

APPENDIX C - PHOTOGRAPHS



Photograph 1 – Leakage area identified by GN-CGS at easternmost berm; facing south (liquid level on 23 August)



Photograph 2 – Settlement across access roadway adjacent to easternmost berm of lagoon⁵

⁵ Point of interest 1 to the immediate right of this photograph



Photograph 3 – Sampling point I1 inside lagoon at north-west corner



Photograph 4 – Sampling point I2 inside lagoon midway along northernmost berm



Photograph 5 – Sampling point I3 inside lagoon at easternmost berm



Photograph 6 – Sampling point E1 outside of lagoon just beyond access roadway midway along easternmost berm (point of interest identified by GN-CGS)



Photograph 7 – Sampling point E2 outside of lagoon just beyond access roadway midway along easternmost berm, approximately 15 m south of sampling point 4



Photograph 8 – Sampling point E3 outside lagoon just beyond access roadway midway along southernmost berm⁶

⁶ Samples requested to be procured from this location by GN-CGS at 12:30PM on 5 September 2012, approximately 21 hours after the release of dye into the lagoon



Photograph 9 – Water being added to the mixing pool located on the top of the westernmost berm of the lagoon



Photograph 10 – Dye deposited in mixing pool



Photograph 11 – Mixing of dye prior to release into lagoon



Photograph 12 – Fully mixed dye prior to release into lagoon



Photograph 13 – Mixed dye released into lagoon via gravity fed hose



Photograph 14 – Dye plume diffusing north and east through lagoon after initial release



Photograph 15 – Dye plume not yet visible at northwestern corner of lagoon, approximately 20 minutes after release



Photograph 16 – Progression of dye diffusion at release point approximately 1.5 hours after release



Photograph 17 – Progression of dye diffusion at northwest corner of lagoon approximately 5 hours after release

