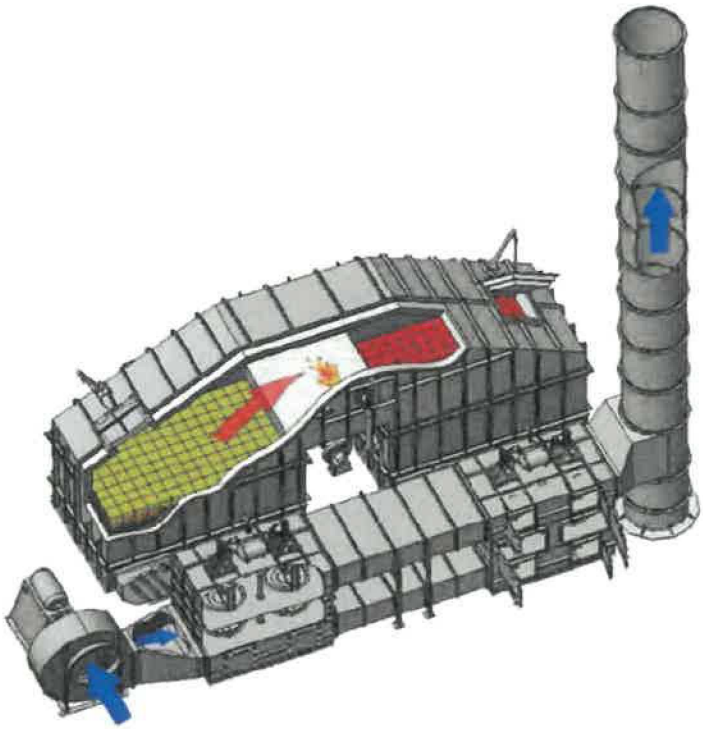
The Anguil Regenerative Thermal Oxidizer (RTO) destroys Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs), and odorous emissions that are discharged from industrial processes. Emission destruction is achieved through the process of high temperature thermal or catalytic oxidation, converting the pollutants to carbon dioxide and water vapor while reusing the thermal energy generated to reduce operating costs.

HOW THE RTO WORKS

VOC and HAP laden process gas enters the oxidizer through an inlet manifold to flow control poppet valves that direct this gas into energy recovery chambers where it is preheated. The process gas and contaminants are progressively heated in the ceramic media beds as they move toward the combustion chamber.

Once oxidized in the combustion chamber, the hot purified air releases thermal energy as it passes through the media bed in the outlet flow direction. The outlet bed is heated, and the gas is cooled so that the outlet gas temperature is only slightly higher than the process inlet temperature. Poppet valves alternate the airflow direction into the media beds to maximize energy recovery within the oxidizer. The high energy recovery within these oxidizers reduces the auxiliary fuel requirement and saves operating cost. The Anguil oxidizer achieves high destruction efficiency and self-sustaining operation with no auxiliary fuel usage at concentrations as low as 3-4% LEL (Lower Explosive Limit).

Anguil Regenerative Thermal Oxidizer (RTO)



POPPET VALVES

Anguil's poppet valves are uniquely designed to divert high volume process air into and out of the oxidizer, properly balance VOC loading, maintain destruction efficiency, and optimize heat recovery. We custom-design, manufacture, and install these vital components to ensure reliability and trouble-free operation. Anguil has several poppet assemblies that have been operating continuously since 1993 and have required nothing but regular maintenance.

SPECIFICATIONS

Vertical Stainless-Steel Shaft

- Orientation works with gravity, requiring no linear bearings to support the weight of the assembly

Carbon Steel Disc & Seat

- Reliable metal to metal seal: 1MM+ cycles
- Removable machined seats: <0.25% leakage at 18" W.C.
- Two-disc system minimizes valve switch distance, maximizes component life, and enhances destruction efficiency
- No gaskets required

Poppet Box Body: 3/16" Plate Steel

- Double acting, three-way air flow design
- Low pressure drop design
- Rectangular ports for inlet/outlet ducting
- Hinged access doors with latches for easier maintenance without bolts
- Over temperature protection for longer equipment life

Cylinder Actuator Supports: 1/4" Plate Steel

- Removable actuator mounting, for easier part maintenance

Heavy Duty Pneumatic Cylinder

- Minimal compressed air usage when solenoids switch from open to closed
- Lockout device for personnel safety
- 90 psi, 10 CFM, -40°F dewpoint

Heavy Duty, High Flow, 4-way Solenoid Valve

Solenoid Valve Exhaust Flow Control

- Soft seat provides quiet operation and reduced wear and tear

Bolted Actuator Mountings with Shaft Guarding

- Personnel protection and simplified maintenance

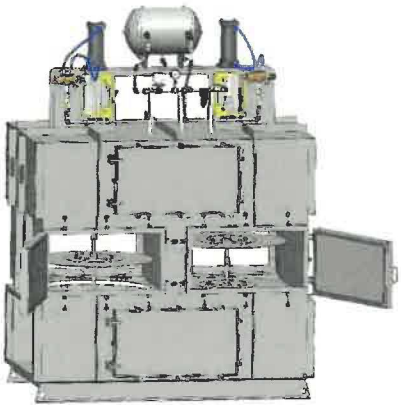
Connecting Duct Work to Fan and Exhaust Stack

Compressed air Accumulator Tank Included

- Moves valves to safe position on loss of air pressure

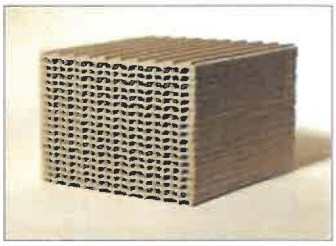
End of Stroke Switches

- Verifies proper valve operation



HEAT TRANSFER MEDIA

- Two (2) beds of high temperature structured heat transfer media and ceramic saddles
- Both types are chemically and thermally stable for rapid heat up and cool down
- Ceramic media is designed to provide optimum heat transfer and surface area
- Media beds are optimized for air distribution, RTO energy recovery, and low pressure drop



BURNER(S)/FUEL TRAIN

The burner installed capacity is higher than required during normal operation. This allows the system to respond rapidly to significant airflow increases, preventing loss of proper RTO operation temperatures. The burner capacity is also sufficient to maintain system operating temperature during full airflow, VOC free conditions.

- Low NOx Kinedizer burner
  - 0.04 lb-NOx/MMBTU (17 ng/J) at burner
- Fuel Train fabricated to NFPA 86 and FM Global specifications
- Service platform and ladder
- 3" burner view port
- Fireye self-checking UV scanner with flame switch and flame strength signal
  - Allows for continuous operation compared to non-self-checking varieties
- Electronic linkageless fuel and combustion air valves (Maxon Smartlink valves)
- Platform to access burner and fuel train components
- Follows CGA, CSA guidelines
- Natural gas fuel train painted yellow

COMBUSTION AIR FAN

- Twin City Fan, New York Blower or equal
- VFD rated, TEFC motor
- Flexible connection on outlet of fan
- Pre-piped with inlet filter

FRESH AIR/PURGE DAMPER

The Fresh Air / Purge Damper is used during oxidizer purging, start-up, shut down, or offline idle. It allows for safe start-up and shutdown on ambient air. The damper is also used if dilution air is required during periods of high VOC loading or low process flow. It is controlled by a signal from the PLC.

- Modulating damper with actuator
- Bird screen included
- Shipped loose for installation in customer ductwork

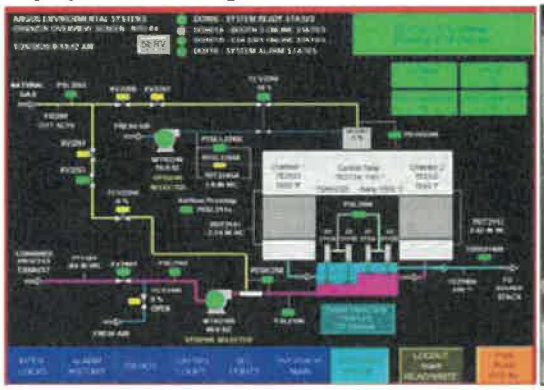
RTO SYSTEM FAN

The system fan is sized for -1 in. W.C. at the RTO inlet. This is equivalent to 100' of ductwork, with two elbows and 2,500 fpm maximum velocity from T-dampers to oxidizer inlet. Any additional ductwork, elbows or duct velocity may affect fan selection. **Estimated 20 in. W.C. to push through entire RTO.**

- Twin City Fan, New York Blower or equal
- VFD rated, TEFC motor
- Flexible connection on inlet/outlet of fan
- Insulated bearings and shaft grounding ring
- Vibration and temperature monitoring
- TEFC inverter duty motor, belt guard, and frame rail

SYSTEM AUTOMATION AND CONTROLS

Anguil's control systems to provide the safest, most efficient, and highly reliable operation while integrating smoothly into existing plant operations **with a "handshake" between Anguil's and Bausch's equipment.** Our systems utilize the latest in Programmable Logic Controller (PLC) based controls, touch screen interfaces, and remote telemetry, resulting in a system which meets variable operational demands while limiting the necessary operator oversight.



View of Anguil HMI Touchscreen

NEMA 12 Control

AUTOMATION AND CONTROLS SPECIFICATIONS

Control Panel Enclosure	NEMA 12 control panel enclosure mounted in a temperature-controlled environment (85°F). Includes Canadian UL sticker, UPS back up, and includes lock and key for security.
Programmable Logic Controller (PLC)	Allen Bradley CompactLogix controls. With a sign confidentiality agreement, Anguil will share PLC program.
Human Machine Interface (HMI)	Allen Bradley PanelView Plus 10" Touchscreen HMI
Digital Chart Recorder	Data record of combustion chamber temperature and cold face temperatures. Data trending and alarms are included through chart recorder and PLC.
Remote Telemetry	For remote diagnostics and service support. All Anguil oxidizers come with remote monitoring and data logging capabilities.
Variable Frequency Drive (VFD)	Regulate airflow via pressure transmitters, aiding in minimizing operating cost by providing fan turn-down during periods of reduced process airflow. Allen Bradley VFDs provided for the RTO system and combustion fans.
Safety Features	Safety PLC for burner management allows for easier troubleshooting with better diagnostic and status information on the HMI
Language	In the event of a system shutdown, the touch screen will indicate the cause via a digital message in English.
Industrial Internet of Things (IIoT)	For additional diagnostics and control, Anguil RTOs can also be equipped with the Industrial Internet of Things (IIoT). The functionality allows customers to take a proactive approach with event-based notifications and predictive maintenance alarms to further protect your investment.
Supervisory Panel	Each RTO will have its own controls and instrumentation for normal operation. But there will be one common control panel to monitor the RTO system.

ENERGY RECOVERY CHAMBERS

The RTO's energy recovery chambers are rectangular cross-sections constructed of carbon steel. They are reinforced to withstand the pressure requirement of the process air fan and all other applied loads. A carbon steel support structure is also provided to support the oxidizer chambers, media support grid and the ceramic heat recovery media itself. To allow for routine inspection of the heat recovery media, cold face and media support grids and two hinged access doors complete with gaskets are included.

Two (2) carbon steel energy recovery chambers

- Internally insulated: 6" thick, 8# density ceramic module insulation
- Insulation rated for 2,300°F
- Insulation modules: shop installed with 310 stainless steel reinforcements and mounting hardware

Support structure and media support grid

- Provides elevation of the media above the RTO floor to allow proper airflow distribution

Two hinged access doors with gaskets and latches (no bolting required)

COMBUSTION CHAMBER

The combustion chamber is a rectangular cross-section constructed of carbon steel and reinforced to withstand the pressure requirements of the process air fan and all other applied loads. The inverted "U" shape design provides the retention time to obtain the specified VOC destruction efficiency. To allow for routine inspection of the heat recovery media, insulation, and burner, access door(s) complete with gaskets and trolley for door support are included.

Inverted "U" shaped oxidation chamber

- Internally insulated: 8" thick, 8# density ceramic module insulation
- Insulation rated for 2,300°F
- Insulation modules: shop installed with 310 stainless steel reinforcements and mounting hardware

Hinged access door(s) with gaskets, latches

- Service platform included. Will be provided as shown in approval drawings.
- Radiant heat loss of 200 BTU/ft2 per ICAC calculation method.

EXHAUST STACK

- Constructed of 304 stainless steel
- Self-supported (Free standing) exhaust stack
- Platform and ladder with OSHA approved fall protection kit
- Two (2) EPA test ports: 90° to each other
- Stack is sandblasted, zinc primed, and high temperature coating applied
- Test ports are minimum two Equivalent Diameters (ED) downstream of flow disturbance and minimum of 0.5 upstream of flow disturbance or exit per EPA Test Method 1.
- Exhaust stack warranty included in equipment warranty
- **O2 monitor to ensure proper VOC oxidation. Includes wiring and install (Separate line item)**
- **Insulation and cladding of entire stack height to reduce chance of condensation within stack (Separate line item)**

INTEGRATED FILTER PLENUM (Shipped Loose)

The inlet filter plenum will have two stages of filter. Access to the filters will be a door on the plenum assembly. Local indication of pressure drop across the filter plenum will be provided. Maximum particulate loading prior to the first stage filter change-out is 0.33 pounds for each 2,000 SCFM of process flow through the filters.

- First Stage – MERV 11 filter
- Second Stage – High Efficiency Pleated final filter (95+% efficiency at 0.8 microns)

LEL MONTOR AND ISOLATION VALVE (SEPARATE LINE ITEM-SHIPPED LOOSE)

To ensure that the process stream's LEL prior to entering the RTO is not excessive, Anguil is offering two (2) LEL monitors as a safety redundancy. Should the process stream's LEL become excessive, a downstream isolation valve will close to protect the oxidizer from a high LEL condition. A vent to atmosphere damper will open to allow the production equipment's exhaust fan(s) to exhaust the excessive LEL process stream to atmosphere. The LEL monitors will be located approximately 2-seconds upstream of the isolation valve, or approximately 80-feet. This system is to be placed on the single, common duct to the RTOs.

- Two (2) Control Instruments PrevEx or equal analyzers
- FM Approved
- RS-485 Serial Port and 4-20mA output
- Calibration regulator and Ethylene span gas cylinder
- Utility requirements: 120 VAC, hydrogen fuel, compressed air
- NEMA 4X housing, Rated C1D2
- Concentric sample probe
- Compressed air filter assembly
- Hydrogen fuel changeover regulator assembly
- One (1) day of LEL start-up and training onsite by LEL vendor representative is required for warranty purposes
- **Electrical install included for 100' linear conduit run from main control panel.**
- **Anguil assumes Bausch's production equipment has built in LEL monitoring equipment, unrelated to the RTO, and the production equipment has their own exhaust fan(s).**

BAKE OUT

The oxidizer can be operated off-line from the process in a bake-out mode to allow for the removal of organic build-up on the cold face of the heat exchange media. At a reduced airflow, the outlet temperature is allowed to reach an elevated temperature before the flow direction is switched. This hot air vaporizes organic particulate that may have collected on the cold face of the heat exchange media. The flow direction is then switched, and the opposite cold face is cleaned. The area below the media support grid will be insulated to prevent the temperature of the outer skin from increasing during bake-out.

PAINTING

All exposed surfaces of the oxidizer shall be primed coated with a high solids epoxy coating. The finish coat shall be a gloss high solids polyurethane multi-function weather resistant coating. The natural gas and compressed air piping will be primed and painted with one (1) coat of Anguil's standard coating. All other equipment will be the manufacturer's standard paint and color. Prior to painting, all welds will be caulked.

- UV-resistant polyurethane paint
- Paint color can be specified by the customer

OPERATION & MAINTENANCE MANUALS

- Anguil to provide a link to the Operation and Maintenance manual, available for electronic download. Paper hard copies available by request only.
- USB flash drive of all vendor bulletins

PRE-ASSEMBLY AND SHOP TEST

We pre-assemble and pre-test modular components in our factory to provide significant savings of time and money during installation and start-up. Units are prewired and pre-piped at the factory for improved quality control and trouble-free start-up.

- Inspection of the unit for manufacturing quality
- Check fuel and electrical connections
- Warning labels are installed
- Test ports are installed
- Run electrical rigid conduit
- Fans and motors installed, cleared of debris, and checked for quality
- Temporary wiring of components that are shipped loose from the RTO skid
- Valves to be cycled and set
- Customer is invited to witness shop testing

ON-SITE OPERATOR TRAINING

Anguil will provide personnel for two eight-hour days of operator training. To be billed at the daily rate. This will be conducted after the RTO startup.

OUTDOOR INSTALLATION SPECIFICATIONS

Regenerative Thermal Oxidizer shall be installed outdoors on a concrete pad. Installation is based on free and clear access to the site, meaning the ability to pull crane and delivery trucks to the equipment pad. No landscape, physical or overhead obstructions to set up crane or unload equipment directly from truck onto final equipment location on grade. Installation assumes non-union labor cost.

ENGINEERING SERVICES

- Provide foundation loading diagram for concrete pad.
- Customer supplied pad/platform to be flat and level.
- Provide electrical interconnect drawings

INSTALLATION SUPERVISION

- An Anguil Project Installation Supervisor shall manage and supervise the oxidizer installation work
- Travel and living expenses included

MECHANICAL INSTALLATION

- Labor and material necessary to unload and set the equipment
- Rental of all necessary equipment including crane, forklift and manlift
- Off-loading of RTO and components from shipping trucks
- Erection of RTO on concrete pad
- Setting of energy recovery chambers, combustion chambers, poppet valves, transitions and system fan
- Loading of heat exchanger media and insulation if applicable
- Erection and installation of exhaust stack
- Mechanical reassembly of Anguil supplied oxidizer components, excluding shipped loose items installed in customer ductwork
- Finish/touch-up painting as required after installation is complete

ELECTRICAL WORK

- Setting control panel and VFD
- Interconnecting wiring between RTO and control panel (control panel located indoors) including up to 50 feet of conduit runs

EXCEPTIONS AND CLARIFICATIONS

Anguil takes exception to, requires clarification, or proposes changes on the following items. Anguil welcomes the opportunity to negotiate these items upon award of the final contract.

- Spare parts lists are determined after engineering design and customer approval of drawings. Each oxidizer system is unique and specific ware parts are determined after the design phase. Anguil can provide a sample spare parts list and the current lead time for long lead items if desired.
- Anguil takes exception to conforming with ACI 307 for stack design. That is only applicable to reinforced concrete exhaust stack. Ours will be made of stainless steel.
- Anguil takes exception to RFI 4.1.1.3.1.3: Anguil takes exception to quoting "Blast Gates". Hinged doors with a latch will open in an over pressurization event.
- Anguil takes exception to RFI 4.2.2.6.5: Anguil is quoting an exhaust stack constructed of 304 stainless steel, in lieu of a carbon steel exhaust stack with stainless steel liner. This will allow for a robust design while minimizing cost.
- Anguil takes exception to RFI 4.2.2.6.8: The equipment will have the standard warranty. See "Terms and Conditions" section of this proposal.
- Anguil takes exception to RFI 4.2.2.3.13: The process stream is plant exhaust air with VOC and doesn't require O2 monitoring.
- Anguil takes exception to RFI 4.2.2.8: A specific stack testing method needs to be determined. Anguil can perform an unofficial test using summa canisters.
- Anguil takes exception to RFI 9.1: Anguil is not responsible for a Canadian PE stamp on drawings.
- Anguil takes exception to winterization of the RTO. It will be cheaper to winterize the instrumentation in the field, done by others. Anguil can provide documentation to explain what should be winterized.
- The provided "TOX Airflow & VOC Scenarios" sheet shows a "Worst Case CFM" of 56,475-CFM. This proposal is quoting units to handle 35,000-SCFM of process flow, as stated in the RFI. If a condition exists where the equipment must handle a process flow in excess of 35,000-SCFM, a redesign will be required.
- Anguil will define thermal efficiency as:

  $\%T.E.R.= \frac{Mo*(Tc-\ )}{Mi*(Tc-Ti)}$

  Where:
  % T.E.R. = Thermal Energy Recovered.
  Mo = Mass airflow rate in the outlet (stack) from the Thermal Oxidizer.
  Mi = Mass airflow rate at the inlet to the Thermal Oxidizer.
  Tc = Operating temperature in the Thermal Oxidizer combustion chamber.
  To = Outlet (stack) air temperature leaving the Thermal Oxidizer.
  Ti = Inlet air temperature entering the Thermal Oxidizer.
- Approval drawings are submitted to client after PO and start of Engineering will show the following drawings:
  - Clearance for ops, maintenance, service, cleaning, etc., Foundation drawing, Compressed air and gas piping sizes, Gasketing/bolting details, Electrical schematics and control panel drawings, Burner size and P&ID controls, shipped loose instrumentation will be clearly identified in P&ID, Free standing
- The O&M manual is written for this specific piece of equipment based on approval drawings and operating sequences shared with the customer. This will be done following detailed engineering of the RTO(s).
- Storage can be provided if the site is not ready to accept shipment of the completed RTO(s)
- Indoor RTO installation does not appreciably change the RTO design, with the exception of induced draft fans to keep the entire unit under suction pressure. This can have significant cost impact if the stack temp is expected to be high during high VOC emissions rates.

