

Town of Upton, MA  
Stormwater Management Program (SWMP):  
Volume 2  
*NPDES Phase II Small MS4 General Permit*  
*September 2019*

ILLICIT DISCHARGE DETECTION &  
ELIMINATION (IDDE) PLAN

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# **Stormwater Management Program (SWMP): Volume 2**

Town of Upton, MA

*NPDES Phase II Small MS4 General Permit*

## **ILLICIT DISCHARGE DETECTION & ELIMINATION (IDDE) PLAN**

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Prepared for: Town of Upton, Massachusetts

September 2019

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## 1.0 INTRODUCTION

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed by the Town of Upton (the Town) to address the IDDE program requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollution Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereinafter referred to as the Permit. The Permit requires a Stormwater Management Program (SWMP), which is comprised of four volumes. This IDDE Plan is Volume 2 of 4.

- SWMP Volume 1: Stormwater Management Program
- **SWMP Volume 2: Illicit Discharge Detection and Elimination (IDDE) Plan**
- SWMP Volume 3: Good Housekeeping and Pollution Prevention (O&M) Plan
- SWMP Volume 4: Annual Reports

## 2.0 OBJECTIVE

The objective of this IDDE program is to systematically find and eliminate sources of non-stormwater discharges to the municipal separate storm sewer system and implement procedures to prevent such discharges. The required timeline for implementing the IDDE program per the Permit is shown in Table 2.1.

**Table 2-1 IDDE Program Implementation Timeline**

IDDE Program Requirements	Completion Date from Effective Date of Permit					
	1 Year	1.5 Years	2 Years	3 Years	7 Years	10 Years
Written IDDE Program Plan	→					
SSO Inventory	→					
Written Catchment Investigation Procedure	→	→				
Phase I Mapping	→	→	→			
Phase II Mapping	→	→	→	→	→	→
Dry Weather Outfall Screening & Sampling	→	→	→	→		
Follow-up Ranking of Outfalls and Interconnections	→	→	→	→		
Catchment Investigations – Problem Outfalls	→	→	→	→	→	
Catchment Investigations – all Problem, High and Low Priority Outfalls	→	→	→	→	→	→
Training for All IDDE Staff	Annually					



### 3.0 LEGAL AUTHORITY AND STATEMENT OF RESPONSIBILITIES

The Town of Upton Stormwater Bylaw adopted on April 25, 2012, provides legal authority to: prohibit illicit discharges; investigate suspected illicit discharges; eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system; and implement appropriate enforcement procedures and actions.

The Department of Public Works is the lead municipal department responsible for implementing the IDDE program. The DPW has primary responsibility for mapping, screening and sampling, catchment investigations, illicit discharge removal, training and annual reporting components of the program in addition to overall implementation and coordination. There are other departments that assist in operating, managing and inspecting the sanitary sewer and storm drain and/or review plans for proposed construction and inspecting new construction that connect to these systems. These departments have key roles in implementing the IDDE program effectively. They are listed below with roles and responsibilities identified that support planning and administrative efforts of the IDDE program:

- **Department of Public Works** – Maintenance of Stormwater Systems, IDDE Detection and Reporting, Record Keeping, Inspection and Maintenance of Sewer Systems; Respond to SSOs; IDDE Investigation, Detection, Elimination and Record Keeping
- **Building and Plumbing Inspector(s)** – Education, Sewer Inspection, Reporting, Enforcement, Record Keeping
- **Board of Health** – Education (Pet waste & Septic maintenance), Septic Inspection & Plan Review, Reporting, Enforcement, Record Keeping
- **Conservation Commission** - Education, Plan Review, Construction Inspection, Enforcement, Stormwater Management O& M Record Keeping
- **Planning Board**– Education, Plan Review, Construction Inspection, Enforcement, Stormwater Management O& M Record Keeping, Bylaw compliance, Authorized Enforcement Agency for discharges to the MS4

The Department of Public Works will conduct meetings involving persons with key roles from the departments listed above to review the responsibilities and coordinate IDDE efforts between the departments. The meetings will educate the different departments about IDDE and the roles of each in identifying and resolving illicit discharges.

## 4.0 DEFINITIONS

The following definitions are provided for terms used in this IDDE Plan.

A **catchment** is the area that drains to an individual outfall or interconnection.

A **sanitary sewer overflow (SSO)** is a discharge of untreated sanitary wastewater from a municipal sanitary sewer.

An **illicit discharge** is any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

An **interconnection** is the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

**Key junction** is a manhole or structure that can represent one or more junction manholes without compromising adequate implementation of the IDDE program. Adequate implementation of the IDDE program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the ability to determine possible presence of an upstream illicit discharge.

The **MATRIX** is the Outfall/Interconnection Data and Priority Ranking Matrix

**MS4** is a municipal separate stormwater system

An **outfall** is a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)).

## 5.0 PROHIBITIONS AND REQUIRED ACTIONS

Illicit discharges and sanitary sewer overflows (SSOs) to the MS4 are prohibited.

Upon detection of an illicit discharge or SSO, the Town will commence action to locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source the Town will notify all parties responsible for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 days of its identification as an illicit discharge is not possible, an expeditious schedule will be established for its elimination and the dates of identification and schedules for removal will be included in annual reports. In the interim, the Town will take all reasonable and prudent measures to minimize the discharge of pollutants to and from its MS4.

## 6.0 NON-STORMWATER DISCHARGES

The following categories of non-stormwater discharges are allowed under the Permit unless the Town, EPA, or the MassDEP identifies any category or individual discharge of non-stormwater discharge listed below as a significant contributor of pollutants to the MS4, in which case that category or individual discharge is not allowed, and is to be deemed an “illicit discharge” and treated as part of the IDDE Program.

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
- Uncontaminated pumped ground water
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- Flows from riparian habitats and wetlands
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

Discharges or flows from firefighting activities are allowed under the Permit and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

## 7.0 SANITARY SEWER OVERFLOWS

The Town does not have any known locations where SSOs have discharged to the MS4 within the previous five (5) years. This includes SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. The Town will continue to monitor and identify SSOs. The inventory of all future identified SSOs will include the following information, if available:

- Location (approximate street crossing/address and receiving water, if any);
- A statement of whether the discharge entered a surface water directly or entered the MS4;
- Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
- Estimated volume(s) of the occurrence;
- Description of the occurrence indicating known or suspected cause(s);
- Mitigation and corrective measures completed with dates implemented; and
- Mitigation and corrective measures planned with implementation schedules.

See **Appendix H** for the SSO inventory.

In accordance with Paragraph B.12 of **Appendix B** of the Permit, upon becoming aware of an SSO to the MS4, the Town will provide oral notice to EPA within 24 hours. Additionally, written notice will be provided to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence and will include the information in the updated inventory. The notice will contain all of the information listed in part 2.3.4.4.b. Where common notification requirements for SSOs are included in multiple NPDES permits issued to a Town, a single notification may be made to EPA as directed in the Town's wastewater or combined sewer overflow (CSO) NPDES permit and constitutes compliance with this part.

An updated SSO inventory will be included in annual reporting, including the status of mitigation and corrective measures implemented to address each SSO identified pursuant to this part.

It is understood that the period between detection and elimination of a discharge from the SSO to the MS4 is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by the Permit and remain unlawful until eliminated.

## 8.0 SYSTEM MAPPING

Mapping of the Town's separate storm sewer system is required to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit sanitary sewer discharges. The following information, outlined by phase, is required as described in the Permit:

Phase I: System mapping required within two (2) years of the permit effective date:

- Outfalls and receiving waters (required by MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
- Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of waters report pursuant to Clean Water Act section 303(d) and 305(b)
- Initial catchment delineations developed from available system data and topographic information.

As shown in **Appendix B**, all requirements for Phase 1 except for the initial catchment delineations development have been completed at this time.

Phase II: Information that must be included in the map for all outfalls with ten (10) years of the permit effective date, and updated as information becomes available during implementation of catchment investigations:

- Outfall spatial location (latitude and longitude with a minimum accuracy of  $\pm 30$  feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations based on new information collected during catchment investigations
- Municipal sanitary sewer system

The following information is to be included in the system map as information becomes available:

- Storm sewer material, size (pipe diameter) and age
- Sanitary sewer system material, size (pipe diameter) and age
- Privately-owned stormwater treatment structures
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high-density urban areas
- Area where the Town of Upton's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
- Seasonal high-water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).

The existing system map can be found in **Appendix A**. The Town will update the mapping as necessary to reflect newly discovered information and required corrections or modifications and will report on the progress towards the completion of the system map in each annual report.

## 9.0 OUTFALL AND INTERCONNECTION INVENTORY

The outfall and interconnection inventory identifies each outfall and interconnection discharging from the MS4, including its location and condition based on existing information. The inventory is recorded in the MATRIX, which provides documentation for tracking data, inspections, screenings and other IDDE program activities.

The MATRIX will be updated annually to include data collected in connection with the dry weather screening and other relevant inspections conducted as part of the IDDE program. See **Appendix B** for the MATRIX.

## 10.0 INITIAL RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town investigated, and recorded in the MATRIX found in **Appendix B**, the catchment area characteristics of each outfall and interconnection where information is available. This includes waterbodies with limited water quality that receive a discharge from the MS4 or waters with approved total maximum daily loads (TMDLs), where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Due to the limited number of outfalls and interconnections, the Town decided to screen and sample all known outfalls during dry weather. Based on the contaminants identified while sampling and the information above, the outfalls were classified into one of the following categories.

