Toxic Organic Management Plan

Monitoring Point 001

NASA Goddard Space Flight Center
Medical and Environmental Management Division,
Code 250

Greenbelt, Maryland 20771

January 2020

DOCUMENT	TOMP; NASA GSFC Toxic Organic Management Plan (Monitoring Point 001)
EFFECTIVE DATE:	January 1, 2020
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1. Purpose

This Toxic Organic Management Plan (TOMP) is being submitted on behalf of NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland, in lieu of periodic sampling required by the Washington Suburban Sanitary Commission (WSSC) Discharge Authorization Permit (DAP) (Permit No. 00449) for Total Toxic Organics (TTOs) at the building 5 Plating Facility, Monitoring Point 001. GSFC controls potential discharges of toxic organic chemicals at the Plating Facility through process modification, solvent substitution, regulated waste disposal/management and various other administrative controls. This document encompasses TTO control procedures as they pertain to the WSSC permit for self-monitoring exemption status.

2. Summary

Effective November 24, 2015, the WSSC modified GSFC's DAP to add GSFC Plating Facility as a categorical industrial user. Quarterly monitoring of the Plating Facility at the desginated industrial waste monitoring point (IWMP) (Monitoring Point 001) began in January 2016. Analytical results at the building 5 Plating Facility began the first quarter of 2016. GSFC submitted a TTO Exemption Application with the Fourth Quarter 2016 WSSC Periodic Compliance Report. The building 5 Plating Facility was granted exemption from TTO self-monitoring on May 10, 2017.

GSFC has implemented pollution prevention and hazardous waste management practices to ensure that wastes and hazardous materials are managed and disposed in accordance with applicable regulations. GSFC's pollution prevention measures and management practices have resulted in very low concentrations of TTOs in GSFC's wastewater.

3. Description of Facility

The GSFC Plating Facility provides manufacturing and fabrication support for developing science instruments, spacecraft systems, components, and devices used for NASA science experiment aircraft, balloons, space flight, and laboratory research. The Plating Facility personnel have obtained the required Class 2 Industrial Wastewater Operator Certification from the State of Maryland, Board of Waterworks and Waste Systems Operators (Certification Nos. 4558 and 2132) for operation of the facility's ion exchange system and pH neutralization system utilized for pretreatment of wastewater from electroplating processes.

4. Toxic Organics Inventory

4.1 TTO Monitoring at Monitoring Point 001

Upgrades to the GSFC Plating Facility's pH neutralization system took place in 2015. These upgrades included the installation of an automated pre-treatment system that provides control and documented evidence of the effectiveness of the pH neutralization system. In response to these upgrades, WSSC informed GSFC that based on Title 40 of the *Code of Federal Regulations*, Part 403, GSFC's Plating Facility should be regulated according to the categorical pretreatment standards. A compliance directive was submitted, requiring GSFC to install a second IWMP immediately following pretreatment and prior to the categorically regulated wastewater becoming comingled with other dilution or unregulated wastestreams.

A sampling spigot was installed on the effluent pipe of the pH neutralization system directly above where the Plating Facility's treated wastewater enters the sanitary sewer system. WSSC approved the installation of the sampling port on July 29, 2015. In July 2018, GSFC completed reconfiguration of the pre-treatment system's ion exchange columns to a worker-polisher configuration (i.e., two ion exchange columns). Monitoring for TTO VOA/BNAP at the building 5 Plating Facility was continued through the first two quarterly WSSC Periodic Compliance Reports for 2017.

GSFC samples pretreated electroplating wastewater two working days each quarter, as required by the WSSC DAP. Samples are collected from a red spigot on the effluent pipe of the pH neutralization system located in the pretreatment room of the building 5 Plating Facility. Because the electroplating wastewater is discharged from the pH neutralization system as a batch discharge, it is possible to have multiple batch discharges during a monitoring day. Since the implementation of the building 5 Plating Facility as a categorical industrial user, GSFC has collected samples for TTOs and submitted them for analysis for the first two quarters of 2017. Analytical results for TTO/BNAP monitoring at the Plating Facility showed 'Non-Detectable' for all parameters for each monitoring day.

4.2 TTOs Stored and Estimate Useage at Monitoring Point 001

TTOs used at the building 5 Plating Facility generally consist of small chemical constituents found in materials used for Plating Facility processes. A majority of these chemicals are solvents that can be used for wiping or cleaning parts. Table 1 lists TTOs that are stored for the Plating Facility, as well as estimated annual usage of TTOs by the Plating Facility personnel. The storage and usage data were acquired from the GSFC's hazardous materials management system

(HMMS). The HMMS queries use and storage of chemicals at the constituent level and reports the unit of measure in pounds, regardless of the chemical phase (i.e., liquid, solid, gas). This level of tracking allows for the chemicals to be accurately reported at the constituent level rather than estimating for chemicals that are components or trace additives of other products.

Table 1: Estimated Usage and Storage Quantities of TTOs at Monitoring Point 001[1,2]

Chemical Name	CAS Number	Annual Use (lbs)	Inventory Storage (lbs)
TOLUENE	108883	8.35	75.24
TETRACHLOROETHYLENE	127184	0	87.49
ETHYLBENZENE	100414	0	0.19
PERCHLOROETHYLENE	127184	0	16.29
DICHLOROMETHANE	75092	0	0.075

[1]**Annual Usage quantities for GSFC TTOs are queried for November 30, 2018 through November 30, 2019.**

[2]**Inventory Storage quantities for GSFC TTOs are queried for January 1, 2013 through November 30, 2019.**

4.3 Enforcement of TOMP

The GSFC Environmental Team validates TTO storage and use data from GSFC's HMMS annually to maintain the TOMP. The Plating Facility operators are required to notify the GSFC Environmental Team of changes to any processes that have the potential to impact the nature of the facility's discharge(s) or waste (s) generated. The Environmental Team then reviews changes to determine applicable regulatory reporting and management practices.