- The RTO(s) will meet the CSSA requirements.
- The RTO(s) can go from idle to full process flow assuming the RTO(s) is/are kept hot and run at idle flow conditions.
- Anguil assumes the compressed air will be coming into the RTO air inlet at 80 – 100 PSIg. Any higher would require a pressure relief valve.
- For the dual RTO 150 option, Anguil assumes that half of the total process flow and half the VOC loading will be processed by each RTO. Isolation dampers are provided to shut off flow to an RTO if needed.
- Anguil assumes that the unloading of the RTO(s) will coincide with the installation of said RTO(s). The same crane used for installation will be used to unload any and all freight trucks.
- Anguil's warranty does not cover replacement of any consumable items. I.e., thermocouples and instrumentation.
- **Anguil recommends fans with 200+HP be aligned/balanced. The proposed Dual RTO 150s are only expected to have a 100-HP motor for each RTO. However, all fans, regardless of size, are balanced at the vendor's manufacturing shop prior to shipment. Please note that all equipment sizing is estimated pending engineering design and review.**
- For the LEL monitors to function properly with the entire system, the monitors need to be placed a minimum of 2-seconds (~80-feet) upstream of the isolation valve. That is the minimum amount of time it takes the equipment to read and transmit a signal, then allow the valve to physically close.
- Anguil assumes Bausch's production equipment has built in LEL monitoring equipment, unrelated to the RTO, and the production equipment has their own exhaust fan(s) and vent to atmosphere damper/valve. Anguil's LEL monitors are intended to be safety shut down devices, not dilution air control devices.
- **Anguil assumes that the conduit runs for the LEL monitor and its iso-valves are 100' linear from the main control panel (MCP). Additional distance will alter the installation price.**

All items, components, and equipment proposed within this document are Anguil standard unless indicated otherwise. Any customer specifications that may alter the included device selections are not included at this time.

ITEMS NOT INCLUDED

- Concrete pad / platform
- Mounting and wiring of shipped loose dampers, instrumentation, **and filter plenum**
- Supply and installation of compressed air piping (if applicable) for dampers between process(es) and oxidizer
- Interconnecting wiring between VFDs and Anguil supplied motors
- All-natural gas piping to RTO fuel train
- All compressed air piping to RTO air train (-40°F dewpoint requirement) and tee dampers
- Winterization of the pneumatic piping and sensing lines, if required
- Power source to RTO control panel
- Ductwork/dampers from process to oxidizer inlet
- **External insulation of ductwork, valves, and fan**
- Oxidizer system fan and combustion air fan motor disconnects not included
- Personnel protection, security fencing and lighting
- Moving of oxidizer obstructions, fencing, landscaping, etc.
- Multiple installation trips if delays beyond Anguil's control
- All roof and building penetrations
- All fire suppression piping and controls
- All required sound abatement equipment
- HAZOP / PHA Participation (charged at daily rate plus T&L)
- Compliance testing
- Internet connection
- Taxes, permits
- Overtime, holiday, or weekend work
- Installation Supervision (Can be quoted as an option)
- Mechanical and electrical installation (**Quoted as an option**)
- Oxidizer startup and training (**Quoted at daily rate**)
- Budget Freight (**Estimate provided**)

PRICING AND DELIVERY: DUAL RTO 150

One **(2) Anguil Model 150 Regenerative Thermal Oxidizer** will process 17,000 SCFM each of VOC laden process, meets stated DRE requirement.

EQUIPMENT PRICE DPU, per Incoterms 2010, Freight Prepaid & Add to the invoice	$[redacted]
ADDER: EXHAUST STACK O2 MONITOR	$[redacted]
ADDER: EXHAUST STACK INSULATION AND CLADDING	$[redacted]
ADDER: LEL MONITORING AND PURGE VALVE	$[redacted]
ADDER: LEL INSTALLATION (ESTIMATED)	$[redacted]
ADDER: WINTERIZATION (ESTIMATED)	$[redacted]
INSTALLATION PRICE	$[redacted]
STARTUP AND TRAINING (Estimated 12-20 days needed for startup and training)	$[redacted] + travel and living
PACKAGING AND FREIGHT (ESTIMATED) DPU, per Incoterms 2010, price listed reflects product only **Due to the current volatile market conditions, all freight quotes are advisory only. Actual freight rates cannot be confirmed until the actual day of booking. Estimate assumes a single crane mobilization, the same crane will be used for mechanical installation and installation will begin immediately after unloading. .**	$[redacted] **(Estimated)** Billed at Cost plus 10% handling fee

TERMS

- 40% down payment due upon order placement
- 30% due 8 weeks after receipt of purchase order, net 30
- 10% due prior to shipment or notification of readiness to ship
- 10% due after mechanical installation completion, not to exceed 90 days from shipment, net 30
- 10% due upon start up, not to exceed 60 days from mechanical installation completion, net 30

SHIPMENT

32-36 Weeks after approval of drawings (General Arrangement and Process and Instrumentation Diagram), based on current shop workloads.

ALL PRICES HAVE BEEN QUOTED IN US DOLLARS. ALL PRICES WILL REMAIN FIRM FOR 14 DAYS. THEREAFTER, A RE-QUOTE MAY BE REQUIRED

The Contract Price and Contract Time have been calculated based on the prices and availability of the component materials as indicated by Anguil's suppliers as of the date of this Agreement. However, the market for the materials necessary to complete the Work are considered to be highly volatile, and sudden price increases and changes in material availability are likely to occur. Anguil agrees to use commercially reasonable efforts to obtain the prices quoted herein within the time frames indicated in the project schedule, but should there be an increase in the prices of these materials after execution of this Agreement, or should any materials subsequently become unavailable or the delivery of such materials be delayed, the parties shall enter into a Change Order to increase the Contract Price and extend the Contract Time accordingly. For the avoidance of doubt, Anguil shall not be liable for cost increases or delay costs (including, without limitation, any liquidated or consequential damages associated with delay) which result from changes in the cost or availability of materials.

OPERATING COST SUMMARY

The operating costs are based on the following standards outlined by the Institute of Clean Air Companies (ICAC) Guidance Method for Estimation of Gas Consumption in a Regenerative Thermal Oxidizer (see the attachment):

PROCESS SUMMARY		
Process Flow	Varies	SCFM
Destruction Efficiency	99	%
Nominal Heat Transfer Efficiency	95	%
Assumed Inlet Temperature	80	°F
Btu/lb Value	14,244	BTU/lb
Electricity Price	$0.08	per kWh
Natural Gas Price	$5.00	per MMBTU

Dual Model 150

Process Flow VOC Loading	Electric Cost / hour	Gas Cost / hour	Total Cost / hour
8,000 SCFM 184.30 lb/hr	$[redacted]	[redacted]	[redacted]
12,475 SCFM 450.40 lb/hr	$[redacted]	[redacted]	[redacted]
20,975 SCFM 511.30 lb/hr	$[redacted]	[redacted]	[redacted]
32,600 SCFM 916.90 lb/hr	$[redacted]	[redacted]	[redacted]

FIELD SERVICE RATES

Field Service Engineer and Installation Supervision *Weekdays, 8 hours/day; minimum of 4 hours

Straight Time *	$ [redacted]
International Labor Rate *	$
Emergency Service Rate *	$
(Site visit within 48 hours of call)	
Overtime (More than 8 hours/day and Saturdays)	$ [redacted]
Sundays and Holidays	$
Travel Time	$
Trip Preparation	$
Report Writing	$
Technical Phone Support (Minimum of 4 hours)	$
Remote Safety Training and Drug Screening (Anguil Office)	$

Engineering *Weekdays, 8 hours/day; minimum of 4 hours

Project Engineer *	$ [redacted]
Project Manager *	$
Electrical Engineer / Programming*	$

Travel and Living Expenses

Airline ticket, Hotel, Car rental, Car service and Expenses	Cost + 15% Administrative fee
Meal allowance - Domestic	$ [redacted]
Meal allowance - International	$
Airport parking	$
Mileage	$

Terms

Net 30 days

Terms subject to change upon credit review

Holiday Schedule

New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving
Christmas
New Year's Eve

- When an Anguil Employee is scheduled to work on-site but not granted access, due to no fault of Anguil, customer will be billed at the daily rate for 8 hours in addition to expenses.
- Pre-negotiated days off will not be billed for service labor unless reports/training are being compiled.
- If receipts or time sheets are required, a 10% handling charge will be applied to the total invoice for report generation.

STANDARD TERMS AND CONDITIONS

- See attached document for Terms and Conditions.

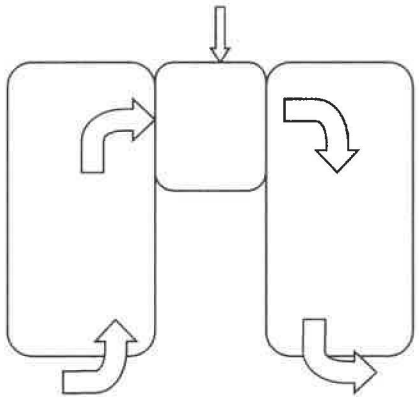
INSTITUTE OF CLEAN AIR COMPANIES (ICAC) GUIDANCE METHOD FOR ESTIMATION OF GAS CONSUMPTION IN AN REGENERATIVE THERMAL OXIDIZER (RTO)

1. OBJECT AND SCOPE

Supplemental fuel consumption, typically natural gas, can be a significant consideration for the installation and operation of a regenerative thermal oxidizer (RTO). Regenerative thermal oxidizers are used in a variety of processes in the destruction of volatile organic compounds (VOC) and hazardous air pollutants (HAP). The amount of fuel required will vary by application; however, within a single application an estimate of fuel consumption should be consistent among RTO manufacturers and suppliers. As a result, the following procedure developed by ICAC and its member companies describes an industry derived guidance method for estimating gas consumption requirements of an RTO. Once fuel consumption has been estimated, fuel as part of the operating cost can be calculated using current or projected fuel cost assumptions. Generally, this method can also be used as a reference to confirm and compare manufacturers' fuel consumption estimates. The guidance method estimate will provide a reference for gas consumption estimates.

2. OVERVIEW OF GAS CONSUMPTION IN AN RTO

F_{cc} (Combustion Air) @ T_A



F_1 (Process Air + VOC) @T_1

F_0 (Process Air + Products of Combustion + Combustion Air) @ T_O

3. GUIDANCE ESTIMATION METHOD

Energy consumed in the RTO can be determined by performing a heat balance as follows:

$$Q_T = Q_I + Q_{cc} + Q_{RL} - Q_{VOC}$$

Q_I :Heat used to raise temperature of F_I (BTU/hr)
Q_{cc} :Heat used to raise temperature of F_{CC} (BTU/hr)
Q_{RL} :Radiation Heat loss from RTO (BTU/hr)
Q_{VOC} :Heat Release from oxidation of VOCs (BTU/hr)

$$Q_I = F_I \text{ X } 1.10 \text{ x } (T_O - T_I)$$

$$Q_{CC} = F_{CC} \text{ X } 1.10 \text{ X } (T_O - T_A)$$

$$Q_{VOC} = \text{VOC X } H_C \text{ X } (\%\text{ Dest} / 100)$$

Where:

F_I: Process air (SCFM)
F_{CC}: Combustion air (SCFM)
T_I: RTO inlet air temperature (°F)
T_A: Ambient or Combustion air temperature (°F)
T_O: Average RTO outlet temperature (°F)
1.10: 60 (min/hr) x 0.075 (lb/ft^3, density of air at standard conditions) x 0.245 (Btu/deg F – lb, specific heat of air), where 0.245 is the average heat capacity of air over the temperature range.
VOC: lbs/hr of VOC to the oxidizer
H_C: Weighted Average for Heat of Combustion of VOCs
% Dest: Guaranteed VOC Destruction Rate

Since F_I, F_{CC}, T_I, T_O and T_A can all be determined by data supplied with proposal, Q_I and Q_{CC} can be determined.

To determine Q_{RL} the following guidelines can be used:

1. Determine surface area of the RTO shell
2. Multiply that area by heat loss factor (assume 200 Btu/ft^2) to arrive at approximate Q_{RL}.

4. CALCULATION OF THERMAL EFFICIENCY (*N*)

$$N = ((F_I + F_{CC}) / F_I) \text{ X } ((T_C - T_O) / (T_C - T_I))$$

Where:
N = Thermal Efficiency

T_C = Temperature, Combustion Chamber

T_O = Temperature, RTO Outlet (Average)

T_I = Temperature, RTO Inlet

BAUSCH HEALTH COMPANIES INC.
STEINBACH, CANADA
PROCESS & INSTRUMENTATION DIAGRAM

TERMINAL POINT SCHEDULE

T.P.	DESCRIPTION	MEDIA	SIZE	CONNECTION	MATERIAL
A	PROCESS INLET	VOC LADEN AIR	TBD	FLANGED	CARBON STEEL
B1/B2	FUEL INLET, RTO #1 & #2	NATURAL GAS	TBD	FNPT	CARBON STEEL
C1/C2	COMPRESSED AIR INLET, RTO #1 & #2	INSTRUMENT AIR	3/4"ø	FNPT	CARBON STEEL
D1/D2	LEL MONITOR COMPRESSED AIR SUPPLY	INSTRUMENT AIR	TBD	FNPT	CARBON STEEL
E1/E2	LEL MONITOR HYDROGEN FUEL SUPPLY	HYDROGEN	TBD	COMPRESSION	SST TUBING

DRAWING SCHEDULE

DRAWING DESCRIPTION	DRAWING NUMBER	REVISION DATE	REVISION
P&ID COVER PAGE	30217-100	06/22/23	-
P&ID SYMBOLOGY	30217-101	06/22/23	-
INLET DUCTWORK	30217-102	06/22/23	-
MODEL 150 RTO (1)	30217-103	06/22/23	-
MODEL 150 RTO (2)	30217-104	06/22/23	-

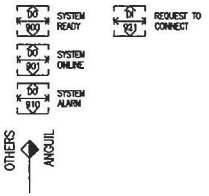
UTILITIES

NATURAL GAS	TBD SCFH @ 5 PSIG
POWER	575V/60Hz/3PH
COMPRESSED AIR	80 PSIG MINIMUM @ 10 SCFM (-40°F DEWPOINT)
LEL ANALYZER HYDROGEN FUEL SUPPLY	58 LITERS/DAY @ 40-45 PSIG (FOR EACH LEL)
LEL ANALYZER COMPRESSED AIR	42 SCFH (21 LITERS/MIN) @ 20 PSIG (FOR EACH LEL)

PROCESS DESIGN CONDITIONS

DESIGN FLOW	35,000 SCFM
FACILITY ALTITUDE	832 FASL
PROCESS INLET TEMPERATURE	80°F
VOC CONSTITUENTS	IPA, ETHYL 200 PROOF, ETHYL, METHANOL, DENATURED ETHYL, ACETONE
MAXIMUM PROCESSING CAPACITY	21.5 LBS/MIN (1,290 LB/HR) @ 14,244 BTU/LB FOR EACH RTO
DESTRUCTION EFFICIENCY	99% OR AN OUTLET CONCENTRATION OF 20 PPMV AS C1 (METHANE), WHICHEVER IS LESS STRINGENT PER EPA METHOD 25A, OVER THE ENTIRE RANGE OF RTO FLOWS
CO EMISSIONS GUARANTEE	50 PPMV CO EMISSIONS AT THE STACK, ASSUMING NO CO IS AT RTO INLET
NOMINAL THERMAL EFFICIENCY	95%
PRESSURE AT TERMINAL POINT "A"	(-1)" W.C.

GENERAL NOTES (GN):
1) ALL THERMOCOUPLES ARE SINGLE TYPE N ELEMENTS, UNLESS NOTED OTHERWISE.
2) ALL EXTERNAL INSULATION FOR HEAT CONSERVATION OR PERSONNEL PROTECTION IS BY OTHERS, EXCEPT AS STATED IN NOTE 11.
3) WINTERIZATION IS BY OTHERS.
4) ELECTRICAL CLASSIFICATION: GENERAL.
5) CONTROL PANEL: NEMA 12 CONTROL PANEL ENCLOSURE MOUNTED IN A TEMPERATURE CONTROLLED ENVIRONMENT (85°F).
6) NEMA 12 CONTROL PANEL INCLUDES CANADIAN UL STICKER, UPS BACK UP, AND INCLUDES LOCK & KEY FOR SECURITY.
7) OFFLINE BAKEOUT INCLUDED.
8) HOT GAS BYPASS VALVE & ASSOCIATED DUCTWORK ARE INTERNALLY INSULATED.
9) PROCESS DUCTWORK PROVIDED BY OTHERS SHALL BE DESIGNED IN ACCORDANCE WITH SMACNA CLASS 2 (±10" W.C.)
10) LOCAL MOTOR DISCONNECTS, IF REQUIRED BY LOCAL ELECTRICAL CODES, SHALL BE PROVIDED BY OTHERS.
11) STACK SHALL BE CONSTRUCTED WITH 304L SST, EXTERNALLY INSULATED, AND HAVE AT LEAST TWO TEST PORTS FOR EMISSIONS TESTING. STACK SHALL BE FREE STANDING.
12) SYSTEM FANS SHALL BE OF AMCA "C" SPARK PROOF CONSTRUCTION.
13) DAMPER LIMIT SWITCH IS A PROXIMITY SWITCH MOUNTED ON THE TAIL SHAFT.
14) STATIC MIXER (BY OTHERS) SHALL BE INSTALLED A MINIMUM OF 3-DIAMETERS UPSTREAM OF TWO STAGE FILTER ASSEMBLY.
15) AE-421 INSTALL LOCATION REQUIRES A MINIMUM OF 2.5-SECONDS TRAVEL TIME UPSTREAM OF THE OXIDIZER ISOLATION DAMPERS.
16) HYDROGEN FUEL SUPPLY TO LEL MONITORS SHALL BE PROVIDED BY OTHERS.
17) XSO-416A AND XSO-421A ARE LEL "SERVICE NEEDED" SWITCHES. XSO-416B AND XSO-421B ARE LEL "FAULT" SWITCHES.