- Past discharge complaints and reports
- Poor receiving water quality- the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; ammonia levels above 0.5 mg/l; surfactants levels greater than or equal to 0.25 mg/l.
- Density of generating sites- Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
- Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
- Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
- Surrounding density of aging septic systems – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- Culverted streams – any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved total maximum daily loads (TMDLs) applicable to Upton, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Based on the information above, the outfalls were classified into one of the following categories and recorded in the MATRIX:

Problem outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information will be designated as Problem outfalls. This will include any outfalls/interconnections where previous screening indicates likely sewer input. According to the Permit, likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and detectable levels of chlorine

Problem outfalls need not be screened pursuant to part 2.3.4.7.b of the Permit.

High Priority outfalls: Outfalls/interconnections that have not been classified as Problem outfalls and that are:

- discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds;
- determined by the permittee as high priority based on the characteristics listed above or other available information;
- discharging to any waterbody impaired for bacteria or pathogens.

Low Priority outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

Excluded outfalls: Outfalls/interconnections that have no potential for illicit discharges. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

The Outfall Ranking Map, located in **Appendix C**, shows the locations of Problem, High Priority, and Low Priority outfalls.



## 11.0 DRY WEATHER OUTFALL & INTERCONNECT SCREENING & SAMPLING

All outfalls/interconnections (excluding Problem and Excluded outfalls) will be inspected for the presence of dry weather flow and sampled as required within three (3) years of the permit effective date. The Town will screen all High and Low Priority outfalls in accordance with their initial ranking developed as part of the outfall/interconnection inventory and initial ranking.

Dry weather screening and sampling will proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.

The following information is to be recorded and included in the summary report for outfall screening:

- unique identifier,
- receiving water,
- date of most recent inspection,
- dimensions,
- shape,
- material (concrete, PVC),
- spatial location (latitude and longitude with a minimum accuracy of +/-30 feet,
- physical condition,
- indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen).

If an outfall/interconnection is inaccessible or submerged, proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.

If no flow is observed, but evidence of illicit flow exists, the outfall will be revisited during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow.

Where dry weather flow is found at an outfall/interconnection, at least one (1) sample will be collected, and analyzed at a minimum for:

- ammonia,
- chlorine,
- conductivity,
- salinity,
- E. coli (freshwater receiving water) or enterococcus (saline or brackish receiving water),
- surfactants (such as MBAS),
- temperature, and
- pollutants of concern.

When the discharge is directly into a water quality limited water, or a water subject to an approved TMDL as indicated in Appendix F of the MS4 Permit, the sample will be analyzed for the pollutant(s) of concern identified as the cause of the impairment as specified in Appendix G of the MS4 Permit. The receiving waters and pollutants of concern for sampling are identified in **Table 11-1** and on the map in **Appendix C**. The estimated number of outfalls directly discharging to these receiving waters are identified in the NOI and their locations are identified on the map in **Appendix C**.

All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern will be conducted using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.5 mg/L for ammonia and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L or 20 ug/L. Detailed dry weather screening and sampling procedures, methods and forms can be found in **Appendix D**.

All screening and sampling data collected in compliance with this part will be submitted in the Annual Report.

The MATRIX will be updated annually to reprioritize outfalls and interconnections based on information gathered during dry weather screening and sampling. Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or where sampling results indicate sewer input will be considered highly likely to contain illicit discharges from sanitary sources, and ranking of such outfalls/interconnections will be updated to the top of the High Priority outfalls category for investigation.

Table 11-1 MS4 Area Receiving Waters and Pollutants of Concern for Sampling

NAME	CATEGORY	SEGMENT ID	WATERSHED	IMPAIRMENT CAUSE (EPA TMDL NO.)	MONITORING PARAMETERS FOR ANALYSIS (NMR = No Monitoring Requirement)
West River	5	MA51-11	Blackstone	Non-Native Aquatic Plants	NMR
				pH, Low	pH
West River	5	MA51-12	Blackstone	Aquatic Plants (Macrophytes)	NMR
				<b>Cadmium</b>	Cadmium, Total
				<b>Chloride</b>	Chloride
				<b>Copper</b>	Copper, Total
				<b>Lead</b>	Lead, Total
				Non-Native Aquatic Plants	NMR
				Nutrient/Eutrophication Biological Indicators	Total Phosphorous (freshwater)
				pH, Low	pH
Mill River	5	MA51-35	Blackstone	Aquatic Plants (Macrophytes)	NMR
				Non-Native Aquatic Plants	NMR
				Other (Unspecified Metals)	NMR
				PCB in Fish Tissue	NMR
Mill Pond	4C	MA51104	Blackstone	Non-Native Aquatic Plants	NMR
Taft Pond	4C	MA51165	Blackstone	Non-Native Aquatic Plants	NMR
Pratt Pond	4C	MA51123	Blackstone	Non-Native Aquatic Plants	NMR
North Pond	4C	MA51112	Blackstone	Non-Native Aquatic Plants	NMR

Source: Massachusetts Year 2016 Integrated List of Waters (<https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-g-2016-ma-sms4-gp.pdf>)

NOTE: Table Based on the proposed Massachusetts Year 2016 Integrated List of Waters with exceptions/clarifications where 2014 Integrated List of Waters (ILW) are more stringent as noted below.

NOTE: Certain Pollutants (in BOLD) result in Total Maximum Daily Load (TMDL) or Water Quality Limited Water Bodies (WQLW) requirements defined in Appendix H & F of the Permit.

Table 11-1 MS4 Area Receiving Waters and Pollutants of Concern for Sampling (Continued)

NAME	CATEGORY	SEGMENT ID	WATERSHED	IMPAIRMENT CAUSE (EPA TMDL NO.)	MONITORING PARAMETERS FOR ANALYSIS (N/A = Not Applicable)
Blackstone River	5	MA51-05	Blackstone	Phosphorus (Total)	Total Phosphorus (fresh water)
				Other flow regime alterations	N/A
				Aquatic Plants (Macrophytes)	N/A
				Non-Native Aquatic Plants	N/A
				Aquatic Macroinvertebrate Bioassessments	N/A
				<b>Cadmium</b>	N/A
				<b>Copper</b>	N/A
				<b>Escherichia coli</b>	N/A
				Excess Algal Growth	N/A
				Lead	N/A
				Nutrient/Eutrophication Biological Indicators	N/A
				Polychlorinated biphenyls	N/A
				Taste and Odor	N/A
				<b>Total Suspended Solids (TSS)</b>	N/A
				<b>Turbidity</b>	N/A

Source: Massachusetts Year 2016 Integrated List of Waters (<https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-g-2016-ma-sms4-gp.pdf>)

NOTE: Blackstone River is outside of Upton, but Upton is a tributary for the Blackstone River. According to the MA MS4 General Permit (2.2.2.b), Upton is on the list that states the permittee must comply with the provisions in Appendix H applicable to it. Therefore, it is important to note the Phosphorus in the Blackstone River.

NOTE: Table Based on the proposed Massachusetts Year 2016 Integrated List of Waters with exceptions/clarifications where 2014 Integrated List of Waters (ILW) are more stringent as noted below.

NOTE: Certain Pollutants (in BOLD) result in Total Maximum Daily Load (TMDL) or Water Quality Limited Water Bodies (WQLW) requirements defined in Appendix H & F of the Permit.

## 12.0 CATCHMENT INVESTIGATIONS

The Permit requires that each catchment associated with an outfall or interconnection of the Town's MS4 be investigated for potential illicit discharges. This section outlines a systematic procedure to prioritize and conduct outfall catchment investigations and to trace the source of potential illicit discharges. The procedures include the following steps as outlined in the Permit and described in this section:

1. **Identify maps, historic plans and records, and other sources of data:** to be used in identifying system vulnerability factors within each catchment.
2. **Manhole inspection methodology:** methodology for performing storm drain network investigation by systematically and progressively observing, sampling, and evaluating all key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs, even where no evidence of an illicit discharge is observed at the outfall. Methodology includes procedures for dry and wet weather investigations
3. **Procedures that will isolate and confirm sources of illicit discharge:** to be applied where investigations or physical evidence or screening has identified that the MS4 is influenced by illicit discharges or SSOs and the location of potential contaminate sources needs to be refined. Implementation of more detailed investigations and inspection of manholes for source isolation and confirmation procedures will be followed as described in **Section 14**.

All data collected as part of the catchment investigation will be recorded using the catchment investigation summary report form in **Appendix E** and reported in each annual report and used to update the system mapping and MATRIX.

### 12.1 System Vulnerability Factors (SVFs)

Begin by identifying maps, historic plans, and records and other sources of data including (but not limited to) plans related to construction of the storm drain and of sanitary sewers, prior work performed on the storm drains and sanitary sewers, board of health or other municipal data on septic system failures or required upgrades, and compliant records related to SSOs, sanitary sewer surcharges, and septic system breakouts. Continue by reviewing relevant mapping and system vulnerability factors previously identified for the catchment. Look for any new information that may be available including Board of Health records on septic systems, plans related to recent construction of storm and sanitary sewer infrastructure, and complaint records related to SSOs. Use this information to identify areas within the catchment with higher potential for illicit connections. The presence of any of the following specific System Vulnerability Factors (SVFs) is to be recorded in the MATRIX:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages;
- Common or twin-invert manholes serving storm and sanitary sewer alignments;
- Common trench construction serving both storm and sanitary sewer alignments;
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system;
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints;
- Areas formerly served by combined sewer systems;
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

If available, the following information may also be included in the evaluation of SVFs:

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs;
- Any sanitary sewer and storm drain infrastructure greater than 40 years old;
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);

Catchments with a minimum of one (1) System Vulnerability Factor are subject to wet weather sampling requirements described in **Section 12.3**.