APPENDIX D – FIGURES

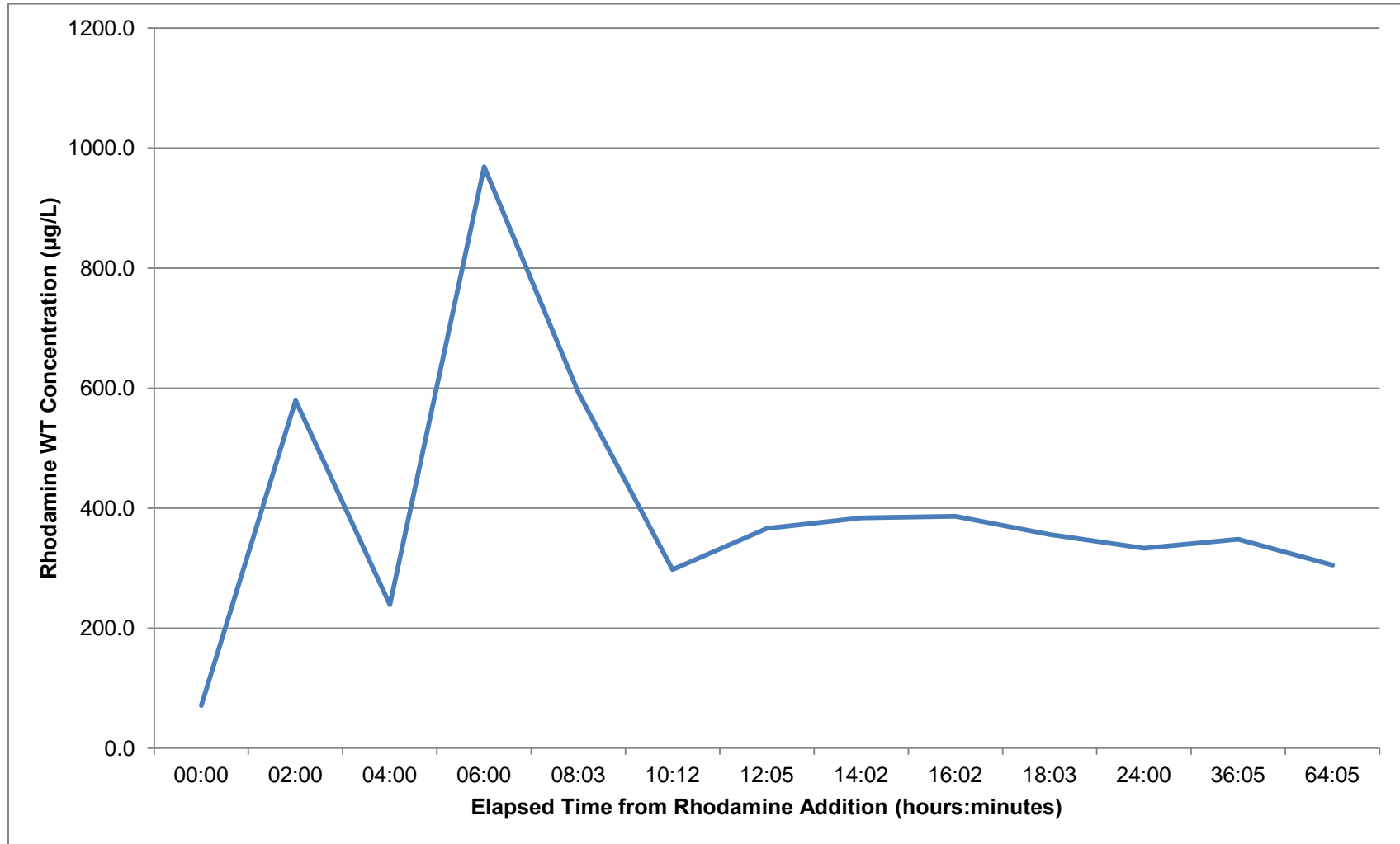


Figure 1 – Rhodamine WT Concentration at Sampling Point I1.