ANGUIL ENVIRONMENTAL SYSTEMS, INC.
MILWAUKEE, WISCONSIN

TITLE	P&ID COVER PAGE
	PROCESS & INSTRUMENTATION DIAGRAM
DRAWING NO.	30217-100
SCALE	NTS
DRAWN	CSV
DATE	06/28/23
CHECKED	
DATE	
APPROVED	
DATE	
CUSTOMER	BAUSCH HEALTH COMPANIES INC.
	STEINBACH, MANITOBA, CA
REV.	-
LAST DRAWN BY	
DATE	
SOURCE	
PAGE	1 OF 5

REV	BY	DATE	CHANGE

INSTRUMENT IDENTIFICATION

	1st LETTER	2nd LETTER	3rd & 4th LETTERS
A	ANALYSIS	ALARM	
B	BURNER		
C	–		CONTROL/CLOSE
D	DIGITAL	DIFFERENTIAL	
E	–	SENSOR/ELEMENT	
F	FLOW RATE		
G	–	GLASS, GAUGE, VIEWING DEVICE	
H	HAND		HIGH
I	CURRENT/IGNITION	INDICATOR/INPUT	INDICATOR
J	POWER		
L	LEVEL	LIGHT	LOW
O			OPEN
P	PRESSURE		
Q	–	TOTALIZER	
R	–	RECORDER/REGULATOR	
S	SOLENOID	SWITCH	SWITCH
T	TEMPERATURE	TRANSMITTER	TOTALIZER
V	VARIABLE	VALVE	VALVE
X	SHUT OFF		
Z	POSITION	POSITIONER	
BE	UV SCANNER		
BT	FLAME STRENGTH TRANSMITTER		
BX	SPARK IGNITOR		
FSC	FLAME SAFETY CONTROLLER		
HS	LEAK TEST		
IT	IGNITION TRANSFORMER		
MTR	MOTOR		
FASL	FEET ABOVE SEA LEVEL		

PROCESS

ELECTRICAL COMMUNICATION

CAPILLARY

PIPING AND INSTRUMENT SYMBOLS

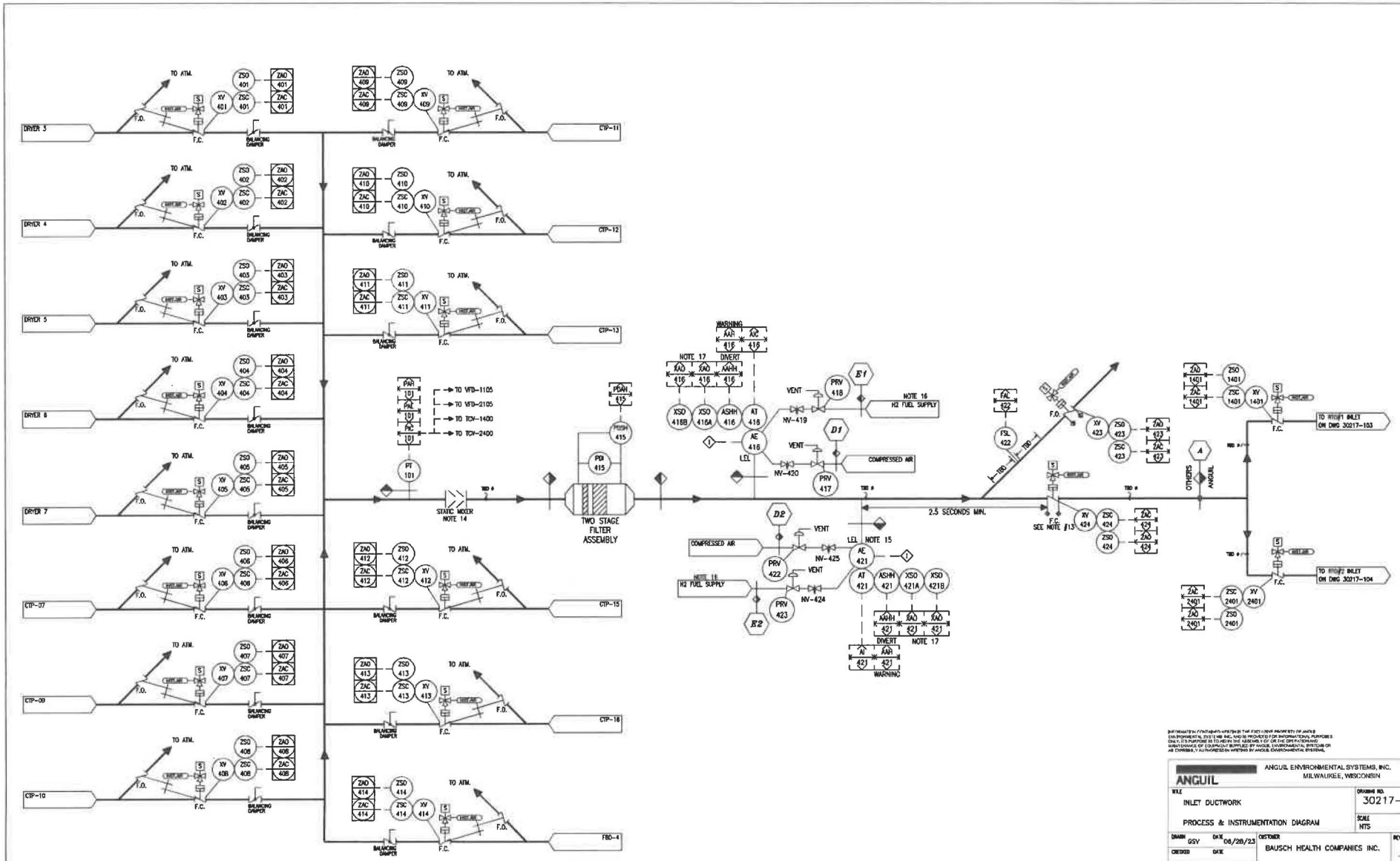
VALVES	MISCELLANEOUS	MISCELLANEOUS (CONT.)	OPERATORS	INSTRUMENTS
BALL VALVE	CENTRIFUGAL BLOWER	ORIFICE PLATE	ELECTRIC ACTUATOR	LOCALLY MOUNTED INSTRUMENT
BUTTERFLY VALVE/DAMPER	CENTRIFUGAL PUMP	ROTARY BLOWER	PNEUMATIC ACTUATOR (ON/OFF)	PANEL MOUNTED INSTRUMENT (MAIN)
CHECK VALVE	METERING PUMP	REDUCER	PNEUMATIC ACTUATOR W/ POSITIONER	PANEL MOUNTED INSTRUMENT (SECONDARY)
DIAPHRAGM VALVE	AIR FILTER	STRAINER	SOLENOID	SIGNAL FROM/TO PLC
GATE VALVE	AIR FILTER/REGULATOR	REV TRIANGLE	ACTUATOR RELIEF	DCS
GLOBE VALVE	AIR FILTER/SILENCER	PRESSURE REGULATOR	MANUAL/BALANCING	INTERLOCK
KNIFE GATE VALVE	AIR LUBRICATOR	INSTRUMENT AIR	PRESSURE RELIEF VALVE	I TO P TRANSDUCER
NEEDLE VALVE	CAP	SIMPLEX BASKET STRAINER	VANEAXIAL FAN	ROTAMETER
PLUG VALVE	DIAPHRAGM SEAL	LINE BREAK		MAGNETIC FLOW METER
3-WAY VALVE	EXPANSION JOINT	DIMENSION INDICATOR		THERMAL MASS FLOW METER
4-WAY VALVE	FLAME ARRESTOR	BATTERY LIMIT		DIVIDER
BACKFLOW PREVENTER	FLANGE	BATTERY LIMIT TAG		
	FLEX HOSE	CROSS-PAGE TAG (2 LINE)		
	HEAT EXCHANGER	CROSS-PAGE TAG (3 LINE)		
	INJECTOR	SFI INJECTION		
	INLINE MIXER	STATIC MIXER		
	INSULATION	FLOW DIRECTION		
	INSULATION W/ HEAT TRACE	TO/FROM ELECTRICAL COMMUNICATION		
	PRESSURE REDUCED REGULATOR WITH SLAM-SHUT VALVE	FLOW CONDITIONER		

ANGUIL

ANGUIL ENVIRONMENTAL SYSTEMS, INC.
MILWAUKEE, WISCONSIN

TITLE	P&ID SYMBOLOGY PROCESS & INSTRUMENTATION DIAGRAM
DRAWING NO.	30217-101
SCALE	NTS
DRAWN GSV DATE 08/28/23	
CHECKED DATE	
APPROVED DATE	
CUSTOMER	BAUSCH HEALTH COMPANIES INC. STEINBACH, MANITOBA, CA
REV.	—
LAST DRAWN BY DATE	
SOURCE	
PAGE 2 OF 5	

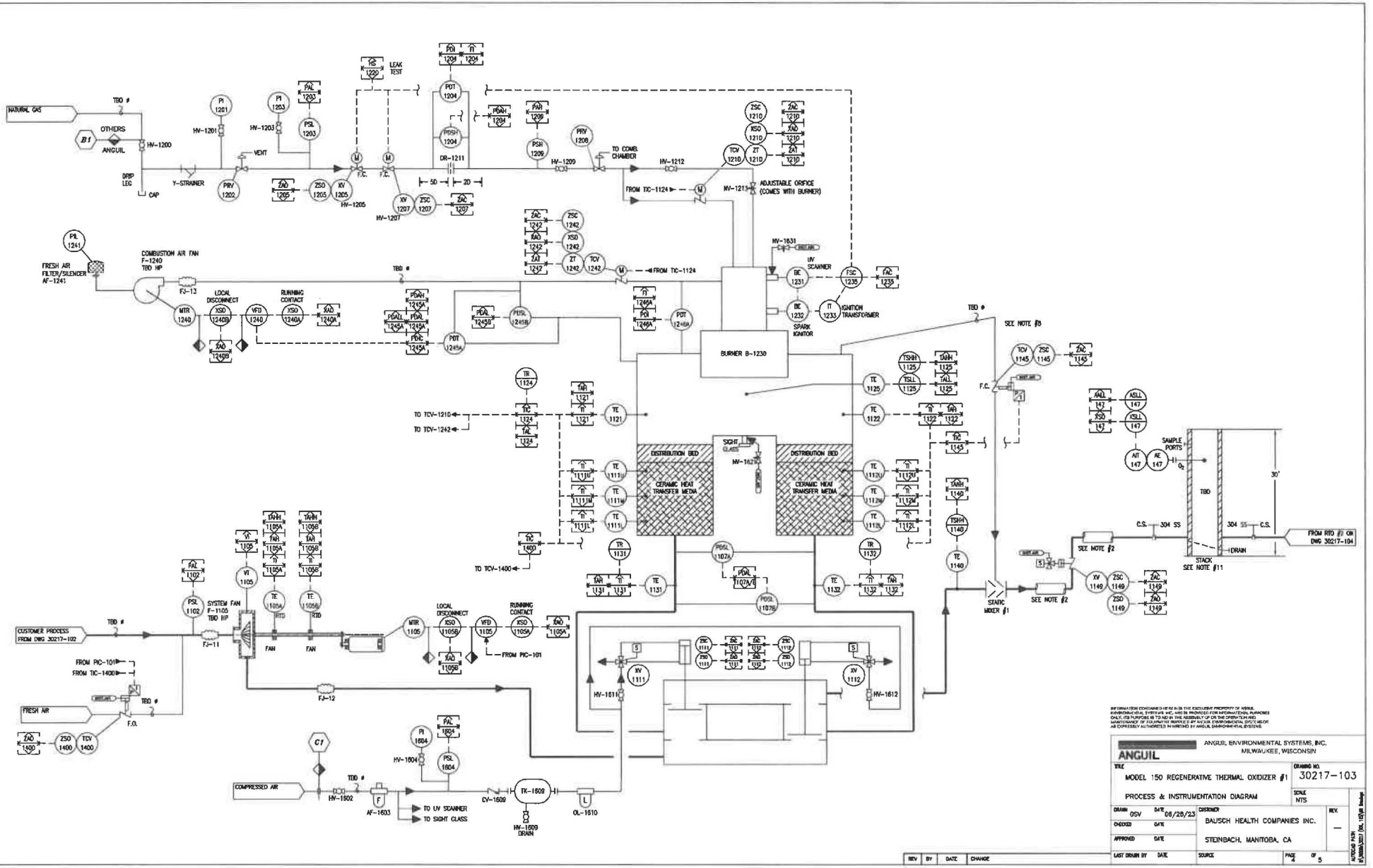
REV	BY	DATE	CHANGE



ANGUIL ENVIRONMENTAL SYSTEMS, INC.
MILWAUKEE, WISCONSIN

TITLE	INLET DUCTWORK PROCESS & INSTRUMENTATION DIAGRAM
DRAWING NO.	30217-102
SCALE	NTS
DRAWN	GSV
DATE	06/28/23
CUSTOMER	BAUSCH HEALTH COMPANIES INC. STEINBACH, MANITOBA, CA
REV.	—
CHECKED	
APPROVED	
LAST CRASH BY	
SOURCE	
PAGE	3 OF 5

REV	BY	DATE	CHANGE

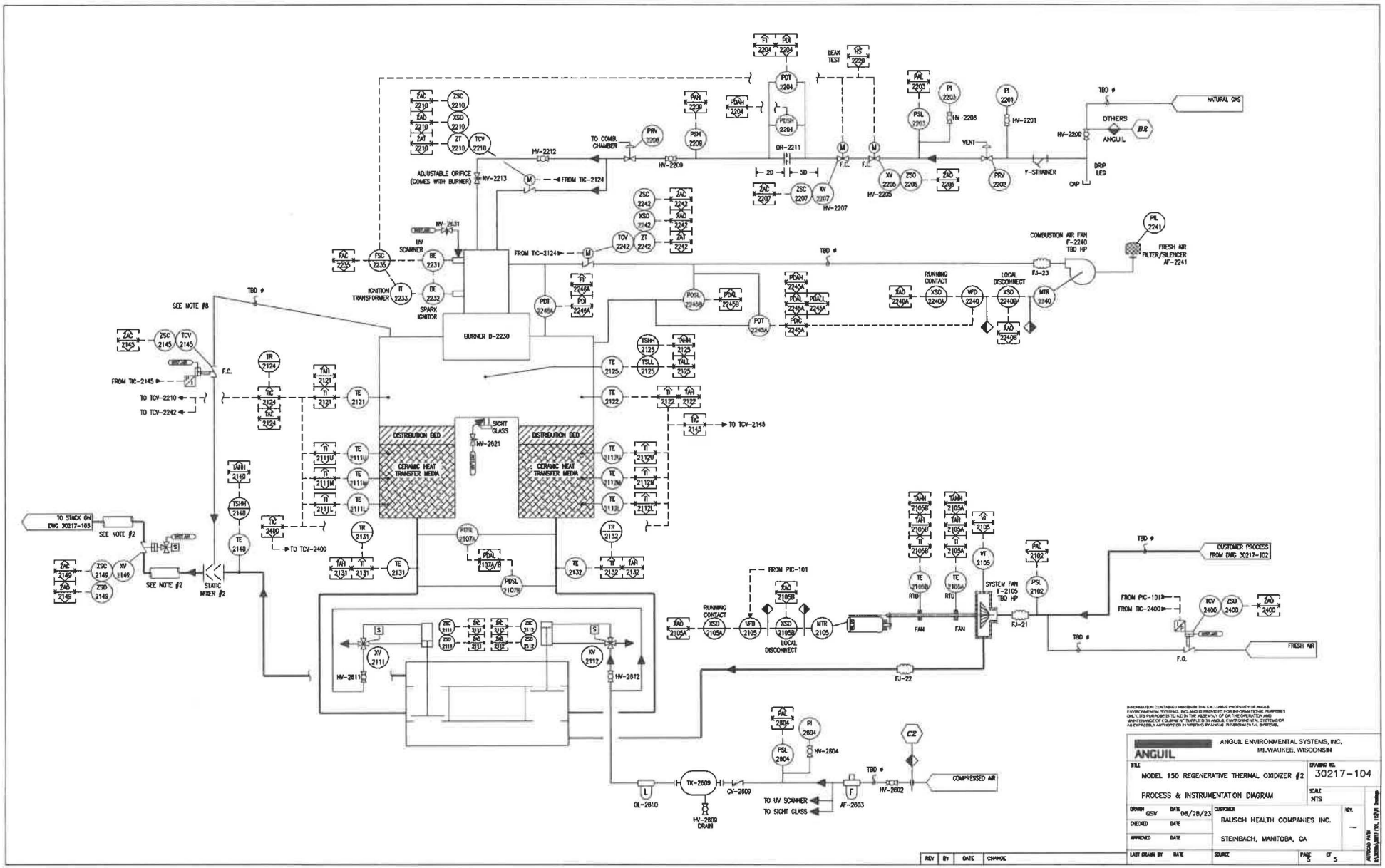


ANGUIL

ANGUIL ENVIRONMENTAL SYSTEMS, INC.
MILWAUKEE, WISCONSIN

TITLE	MODEL 150 REGENERATIVE THERMAL OXIDIZER #1 PROCESS & INSTRUMENTATION DIAGRAM
DRAWING NO.	30217-103
SCALE	NTS
DRAWN	OSV
DATE	06/28/23
CHECKED	
DATE	
APPROVED	
DATE	
LAST DRAWN BY	
DATE	
CUSTOMER	BAUSCH HEALTH COMPANIES INC.
	STEINBACH, MANITOBA, CA
REV.	—
SOURCE	
PAGE	4 OF 5

REV	BY	DATE	CHANGE



ANGUIL ENVIRONMENTAL SYSTEMS, INC.
MILWAUKEE, WISCONSIN

TITLE	MODEL 150 REGENERATIVE THERMAL OXIDIZER #2 PROCESS & INSTRUMENTATION DIAGRAM
DRAWING NO.	30217-104
SCALE	NTS
DRAWN	CSV
DATE	06/28/23
CUSTOMER	BAUSCH HEALTH COMPANIES INC. STEINBACH, MANITOBA, CA
REV.	—
CHECKED	
APPROVED	
LAST CHANGE BY	
SOURCE	
PAGE	5 OF 5

REV	BY	DATE	CHANGE

Attachment E Model Output Files

E-1 Isopropyl Alcohol

AERSCREEN 21112 / AERMOD 22112 03/20/24
21:07:39

TITLE: BH_IPA

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	0.5890	g/s	4.675	lb/hr
STACK HEIGHT:	15.24	meters	50.00	feet
STACK INNER DIAMETER:	1.332	meters	52.44	inches
PLUME EXIT TEMPERATURE:	533.7	K	501.0	Deg F
PLUME EXIT VELOCITY:	11.740	m/s	38.52	ft/s
STACK AIR FLOW RATE:	34664	ACFM		
STACK BASE LONGITUDE:	-96.6666	deg	668882.	Easting
STACK BASE LATITUDE:	49.5193	deg	5487802.	Northing
STACK BASE UTM ZONE:			14	
REFERENCE DATUM (NADA):			4	
STACK BASE ELEVATION:	266.00	meters	872.70	feet
RURAL OR URBAN:	RURAL			

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE =	5000.	meters	16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT:	9.1	meters	30.0	feet
MAXIMUM BUILDING LENGTH:	215.9	meters	708.3	feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	33.30	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	63.40	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	72.95	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	82.70	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	82.76	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	78.10	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	72.54	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	67.77	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	58.95	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	72.65	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	91.78	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	110.8	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	105.5	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	114.2	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	120.4	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	118.0	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	113.7	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	76.77	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	108.1	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	103.4	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	91.28	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	106.5	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	93.72	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	82.66	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	71.74	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	57.68	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	36.59	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	44.27	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	57.88	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	53.91	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	59.29	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	64.74	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	64.84	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	53.03	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	17.11	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	8.740	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	60.78	0.00	2500.00	2.036	0.39
25.00	62.52	0.00	2525.00	2.040	0.00
50.00	64.84	0.00	2550.00	2.043	0.00
75.00	72.95	0.00	2575.00	2.045	0.00
100.00	89.32	0.00	2600.00	2.047	0.00
125.00	109.6	0.00	2625.00	2.049	0.00
150.00	118.0	0.00	2650.00	2.050	0.00
175.00	120.4	0.00	2675.00	2.050	0.00
180.00	120.4	0.00	2700.00	2.050	0.00
200.00	112.3	0.00	2725.00	2.050	0.00
225.00	40.99	0.00	2750.00	2.049	0.00
250.00	38.34	0.57	2775.00	2.048	0.00
275.00	36.52	1.00	2800.00	2.046	0.00
300.00	35.21	1.00	2825.00	2.043	0.00
325.00	34.16	1.00	2850.00	2.037	0.00
350.00	33.24	1.00	2875.00	2.031	0.00
375.00	32.37	1.00	2900.00	2.025	0.00