## 12.2 Dry Weather Key Junction Manhole Inspections

Field crews are to systematically inspect all key junction manholes and gather catchment information of the location of MS4 pipes, manholes and the extent of the contributing catchment. Begin at the first key junction upgradient of the outlet/interconnection or previously investigated key junction and work progressively upstream inspecting and sampling at manholes in the storm drain network to isolate the illicit discharge source as follows:

- During dry weather, key junction manholes will be opened and inspected systematically for visual and olfactory evidence of illicit connections (e.g., excrement, toilet paper, gray filamentous bacterial growth, or sanitary products present).
- If flow is observed, the Town will sample the flow at a minimum for ammonia, chlorine and surfactants using field kits for these analyses.
- Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream investigation.

Key junction and subsequent manhole investigations will proceed, repeating the inspection and sampling of upstream key junction manholes until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes. Source isolation and confirmation procedures will then be followed as described in **Section 14**. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

Where catchments do not contain junction manholes, the dry weather screening and sampling will be considered as meeting the manhole inspection requirement and source isolation and confirmation procedures will be followed as described in **Section 14**.

For most catchments, manhole inspections will proceed from the outfall moving up into the system as described. However, depending on the nature of the drainage system, it may be more efficient to move from upstream down, particularly if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. In either case, once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

### 12.3 Wet Weather Investigation

After meeting the requirements for dry weather investigation, catchments with a minimum of one (1) System Vulnerability Factor will also be inspected and sampled under wet weather conditions to the extent necessary to determine whether wet-weather induced high flows in the sanitary sewers or high groundwater in areas of septic systems result in discharge of sanitary flow to the MS4. Wet weather outfall sampling will be conducted as follows:

- At least one wet weather screening and sampling will be conducted at the outfall with the same parameters required during dry weather screening.
- Wet weather sampling and screening will proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. Every effort should be made to sample during the spring (March through June) when groundwater levels are relatively high.
- The Permit does not require a minimum rainfall event prior to wet weather screening; however, the rainfall event must result in enough depth or intensity to produce a stormwater discharge at the outfall. Sampling should be avoided during the initial period of discharge (“first flush”).

If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 14**. If wet weather outfall sampling does not identify evidence of illicit discharges, then the wet weather investigation is complete.

### 12.4 Marking the Catchment Investigation Complete

If all key junction manholes have been inspected (or, if no key junction manholes are present, junction manholes, or, if no junction manholes are present, the outfall) and found to be free of dry weather flow or illicit discharge indicators, and any required wet weather outfall screening and catchment investigation has been completed, the investigation of that catchment is marked complete.

If sources of illicit discharge or SSO are found in a catchment, the investigation may be marked complete once the sources of the discharge have been isolated and confirmed as described above. In such cases the catchment may be marked “inspection complete, awaiting repair.” Once repairs are finished, further catchment investigation will be scheduled to confirm that all sources of discharge have been eliminated.

If all required manhole inspections are clean but the outfall inspection still shows evidence of illicit discharge, the catchment may be marked “inspection complete, results inconclusive” and the Town will schedule further catchment investigation and/or outfall screening until such time as the source of illicit discharge has been identified, or the catchment has been confirmed to be free of illicit discharges.

### 12.5 Timeline

Investigations of catchments associated with Problem outfalls, and where any information gathered on the outfall/interconnection identifies sewer input, will begin by the end of Year 2 (June 30, 2020) and will be completed by the end of Year 7 (June 30, 2025). Investigations of catchments associated with High and Low Priority outfalls will follow the ranking of outfalls and will be completed by Year 10 (June 30, 2028). In general, catchment investigations will be performed in the order that the team leader believes is likely to lead to the most rapid identification and elimination of problem discharges to the MS4 and/or local waterways, and the team leader retains the discretion to adjust the prioritization as needed to accomplish that goal.



### Citizen Call in Reports

The Town of Upton will provide opportunity to report suspected illicit discharges through their stormwater website, email, phone and by office visit. When a report is received about a suspected illicit discharge, an Illicit Discharge Incident Tracking Form as found in **Appendix G** shall be used to document appropriate information.

Potential illicit discharges reported by citizens should be reviewed on an annual basis to locate patterns of illicit discharges, identify high-priority catchments, and evaluate the call-in inspection program.

## 13.0 IDENTIFICATION/CONFIRMATION OF ILLICIT SOURCE

Where the source of an illicit discharge has been reported and/or delimited between two manholes, more detailed investigation techniques will be used to isolate and confirm the source. Based on the site conditions, one or more of the following techniques may be used:

**SANDBAGGING** is a technique that can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours and **should only be installed when dry weather is forecast**. If flow has collected behind the sandbags/barriers after 48 hours, it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

**DYE TESTING** is used to confirm a suspected illicit connection to a storm drain system. Prior to testing, permission to access the site should be obtained. Dye is discharged into the suspected fixture, and nearby storm drain structures and sanitary sewer manholes observed for presence of the dye. Each fixture, such as sinks, toilets, and sump pumps, should be tested separately. A third-party contractor may be required to perform this testing activity.

**SMOKE TESTING** can be used to locate the source of illicit discharges when there is no obvious potential source. Smoke testing is an appropriate tracing technique for short sections of pipe and for pipes with small diameters. Smoke added to the storm drain system will emerge in connected locations. A third-party contractor may be required to perform this testing activity.

**CLOSED CIRCUIT TELEVISION INSPECTION (CCTV)** can be used to locate illicit connections and infiltration from sanitary sewers. In CCTV, cameras are used to record the interior of the storm drain pipes. They can be manually pushed with a stiff cable or guided remotely on treads or wheels. A third-party contractor may be required to perform this testing activity.

## 14.0 ILLICIT DISCHARGE REMOVAL

When the specific source of an illicit discharge is identified, the Town will exercise its authority as necessary to require its removal pursuant to part 2.3.4.2 or 2.3.4.3 of the Permit.

For each confirmed source, annual reporting will include the following information:

- the location of the discharge and its source(s);
- a description of the discharge;
- the method of discovery;
- date of discovery;
- date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal; and
- estimate of the volume of flow removed.

Within one year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

## 15.0 INDICATORS OF IDDE PROGRAM PROGRESS

The Town of Upton will define or describe indicators for tracking program success and evaluate and report on the overall effectiveness of the IDDE program in each annual report. At a minimum the Town will document in each annual report:

- The MATRIX, updated annually with data collected as part of catchment investigations
- All dry and wet weather screening and sampling results
- Reports on actions taken, SSOs and illicit connection identified and removed, and the estimated volume of sewage removed
- The number and percent of total Town-owned MS4 catchment areas evaluated using the IDDE program procedures
- Training records for frequency and type of employee training

## 16.0 ONGOING SCREENING

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be reprioritized and scheduled for ongoing screening once every five years. Ongoing screening will consist of dry weather screening and sampling consistent with **Section 11** of this report; wet weather screening and sampling will also be required at outfalls where wet weather screening was required due to SVFs as outlined in **Section 12.3** of this report.

## 17.0 TRAINING

The Town will, at a minimum, annually provide training to employees involved in the IDDE program about the program, including how to recognize and report illicit discharges and SSOs. See **Appendix F** for the IDDE Employee Training Record

## 18.0 RECORDS AND REPORTING

The progress and effectiveness of the IDDE program will be evaluated and reported on in each annual report. Indicators and documentation for tracking the program success are identified in **Section 16**. The success of the IDDE program will be measured by the IDDE activities completed within the required Permit timelines.

# APPENDIX A

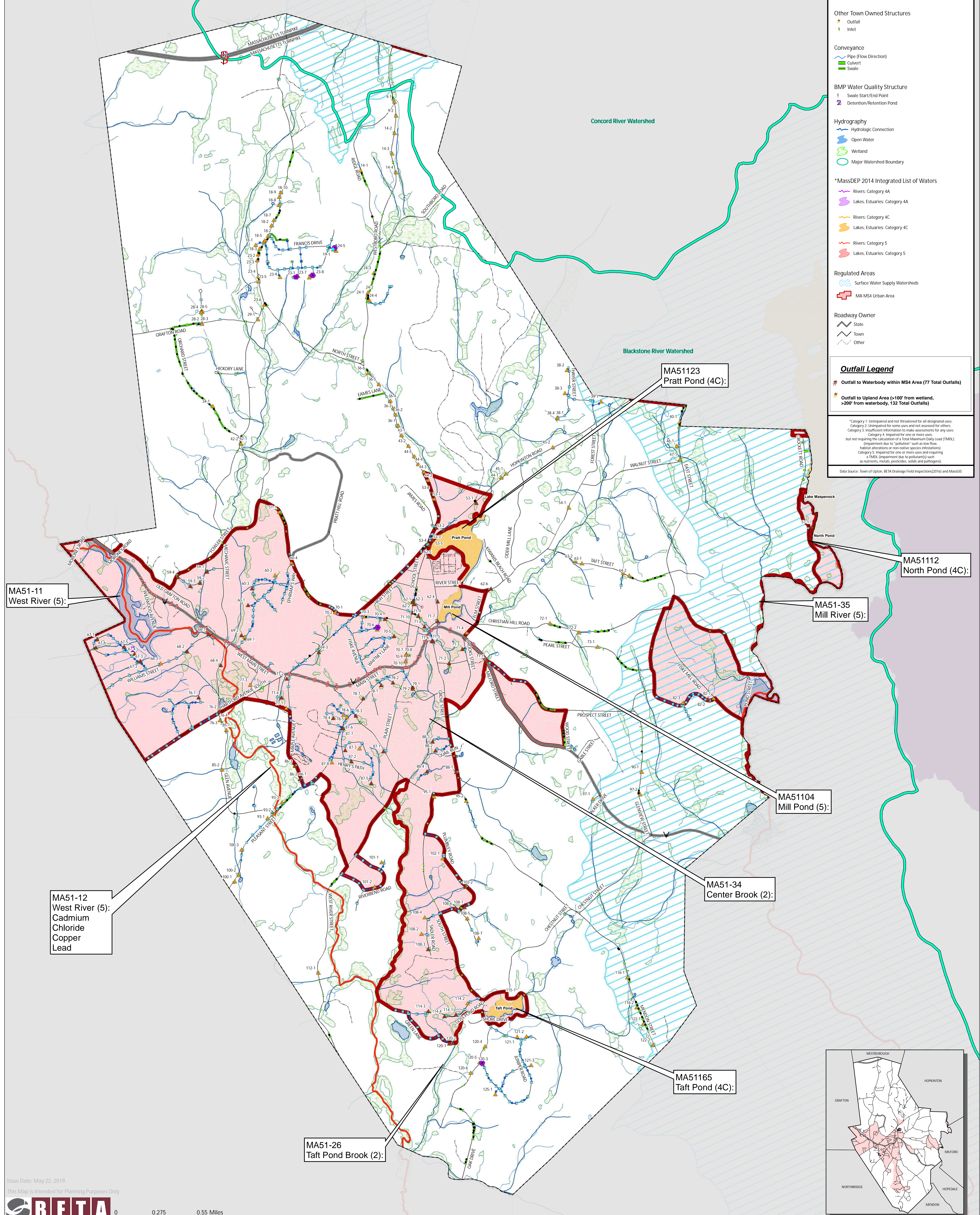
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- Storm Sewer System Map