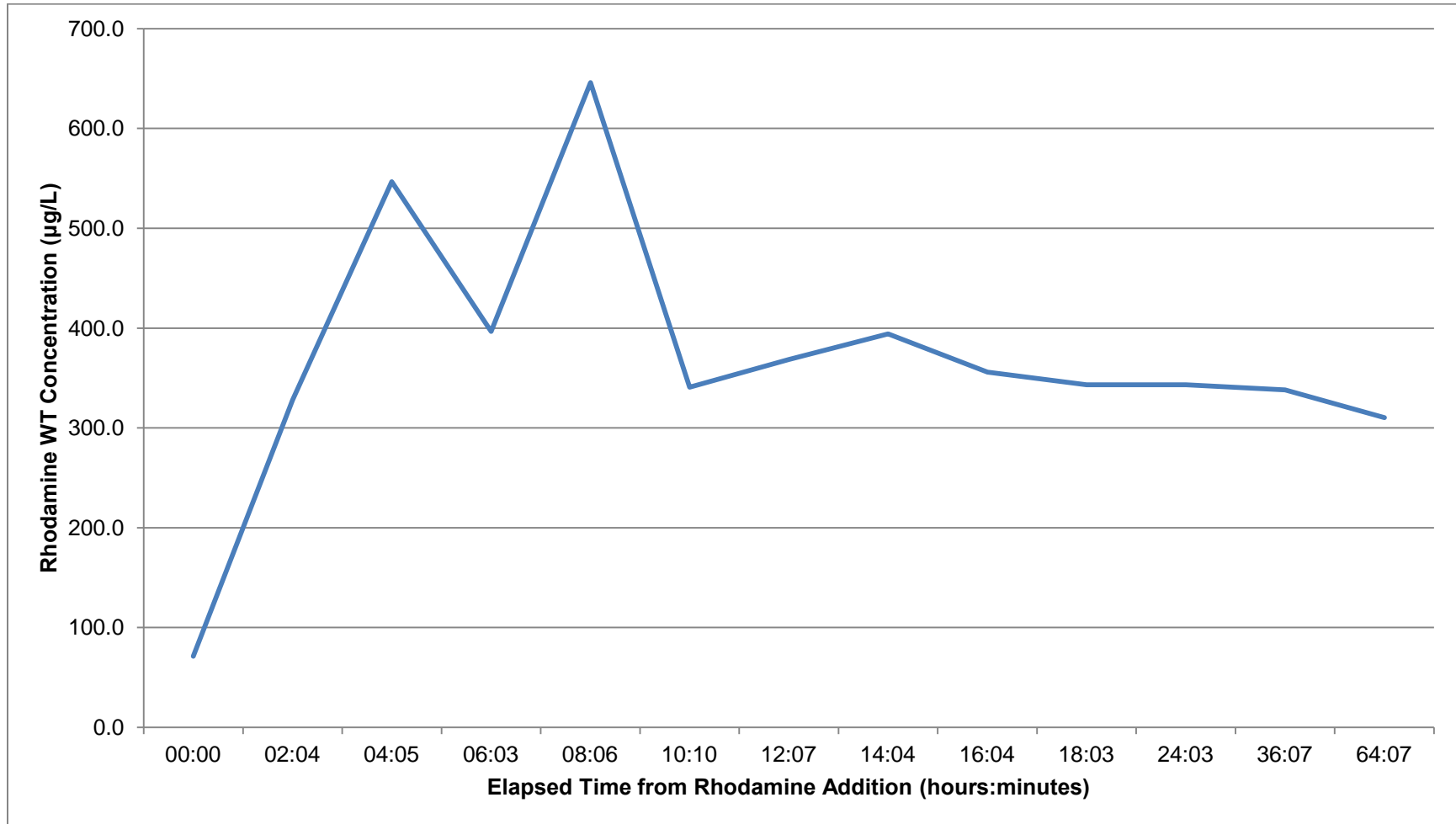


Figure 2 – Rhodamine WT Concentration at Sampling Point I2.

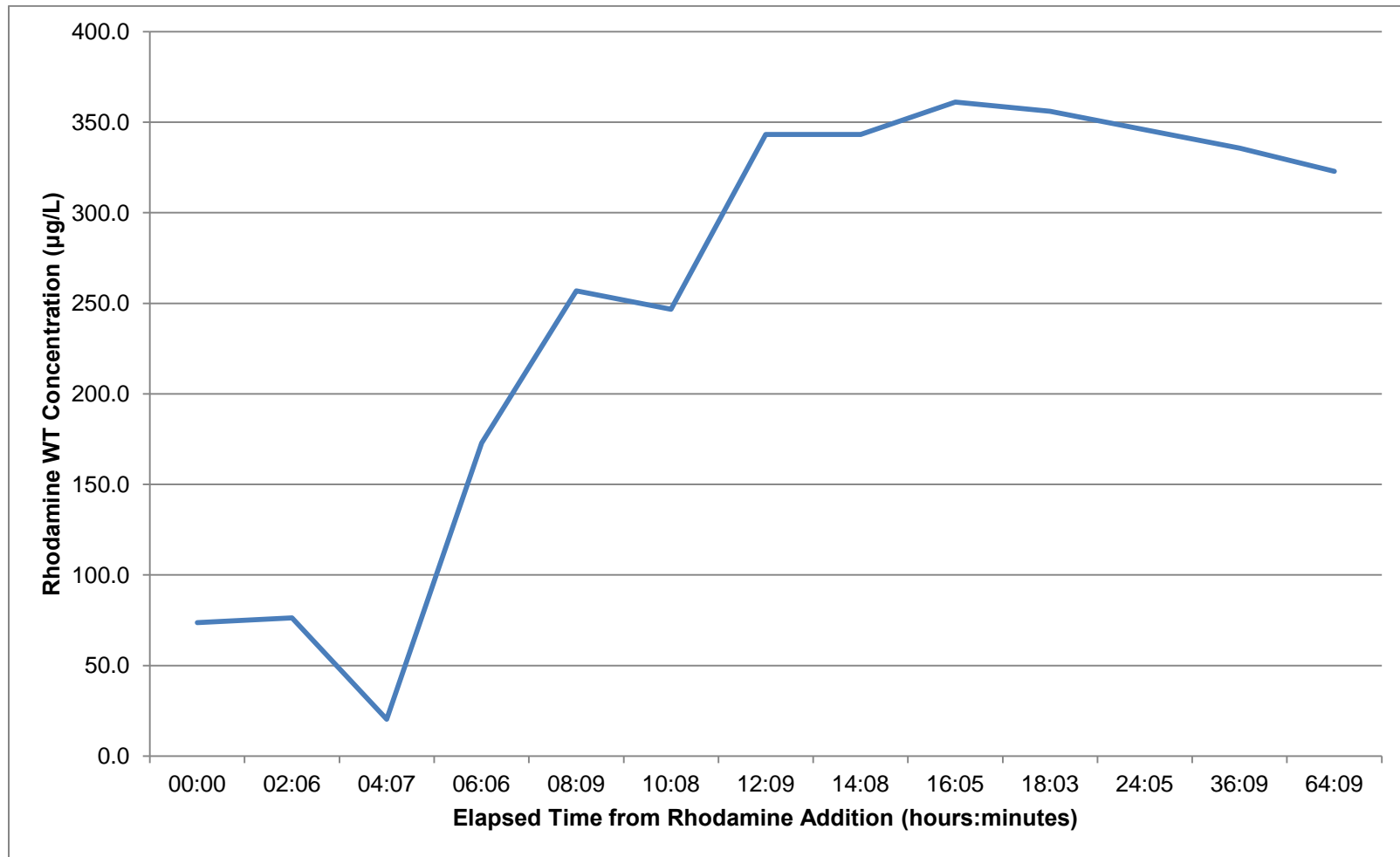


Figure 3 – Rhodamine WT Concentration at Sampling Point I3.