5. Pollution Prevention

Pollution prevention is an integral part of operations at GSFC. Visual aids are posted in the Plating Facility to inform employees of proper chemical management practices. Visual aids posted at sinks instruct users to refrain from pouring chemicals down the drain. A sign is posted at the Plating Facility satellite accumulation area (SAA) listing hazardous waste list requirements for proper waste management practices; such as, keeping containers closed and ensuring that secondary containment is in place to prevent spills.

5.1 Best Management Practices

GSFC employs Best Management Practices (BMPs) to reduce the risk of chemicals and hazardous wastes entering the sanitary sewer. Chemicals and hazardous wastes that contain TTOs are managed in accordance with hazardous waste regulations. Hazardous wastes are stored in SAAs, away from floor drains connected to WSSC sewer lines. GSFC BMPs for pollution prevention

include; implementing good housekeeping practices, maintaining accurate chemical inventories, minimizing the quantity of chemicals stored, and utilizing less environmentally-hazardous chemicals when feasible. Good housekeeping ensures that chemical storage areas are kept clean and organized to avoid potential spills and cross contamination.

The Plating Facility SAA is inspected annually by the Environmental Team to validate that BMPs are being maintained. The Plating Facility has not incurred any violations during their annual SAA inspection in the past four years. GSFC Hazardous Waste Generator training is required annually for personnel responsible for generating hazardous waste or points of contact that maintain an SAA. Plating Facilility personnel and SAA points of contact have been up to date with the GSFC Hazardous Waste Generator Training for the past four years.

Plating Facility personnel have access to the HMMS, which enables them, as well as the GSFC Environmental Team, to track chemical inventory throughout the Center. Plating Facility chemicals are entered into the HMMS inventory and tagged with a serial barcode. When the product is consumed, the empty containers and barcodes are returned to the appropriate personnel to log the inventory consumption in the hazardous material management system.

GSFC has a chemical re-use program to help minimize waste. The program offers unused and unwanted chemicals and other materials to other GSFC organizations as available for use. Redistributing these materials assists in validating and minimizing chemical inventory.

5.2 SAAs and the Less Than 90-Day Hazardous Waste Facility

The Plating Facility generates hazardous wastes, which are stored in their designated SAA location. The Plating Facility SAA is located centrally in the plating shop. Floor grates along the plating shop floor drain directly to pits that flow through the wastewater treatment systems (comprised of an ion exchange system and pH neutralization system). GSFC requires hazardous waste generators to inspect SAAs monthly to ensure that BMPs are maintained. SAA inspections verify the following:

- No spills have occurred and containers are tightly closed and not leaking;
- Hazardous waste containers are labeled appropriately;
- Secondary containment for liquid wastes is present to contain possible spills;
- The area is clean and well-maintained; and,
- Applicable regulations are being met.

The Plating Facility contacts the Environmental Team via the Management Operations Services and Information (MOSI) system, phone, or email, to request additional waste drums or

containers and to collect the waste that has been generated. If a new waste will be generated, Plating Facility personnel are required to request a waste characterization prior to its generation.

After the waste is collected from the Plating Facility, it is transported to the Less-than 90-Day Facility. The Less-than 90-Day Facility is inspected weekly as required by 40 CFR part 262 to ensure BMPs are maintained. The wastes are picked up by a certified waste hauler and transported to a permitted Treatment, Storage, and Disposal Facility (TSDF) for disposal less than 90 days from arrival at the facility. Records of offsite waste shipments, to include manifests, are kept in accordance with NASA records retention schedules and tracked to ensure they have been received by the proper TSDF.

5.3 Spill Prevention

The potential for spills and discharges of hazardous materials at the Plating Facility is minimal. Chemicals are not stored or handled in close proximity to WSSC floor drains. Bulk chemicals for the Plating Facility are stored in chemical storage rooms that have been designed with beveled floors and secondary containment sumps. In the event of a spill, chemicals would enter the sump pit and would be pumped out manually for disposal.

6. Conclusion

The GSFC Environmental Team works closely with the Plating Facility personnel to ensure that hazardous materials onsite are stored and disposed of properly. The Plating Facility maintains current wastewater treatment systems and certifications to ensure that wastewater from facility processes are within the permitted limits prior to discharge to the sanitary sewer system. Analytical results from monitoring at Monitoring Point 001 during the 2017 reporting year showed no traces of TTOs. The Plating Facility complies with GSFC BMPs to ensure that wastes are not poured down the drains and enforces a policy of maintaining low chemical inventories to limit the amount of hazardous materials onsite. GSFC has procedures in place to validate that chemical use, waste management, pollution prevention, and BMPs, are appropriate and effective.

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes

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EFFECTIVE DATE:	January 1, 2020
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Baseline	January 1, 2017	
1	January 3, 2018	Updated 'Estimated Usage and Storage of TTOs at GSFC' table to reflect quantities for the 2017 calendar year. Made minor edits to sections 2, 4.1, 5.2 and 6.
2	January 1, 2019	Updated 'Estmiated Usage and Storage of TTOs at GSFC' table to reflect quantities for the 2018 calendar year. Minor edits made to sections 1, 2, 3, 4.1, 5.1, 5.2 and 5.3.
3	January 1, 2020	Updated 'Estmiated Usage and Storage of TTOs at GSFC' table to reflect quantities for the 2019 calendar year. Minor edits made to sections 4, 5.1 and 5.2.