# Town of Upton, Massachusetts

## Storm Sewer System Map



**Map Legend**

**Catch Basin Owner**

- Town
- State

**Manhole Owner**

- Town
- State

**Other Town Owned Structures**

- Outfall
- Inlet

**Conveyance**

- Pipe (Flow Direction)
- Culvert
- Swale

**BMP Water Quality Structure**

- Swale Start/End Point
- Detention/Retention Pond

**Hydrography**

- Hydrologic Connection
- Open Water
- Wetland
- Major Watershed Boundary

**\*MassDEP 2014 Integrated List of Waters**

- Rivers: Category 4A
- Lakes, Estuaries: Category 4A
- Rivers: Category 4C
- Lakes, Estuaries: Category 4C
- Rivers: Category 5
- Lakes, Estuaries: Category 5

**Regulated Areas**

- Surface Water Supply Watersheds
- MA MS4 Urban Area

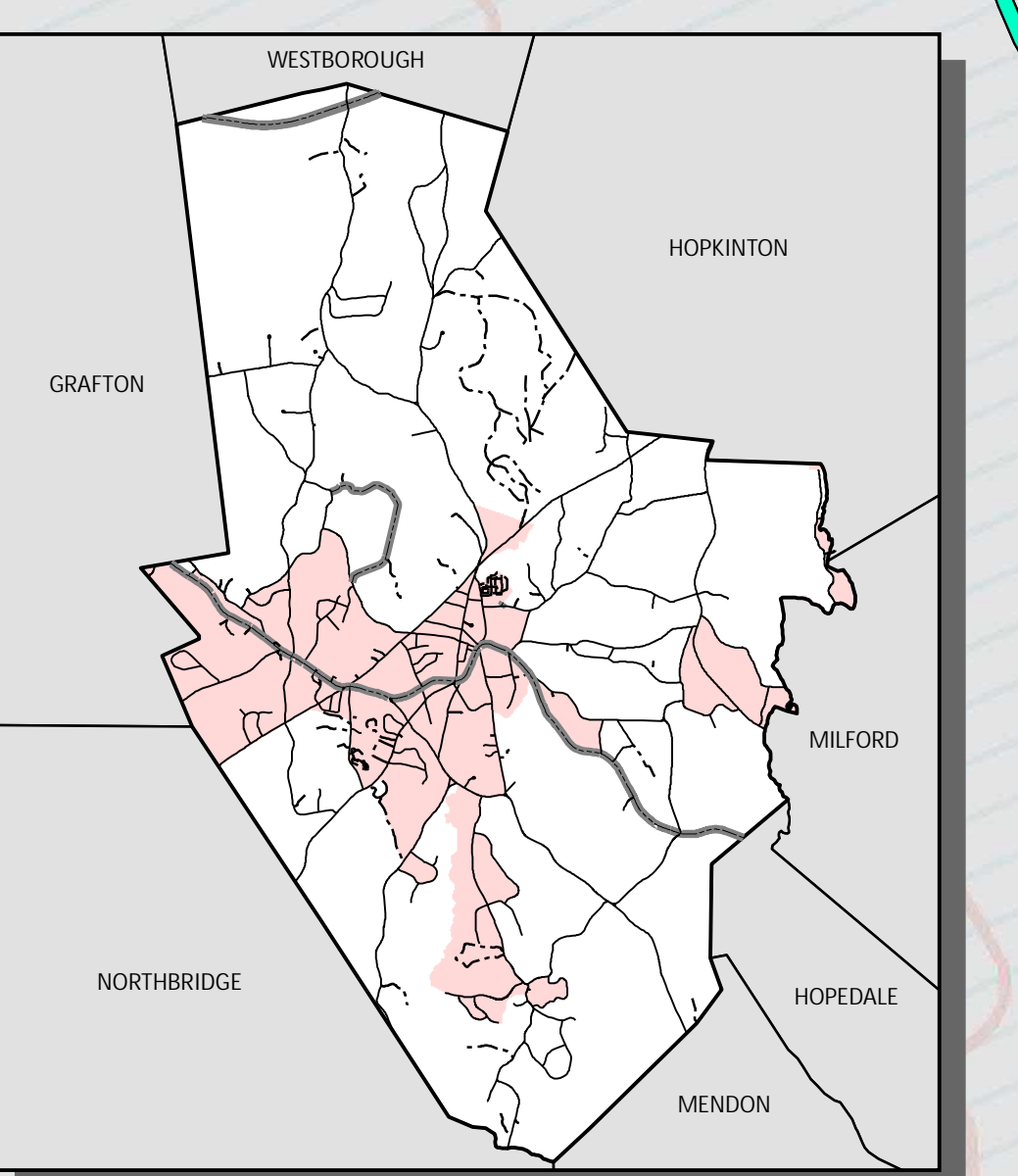
**Roadway Owner**

- State
- Town
- Other

**Outfall Legend**

- Outfall to Waterbody within MS4 Area (77 Total Outfalls)
- Outfall to Upland Area (>100' from wetland, >200' from waterbody, 132 Total Outfalls)

\*Category 1: Unimpaired and not threatened for all designated uses.  
Category 2: Unimpaired for some uses and not assessed for others.  
Category 3: Insufficient information to make assessments for any uses.  
Category 4: Impaired for one or more uses, but not requiring the calculation of a Total Maximum Daily Load (TMDL). (Impairment due to "pollution" such as low flow, habitat alterations or non-native species infestations).  
Category 5: Impaired for one or more uses and requiring a TMDL (Impairment due to pollutant(s) such as nutrients, metals, pesticides, solids and pathogens).  
Data Source: Town of Upton, BETA Drainage Field Inspections(2016) and MassGIS





## APPENDIX B

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- MS4 Outfall and Interconnection Inventory and Priority Ranking Matrix

Appendix B:  
MS4 Outfall and Interconnection Inventory and Priority Ranking Matrix

Outfall Info			Category (Problem, High, Low, Excluded)	Known or suspected illicit discharge <sup>1</sup>	(Yes=Y, No=N)	Comment
Outfall ID	Stream Segment	Waterbody Name			Dry Weather Flow Present? <sup>2</sup>	
OF-78-3	MA51-12	West River	Problem	Yes	Y	0.08 mg/L for Chlorine; 1800 CFU/100mL for E.Coli
OF-60-1	MA51-11	West River	Problem	Yes	Y	0.30 mg/L of Surfactants
OF-53-4	MA51123	Pratt Pond	High	No	Y	Sampled from MH 53.3
OF-60-3	MA51-11	West River	Low	No	Y	
OF-70-5	MA51104	Mill Pond	Low	No	Y	
OF-71-6	MA51104	Mill Pond	Low	No	Y	
OF-77-2	MA51-11	West River	Low	No	Y	
OF-77-4	MA51-11	West River	Low	No	Y	
OF-78-1	MA51104	Mill Pond	Low	No	Y	Sampled from MH 78-28
OF-78-2	MA51104	Mill Pond	Low	No	Y	
OF-82-2	MA51-35	Mill River	High	No	Y	
OF-102-2	MA51-12	West River	Low	No	N	
OF-108-1	MA51-12	West River	Low	No	N	
OF-108-3	MA51-12	West River	Low	No	N	
OF-108-6	MA51-12	West River	Low	No	N	
OF-114-1	MA51165	Taft Pond	Low	No	N	
OF-114-3	MA51165	Taft Pond	Low	No	N	
OF-114-4	MA51165	Taft Pond	Low	No	N	
OF-115-1	MA51165	Taft Pond	High	No	N	
OF-120-1	MA51165	Taft Pond	Low	No	N	
OF-120-2	MA51165	Taft Pond	Low	No	N	
OF-53-1	MA51123	Pratt Pond	Low	No	N	
OF-53-2	MA51123	Pratt Pond	Low	No	N	
OF-53-3	MA51123	Pratt Pond	High	No	N	
OF-53-5	MA51123	Pratt Pond	High	No	N	
OF-53-6	MA51123	Pratt Pond	Low	No	N	
OF-53-8	MA51123	Pratt Pond	Low	No	N	
OF-57-1	MA51112	North Pond	High	No	N	
OF-59-1	MA51-11	West River	Low	No	N	
OF-59-2	MA51-11	West River	Low	No	N	
OF-59-3	MA51-11	West River	Low	No	N	
OF-59-4	MA51-11	West River	Low	No	N	
OF-60-3	MA51-11	West River	Low	No	N	

<sup>1</sup> Outfall screening indicated olfactory or visual evidence of sewage (sulfur odor, color, staining, suds)

<sup>2</sup> Based on 2018 outfall screening

Note: The outfalls highlighted in grey had flow during dry weather (<0.01" of precipitation in the previous 24 hours) in 2018 and were screened and sampled.