400.00	31.47	1.00	2925.00	2.018	0.00
425.00	30.66	1.00	2950.00	2.012	0.00
450.00	29.80	1.00	2975.00	2.006	0.00
475.00	28.87	1.00	3000.00	2.000	0.00
500.00	27.90	1.00	3025.00	1.994	0.00
525.00	26.88	1.00	3050.00	1.988	0.00
550.00	25.88	2.00	3075.00	1.982	0.00
575.00	24.86	2.00	3100.00	1.976	0.00
600.00	23.82	2.00	3125.00	1.970	0.00
625.00	22.76	2.00	3150.00	1.964	0.00
650.00	21.69	2.00	3175.00	1.958	0.00
675.00	20.62	2.00	3200.00	1.952	0.00
700.00	19.55	2.00	3225.00	1.946	0.00
725.00	18.49	2.00	3250.00	1.940	0.00
750.00	17.44	2.00	3275.00	1.934	0.00
775.00	16.40	2.07	3300.00	1.928	0.00
800.00	15.38	3.00	3325.00	1.922	0.00
825.00	14.39	3.00	3350.00	1.916	0.00
850.00	13.42	3.00	3375.00	1.911	0.00
875.00	12.49	3.00	3400.00	1.905	0.00
900.00	11.59	3.00	3425.00	1.899	0.00
925.00	10.73	3.00	3450.00	1.893	0.00
950.00	9.923	3.00	3475.00	1.887	0.18
975.00	9.159	3.00	3500.00	1.882	0.00
1000.00	8.432	3.00	3525.00	1.876	0.00
1025.00	7.739	3.86	3550.00	1.870	0.00
1050.00	7.087	4.00	3575.00	1.864	0.00
1075.00	6.474	4.00	3600.00	1.859	0.00
1100.00	5.898	4.00	3625.00	1.853	0.00
1125.00	5.425	0.00	3650.00	1.847	0.00
1150.00	4.996	0.00	3675.00	1.842	0.00
1175.00	4.592	0.00	3700.00	1.836	0.00
1200.00	4.212	0.00	3725.00	1.830	0.00
1225.00	3.855	0.87	3750.00	1.825	0.00
1250.00	3.521	1.00	3775.00	1.819	0.00
1275.00	3.210	1.00	3800.00	1.813	0.00
1300.00	2.919	1.00	3825.00	1.808	0.00
1325.00	2.650	1.00	3850.00	1.802	0.00
1350.00	2.551	5.00	3875.00	1.797	0.00
1375.00	2.538	5.00	3900.00	1.791	0.00
1400.00	2.524	5.00	3925.00	1.786	0.00
1425.00	2.510	5.00	3950.00	1.780	0.00
1450.00	2.495	5.00	3975.00	1.775	0.00
1475.00	2.481	5.00	4000.00	1.770	0.00
1500.00	2.466	5.00	4025.00	1.764	0.00
1525.00	2.451	5.00	4050.00	1.759	0.00
1550.00	2.435	5.00	4075.00	1.753	0.00
1575.00	2.420	5.00	4100.00	1.748	0.00
1600.00	2.408	5.65	4125.00	1.743	0.00
1625.00	2.394	6.00	4150.00	1.737	0.00

1650.00	2.378	6.00	4175.00	1.732	0.00
1675.00	2.363	6.00	4200.00	1.727	0.00
1700.00	2.347	6.00	4225.00	1.721	0.00
1725.00	2.332	6.00	4250.00	1.716	0.00
1750.00	2.316	6.00	4275.00	1.711	0.00
1775.00	2.301	6.00	4300.00	1.706	0.00
1800.00	2.285	6.00	4325.00	1.701	0.00
1825.00	2.270	6.00	4350.00	1.695	0.00
1850.00	2.255	6.00	4375.00	1.690	0.00
1875.00	2.240	6.06	4400.00	1.685	0.00
1900.00	2.228	6.95	4425.00	1.680	0.00
1925.00	2.214	7.00	4450.00	1.675	0.00
1950.00	2.199	7.00	4475.00	1.670	0.00
1975.00	2.184	7.00	4500.00	1.665	0.00
2000.00	2.170	7.00	4525.00	1.660	0.00
2025.00	2.155	7.00	4550.00	1.655	0.00
2050.00	2.141	7.00	4575.00	1.650	0.00
2075.00	2.127	7.03	4600.00	1.645	0.00
2100.00	2.115	8.00	4625.00	1.640	0.40
2125.00	2.102	8.00	4650.00	1.634	0.81
2150.00	2.088	8.00	4675.00	1.629	1.00
2175.00	2.074	8.00	4700.00	1.624	1.00
2200.00	2.060	8.00	4725.00	1.620	1.00
2225.00	2.047	8.00	4750.00	1.615	1.00
2250.00	2.034	8.00	4775.00	1.610	1.00
2275.00	2.021	8.00	4800.00	1.605	1.00
2300.00	2.008	8.00	4825.00	1.600	1.00
2325.00	2.000	0.00	4850.00	1.596	1.00
2350.00	2.007	0.00	4875.00	1.591	1.00
2375.00	2.013	0.00	4900.00	1.586	1.00
2400.00	2.019	0.00	4925.00	1.582	1.00
2425.00	2.024	0.00	4950.00	1.577	1.00
2450.00	2.028	0.00	4975.00	1.572	1.00
2475.00	2.033	0.00	5000.00	1.568	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	120.4	120.4	108.3	72.21	12.04

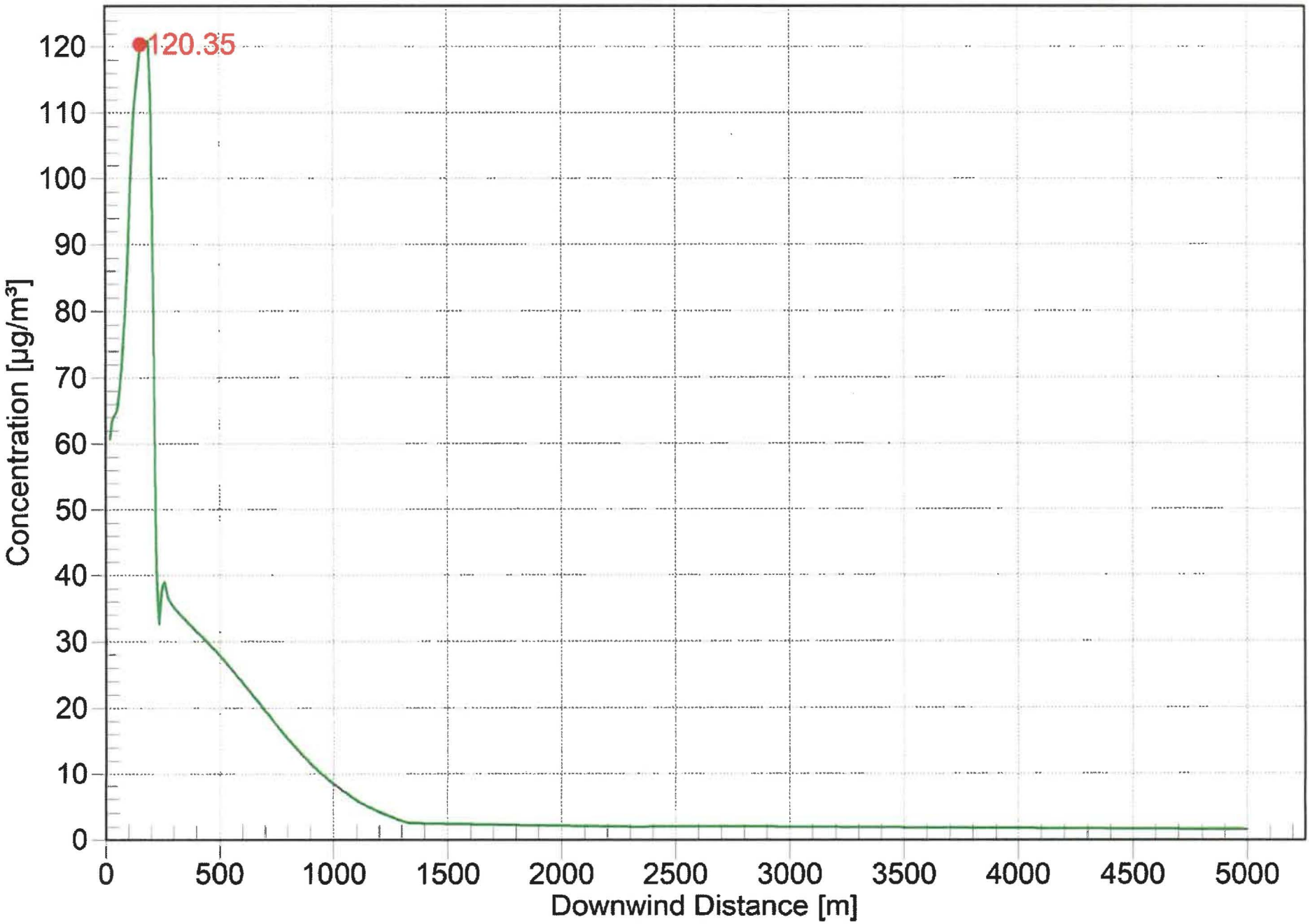
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	60.78	60.78	54.70	36.47	6.078

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

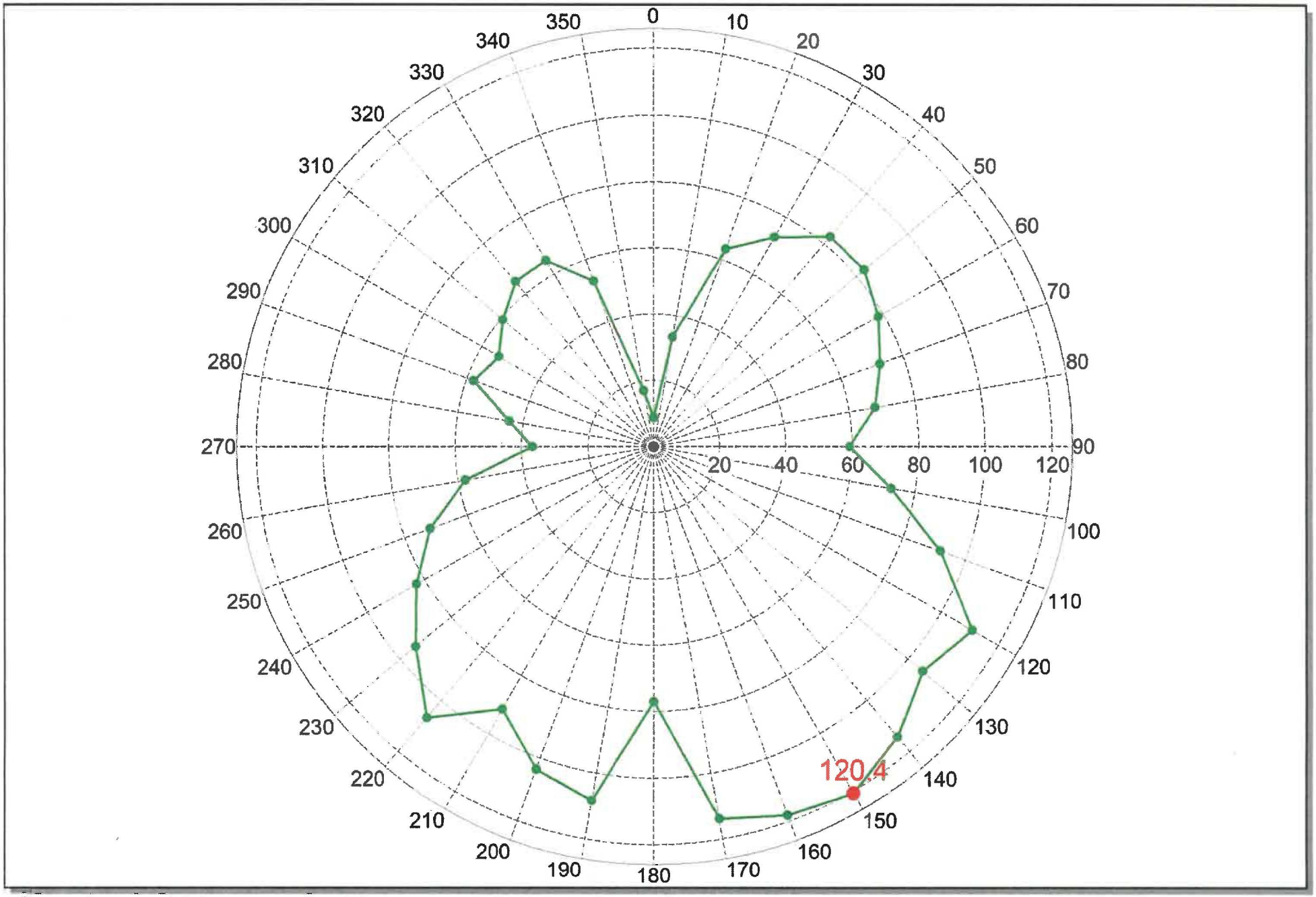
BH_IPA - Bausch Health Isopropyl Alcohol



Max Conc: 120.35 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_IPA - Bausch Health Isopropyl Alcohol



Max Conc: 120.4 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

Reference: Screening Assessment for the Proposed Regenerative Thermal Oxidizer at the Bausch Health Steinbach Facility

E-2 Ethyl Alcohol

AERSCREEN 21112 / AERMOD 22112 03/20/24
22:50:14

TITLE: BH_ETHYL_ALCOHOL

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	1.0370	g/s	8.230	lb/hr
STACK HEIGHT:	15.24	meters	50.00	feet
STACK INNER DIAMETER:	1.332	meters	52.44	inches
PLUME EXIT TEMPERATURE:	533.7	K	501.0	Deg F
PLUME EXIT VELOCITY:	11.740	m/s	38.52	ft/s
STACK AIR FLOW RATE:	34664	ACFM		
STACK BASE LONGITUDE:	-96.6666	deg	668882.	Easting
STACK BASE LATITUDE:	49.5193	deg	5487802.	Northing
STACK BASE UTM ZONE:			14	
REFERENCE DATUM (NADA):			4	
STACK BASE ELEVATION:	266.00	meters	872.70	feet
RURAL OR URBAN:	RURAL			

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE =	5000.	meters	16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT:	9.1	meters	30.0 feet
MAXIMUM BUILDING LENGTH:	215.9	meters	708.3 feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	58.62	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	111.6	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	128.4	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	145.6	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	145.7	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	137.5	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	127.7	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	119.3	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	103.8	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	127.9	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	161.6	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	195.0	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	185.7	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	201.0	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	211.9	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	207.8	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	200.2	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	135.2	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	190.3	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	182.0	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	160.7	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	187.4	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	165.0	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	145.5	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	126.3	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	101.6	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	64.42	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	77.94	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	101.9	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	94.92	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	104.4	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	114.0	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	114.2	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	93.37	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	30.12	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	15.39	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	107.0	0.00	2500.00	3.585	0.00
25.00	110.1	0.00	2525.00	3.591	0.00
50.00	114.2	0.00	2550.00	3.596	0.00
75.00	128.4	0.00	2575.00	3.601	0.00
100.00	157.3	0.00	2600.00	3.604	0.00
125.00	193.0	0.00	2625.00	3.607	0.00
150.00	207.8	0.00	2650.00	3.609	0.00
175.00	211.9	0.00	2675.00	3.610	0.00
180.00	211.9	0.00	2700.00	3.610	0.00
200.00	197.6	0.00	2725.00	3.609	0.00
225.00	72.17	0.00	2750.00	3.608	0.00
250.00	67.49	0.57	2775.00	3.605	0.00
275.00	64.30	1.00	2800.00	3.602	0.00
300.00	61.98	1.00	2825.00	3.597	0.00
325.00	60.13	1.00	2850.00	3.586	0.00
350.00	58.52	1.00	2875.00	3.575	0.00
375.00	56.99	1.00	2900.00	3.564	0.00

400.00	55.41	1.00	2925.00	3.554	0.00
425.00	53.99	1.00	2950.00	3.543	0.00
450.00	52.47	1.00	2975.00	3.532	0.00
475.00	50.84	1.00	3000.00	3.521	0.00
500.00	49.12	1.00	3025.00	3.511	0.00
525.00	47.32	1.00	3050.00	3.500	0.00
550.00	45.56	2.00	3075.00	3.489	0.00
575.00	43.77	2.00	3100.00	3.479	0.00
600.00	41.94	2.00	3125.00	3.468	0.00
625.00	40.08	2.00	3150.00	3.458	0.00
650.00	38.20	2.00	3175.00	3.447	0.00
675.00	36.31	2.00	3200.00	3.437	0.00
700.00	34.42	2.00	3225.00	3.426	0.00
725.00	32.55	2.00	3250.00	3.416	0.00
750.00	30.70	2.00	3275.00	3.405	0.00
775.00	28.87	2.07	3300.00	3.395	0.00
800.00	27.07	3.00	3325.00	3.385	0.00
825.00	25.33	3.00	3350.00	3.374	0.00
850.00	23.64	3.00	3375.00	3.364	0.00
875.00	21.99	3.00	3400.00	3.354	0.00
900.00	20.41	3.00	3425.00	3.343	0.00
925.00	18.89	3.00	3450.00	3.333	0.00
950.00	17.47	3.00	3475.00	3.323	0.18
975.00	16.13	3.00	3500.00	3.313	0.00
1000.00	14.85	3.00	3525.00	3.303	0.00
1025.00	13.62	3.86	3550.00	3.292	0.00
1050.00	12.48	4.00	3575.00	3.282	0.00
1075.00	11.40	4.00	3600.00	3.272	0.00
1100.00	10.38	4.00	3625.00	3.262	0.00
1125.00	9.552	0.00	3650.00	3.252	0.00
1150.00	8.797	0.00	3675.00	3.242	0.00
1175.00	8.085	0.00	3700.00	3.232	0.00
1200.00	7.415	0.00	3725.00	3.222	0.00
1225.00	6.787	0.87	3750.00	3.213	0.00
1250.00	6.200	1.00	3775.00	3.203	0.00
1275.00	5.651	1.00	3800.00	3.193	0.00
1300.00	5.140	1.00	3825.00	3.183	0.00
1325.00	4.666	1.00	3850.00	3.173	0.00
1350.00	4.492	5.00	3875.00	3.164	0.00
1375.00	4.468	5.00	3900.00	3.154	0.00
1400.00	4.444	5.00	3925.00	3.144	0.00
1425.00	4.419	5.00	3950.00	3.135	0.00
1450.00	4.394	5.00	3975.00	3.125	0.00
1475.00	4.368	5.00	4000.00	3.115	0.00
1500.00	4.341	5.00	4025.00	3.106	0.00
1525.00	4.315	5.00	4050.00	3.096	0.00
1550.00	4.288	5.00	4075.00	3.087	0.00
1575.00	4.261	5.00	4100.00	3.077	0.00
1600.00	4.239	5.65	4125.00	3.068	0.00
1625.00	4.214	6.00	4150.00	3.059	0.00