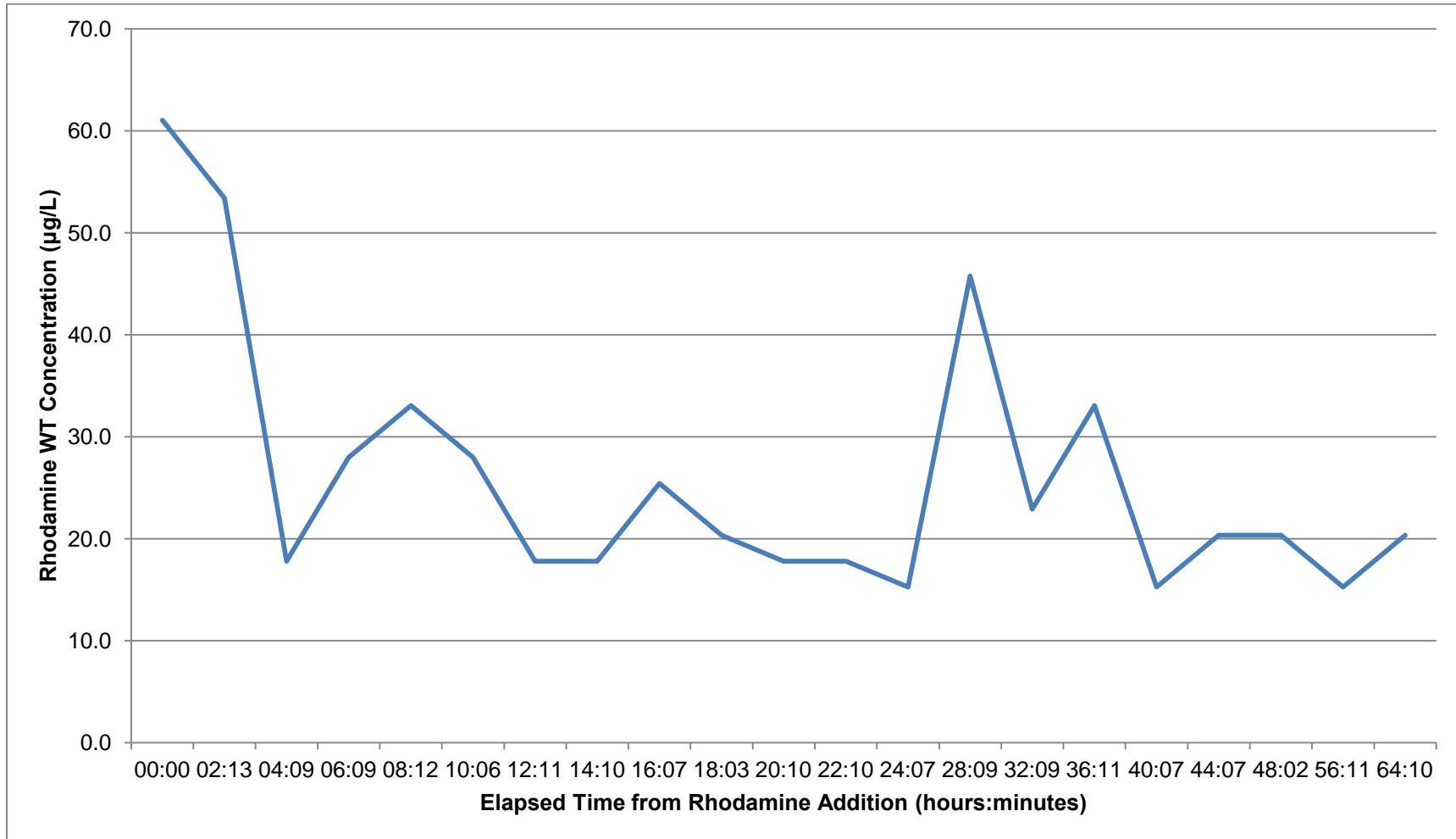


Figure 4 – Rhodamine WT Concentration at Sampling Point E1.