Problem Outfalls - Known or suspected contributions of illicit discharges based on existing information including outfalls where screening indicates likely sewer input.

High Priority Outfalls - Outfalls not classified as problem and that are discharging to an area of concern to public health due to proximity or public beaches, recreational areas, drinking water supplies or shellfish beds or based on ranking criteria

Low Priority Outfalls - Outfalls determined as low priority based on ranking criteria

Appendix B:  
MS4 Outfall and Interconnection Inventory and Priority Ranking Matrix

Outfall Info			Category (Problem, High, Low, Excluded)	Known or suspected illicit discharge <sup>1</sup>	(Yes=Y, No=N)	Comment
Outfall ID	Stream Segment	Waterbody Name			Dry Weather Flow Present? <sup>2</sup>	
OF-62-1	MA51104	Mill Pond	Low	No	N	
OF-62-2	MA51104	Mill Pond	Low	No	N	
OF-62-3	MA51104	Mill Pond	Low	No	N	
OF-62-4	MA51104	Mill Pond	Low	No	N	
OF-62-5	MA51123	Pratt Pond	High	No	N	
OF-62-6	MA51123	Pratt Pond	Low	No	N	
OF-67-1	MA51-11	West River	Low	No	N	
OF-67-2	MA51-11	West River	Low	No	N	
OF-67-3	MA51-11	West River	Low	No	N	
OF-67-4	MA51-11	West River	Low	No	N	
OF-67-5	MA51-11	West River	Low	No	N	
OF-67-6	MA51-11	West River	Low	No	N	
OF-68-1	MA51-11	West River	Low	No	N	
OF-68-2	MA51-11	West River	Low	No	N	
OF-68-4	MA51-11	West River	Low	No	N	
OF-69-2	MA51-11	West River	Low	No	N	
OF-69-3	MA51-11	West River	Low	No	N	
OF-70-4	MA51104	Mill Pond	Low	No	N	
OF-71-1	MA51104	Mill Pond	Low	No	N	
OF-71-10	MA51104	Mill Pond	Low	No	N	
OF-71-2	MA51104	Mill Pond	Low	No	N	
OF-71-3	MA51104	Mill Pond	Low	No	N	
OF-71-5	MA51104	Mill Pond	Low	No	N	
OF-71-7	MA51104	Mill Pond	Low	No	N	
OF-71-8	MA51104	Mill Pond	Low	No	N	
OF-71-9	MA51104	Mill Pond	Low	No	N	
OF-76-1	MA51-11	West River	Low	No	N	
OF-76-2	MA51-11	West River	Low	No	N	
OF-78-4	MA51-12	West River	Low	No	N	
OF-78-7	MA51-12	West River	Low	No	N	
OF-79-1	MA51104	Mill Pond	Low	No	N	
OF-79-2	MA51104	Mill Pond	Low	No	N	
OF-86-1	MA51-12	West River	Low	No	N	
OF-86-2	MA51-12	West River	Low	No	N	
OF-86-3	MA51-12	West River	Low	No	N	

<sup>1</sup> Outfall screening indicated olfactory or visual evidence of sewage (sulfur odor, color, staining, suds)

<sup>2</sup> Based on 2018 outfall screening

Problem Outfalls - Known or suspected contributions of illicit discharges based on existing information including outfalls where screening indicates likely sewer input.

High Priority Outfalls - Outfalls not classified as problem and that are discharging to an area of concern to public health due to proximity or public beaches, recreational areas, drinking water supplies or shellfish beds or based on ranking criteria

Low Priority Outfalls - Outfalls determined as low priority based on ranking criteria





Appendix B:  
MS4 Outfall and Interconnection Inventory and Priority Ranking Matrix

Outfall Info			Category (Problem, High, Low, Excluded)	Known or suspected illicit discharge <sup>1</sup>	(Yes=Y, No=N)	Comment
Outfall ID	Stream Segment	Waterbody Name			Dry Weather Flow Present? <sup>2</sup>	
OF-87-1	MA51-12	West River	Low	No	N	
OF-87-2	MA51-12	West River	Low	No	N	
OF-87-4	MA51-12	West River	Low	No	N	
OF-87-5	MA51104	Mill Pond	Low	No	N	
OF-87-6	MA51-12	West River	Low	No	N	
OF-87-7	MA51-12	West River	Low	No	N	
OF-88-1	MA51104	Mill Pond	Low	No	N	
OF-88-3	MA51104	Mill Pond	Low	No	N	
OF-88-4	MA51104	Mill Pond	Low	No	N	

<sup>1</sup> Outfall screening indicated olfactory or visual evidence of sewage (sulfur odor, color, staining, suds)

<sup>2</sup> Based on 2018 outfall screening

Problem Outfalls - Known or suspected contributions of illicit discharges based on existing information including outfalls where screening indicates likely sewer input.

High Priority Outfalls - Outfalls not classified as problem and that are discharging to an area of concern to public health due to proximity or public beaches, recreational areas, drinking water supplies or shellfish beds or based on ranking criteria

Low Priority Outfalls - Outfalls determined as low priority based on ranking criteria

## APPENDIX C

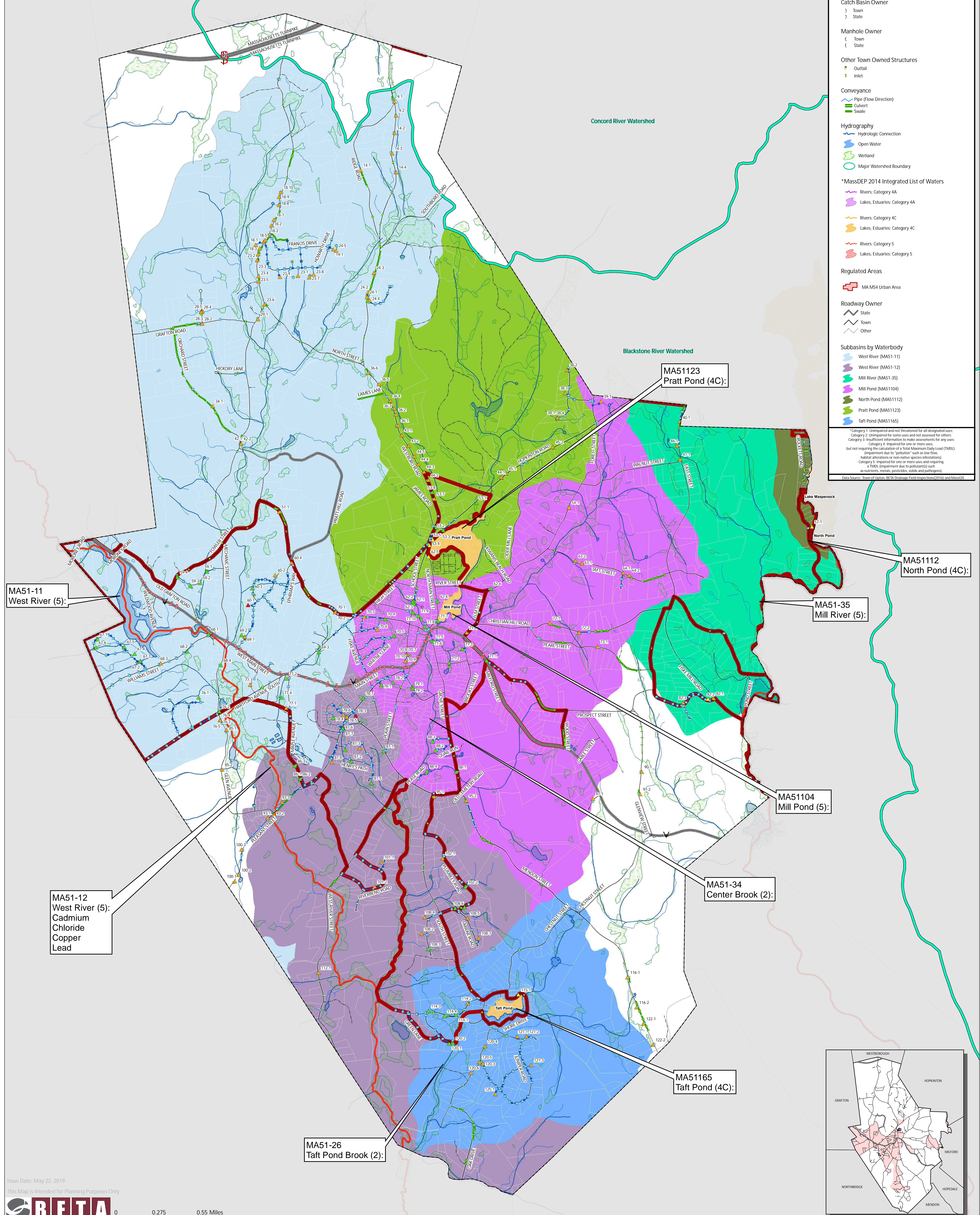
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- Outfall Ranking Map