1650.00	4.187	6.00	4175.00	3.049	0.00
1675.00	4.160	6.00	4200.00	3.040	0.00
1700.00	4.132	6.00	4225.00	3.031	0.00
1725.00	4.105	6.00	4250.00	3.022	0.00
1750.00	4.078	6.00	4275.00	3.012	0.00
1775.00	4.051	6.00	4300.00	3.003	0.00
1800.00	4.024	6.00	4325.00	2.994	0.00
1825.00	3.997	6.00	4350.00	2.985	0.00
1850.00	3.970	6.00	4375.00	2.976	0.00
1875.00	3.944	6.06	4400.00	2.967	0.00
1900.00	3.923	6.95	4425.00	2.958	0.00
1925.00	3.897	7.00	4450.00	2.949	0.00
1950.00	3.871	7.00	4475.00	2.940	0.00
1975.00	3.845	7.00	4500.00	2.931	0.00
2000.00	3.820	7.00	4525.00	2.922	0.00
2025.00	3.794	7.00	4550.00	2.914	0.00
2050.00	3.769	7.00	4575.00	2.905	0.00
2075.00	3.744	7.03	4600.00	2.896	0.00
2100.00	3.725	8.00	4625.00	2.888	0.40
2125.00	3.700	8.00	4650.00	2.878	0.81
2150.00	3.676	8.00	4675.00	2.868	1.00
2175.00	3.652	8.00	4700.00	2.860	1.00
2200.00	3.628	8.00	4725.00	2.851	1.00
2225.00	3.604	8.00	4750.00	2.843	1.00
2250.00	3.581	8.00	4775.00	2.834	1.00
2275.00	3.558	8.00	4800.00	2.826	1.00
2300.00	3.535	8.00	4825.00	2.818	1.00
2325.00	3.522	0.00	4850.00	2.809	1.00
2350.00	3.533	0.00	4875.00	2.801	1.00
2375.00	3.544	0.00	4900.00	2.793	1.00
2400.00	3.554	0.00	4925.00	2.785	1.00
2425.00	3.563	0.00	4950.00	2.777	1.00
2450.00	3.571	0.00	4975.00	2.768	1.00
2475.00	3.579	0.00	5000.00	2.760	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	211.9	211.9	190.7	127.1	21.19

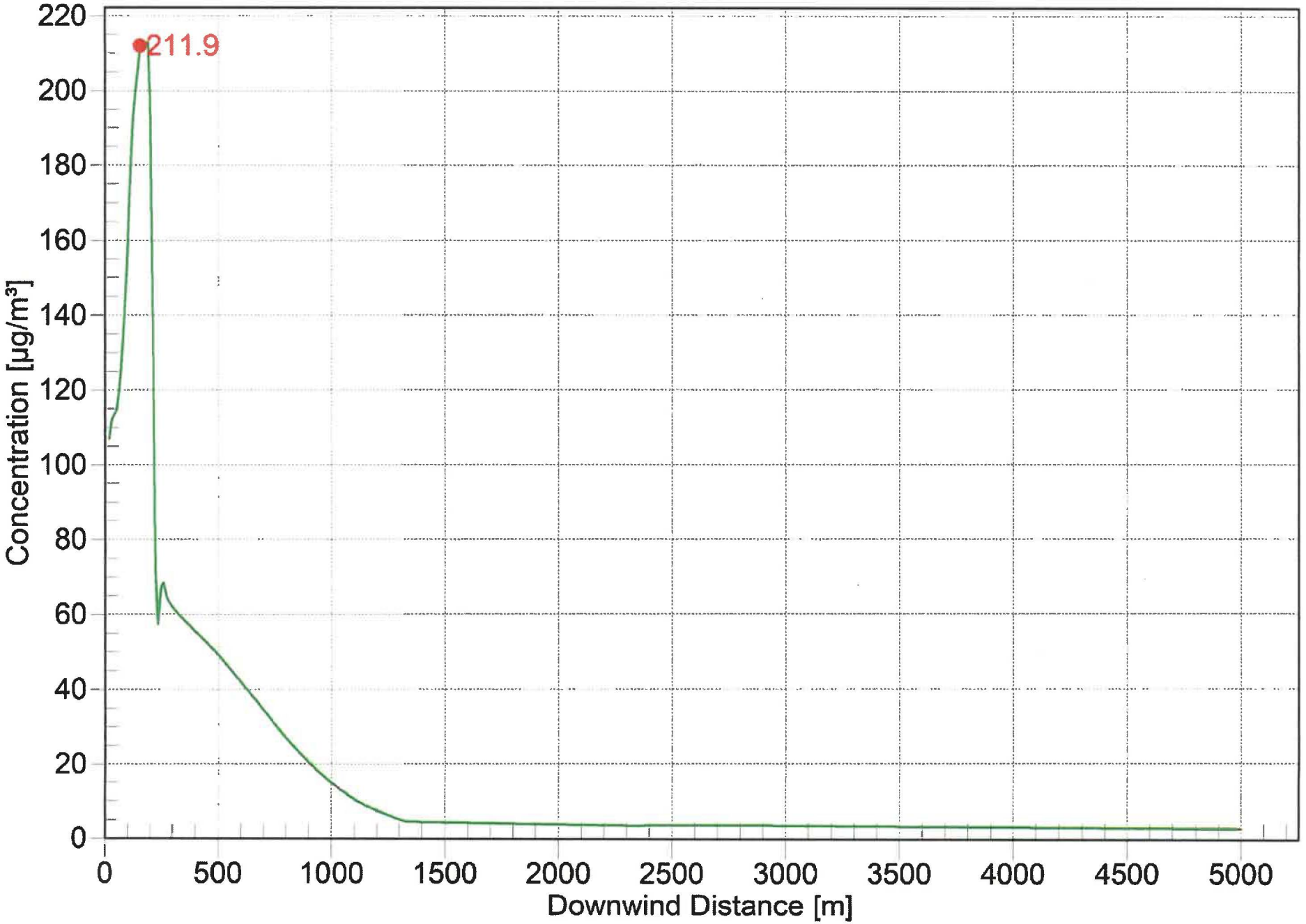
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	107.0	107.0	96.31	64.21	10.70

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

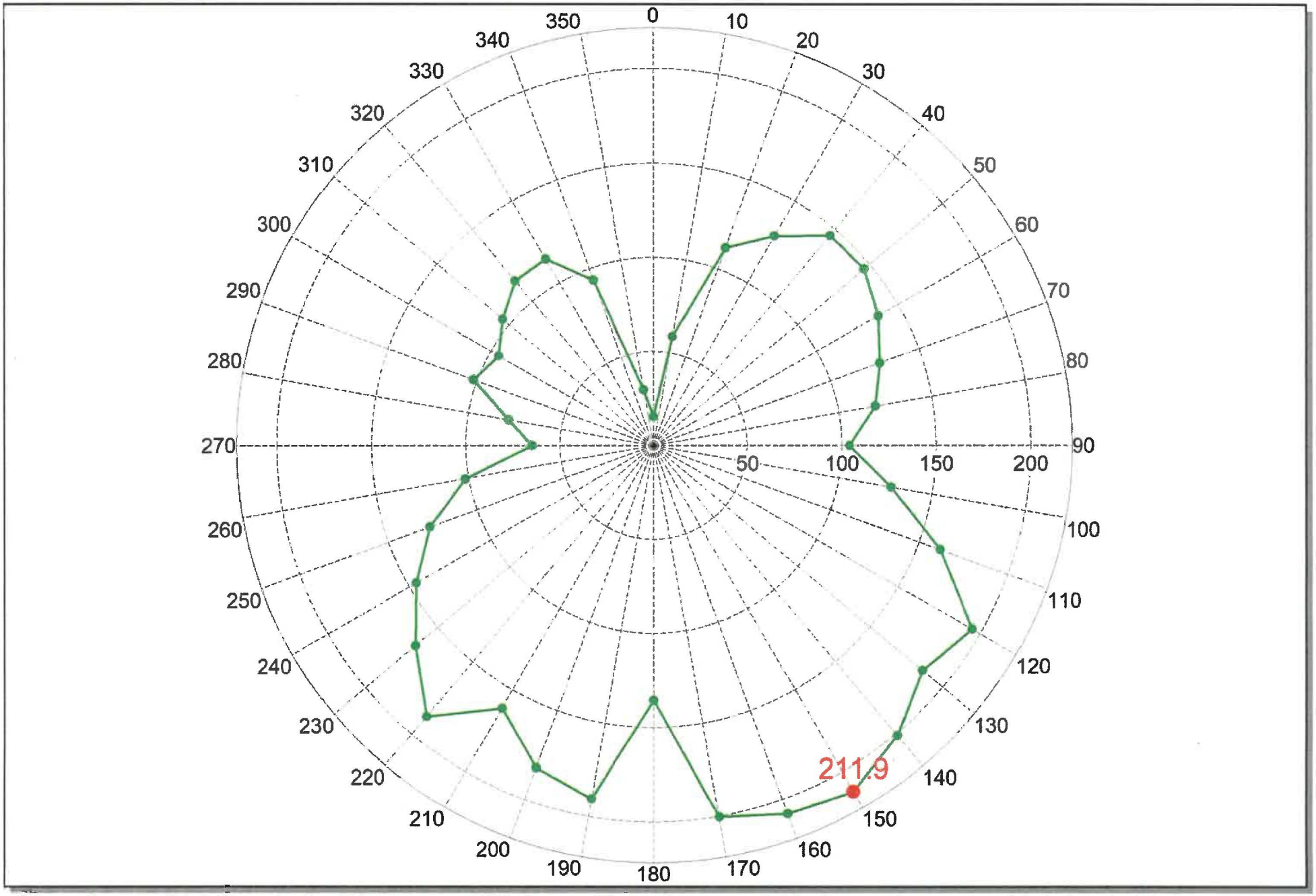
BH_Ethyl_Alcohol - Bausch Health - Ethyl Alcohol



Max Conc: 211.9 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_Ethyl_Alcohol - Bausch Health - Ethyl Alcohol



Max Conc: 211.9 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

E-3 Nitrogen Oxides (NOx)

AERSCREEN 21112 / AERMOD 22112 03/21/24
09:17:41

TITLE: BH_NOX

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	0.1040 g/s	0.825 lb/hr	
STACK HEIGHT:	15.24 meters	50.00 feet	
STACK INNER DIAMETER:	1.332 meters	52.44 inches	
PLUME EXIT TEMPERATURE:	533.7 K	501.0 Deg F	
PLUME EXIT VELOCITY:	11.740 m/s	38.52 ft/s	
STACK AIR FLOW RATE:	34664 ACFM		
STACK BASE LONGITUDE:	-96.6666 deg	668882.	Easting
STACK BASE LATITUDE:	49.5193 deg	5487802.	Northing
STACK BASE UTM ZONE:		14	
REFERENCE DATUM (NADA):		4	
STACK BASE ELEVATION:	266.00 meters	872.70 feet	
RURAL OR URBAN:	RURAL		

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE = 5000. meters 16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT: 9.1 meters 30.0 feet

MAXIMUM BUILDING LENGTH: 215.9 meters 708.3 feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	5.879	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	11.19	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	12.88	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	14.60	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	14.61	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	13.79	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	12.81	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	11.97	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	10.41	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	12.83	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	16.21	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	19.56	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	18.62	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	20.16	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	21.25	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	20.84	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	20.07	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	13.56	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	19.09	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	18.25	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	16.12	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	18.80	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	16.55	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	14.60	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	12.67	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	10.19	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	6.460	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	7.817	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	10.22	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	9.519	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	10.47	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	11.43	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	11.45	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	9.364	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	3.021	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	1.543	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	10.73	0.00	2500.00	0.3596	0.00
25.00	11.04	0.00	2525.00	0.3602	0.00
50.00	11.45	0.00	2550.00	0.3607	0.00
75.00	12.88	0.00	2575.00	0.3611	0.00
100.00	15.77	0.00	2600.00	0.3614	0.00
125.00	19.35	0.00	2625.00	0.3617	0.00
150.00	20.84	0.00	2650.00	0.3619	0.00
175.00	21.25	0.00	2675.00	0.3620	0.00
180.00	21.25	0.00	2700.00	0.3620	0.00
200.00	19.82	0.00	2725.00	0.3620	0.00
225.00	7.238	0.00	2750.00	0.3618	0.00
250.00	6.769	0.57	2775.00	0.3616	0.00
275.00	6.449	1.00	2800.00	0.3613	0.00
300.00	6.216	1.00	2825.00	0.3607	0.00
325.00	6.031	1.00	2850.00	0.3596	0.00
350.00	5.869	1.00	2875.00	0.3586	0.00
375.00	5.715	1.00	2900.00	0.3575	0.00

400.00	5.557	1.00	2925.00	0.3564	0.00
425.00	5.414	1.00	2950.00	0.3553	0.00
450.00	5.262	1.00	2975.00	0.3542	0.00
475.00	5.098	1.00	3000.00	0.3532	0.00
500.00	4.926	1.00	3025.00	0.3521	0.00
525.00	4.746	1.00	3050.00	0.3510	0.00
550.00	4.570	2.00	3075.00	0.3499	0.00
575.00	4.390	2.00	3100.00	0.3489	0.00
600.00	4.206	2.00	3125.00	0.3478	0.00
625.00	4.019	2.00	3150.00	0.3468	0.00
650.00	3.831	2.00	3175.00	0.3457	0.00
675.00	3.641	2.00	3200.00	0.3447	0.00
700.00	3.452	2.00	3225.00	0.3436	0.00
725.00	3.265	2.00	3250.00	0.3426	0.00
750.00	3.079	2.00	3275.00	0.3415	0.00
775.00	2.896	2.07	3300.00	0.3405	0.00
800.00	2.715	3.00	3325.00	0.3394	0.00
825.00	2.540	3.00	3350.00	0.3384	0.00
850.00	2.370	3.00	3375.00	0.3374	0.00
875.00	2.206	3.00	3400.00	0.3363	0.00
900.00	2.047	3.00	3425.00	0.3353	0.00
925.00	1.895	3.00	3450.00	0.3343	0.00
950.00	1.752	3.00	3475.00	0.3333	0.18
975.00	1.617	3.00	3500.00	0.3322	0.00
1000.00	1.489	3.00	3525.00	0.3312	0.00
1025.00	1.366	3.86	3550.00	0.3302	0.00
1050.00	1.251	4.00	3575.00	0.3292	0.00
1075.00	1.143	4.00	3600.00	0.3282	0.00
1100.00	1.041	4.00	3625.00	0.3272	0.00
1125.00	0.9579	0.00	3650.00	0.3262	0.00
1150.00	0.8822	0.00	3675.00	0.3252	0.00
1175.00	0.8108	0.00	3700.00	0.3242	0.00
1200.00	0.7437	0.00	3725.00	0.3232	0.00
1225.00	0.6807	0.87	3750.00	0.3222	0.00
1250.00	0.6218	1.00	3775.00	0.3212	0.00
1275.00	0.5667	1.00	3800.00	0.3202	0.00
1300.00	0.5155	1.00	3825.00	0.3192	0.00
1325.00	0.4679	1.00	3850.00	0.3182	0.00
1350.00	0.4505	5.00	3875.00	0.3173	0.00
1375.00	0.4481	5.00	3900.00	0.3163	0.00
1400.00	0.4457	5.00	3925.00	0.3153	0.00
1425.00	0.4432	5.00	3950.00	0.3144	0.00
1450.00	0.4406	5.00	3975.00	0.3134	0.00
1475.00	0.4380	5.00	4000.00	0.3124	0.00
1500.00	0.4354	5.00	4025.00	0.3115	0.00
1525.00	0.4327	5.00	4050.00	0.3105	0.00
1550.00	0.4300	5.00	4075.00	0.3096	0.00
1575.00	0.4273	5.00	4100.00	0.3086	0.00
1600.00	0.4251	5.65	4125.00	0.3077	0.00
1625.00	0.4226	6.00	4150.00	0.3068	0.00

1650.00	0.4199	6.00	4175.00	0.3058	0.00
1675.00	0.4172	6.00	4200.00	0.3049	0.00
1700.00	0.4144	6.00	4225.00	0.3040	0.00
1725.00	0.4117	6.00	4250.00	0.3030	0.00
1750.00	0.4090	6.00	4275.00	0.3021	0.00
1775.00	0.4062	6.00	4300.00	0.3012	0.00
1800.00	0.4035	6.00	4325.00	0.3003	0.00
1825.00	0.4008	6.00	4350.00	0.2994	0.00
1850.00	0.3981	6.00	4375.00	0.2985	0.00
1875.00	0.3955	6.06	4400.00	0.2976	0.00
1900.00	0.3935	6.95	4425.00	0.2967	0.00
1925.00	0.3909	7.00	4450.00	0.2958	0.00
1950.00	0.3882	7.00	4475.00	0.2949	0.00
1975.00	0.3856	7.00	4500.00	0.2940	0.00
2000.00	0.3831	7.00	4525.00	0.2931	0.00
2025.00	0.3805	7.00	4550.00	0.2922	0.00
2050.00	0.3780	7.00	4575.00	0.2913	0.00
2075.00	0.3755	7.03	4600.00	0.2905	0.00
2100.00	0.3735	8.00	4625.00	0.2896	0.40
2125.00	0.3711	8.00	4650.00	0.2886	0.81
2150.00	0.3686	8.00	4675.00	0.2877	1.00
2175.00	0.3662	8.00	4700.00	0.2868	1.00
2200.00	0.3638	8.00	4725.00	0.2860	1.00
2225.00	0.3615	8.00	4750.00	0.2851	1.00
2250.00	0.3591	8.00	4775.00	0.2843	1.00
2275.00	0.3568	8.00	4800.00	0.2834	1.00
2300.00	0.3545	8.00	4825.00	0.2826	1.00
2325.00	0.3532	0.00	4850.00	0.2818	1.00
2350.00	0.3544	0.00	4875.00	0.2809	1.00
2375.00	0.3554	0.00	4900.00	0.2801	1.00
2400.00	0.3564	0.00	4925.00	0.2793	1.00
2425.00	0.3573	0.00	4950.00	0.2785	1.00
2450.00	0.3581	0.00	4975.00	0.2776	1.00
2475.00	0.3589	0.00	5000.00	0.2768	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	21.25	21.25	19.13	12.75	2.125

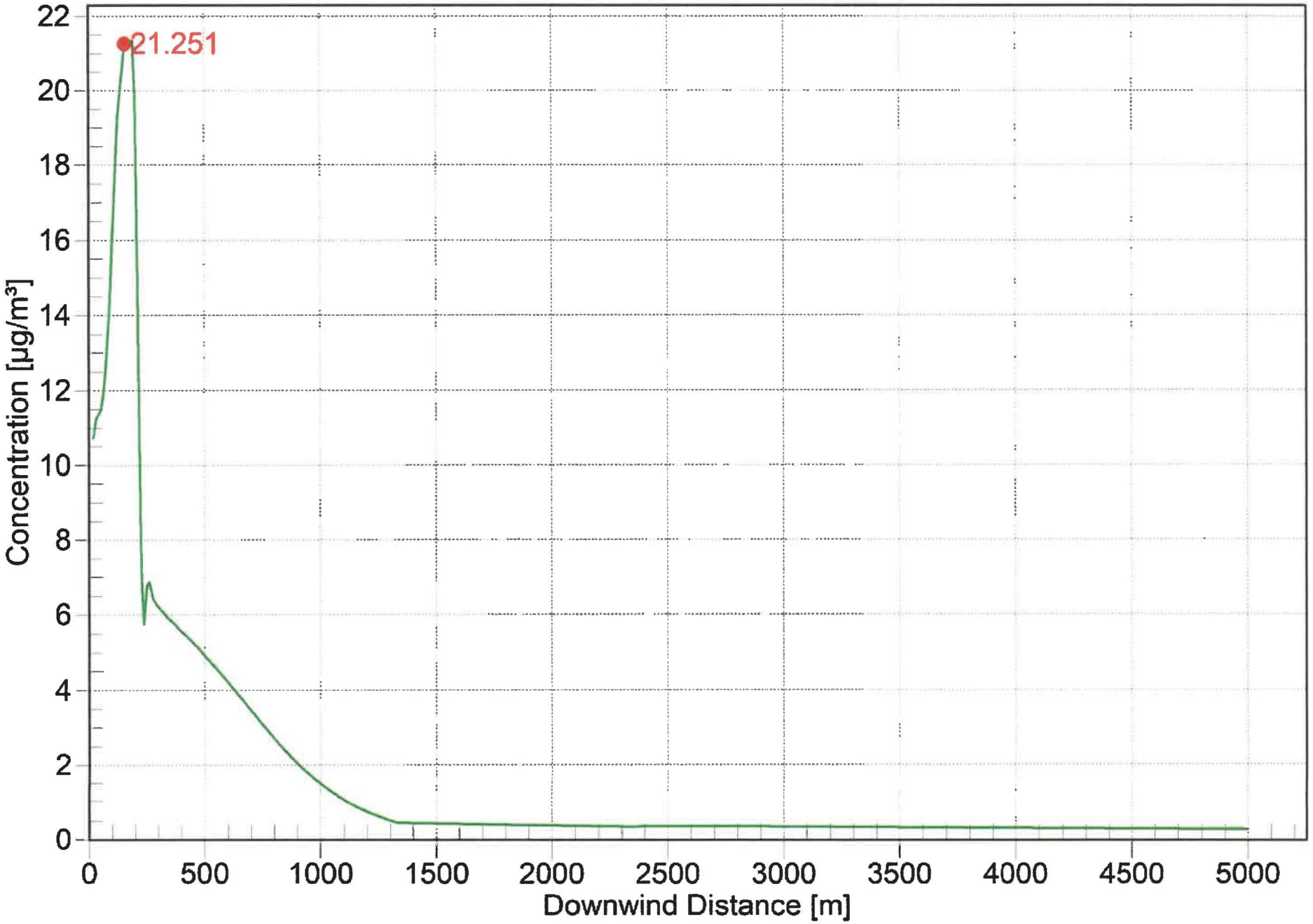
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	10.73	10.73	9.659	6.439	1.073