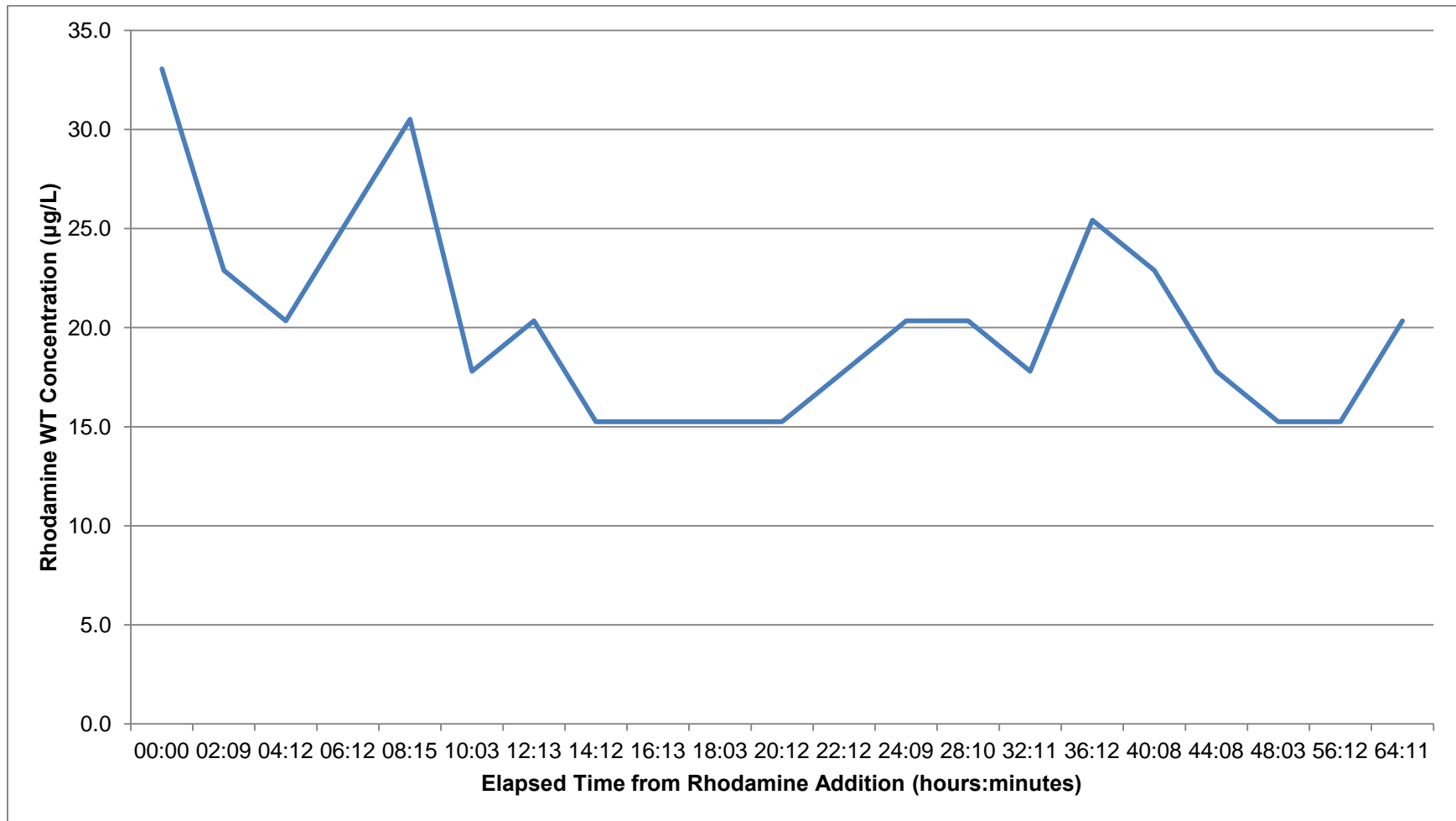


Figure 5 – Rhodamine WT Concentration at Sampling Point E2.