# Town of Upton, Massachusetts

## Outfall Ranking Map



### Map Legend

**Outfall Ranking Category**

- Problem
- High Priority
- Low Priority
- Non MS4 Outfalls
- Ditch

**Catch Basin Owner**

- Town
- State

**Manhole Owner**

- Town
- State

**Other Town Owned Structures**

- Outfall
- Inlet

**Conveyance**

- Pipe (Flow Direction)
- Culvert
- Swale

**Hydrography**

- Hydrologic Connection
- Open Water
- Wetland
- Major Watershed Boundary

**\*MassDEP 2014 Integrated List of Waters**

- Rivers: Category 4A
- Lakes, Estuaries: Category 4A
- Rivers: Category 4C
- Lakes, Estuaries: Category 4C
- Rivers: Category 5
- Lakes, Estuaries: Category 5

**Regulated Areas**

- MA MS4 Urban Area

**Roadway Owner**

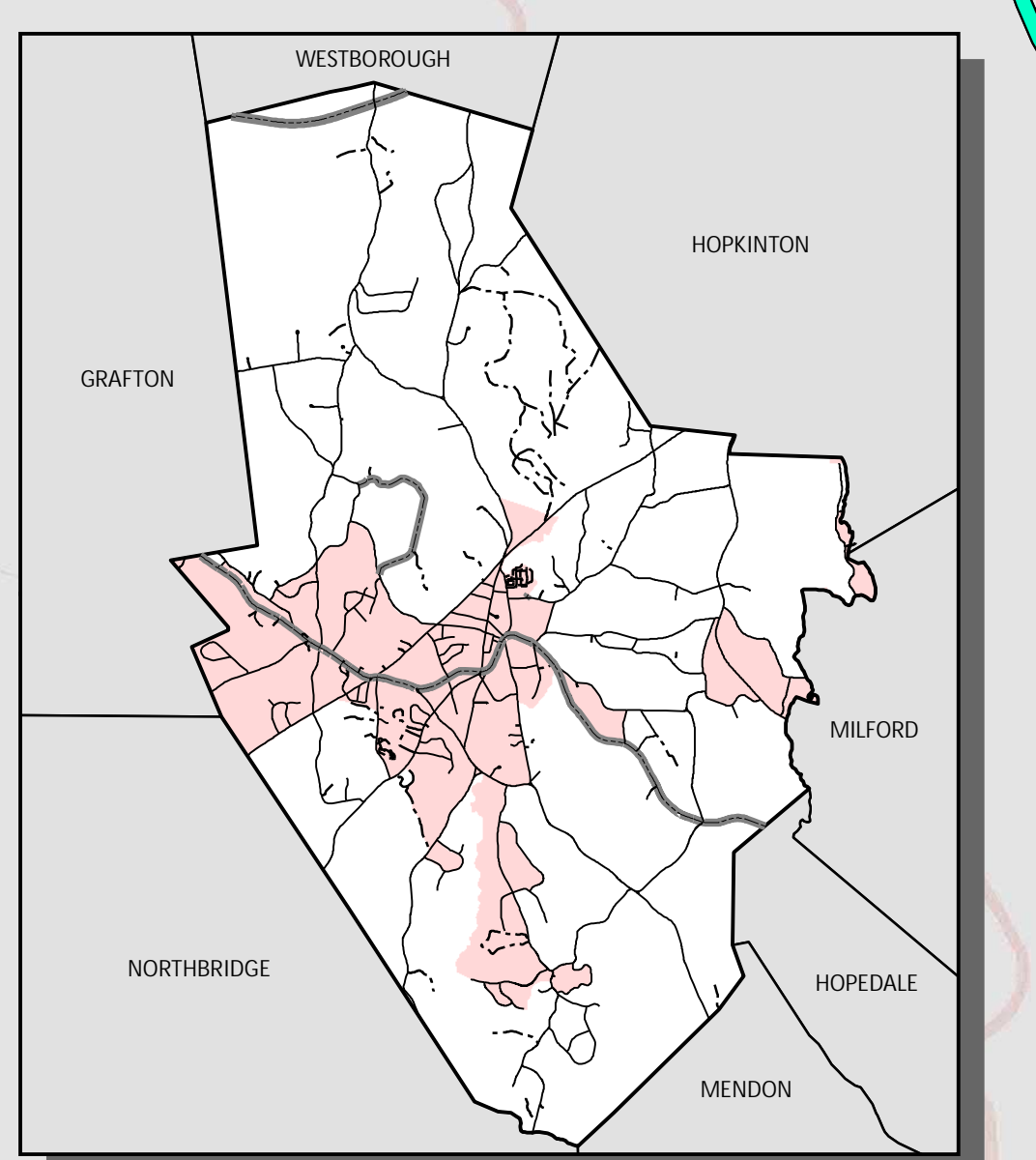
- State
- Town
- Other

**Subbasins by Waterbody**

- West River (MA51-11)
- West River (MA51-12)
- Mill River (MA51-35)
- Mill Pond (MA51104)
- North Pond (MA51112)
- Pratt Pond (MA51123)
- Taft Pond (MA51165)

\*Category 1: Unimpaired and not threatened for all designated uses.  
Category 2: Unimpaired for some uses and not assessed for others.  
Category 3: Insufficient information to make assessments for any uses.  
Category 4: Impaired for one or more uses, but not requiring the calculation of a Total Maximum Daily Load (TMDL).  
Category 5: Impaired for one or more uses and requiring a TMDL (impairment due to pollutants such as nutrients, metals, pesticides, solids and pathogens).

Data Source: Town of Upton, BETA Drainage Field Inspectors (2016) and MassGIS





## APPENDIX D

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- Screening/Sampling Standard Operating Procedures and Forms

## SAMPLING SPECIFICATIONS STANDARD OPERATING PROCEDURES AND FORMS

### 1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) was prepared for the collection of stormwater sampling as required by the Massachusetts MS4 General Permit. The SOP outlines procedures to:

- Collect field water quality measurements
- Screen for the presence of ammonia, surfactants and residual chlorine using field test kits; and
- Collect samples for laboratory analysis for E. coli or enterococcus along with identified pollutants of concern for that catchment. Per the MS4 permit, the pollutant of concern is identified as the compound causing the impairment and shall be sampled for the requirements outlined in Appendix G of the permit.

### 2.0 OUTFALL SAMPLING REQUIREMENTS

Dry weather flow shall be sampled for the parameters summarized in **Table 1** along with pollutant of concern.

### 3.0 EQUIPMENT INSPECTION, MAINTENANCE, AND CALIBRATION

- The field test kit reagents have expiration dates (the surfactant test kit has the shortest expiration date (5 months)). One month prior to initiating a sampling program check all expiration dates and order as needed. Dispose of expired test kits per manufacturer instruction.
- Prior to each sampling event, each of the test kits will be inspected to ensure the availability of testing materials (Hach strips, reagents, etc.).
- Instructions for each test kit is attached. A laminated version of the test kit instructions has been made and should be used in the field.
- Calibration of the YSI 556 Multiparameter System unit (YSI) is completed by the rental company (US Environmental). Calibration checks on the YSI meters and colorimeter will be performed by the Field Team prior to each sampling event with the equipment being re-adjusted as needed in accordance to manufacturer's instructions.

### 4.0 MSDS SHEETS AND WASTE MANAGEMENT

A material safety data sheet (MSDS) for each of the field test kits is attached. Active ingredients for each field test kit is listed below, however, the MSDS should be reviewed for hazards, proper personal protective equipment (PPE) and waste management as part of the training to use these test kits.

**Chemetrics K-9400 Surfactant Screening kit:** Reagents include chloroform, sodium phosphate, sulfuric acid and methylene blue

**Hach NI-SA ammonia test kit:** Reagents contain 3-7% sodium hydroxide

**Hach CN-80 total and residual chlorine test kit:** Reagents include sodium phosphate, potassium iodide, DPD salt, glycine and disodium EDTA.

During field testing, reagent waste will be placed in a 1-liter amber jar labeled "Waste" and brought back to the office for disposal.