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

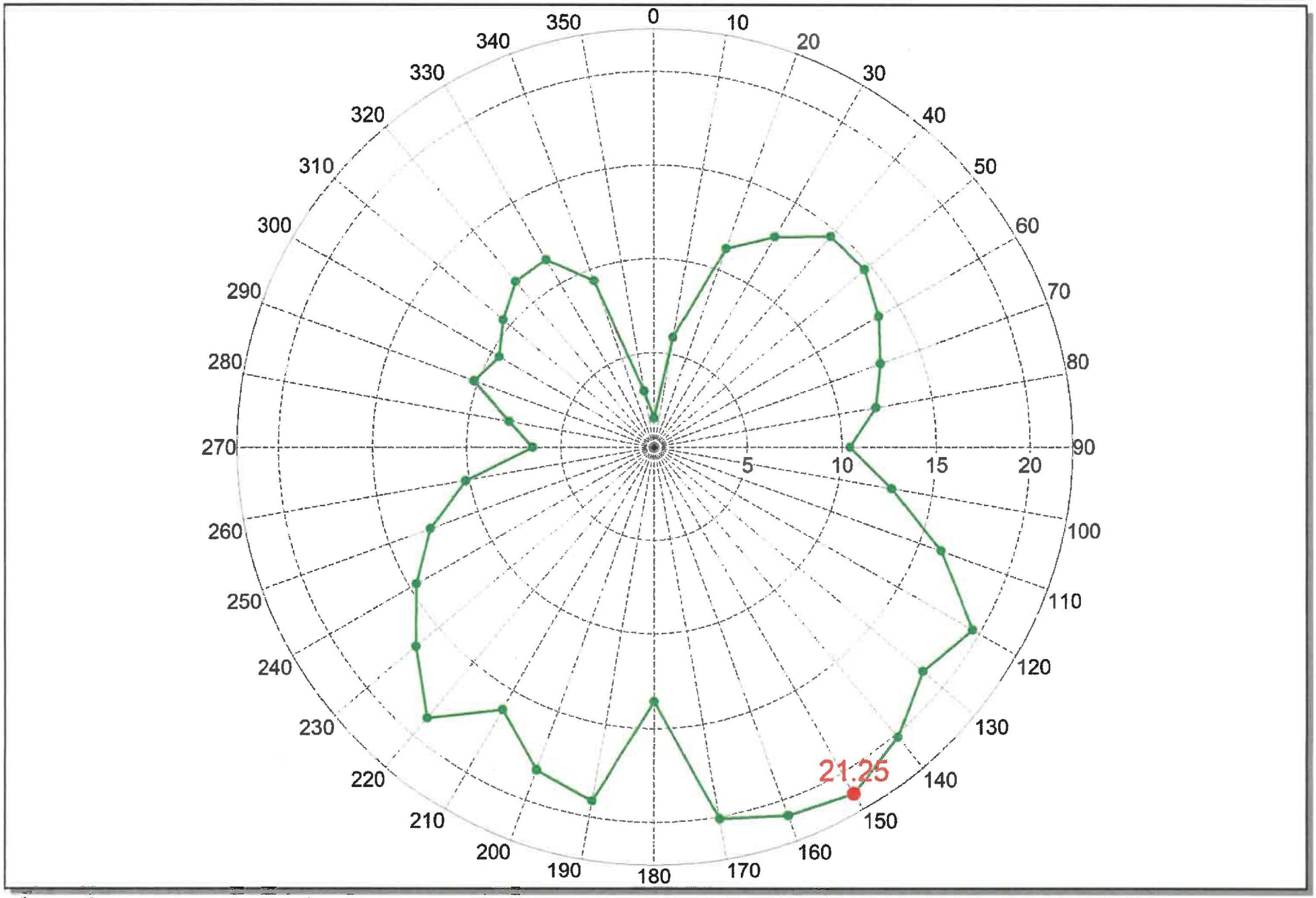
BH_NOx - Bausch Health - Nitrogen Dioxide



Max Conc: 21.251 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_NOx - Bausch Health - Nitrogen Dioxide



Max Conc: 21.25 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

E-4 Fine Particulate Matter ($PM_{2.5}$)

AERSCREEN 21112 / AERMOD 22112 03/20/24
22:52:54

TITLE: BH_PM2.5

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	0.475E-02	g/s	0.377E-01	lb/hr
STACK HEIGHT:	15.24	meters	50.00	feet
STACK INNER DIAMETER:	1.332	meters	52.44	inches
PLUME EXIT TEMPERATURE:	533.7	K	501.0	Deg F
PLUME EXIT VELOCITY:	11.740	m/s	38.52	ft/s
STACK AIR FLOW RATE:	34664	ACFM		
STACK BASE LONGITUDE:	-96.6666	deg	668882.	Easting
STACK BASE LATITUDE:	49.5193	deg	5487802.	Northing
STACK BASE UTM ZONE:			14	
REFERENCE DATUM (NADA):			4	
STACK BASE ELEVATION:	266.00	meters	872.70	feet
RURAL OR URBAN:	RURAL			

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE =	5000.	meters	16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT:	9.1	meters	30.0 feet
MAXIMUM BUILDING LENGTH:	215.9	meters	708.3 feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	0.2685	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	0.5113	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	0.5883	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	0.6669	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	0.6674	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	0.6298	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	0.5850	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	0.5465	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	0.4754	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	0.5859	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	0.7401	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	0.8933	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	0.8504	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	0.9206	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	0.9706	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	0.9516	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	0.9169	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	0.6191	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	0.8718	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	0.8337	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	0.7361	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	0.8585	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	0.7558	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	0.6666	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	0.5785	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	0.4652	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	0.2951	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	0.3570	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	0.4667	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	0.4348	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	0.4781	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	0.5221	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	0.5229	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	0.4277	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	0.1380	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	0.7048E-01	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	0.4902	0.00	2500.00	0.1642E-01	0.00
25.00	0.5042	0.00	2525.00	0.1645E-01	0.00
50.00	0.5229	0.00	2550.00	0.1647E-01	0.00
75.00	0.5883	0.00	2575.00	0.1649E-01	0.00
100.00	0.7204	0.00	2600.00	0.1651E-01	0.00
125.00	0.8840	0.00	2625.00	0.1652E-01	0.00
150.00	0.9516	0.00	2650.00	0.1653E-01	0.00
175.00	0.9706	0.00	2675.00	0.1653E-01	0.00
180.00	0.9706	0.00	2700.00	0.1653E-01	0.00
200.00	0.9053	0.00	2725.00	0.1653E-01	0.00
225.00	0.3306	0.00	2750.00	0.1653E-01	0.00
250.00	0.3092	0.57	2775.00	0.1651E-01	0.00
275.00	0.2945	1.00	2800.00	0.1650E-01	0.00
300.00	0.2839	1.00	2825.00	0.1648E-01	0.00
325.00	0.2754	1.00	2850.00	0.1643E-01	0.00
350.00	0.2681	1.00	2875.00	0.1638E-01	0.00
375.00	0.2610	1.00	2900.00	0.1633E-01	0.00

400.00	0.2538	1.00	2925.00	0.1628E-01	0.00
425.00	0.2473	1.00	2950.00	0.1623E-01	0.00
450.00	0.2403	1.00	2975.00	0.1618E-01	0.00
475.00	0.2329	1.00	3000.00	0.1613E-01	0.00
500.00	0.2250	1.00	3025.00	0.1608E-01	0.00
525.00	0.2168	1.00	3050.00	0.1603E-01	0.00
550.00	0.2087	2.00	3075.00	0.1598E-01	0.00
575.00	0.2005	2.00	3100.00	0.1593E-01	0.00
600.00	0.1921	2.00	3125.00	0.1589E-01	0.00
625.00	0.1836	2.00	3150.00	0.1584E-01	0.00
650.00	0.1750	2.00	3175.00	0.1579E-01	0.00
675.00	0.1663	2.00	3200.00	0.1574E-01	0.00
700.00	0.1577	2.00	3225.00	0.1569E-01	0.00
725.00	0.1491	2.00	3250.00	0.1565E-01	0.00
750.00	0.1406	2.00	3275.00	0.1560E-01	0.00
775.00	0.1323	2.07	3300.00	0.1555E-01	0.00
800.00	0.1240	3.00	3325.00	0.1550E-01	0.00
825.00	0.1160	3.00	3350.00	0.1546E-01	0.00
850.00	0.1083	3.00	3375.00	0.1541E-01	0.00
875.00	0.1007	3.00	3400.00	0.1536E-01	0.00
900.00	0.9350E-01	3.00	3425.00	0.1531E-01	0.00
925.00	0.8655E-01	3.00	3450.00	0.1527E-01	0.00
950.00	0.8003E-01	3.00	3475.00	0.1522E-01	0.18
975.00	0.7386E-01	3.00	3500.00	0.1517E-01	0.00
1000.00	0.6800E-01	3.00	3525.00	0.1513E-01	0.00
1025.00	0.6241E-01	3.86	3550.00	0.1508E-01	0.00
1050.00	0.5715E-01	4.00	3575.00	0.1503E-01	0.00
1075.00	0.5221E-01	4.00	3600.00	0.1499E-01	0.00
1100.00	0.4757E-01	4.00	3625.00	0.1494E-01	0.00
1125.00	0.4375E-01	0.00	3650.00	0.1490E-01	0.00
1150.00	0.4029E-01	0.00	3675.00	0.1485E-01	0.00
1175.00	0.3703E-01	0.00	3700.00	0.1481E-01	0.00
1200.00	0.3397E-01	0.00	3725.00	0.1476E-01	0.00
1225.00	0.3109E-01	0.87	3750.00	0.1472E-01	0.00
1250.00	0.2840E-01	1.00	3775.00	0.1467E-01	0.00
1275.00	0.2588E-01	1.00	3800.00	0.1462E-01	0.00
1300.00	0.2354E-01	1.00	3825.00	0.1458E-01	0.00
1325.00	0.2137E-01	1.00	3850.00	0.1454E-01	0.00
1350.00	0.2058E-01	5.00	3875.00	0.1449E-01	0.00
1375.00	0.2047E-01	5.00	3900.00	0.1445E-01	0.00
1400.00	0.2036E-01	5.00	3925.00	0.1440E-01	0.00
1425.00	0.2024E-01	5.00	3950.00	0.1436E-01	0.00
1450.00	0.2012E-01	5.00	3975.00	0.1431E-01	0.00
1475.00	0.2001E-01	5.00	4000.00	0.1427E-01	0.00
1500.00	0.1989E-01	5.00	4025.00	0.1423E-01	0.00
1525.00	0.1976E-01	5.00	4050.00	0.1418E-01	0.00
1550.00	0.1964E-01	5.00	4075.00	0.1414E-01	0.00
1575.00	0.1952E-01	5.00	4100.00	0.1410E-01	0.00
1600.00	0.1942E-01	5.65	4125.00	0.1405E-01	0.00
1625.00	0.1930E-01	6.00	4150.00	0.1401E-01	0.00

1650.00	0.1918E-01	6.00	4175.00	0.1397E-01	0.00
1675.00	0.1905E-01	6.00	4200.00	0.1393E-01	0.00
1700.00	0.1893E-01	6.00	4225.00	0.1388E-01	0.00
1725.00	0.1880E-01	6.00	4250.00	0.1384E-01	0.00
1750.00	0.1868E-01	6.00	4275.00	0.1380E-01	0.47
1775.00	0.1855E-01	6.00	4300.00	0.1376E-01	0.00
1800.00	0.1843E-01	6.00	4325.00	0.1371E-01	0.00
1825.00	0.1831E-01	6.00	4350.00	0.1367E-01	0.00
1850.00	0.1818E-01	6.00	4375.00	0.1363E-01	0.00
1875.00	0.1806E-01	6.06	4400.00	0.1359E-01	0.00
1900.00	0.1797E-01	6.95	4425.00	0.1355E-01	0.00
1925.00	0.1785E-01	7.00	4450.00	0.1351E-01	0.00
1950.00	0.1773E-01	7.00	4475.00	0.1347E-01	0.00
1975.00	0.1761E-01	7.00	4500.00	0.1343E-01	0.00
2000.00	0.1750E-01	7.00	4525.00	0.1339E-01	0.00
2025.00	0.1738E-01	7.00	4550.00	0.1335E-01	0.00
2050.00	0.1726E-01	7.00	4575.00	0.1331E-01	0.00
2075.00	0.1715E-01	7.03	4600.00	0.1327E-01	0.00
2100.00	0.1706E-01	8.00	4625.00	0.1323E-01	0.40
2125.00	0.1695E-01	8.00	4650.00	0.1318E-01	0.81
2150.00	0.1684E-01	8.00	4675.00	0.1314E-01	1.00
2175.00	0.1673E-01	8.00	4700.00	0.1310E-01	1.00
2200.00	0.1662E-01	8.00	4725.00	0.1306E-01	1.00
2225.00	0.1651E-01	8.00	4750.00	0.1302E-01	1.00
2250.00	0.1640E-01	8.00	4775.00	0.1298E-01	1.00
2275.00	0.1630E-01	8.00	4800.00	0.1294E-01	1.00
2300.00	0.1619E-01	8.00	4825.00	0.1291E-01	1.00
2325.00	0.1613E-01	0.00	4850.00	0.1287E-01	1.00
2350.00	0.1618E-01	0.00	4875.00	0.1283E-01	1.00
2375.00	0.1623E-01	0.00	4900.00	0.1279E-01	1.00
2400.00	0.1628E-01	0.00	4925.00	0.1276E-01	1.00
2425.00	0.1632E-01	0.00	4950.00	0.1272E-01	1.00
2450.00	0.1636E-01	0.00	4975.00	0.1268E-01	1.00
2475.00	0.1639E-01	0.00	5000.00	0.1264E-01	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	0.9706	0.9706	0.8735	0.5824	0.9706E-01

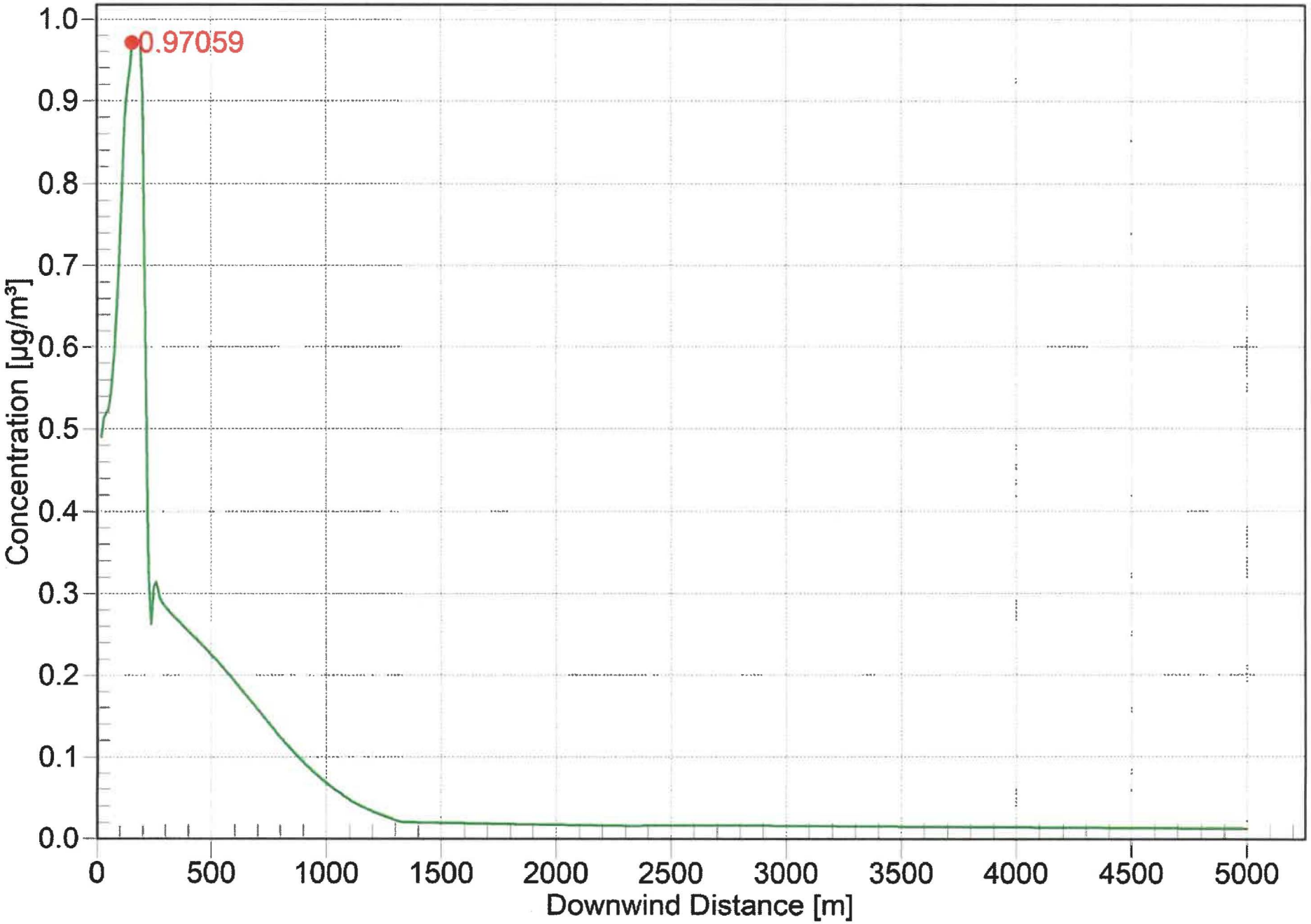
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	0.4902	0.4902	0.4411	0.2941	0.4902E-01