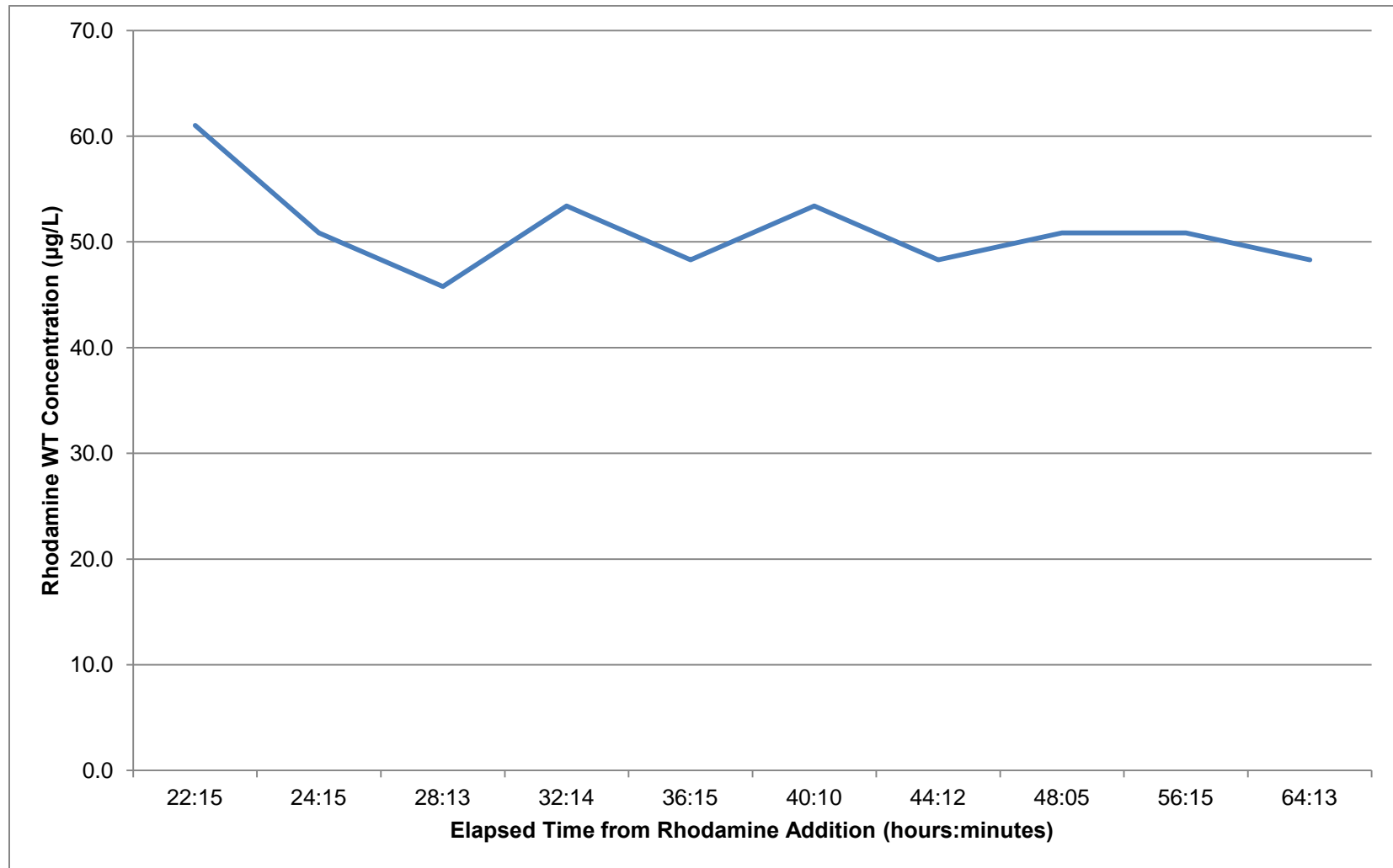


Figure 6 – Rhodamine WT Concentration at Sampling Point E3.

APPENDIX E - RHODAMINE WT MATERIAL SAFETY DATA SHEET

08/24/2011 02:01 4809299565

PYLAM PRODUCTS

PAGE 01/04

Material Safety Data Sheet
RHODAMINE WT POWDER 72834

Pylam Products Company, Inc.