Table 1: Monitoring and Sampling Parameters and Methods

Analysis	Monitoring Parameter	EPA or approved Method No.	Field Test Kit	Field Instr.	Lab	Req'd MDL	Field Instrument	Range	Laboratory Glassware	Preservation	Holding Time
Ammonia	Ammonia - Nitrogen	350.1	X			0.5 mg/L	Hach NI-SA (fresh or saltwater) or Hach test strips (freshwater only)	0-2.5 mg/l	125-250 mL plastic	Ice	Instant
(un-ionized)											
Chlorine	-	-	X			0.02 mg/L	Hach CN 80	0-10 mg/l	125-250 mL plastic	Ice	Instant
Conductivity	-	-		X		0.2 mS/cm	YSI 556		500 mL plastic	Ice	Instant
Salinity	Specific Conductance	120.1		X		-	YSI 556		500 mL plastic	Ice	Instant
Escherichia coli	E. coli	1103.1; 1603; Colilert® 12 16, Colilert-18® 12 15 16;			X	4 cfu or mpn	-		125-250 mL sterile plastic	Ice	6 hours
	(fresh water)	mColiBlue-24® 17									to Lab
	Enterococcus (Marine water)	1106.1; 1600; Enterolert® 12 22			X	4 cfu or mpn	-		125-250 mL sterile plastic	Ice	6 hours to Lab
Surfactant-MBAS	MBAS		X			0.25 mg/L	Chemetrics K*9400	0-3 mg/l	125-250 mL plastic	Ice	Instant
pH	pH	150.2		X		-	YSI 556	-			Instant
Temp. water	NMR	--		X		0-40 C	YSI 556	-			Instant
*Fecal Coliform	Fecal Coliform	1680; 1681			X	1 cfu	-	-	4oz sterile cup	Ice	8 hours to Lab
*Phosphorus	Phosphorus, Total	365.1; 365.2; 365.3; SM 4500-P-E			X	10 ug/L	-	-	125-250 mL plastic	H2SO4 (pH <2) + Ice	28 Days
*TSS	Total Suspended Solids	160.2, 180.1			X	-	-	-		Ice	
Cadmium	Cadmium, Total	200.7; 200.8; 200.9			X	0.005 mg/kg	-	-	250 mL plastic	Ice	6 months
Copper	Copper, Total	200.7; 200.8; 200.9			X	0.02 mg/kg	-	-	250 mL plastic	Ice	6 months
Lead	Lead, Total	200.7; 200.8; 200.9			X	0.005 mg/kg	-	-	250 mL plastic	Ice	6 months

Sampling requirements in accordance with §2.3.4.7.b.iii.4 of Massachusetts MS4 Permit

MDL = minimum detection limit

NMR = no monitoring required





## 5.0 FIELD MEASUREMENT PROCEDURE

- Whenever possible, the field measurements will be taken at the center of the discharge flow, at half of the depth and upstream of the sample collector. For the YSI meter, care will be taken not to allow the probe to contact any accumulated sediment.
- The sample collection point, collection conditions, and accessibility will be noted on the field data sheet.
- Equipment will be cleaned following each sampling location.

## 6.0 SAMPLE COLLECTION PROCEDURES

Procedures for collecting a grab sample are summarized below:

- Do not eat or drink during sample collection and processing.
- Do not collect or process samples near a running vehicle.
- Always wear clean, powder-free nitrile gloves when handling sample containers and lids.
- Depending on the analysis, preservatives (e.g. sulfuric acid, hydrochloric acid) are added to some sample containers by the lab. Never touch the inside surface of a sample container or lid, even with gloved hands. Do not dump out the preservative or overfill the sample containers.
- Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
- Label the sample with the time and sample ID.

## 7.0 ANALYTICAL METHODS AND HOLDING TIMES

Check holding times for the requested analytical. Note that the lab needs sufficient time to extract and process the sample. Due to short holding time the lab needs any samples that are to be analyzed for E. coli, fecal coliform, or enterococcus within 6 hours of collection. Record the time that the bacteria samples were collected. A summary of the laboratory holding times is provided in **Table 1**.

## 8.0 DATA EVALUATION

Evaluation of the data should include a review for potential positive results due to sources other than human wastewater, and for false negative results due to chemical action or interferences.

As described in the EPA New England Bacterial Source Tracking Protocol:

- “In the EPA-NE region, field sampling has indicated that the biological breakdown of organic material in historically filled tidal wetlands may cause elevated ammonia readings, as can the discharge from many landfills.
- Salinity levels greater than 1 part per thousand may cause elevated surfactant readings, the presence of oil may likewise indicate elevated levels, and fine suspended particulate matter may cause inconclusive surfactant readings (for example, the indicator ampule may turn green instead of a shade of blue).
- Elevated chlorine from leaking drinking water infrastructure or contained in the illicit wastewater discharge may inhibit bacterial growth and cause very low bacterial concentrations. Any detection of total chlorine above the instrument Reporting Limit should be noted.”

The following table was obtained from the EPA IDDE Guidance Manual, 2004.

Table 2: Parameter specifications

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Wash water	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	•	•	○	•	Can change into other nitrogen forms as the flow travels to the
Boron	•	•	○	N/A	
Chlorine	○	○	○	○	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	•	•	○	•	
Conductivity	•	•	○	•	Ineffective in saline waters
Detergents Surfactants	•	•	○	•	Reagent is a hazardous waste
<i>E. coli</i> Enterococci Total Coliform	•	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	•	○	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	•	•	•	•	
pH	○	•	○	•	
Potassium	•	○	○	•	May need to use two separate analytical techniques, depending on the concentration
Turbidity	•	•	○	•	
<p>● = Can almost always (&gt;80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.</p> <p>• = Can sometimes (&gt;50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter</p> <p>○ = Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water</p> <p>N/A = Data are not available to assess the utility of this parameter for this purpose.</p> <p>Data sources: Pitt (this study)</p> <p>*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as</p>					

## 9.0 STORMWATER MONITORING FIELD EQUIPMENT LIST

### Field Equipment

- |  |  |
|--|--|
| <input type="checkbox"/> Log book                              | <input type="checkbox"/> Waders/Boots  |
| <input type="checkbox"/> COC forms                             | <input type="checkbox"/> Telescopic pole and dipper cups   |
| <input type="checkbox"/> Laminated field test kit Instructions | <input type="checkbox"/> YSI multi parameter Meter   |
| <input type="checkbox"/> Sample Bottles- See sampling chart    | <input type="checkbox"/> Turbidimeter (If required per App G)                                      |
| <input type="checkbox"/> Coolers with Ice                      | <input type="checkbox"/> Hach Ammonia test kit (NI-SA) (salt or freshwater)                        |
| <input type="checkbox"/> Sharpies                              | <input type="checkbox"/> Hach Ammonia Test strips (freshwater only)                                |
| <input type="checkbox"/> Pens                                  | <input type="checkbox"/> Chemetrics K-9400 Surfactant test kit                                     |
| <input type="checkbox"/> Paper towels                          | <input type="checkbox"/> Hach CN80 residual chlorine test kit                                      |
| <input type="checkbox"/> Wet Wipes                             | <input type="checkbox"/> Waste Container for field test kits (1 amber liter clearly labeled waste) |
| <input type="checkbox"/> Sampling plan                         |  |
| <input type="checkbox"/> Nitrile Gloves                        |  |
| <input type="checkbox"/> Squirt bottle of DI Water             |  |

## 10.0 REFERENCES

YSI Pro 30 Users Manual (2011) <https://www.ysi.com/File%20Library/Documents/I1>

[Pro30-Manual-English.pdf](#)

Chemetrics Instructions [http://www.chemetrics.com/Detergents+\(anionic+surfactants, 9400/R-9400](http://www.chemetrics.com/Detergents+(anionic+surfactants, 9400/R-9400)

Hach test strips <http://www.hach.com/teststrips>





Town of Upton

# SCREENING AND SAMPLING FORM

Type:	<input type="checkbox"/> Outfall <input type="checkbox"/> Interconnection <input type="checkbox"/> Key Junction	<input type="checkbox"/> Pipe <input type="checkbox"/> DMH <input type="checkbox"/> CB <input type="checkbox"/> Other	ID:	
Location:		Material:		Size:
Inspector:		Date:		Time:
Weather:	<input type="checkbox"/> Sunny <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Snow	Recent Rainfall:		

## ENVIRONMENTAL INSPECTION

Area:	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Municipal <input type="checkbox"/> Open Space <input type="checkbox"/> Unknown			
Flowing To:	<input type="checkbox"/> Upland <input type="checkbox"/> Wetland/Marsh <input type="checkbox"/> Stream/River <input type="checkbox"/> Lake/Pond <input type="checkbox"/> Open Space <input type="checkbox"/> Other MS4 <input type="checkbox"/> Outfall			
Submerged:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Accessible:	<input type="checkbox"/> Yes... <input type="checkbox"/> No	Other Info:

## FLOW

Amount:	<input type="checkbox"/> None <input type="checkbox"/> Drip <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial	Clarity:	<input type="checkbox"/> None <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Opaque
Color:		Other Info:	

## INDICATORS OF POTENTIAL ISSUES – FURTHER INVESTIGATION RECOMMENDED

Sediment:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Scouring:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Staining	<input type="checkbox"/> Yes <input type="checkbox"/> No
Algae Growth:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Stressed Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No
Oil Sheen:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Turbidity:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No
Odor:	<input type="checkbox"/> None <input type="checkbox"/> Sewer <input type="checkbox"/> Eggs <input type="checkbox"/> Fuel <input type="checkbox"/> Laundry <input type="checkbox"/> Unknown			Other:	

## SAMPLING

Sampling Required:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Sampling Performed:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Struct. ID	
Algae Growth:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Stressed Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No
Oil Sheen:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Turbidity:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Floatables	<input type="checkbox"/> Yes <input type="checkbox"/> No
Odor:	<input type="checkbox"/> None <input type="checkbox"/> Sewer <input type="checkbox"/> Eggs <input type="checkbox"/> Fuel <input type="checkbox"/> Laundry <input type="checkbox"/> Unknown			Other:	

## RECORDED DATA

Ammonia:		Salinity:		Temp:		pH:	
Chlorine:		Conductivity:		Surfactant:	<input type="checkbox"/> Yes <input type="checkbox"/> No		

## LAB SAMPLES TAKEN

<input type="checkbox"/> E. coli		<input type="checkbox"/> Phosphorus		<input type="checkbox"/> Nitrogen		<input type="checkbox"/> DO	
<input type="checkbox"/> Enterococcus		<input type="checkbox"/> Fecal Coliform		<input type="checkbox"/> Metals		<input type="checkbox"/> TSS	
Sent To			Date:			Date Received:	