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

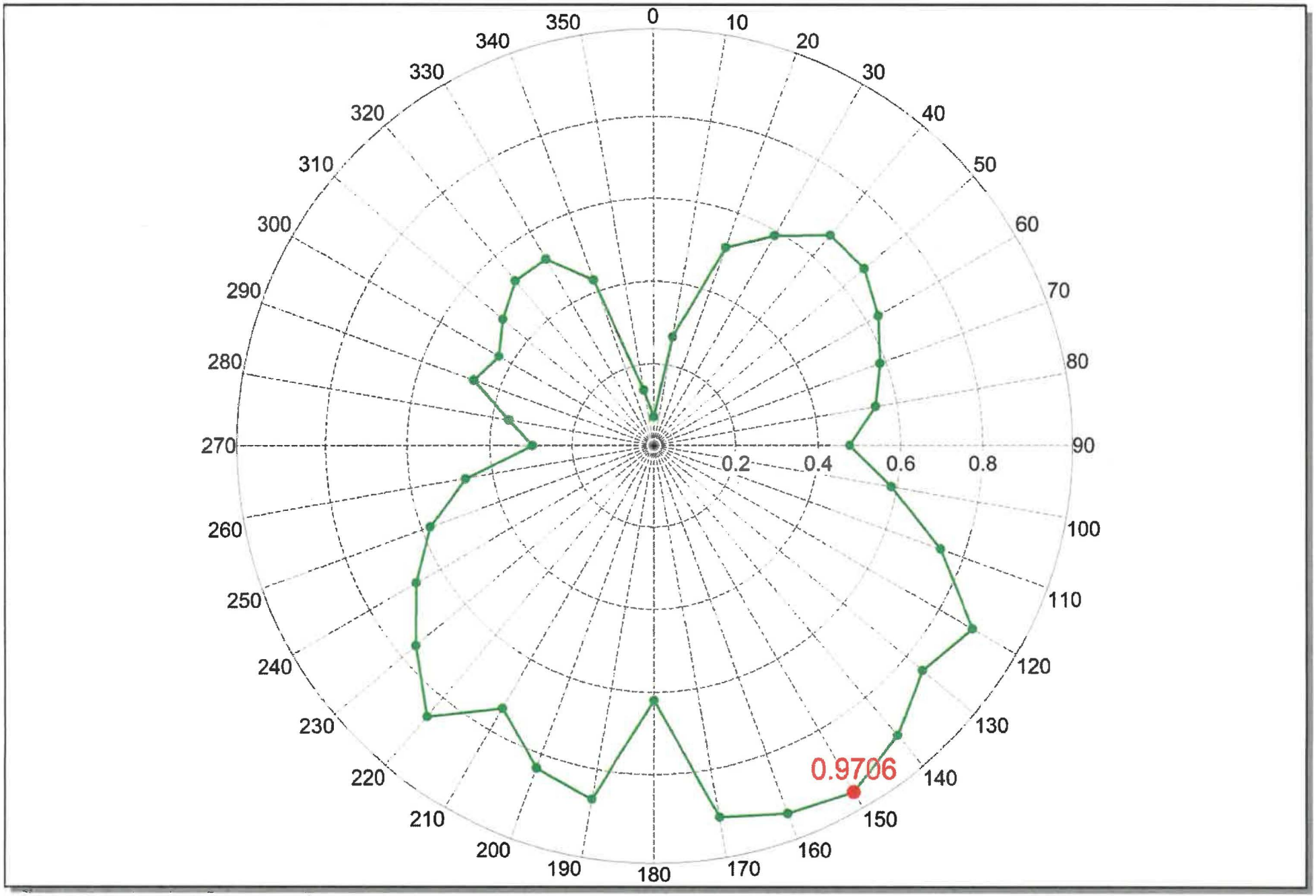
BH_PM2.5 - Bausch Health - PM2.5



Max Conc: 0.971 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_PM2.5 - Bausch Health - PM2.5



Max Conc: 0.971 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

E-5 Methane (CH_4)

AERSCREEN 21112 / AERMOD 22112 04/05/24
17:21:50

TITLE: BH_CH4_UPDATED

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	0.1180	g/s	0.937	lb/hr
STACK HEIGHT:	15.24	meters	50.00	feet
STACK INNER DIAMETER:	1.332	meters	52.44	inches
PLUME EXIT TEMPERATURE:	533.7	K	501.0	Deg F
PLUME EXIT VELOCITY:	11.740	m/s	38.52	ft/s
STACK AIR FLOW RATE:	34664	ACFM		
STACK BASE LONGITUDE:	-96.6666	deg	668882.	Easting
STACK BASE LATITUDE:	49.5193	deg	5487802.	Northing
STACK BASE UTM ZONE:			14	
REFERENCE DATUM (NADA):			4	
STACK BASE ELEVATION:	266.00	meters	872.70	feet
RURAL OR URBAN:	RURAL			

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE =	5000.	meters	16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT:	9.1	meters	30.0	feet
MAXIMUM BUILDING LENGTH:	215.9	meters	708.3	feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	6.671	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	12.70	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	14.61	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	16.57	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	16.58	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	15.65	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	14.53	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	13.58	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	11.81	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	14.55	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	18.39	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	22.19	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	21.13	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	22.87	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	24.11	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	23.64	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	22.78	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	15.38	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	21.66	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	20.71	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	18.29	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	21.33	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	18.78	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	16.56	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	14.37	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	11.56	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	7.330	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	8.869	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	11.60	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	10.80	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	11.88	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	12.97	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	12.99	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	10.62	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	3.427	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	1.751	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	12.18	0.00	2500.00	0.4080	0.39
25.00	12.52	0.00	2525.00	0.4086	0.00
50.00	12.99	0.00	2550.00	0.4092	0.00
75.00	14.61	0.00	2575.00	0.4097	0.00
100.00	17.90	0.00	2600.00	0.4101	0.00
125.00	21.96	0.00	2625.00	0.4104	0.00
150.00	23.64	0.00	2650.00	0.4106	0.00
175.00	24.11	0.00	2675.00	0.4107	0.00
180.00	24.11	0.00	2700.00	0.4108	0.00
200.00	22.49	0.00	2725.00	0.4107	0.00
225.00	8.212	0.00	2750.00	0.4105	0.00
250.00	7.680	0.57	2775.00	0.4103	0.00
275.00	7.317	1.00	2800.00	0.4099	0.00
300.00	7.053	1.00	2825.00	0.4093	0.00
325.00	6.843	1.00	2850.00	0.4081	0.00
350.00	6.659	1.00	2875.00	0.4068	0.00
375.00	6.485	1.00	2900.00	0.4056	0.00

400.00	6.305	1.00	2925.00	0.4044	0.00
425.00	6.143	1.00	2950.00	0.4031	0.00
450.00	5.970	1.00	2975.00	0.4019	0.00
475.00	5.785	1.00	3000.00	0.4007	0.00
500.00	5.589	1.00	3025.00	0.3995	0.00
525.00	5.385	1.00	3050.00	0.3983	0.00
550.00	5.185	2.00	3075.00	0.3971	0.00
575.00	4.981	2.00	3100.00	0.3959	0.00
600.00	4.772	2.00	3125.00	0.3946	0.00
625.00	4.560	2.00	3150.00	0.3934	0.00
650.00	4.346	2.00	3175.00	0.3922	0.00
675.00	4.132	2.00	3200.00	0.3911	0.00
700.00	3.917	2.00	3225.00	0.3899	0.00
725.00	3.704	2.00	3250.00	0.3887	0.00
750.00	3.493	2.00	3275.00	0.3875	0.00
775.00	3.286	2.07	3300.00	0.3863	0.00
800.00	3.081	3.00	3325.00	0.3851	0.00
825.00	2.882	3.00	3350.00	0.3839	0.00
850.00	2.689	3.00	3375.00	0.3828	0.00
875.00	2.503	3.00	3400.00	0.3816	0.00
900.00	2.323	3.00	3425.00	0.3804	0.00
925.00	2.150	3.00	3450.00	0.3793	0.00
950.00	1.988	3.00	3475.00	0.3781	0.18
975.00	1.835	3.00	3500.00	0.3770	0.00
1000.00	1.689	3.00	3525.00	0.3758	0.00
1025.00	1.550	3.86	3550.00	0.3746	0.00
1050.00	1.420	4.00	3575.00	0.3735	0.00
1075.00	1.297	4.00	3600.00	0.3724	0.00
1100.00	1.182	4.00	3625.00	0.3712	0.00
1125.00	1.087	0.00	3650.00	0.3701	0.00
1150.00	1.001	0.00	3675.00	0.3689	0.00
1175.00	0.9200	0.00	3700.00	0.3678	0.00
1200.00	0.8438	0.00	3725.00	0.3667	0.00
1225.00	0.7723	0.87	3750.00	0.3656	0.00
1250.00	0.7055	1.00	3775.00	0.3644	0.00
1275.00	0.6430	1.00	3800.00	0.3633	0.00
1300.00	0.5849	1.00	3825.00	0.3622	0.00
1325.00	0.5309	1.00	3850.00	0.3611	0.00
1350.00	0.5111	5.00	3875.00	0.3600	0.00
1375.00	0.5084	5.00	3900.00	0.3589	0.00
1400.00	0.5057	5.00	3925.00	0.3578	0.00
1425.00	0.5028	5.00	3950.00	0.3567	0.00
1450.00	0.4999	5.00	3975.00	0.3556	0.00
1475.00	0.4970	5.00	4000.00	0.3545	0.00
1500.00	0.4940	5.00	4025.00	0.3534	0.00
1525.00	0.4910	5.00	4050.00	0.3523	0.00
1550.00	0.4879	5.00	4075.00	0.3513	0.00
1575.00	0.4848	5.00	4100.00	0.3502	0.00
1600.00	0.4823	5.65	4125.00	0.3491	0.00
1625.00	0.4795	6.00	4150.00	0.3480	0.00

1650.00	0.4764	6.00	4175.00	0.3470	0.00
1675.00	0.4733	6.00	4200.00	0.3459	0.00
1700.00	0.4702	6.00	4225.00	0.3449	0.00
1725.00	0.4671	6.00	4250.00	0.3438	0.00
1750.00	0.4640	6.00	4275.00	0.3428	0.00
1775.00	0.4609	6.00	4300.00	0.3417	0.00
1800.00	0.4579	6.00	4325.00	0.3407	0.00
1825.00	0.4548	6.00	4350.00	0.3397	0.00
1850.00	0.4517	6.00	4375.00	0.3386	0.00
1875.00	0.4488	6.06	4400.00	0.3376	0.00
1900.00	0.4464	6.95	4425.00	0.3366	0.00
1925.00	0.4435	7.00	4450.00	0.3356	0.00
1950.00	0.4405	7.00	4475.00	0.3346	0.00
1975.00	0.4376	7.00	4500.00	0.3336	0.00
2000.00	0.4346	7.00	4525.00	0.3325	0.00
2025.00	0.4317	7.00	4550.00	0.3315	0.00
2050.00	0.4289	7.00	4575.00	0.3306	0.00
2075.00	0.4260	7.03	4600.00	0.3296	0.00
2100.00	0.4238	8.00	4625.00	0.3286	0.40
2125.00	0.4210	8.00	4650.00	0.3275	0.81
2150.00	0.4182	8.00	4675.00	0.3264	1.00
2175.00	0.4155	8.00	4700.00	0.3254	1.00
2200.00	0.4128	8.00	4725.00	0.3245	1.00
2225.00	0.4101	8.00	4750.00	0.3235	1.00
2250.00	0.4075	8.00	4775.00	0.3225	1.00
2275.00	0.4048	8.00	4800.00	0.3216	1.00
2300.00	0.4022	8.00	4825.00	0.3206	1.00
2325.00	0.4007	0.00	4850.00	0.3197	1.00
2350.00	0.4021	0.00	4875.00	0.3187	1.00
2375.00	0.4033	0.00	4900.00	0.3178	1.00
2400.00	0.4044	0.00	4925.00	0.3169	1.00
2425.00	0.4054	0.00	4950.00	0.3159	1.00
2450.00	0.4064	0.00	4975.00	0.3150	1.00
2475.00	0.4072	0.00	5000.00	0.3141	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	24.11	24.11	21.70	14.47	2.411

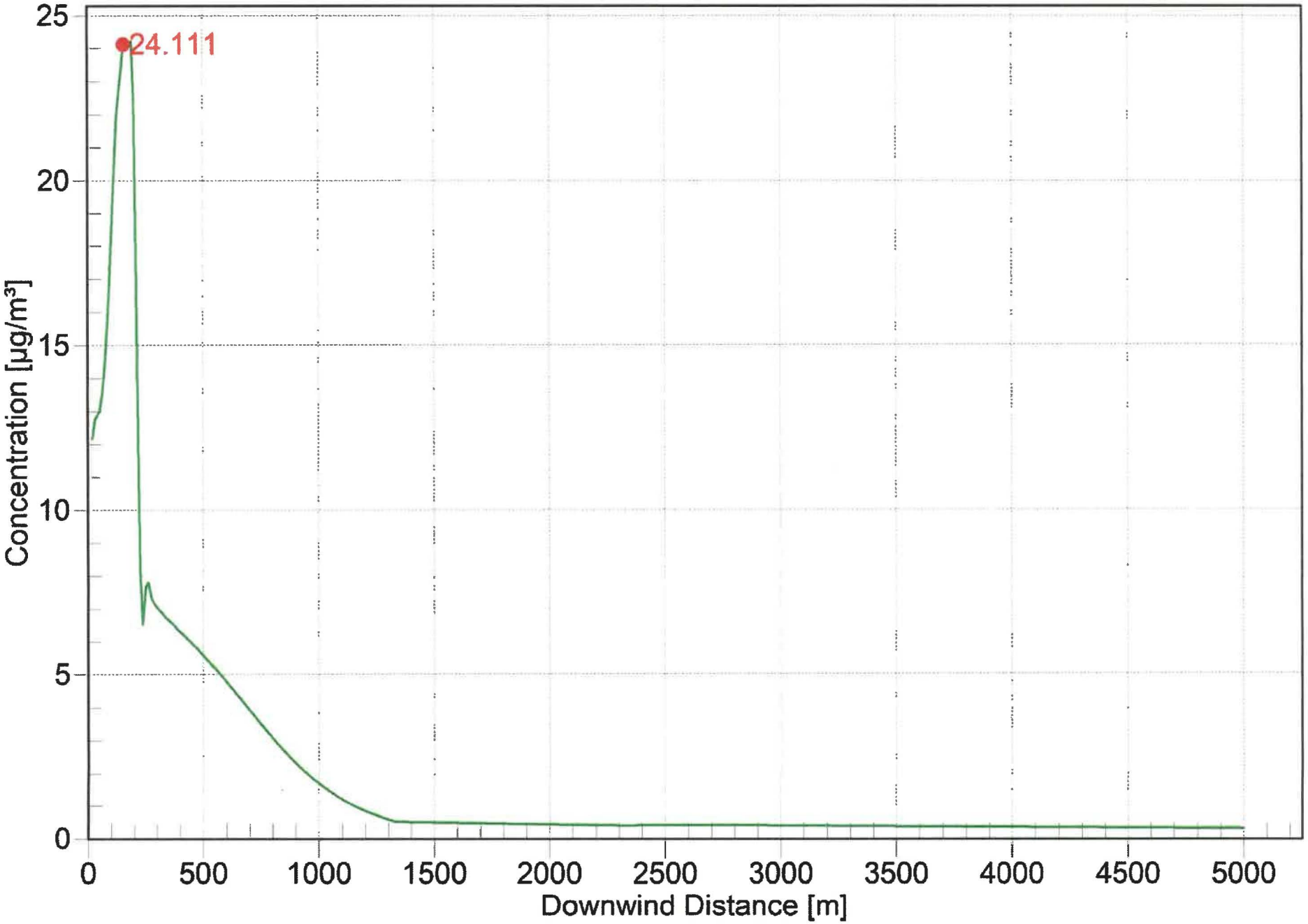
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	12.18	12.18	10.96	7.306	1.218

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

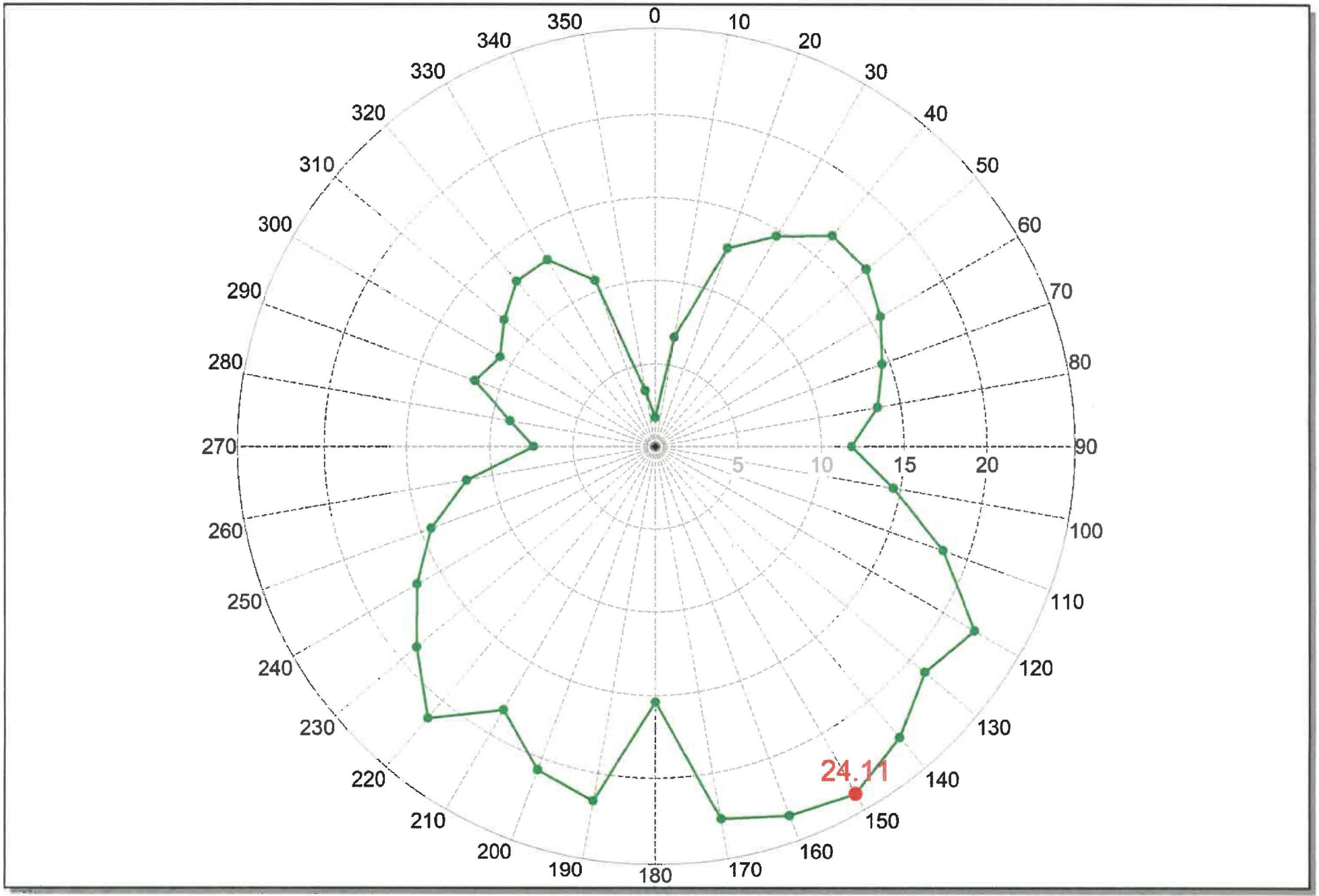
BH_CH4_updated - Bausch Health Methane



Max Conc: 24.111 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_CH4_updated - Bausch Health Methane



Max Conc: 24.11 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m

E-6 Carbon Monoxide (CO)

AERSCREEN 21112 / AERMOD 22112 03/20/24
22:47:35

TITLE: BH_CO

********** STACK PARAMETERS **********

SOURCE EMISSION RATE:	0.5140	g/s	4.079	lb/hr
STACK HEIGHT:	15.24	meters	50.00	feet
STACK INNER DIAMETER:	1.332	meters	52.44	inches
PLUME EXIT TEMPERATURE:	533.7	K	501.0	Deg F
PLUME EXIT VELOCITY:	11.740	m/s	38.52	ft/s
STACK AIR FLOW RATE:	34664	ACFM		
STACK BASE LONGITUDE:	-96.6666	deg	668882.	Easting
STACK BASE LATITUDE:	49.5193	deg	5487802.	Northing
STACK BASE UTM ZONE:			14	
REFERENCE DATUM (NADA):			4	
STACK BASE ELEVATION:	266.00	meters	872.70	feet
RURAL OR URBAN:	RURAL			