2175 East Cedar St

Tempe, AZ 85281

480-929-0070

www.pylamdyes.com

DATE PREPARED:.....August 9, 1990

DATE REVISED:.....February 10, 2011

CHEMTREC PHONE#:.....800-424-9300

PRODUCT NUMBER:72834

Section 1 - Chemical Product and Company Identification

PRODUCT NAME:RHODAMINE WT POWDER

TRADE NAME:Rhodamine WT Powder

SYNONYMS:Acid Red 388

CHEMICAL FAMILY:Xanthene

CHEMICAL FORMULA: Acid Red 388 (CAS# Proprietary)

CAS NUMBER:Proprietary CAS #.

Section 2 - Composition Information on Ingredients

HAZARDOUS INGREDIENTS	HAZARDOUS %	TLV (UNITS)	PRODUCT CAS#
None as per 29CFR Part 1910.1200.	N/A	N/A	N/A

TOXIC INGREDIENTS	PERCENT	CAS NUMBER	De Minimis Level
N/A	N/A	N/A	N/A

Section 3 - Hazard Identification

Health	1
Flammability	1
Reactivity	0
Personal Protection	F

Primary Entry Routes:.....Ingestion, Inhalation, Skin & Eyes.

ACUTE EFFECTS:

Inhalation:Inhalation may cause respiratory tract discomfort.

Eyes:.....Solid particles (powder/dust) on the eye may cause pain and irritation.

Skin:.....N/A.

Ingestion:N/A.

Carcinogenicity:This chemical is not considered to be carcinogenic by NTP, IARC, or OSHA.

Chronic Effects:.....N/A.

Threshold Limit Value:.....N/A.

Signs & Symptoms of Exposure: Skin may get discolored upon contact with the dye.

Section 4 - First Aid Measures

Inhalation:If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and call a physician.

08/24/2011 02:01 4809299565

PYLAM PRODUCTS

PAGE 02/04

Material Safety Data Sheet
RHODAMINE WT POWDER 72834

Eye Contact: Immediately flush eyes with plenty of water for at least fifteen minutes. Get medical attention.
Skin Contact: Wash thoroughly with soap and water.
Ingestion: If swallowed, rinse mouth with plenty of water. Seek medical attention. Never give fluids to an unconscious person.

Section 5 – Fire-Fighting Measures

Flash Point (F): N/A.
LFL: N/A.
HFL: N/A.
Extinguishing Media: In case of fire use water spray, foam, dry chemical or CO₂.
Unusual Fire/Explosion Hazard: Dusts, when mixed with the right proportions of air and in a source of ignition, have the potential to be explosive.
Fire Fighting Instructions: Use water spray to cool fire-exposed containers.
Fire Fighting Equipment: Firefighters should be equipped with self-contained breathing apparatus and protective clothing.

Section 6 – Accidental Release Measures

Spills: Spills should be swept up and placed in containers. Spill areas can be washed with water; collect waste water for approved disposal method.
Regulatory Requirements: Follow All OSHA Regulations and Standards (29 CFR 1910.1200)

Section 7 – Handling and Storage

Handling Precautions: In accordance with good industrial practices, handle with care to avoid contact.
Storage Requirements: Keep container tightly closed. Store in a cool, dry place.
Regulatory Requirements: Follow All OSHA Regulations and Standards (29 CFR 1910.1200)

Section 8 – Exposure Controls / Personal Protection

Engineering Controls

Ventilation: Use local ventilation if dusting is a problem.

Administrative Controls

Respiratory Protection: Avoid the inhalation of dusts. When the potential for dusting exists use a NIOSH/MSHA approved respirator with dust filter.
Protective Clothing / Equipment: Wear gloves, coveralls, apron, and boots as necessary to prevent skin contact. Wear safety glasses with side-shields (frame goggles).
Safety Stations: Eye wash station should be easily accessible.
Contaminated Equipment: N/A.
Comments: Wash hands after using.

Section 9 – Physical and Chemical Properties

Physical State: Powder.	Water Solubility: Soluble.
Appearance & Odor: Dark powder; odorless.	Other Solubility: N/A.
Vapor Pressure: N/A.	Boiling Point: N/A.
Vapor Density (Air=1): N/A.	Freezing Point: N/A.

08/24/2011 02:01 4809299565

PYLAM PRODUCTS

PAGE 03/04

Material Safety Data Sheet RHODAMINE WT POWDER 72834

Formula Weight:N/A.	% Volatile:N/A.
Specific Gravity:N/A.	Evaporation Rate:N/A.
	Ph:N/A.