DIGITAL ELEVATION MAP(S) "062h07_0200_deme.dem"

"062h07_0200_demw.dem"

"062h10_0200_deme.dem"

"062h10_0200_demw.dem"

INITIAL PROBE DISTANCE =	5000.	meters	16404. feet

********** BUILDING DOWNWASH PARAMETERS **********

USER DEFINED BPIPPRM INPUT FILE: AERSCREEN.BPI

MAXIMUM BUILDING HEIGHT:	9.1	meters	30.0 feet
MAXIMUM BUILDING LENGTH:	215.9	meters	708.3 feet

MINIMUM BUILDING WIDTH: 128.8 meters 422.5 feet

********** FLOW SECTOR ANALYSIS **********

25 meter receptor spacing: 20. meters - 5000. meters

FLOW SECTOR	BUILD WIDTH	BUILD LENGTH	XBADJ	YBADJ	MAXIMUM 1-HR CONC (ug/m3)	IMPACT DIST (m)	RECEPTOR HEIGHT (m)	TEMPORAL PERIOD
10	206.70	143.01	-129.24	-38.81	29.06	50.0	0.00	WIN
20	214.55	166.80	-133.40	-45.93	55.33	50.0	0.00	WIN
30	215.89	185.59	-133.59	-51.66	63.66	75.0	0.00	WIN
40	210.95	199.86	-130.83	-55.96	72.17	100.0	0.00	WIN
50	201.94	208.36	-124.41	-59.74	72.22	100.0	0.00	WIN
60	186.79	210.53	-114.20	-61.69	68.15	125.0	0.00	WIN
70	165.97	206.31	-100.53	-61.77	63.30	125.0	0.00	WIN
80	140.10	195.81	-83.80	-59.98	59.14	125.0	0.00	WIN
90	128.77	192.57	-65.78	-64.90	51.44	150.0	0.00	WIN
100	143.01	206.70	-64.54	-57.73	63.40	175.0	0.00	WIN
110	166.80	214.55	-61.34	-50.00	80.09	180.0	0.00	WIN
120	185.59	215.89	-56.28	-40.79	96.67	180.0	0.00	WIN
130	199.86	210.95	-49.51	-30.90	92.03	200.0	0.00	WIN
140	208.36	201.94	-41.23	-20.22	99.62	175.0	0.00	WIN
150*	210.53	186.79	-31.70	-8.93	105.0	175.0	0.00	WIN
160	206.31	165.97	-21.21	2.63	103.0	150.0	0.00	WIN
170	195.81	140.10	-10.07	14.11	99.22	150.0	0.00	WIN
180	192.57	128.77	0.52	30.51	67.00	150.0	0.00	WIN
190	206.70	143.01	-13.78	38.81	94.33	150.0	0.00	WIN
200	214.55	166.80	-33.40	45.93	90.21	150.0	0.00	WIN
210	215.89	185.59	-52.00	51.66	79.66	150.0	0.00	WIN
220	210.95	199.86	-69.03	55.96	92.90	150.0	0.00	WIN
230	201.94	208.36	-83.96	59.74	81.79	150.0	0.00	WIN
240	186.79	210.53	-96.33	61.69	72.14	125.0	0.00	WIN
250	165.97	206.31	-105.78	61.77	62.60	125.0	0.00	WIN
260	140.10	195.81	-112.02	59.98	50.34	100.0	0.00	WIN
270	128.77	192.57	-126.79	64.91	31.93	100.0	0.00	WIN
280	143.01	206.70	-142.16	57.73	38.63	75.0	0.00	WIN
290	166.80	214.55	-153.21	50.00	50.51	75.0	0.00	WIN
300	185.59	215.89	-159.60	40.79	47.05	75.0	0.00	WIN
310	199.86	210.95	-161.44	30.90	51.74	50.0	0.00	WIN
320	208.36	201.94	-160.70	20.22	56.50	50.0	0.00	WIN
330	210.53	186.79	-155.09	8.93	56.58	50.0	0.00	WIN

340	206.31	165.97	-144.76	-2.63	46.28	25.0	0.00	WIN
350	195.81	140.10	-130.03	-14.11	14.93	20.0	0.00	WIN
360	192.57	128.77	-129.29	-30.51	7.627	250.0	-1.00	WIN

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Winter

ALBEDO: 0.35
BOWEN RATIO: 1.50
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR	MO	DY	JDY	HR
10	03	02	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-11.68	0.130	-9.000	0.020	-999.	108.	18.0	1.000	1.50	0.35	1.50

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 2.0 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 15.2 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 46.5 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 61.8 meters

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR	MO	DY	JDY	HR
10	05	01	2	01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-64.00	1.732	-9.000	0.020	-999.	4000.	7733.9	1.000	1.50	0.35	10.00

HT	REF TA	HT
10.0	310.0	2.0

WIND SPEED AT STACK HEIGHT (non-downwash): 11.8 m/s
STACK-TIP DOWNWASH ADJUSTED STACK HEIGHT: 13.9 meters
ESTIMATED FINAL PLUME RISE (non-downwash): 2.6 meters
ESTIMATED FINAL PLUME HEIGHT (non-downwash): 16.5 meters

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	RECEPTOR HEIGHT (m)
20.00	53.04	0.00	2500.00	1.777	0.00
25.00	54.56	0.00	2525.00	1.780	0.00
50.00	56.58	0.00	2550.00	1.783	0.00
75.00	63.66	0.00	2575.00	1.785	0.00
100.00	77.95	0.00	2600.00	1.786	0.00
125.00	95.65	0.00	2625.00	1.788	0.00
150.00	103.0	0.00	2650.00	1.789	0.00
175.00	105.0	0.00	2675.00	1.789	0.00
180.00	105.0	0.00	2700.00	1.789	0.00
200.00	97.97	0.00	2725.00	1.789	0.00
225.00	35.77	0.00	2750.00	1.788	0.00
250.00	33.45	0.57	2775.00	1.787	0.00
275.00	31.87	1.00	2800.00	1.786	0.00
300.00	30.72	1.00	2825.00	1.783	0.00
325.00	29.81	1.00	2850.00	1.777	0.00
350.00	29.01	1.00	2875.00	1.772	0.00
375.00	28.25	1.00	2900.00	1.767	0.00

400.00	27.47	1.00	2925.00	1.761	0.00
425.00	26.76	1.00	2950.00	1.756	0.00
450.00	26.00	1.00	2975.00	1.751	0.00
475.00	25.20	1.00	3000.00	1.745	0.00
500.00	24.35	1.00	3025.00	1.740	0.00
525.00	23.46	1.00	3050.00	1.735	0.00
550.00	22.58	2.00	3075.00	1.730	0.00
575.00	21.70	2.00	3100.00	1.724	0.00
600.00	20.79	2.00	3125.00	1.719	0.00
625.00	19.86	2.00	3150.00	1.714	0.00
650.00	18.93	2.00	3175.00	1.709	0.00
675.00	18.00	2.00	3200.00	1.703	0.00
700.00	17.06	2.00	3225.00	1.698	0.00
725.00	16.13	2.00	3250.00	1.693	0.00
750.00	15.22	2.00	3275.00	1.688	0.00
775.00	14.31	2.07	3300.00	1.683	0.00
800.00	13.42	3.00	3325.00	1.678	0.00
825.00	12.56	3.00	3350.00	1.672	0.00
850.00	11.72	3.00	3375.00	1.667	0.00
875.00	10.90	3.00	3400.00	1.662	0.00
900.00	10.12	3.00	3425.00	1.657	0.00
925.00	9.365	3.00	3450.00	1.652	0.00
950.00	8.660	3.00	3475.00	1.647	0.18
975.00	7.993	3.00	3500.00	1.642	0.00
1000.00	7.358	3.00	3525.00	1.637	0.00
1025.00	6.753	3.86	3550.00	1.632	0.00
1050.00	6.184	4.00	3575.00	1.627	0.00
1075.00	5.649	4.00	3600.00	1.622	0.00
1100.00	5.147	4.00	3625.00	1.617	0.00
1125.00	4.734	0.00	3650.00	1.612	0.00
1150.00	4.360	0.00	3675.00	1.607	0.00
1175.00	4.007	0.00	3700.00	1.602	0.00
1200.00	3.675	0.00	3725.00	1.597	0.00
1225.00	3.364	0.87	3750.00	1.592	0.00
1250.00	3.073	1.00	3775.00	1.587	0.00
1275.00	2.801	1.00	3800.00	1.583	0.00
1300.00	2.548	1.00	3825.00	1.578	0.00
1325.00	2.313	1.00	3850.00	1.573	0.00
1350.00	2.227	5.00	3875.00	1.568	0.00
1375.00	2.215	5.00	3900.00	1.563	0.00
1400.00	2.203	5.00	3925.00	1.558	0.00
1425.00	2.190	5.00	3950.00	1.554	0.00
1450.00	2.178	5.00	3975.00	1.549	0.00
1475.00	2.165	5.00	4000.00	1.544	0.00
1500.00	2.152	5.00	4025.00	1.539	0.00
1525.00	2.139	5.00	4050.00	1.535	0.00
1550.00	2.125	5.00	4075.00	1.530	0.00
1575.00	2.112	5.00	4100.00	1.525	0.00
1600.00	2.101	5.65	4125.00	1.521	0.00
1625.00	2.089	6.00	4150.00	1.516	0.00

1650.00	2.075	6.00	4175.00	1.511	0.00
1675.00	2.062	6.00	4200.00	1.507	0.00
1700.00	2.048	6.00	4225.00	1.502	0.00
1725.00	2.035	6.00	4250.00	1.498	0.00
1750.00	2.021	6.00	4275.00	1.493	0.00
1775.00	2.008	6.00	4300.00	1.489	0.00
1800.00	1.994	6.00	4325.00	1.484	0.00
1825.00	1.981	6.00	4350.00	1.480	0.00
1850.00	1.968	6.00	4375.00	1.475	0.00
1875.00	1.955	6.06	4400.00	1.471	0.00
1900.00	1.945	6.95	4425.00	1.466	0.00
1925.00	1.932	7.00	4450.00	1.462	0.00
1950.00	1.919	7.00	4475.00	1.457	0.00
1975.00	1.906	7.00	4500.00	1.453	0.00
2000.00	1.893	7.00	4525.00	1.449	0.00
2025.00	1.881	7.00	4550.00	1.444	0.00
2050.00	1.868	7.00	4575.00	1.440	0.00
2075.00	1.856	7.03	4600.00	1.436	0.00
2100.00	1.846	8.00	4625.00	1.431	0.40
2125.00	1.834	8.00	4650.00	1.426	0.81
2150.00	1.822	8.00	4675.00	1.422	1.00
2175.00	1.810	8.00	4700.00	1.418	1.00
2200.00	1.798	8.00	4725.00	1.413	1.00
2225.00	1.786	8.00	4750.00	1.409	1.00
2250.00	1.775	8.00	4775.00	1.405	1.00
2275.00	1.763	8.00	4800.00	1.401	1.00
2300.00	1.752	8.00	4825.00	1.397	1.00
2325.00	1.746	0.00	4850.00	1.393	1.00
2350.00	1.751	0.00	4875.00	1.388	1.00
2375.00	1.757	0.00	4900.00	1.384	1.00
2400.00	1.761	0.00	4925.00	1.380	1.00
2425.00	1.766	0.00	4950.00	1.376	1.00
2450.00	1.770	0.00	4975.00	1.372	1.00
2475.00	1.774	0.00	5000.00	1.368	1.00

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
ELEVATED TERRAIN	105.0	105.0	94.53	63.02	10.50

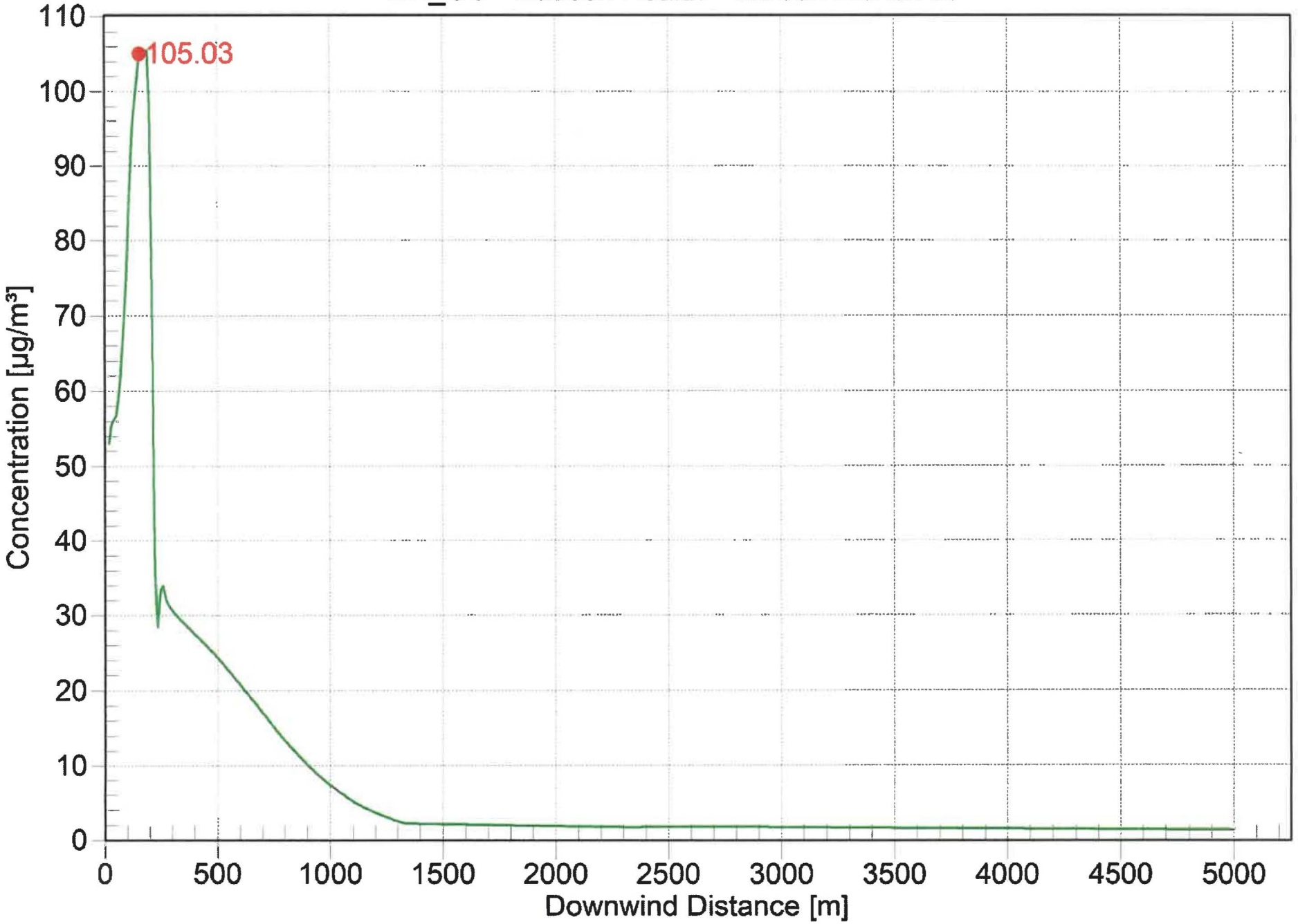
DISTANCE FROM SOURCE 156.00 meters directed toward 150 degrees
RECEPTOR HEIGHT 0.00 meters

IMPACT AT THE AMBIENT BOUNDARY	53.04	53.04	47.74	31.82	5.304

DISTANCE FROM SOURCE 20.00 meters directed toward 330 degrees
RECEPTOR HEIGHT 0.00 meters

Max 1-Hour Concentration vs Downwind Distance

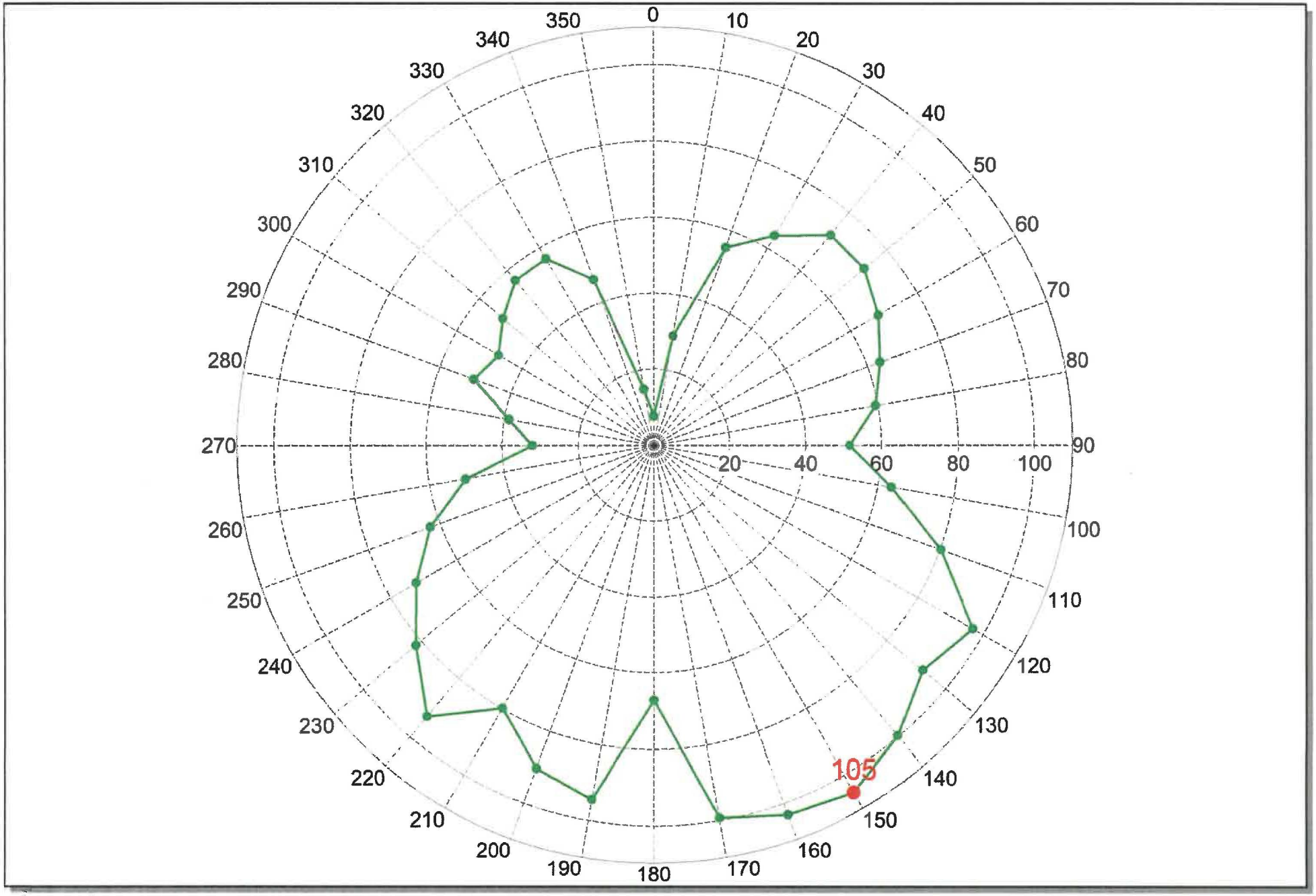
BH_CO - Bausch Health - Carbon Monoxide



Max Conc: 105.03 µg/m³ - Distance: 156.0 m - Flow Sector: 150 deg - Elevation: 0.00 m

Flow Sector Analysis - Max 1-Hour Concentration [µg/m³]

BH_CO - Bausch Health - Carbon Monoxide



Max Conc: 105.0 µg/m³ - Distance: 175.0 m - Flow Sector: 150 deg - Receptor Height: 0.00 m