Section 10 – Stability and Reactivity
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Stability: Stable.
Polymerization: None expected.
Polymerization to Avoid: None expected.
Chemical Incompatibilities: Oxidizing and reducing agents may destroy color.
Conditions to Avoid: None.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of nitrogen, sulfur, and other potentially toxic fumes.

Section 11- Toxicological Information
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Signs and Symptoms of Exposure: Skin may get discolored upon contact with the dye.
Irritation: May be slightly irritating to the skin.
Acute Oral Effects: N/A.
Chronic Effects: N/A.
Carcinogenicity: This chemical is not considered to be carcinogenic by NTP, IARC, or OSHA.
Acute Inhalation Effects: Inhalation may cause respiratory tract discomfort.
LD₅₀: Approximately 5,000 mg/kg.

Section 12 – Ecological Information
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Ecotoxicity: N/A.

Section 13 – Disposal Considerations

Disposal: Waste disposal should be in accordance with existing federal, state and local environmental regulations.
Container Cleaning/Disposal: Disposal should be in accordance with existing federal, state and local environmental regulations.

Section 14 - Transportation Information
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DOT Transportation Data

Shipping Name: Non-hazardous powdered dye; Item # 154800.
Hazard Class: N/A.
ID No. / UN Code: N/A.
NA Number: N/A.
Packaging Group: N/A.
Special Provisions: None.
Reportable Quantity: N/A.
Vessel Stowage: N/A.
Emergency Response Page#: N/A.

08/24/2011 02:01 4009299565

PYLAM PRODUCTS

PAGE 04/04

Material Safety Data Sheet
RHODAMINE WT POWDER 72834

Section 15 – Regulatory Information

EPA Regulations

RCRA Hazardous Waste Number:.....Not regulated.
RCRA Hazardous Waste Classification:.....N/A.
CERCLA Hazardous Substance:.....Not regulated.
CERCLA Reportable Quantity (RQ):.....N/A.
SARA 311/312 Codes:.....N/A.
SARA Toxic Chemical:.....N/A.
SARA EHS:.....SARA Title III Section 302: This product does not contain any
chemicals regulated under Section 302 as extremely hazardous.
TSCA:.....This product is registered under the regulations of the Toxic
Substances Control Act (TSCA).

OSHA Regulations

Air Contaminant:.....N/A.
OSHA Criteria:.....No carcinogenicity unless listed in Section 3 of the Material Safety
Data Sheet.

REGULATORY INFORMATION		
COMPONENT/ CAS #	CONCENTRATION	STATE CODE
N/A	N/A	N/A

Section 16 – Other Information

Disclaimer:..... Pylam Products Co., Inc. believes all the information and data given is accurate as of the
date of preparation and is offered in good faith. This information is given without warranty
or representation solely for your consideration, investigation, and verification. Since
conditions of use are beyond our control, Pylam Products Co., Inc. expressly disclaims all
liability for the use or handling of this product. All risks of use are assumed by end-users.

APPENDIX F – GENERAL TERMS AND CONDITIONS

USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained within are intended for the sole use of the Government of Nunavut – Department of Community Government and Services (herein after referred to as the “Client”). Arktis Piusitippaa Inc. (herein after referred to as “API”) does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any third party unless otherwise authorized in writing by API. Any unauthorized use of the report is at the sole risk of the user.

LIMITATIONS OF REPORT

This report is based solely on the conditions which existed on site at the time of API’s investigation. The client, and any other parties using this report with the express written consent of the client and API, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and API, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that API is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

During the performance of the work and the preparation of this report, API may have relied on the information provided by third parties. While API endeavors to verify the accuracy of such information when instructed to do so by the client, API accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

LIMITATIONS OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of API providing the services requested, the client agrees that API’s liability to the client, with respect to any

issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

- a. With respect to any claims brought against API by the client arising out of the provisions or failure to provide services hereunder shall be limited to the amount of fees paid by the client to API under this Agreement, whether the action is based on breach of contract or tort;
- b. With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless API from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by API, whether the claim be brought against API for breach of contract or tort.

STANDARD OF CARE

Services performed by API for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

ALTERNATE REPORT FORMAT

Where API submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed API's instruments of professional service), the Client agrees that only the signed and sealed (if applicable) hard copy versions shall be considered final and legally binding. The hard copy versions submitted by API shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by API shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions (or scanned electronic versions thereof) of API's instruments of professional services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except API. The Client warrants that API's instruments of professional services will be used only and exactly as submitted by API.