# SAFETY DATA SHEETS

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**Be Right™**

# SAFETY DATA SHEET

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## 1. IDENTIFICATION

### Product identifier

**Product Name** Ammonia Nitrogen 1 Reagent

### Other means of identification

**Product Code(s)** 1455523

**Safety data sheet number** M00944

### Recommended use of the chemical and restrictions on use

**Recommended Use** Determination of ammonium nitrogen.

**Uses advised against** No information available.

**Restrictions on use** None.

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

Hach Company P.O.Box 389 Loveland,  
CO 80539 USA +1(970) 669-3050

#### **Emergency telephone number**

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

## 2. HAZARDS IDENTIFICATION

### Classification

#### **Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1 Sub-category A
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	
Skin sensitization	
Mutagenicity	
Carcinogenicity	
Reproductive toxicity	
Specific target organ toxicity (single exposure)	
Specific target organ toxicity (repeated exposure)	

#### **Hazards not otherwise classified (HNOC)**

Not applicable

### Label elements

**Signal word** - Danger

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#### **Hazard statements**

H290 - May be corrosive to metals  
H314 - Causes severe skin burns and eye damage

#### **Precautionary statements**

P260 - Do not breathe dust/fume/gas/mist/vapors/spray  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower  
P363 - Wash contaminated clothing before reuse  
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
P405 - Store locked up  
P501 - Dispose of contents/ container to an approved waste disposal plant  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor/physician  
P234 - Keep only in original container  
P390 - Absorb spillage to prevent material damage

#### **Other Information**

Not applicable

### **3. COMPOSITION/INFORMATION ON INGREDIENTS**

#### **Substance**

Not applicable

#### **Mixture**

**Chemical Family** Mixture.  
**Chemical nature** aqueous solution.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sodium hydroxide	1310-73-2	3 - 7%	-

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	See section 8 for PPE that may be required during handling. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). If no local exhaust use approved fume hood and/or respirator. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. Remove from exposure, lie down. Immediate medical attention is required. IF IN EYES: Flush eyes for at least 15 minutes. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
<b>Eye contact</b>	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.
<b>Skin contact</b>	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.
<b>Inhalation</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a physician immediately.
<b>Ingestion</b>	IF SWALLOWED: Rinse Mouth. Do NOT induce vomiting. Call a physician immediately.
<b>Self-protection of the first aider</b>	First aider: Pay attention to self-protection!. Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

### Most important symptoms and effects, both acute and delayed

**Symptoms** See Section 11: TOXICOLOGICAL INFORMATION.

### Indication of any immediate medical attention and special treatment needed

**Note to physicians** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

### Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable Extinguishing Media** Caution: Use of water spray when fighting fire may be inefficient.

### Flammable properties

Substance does not burn.

### Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe fumes.

**Hazardous combustion products** This material will not burn.

### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES



#### **U.S. Notice**

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

#### **Personal precautions, protective equipment and emergency procedures**

**Personal precautions** Evacuate personnel to safe areas. Remove all sources of ignition. Do not touch or walk through spilled material. Ventilate affected area. Use personal protective equipment as required.

**For emergency responders** Use personal protection recommended in Section 8.

#### **Environmental precautions**

**Environmental precautions** Do not allow into any sewer, on the ground or into any body of water. Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. See Section 12 for additional ecological information.

#### **Methods and material for containment and cleaning up**

**Methods for containment** Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

**Methods for cleaning up** Take necessary precautions in observance of pertinent physical hazards. Neutralize spill if necessary. Soak up with inert absorbent material. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Dispose of in accordance with local, state and federal regulations or laws.

**Emergency Response Guide Number** Not applicable

### **7. HANDLING AND STORAGE**

#### **Precautions for safe handling**

**Advice on safe handling** Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray.

#### **Conditions for safe storage, including any incompatibilities**

**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers.

**Flammability class** Not applicable

### **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### **Control parameters**

#### **Exposure Guidelines**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hydroxide 3 - 7%	Ceiling: 2 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup> (vacated) Ceiling: 2 mg/m <sup>3</sup>	IDLH: 10 mg/m <sup>3</sup> Ceiling: 2 mg/m <sup>3</sup>

Chemical name	Alberta OEL	British Columbia	Manitoba OEL	New Brunswick	Newfoundland &
---------------	-------------	------------------	--------------	---------------	----------------

		OEL		OEL	Labrador OEL
Sodium hydroxide 3 - 7%	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>

Chemical name	Northwest Territories OEL	Nova Scotia OEL	Nunavut OEL	Ontario TWA	Prince Edward Island OEL
Sodium hydroxide 3 - 7%	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>

Chemical name	Quebec OEL	Saskatchewan OEL	Yukon OEL
Sodium hydroxide 3 - 7%	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>

**Other Information** Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

**Legend** See section 16 for terms and abbreviations

#### Appropriate engineering controls

**Engineering Controls** If no local exhaust use approved fume hood or self-contained breathing apparatus  
If no local exhaust use approved fume hood and/or respirator  
Showers  
Eyewash stations

#### **Individual protection measures, such as personal protective equipment**

**Eye/face protection** Wear tight sealing safety goggles and/or face protection shield. Avoid contact with eyes.

**Skin and body protection** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Respiratory protection** Do not breathe gas/fumes/vapor/spray. If no local exhaust use approved fume hood and/or respirator. In case of inadequate ventilation wear respiratory protection.

**General Hygiene Considerations** Avoid breathing (dust, vapor, mist, gas). Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wear suitable gloves and eye/face protection. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feeding stuffs. Regular cleaning of equipment, work area and clothing is recommended. Handle in accordance with good industrial hygiene and safety practice. Avoid prolonged or repeated contact with skin. Take off all contaminated clothing and wash it before reuse.

#### Environmental exposure controls

Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

**Physical state** Liquid

**Gas Under Pressure** Not classified according to GHS criteria

**Appearance** aqueous solution

**Color** Colorless to light yellow

**Odor** None

**Odor threshold** Not applicable

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<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	Not applicable	
pH	10.0	
Melting point/freezing point	No data available	
Boiling point / boiling range	~ 100 °C / 212 °F	Estimation based on theoretical calculation
Evaporation rate	0.46 (water = 1)	
Vapor pressure	No data available	
Vapor density (air = 1)	No data available	
Specific gravity (water = 1 / air = 1)	1.163	
Partition Coefficient (n-octanol/water)	No information available	
Soil Organic Carbon-Water Partition Coefficient	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No information available	
Dynamic viscosity	No data available	
Kinematic viscosity	No information available	

#### Solubility(ies)

##### Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

##### Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

#### Other Information

Metal Corrosivity	Not classified as corrosive to metal according to GHS criteria
GHS Metal Corrosivity Classification	Category 1, H290
Steel Corrosion Rate	No data available /
Aluminum Corrosion Rate	No data available /
Bulk density	Not applicable
Explosive properties	Not classified according to GHS criteria.
Explosion data	No data available
Upper explosion limit	No information available



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**Lower explosion limit**

No information available

**Flammable properties**

Not classified as flammable according to GHS criteria.

**Flammability Limit in Air**

**Upper flammability limit:**

No data available

**Lower flammability limit:**

No data available

**Flash point**

No data available

**Method**

No information available

**Oxidizing properties**

Not classified according to GHS criteria.

**Reactivity properties**

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

## 10. STABILITY AND REACTIVITY

### Reactivity properties

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

### Chemical stability

Stable under recommended storage conditions.

### Special dangers of the product

None reported

### Possibility of Hazardous Reactions

None under normal processing.

**Hazardous polymerization**

Hazardous polymerization does not occur.

### Conditions to avoid

Extremes of temperature and direct sunlight. Incompatible materials.

### Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases.

### Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

### Explosive properties

Not classified according to GHS criteria.

**Upper explosion limit**

No information available

**Lower explosion limit**

No information available

### Autoignition temperature

No data available

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#### Sensitivity to Static Discharge

None reported

#### Sensitivity to Mechanical Impact

None reported

## 11. TOXICOLOGICAL INFORMATION

#### Information on Likely Routes of Exposure

Product Information	Corrosive to skin. Corrosive to eyes.
Inhalation	Causes burns. Corrosive by inhalation.
Eye contact	Corrosive to the eyes and may cause severe damage including blindness. Causes burns.
Skin contact	Cause severe skin burns and eye damage.
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.
Aggravated Medical Conditions	Eye disorders. Skin disorders. Respiratory disorders.
Toxicologically synergistic products	None known.
Toxicokinetics, metabolism and distribution	No information available.

#### Product Acute Toxicity Data

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available

#### Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

#### Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	33,798.00 mg/kg
---------------	-----------------

#### Ingredient Acute Toxicity Data

Oral Exposure Route					
If available, see data below					
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	Rabbit LD <sub>50</sub>	500 mg/kg	None reported	None reported	No information available

Dermal Exposure Route					
If available, see data below					
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	Rabbit LD <sub>50</sub>	1350 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)

Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

#### Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available



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**Ingredient Specific Target Organ Toxicity Single Exposure Data**

Oral Exposure Route	If available, see data below
Dermal Exposure Route	If available, see data below
Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

**Aspiration toxicity**

If available, see data below

**Kinematic viscosity**

No information available

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	Patch test	Human	20 mg	24 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	Standard Draize Test	Rabbit	0.05 mg	24 hours	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)

**Sensitization Information**

**Product Sensitization Data**

**Skin Sensitization Exposure Route**

No data available.

**Respiratory Sensitization Exposure Route**

No data available.

**Ingredient Sensitization Data**

**Skin Sensitization Exposure Route**

If available, see data below.

**Respiratory Sensitization Exposure Route**

If available, see data below.

**Chronic Toxicity Information**

**Product Specific Target Organ Toxicity Repeat Dose Data**

Oral Exposure Route	No data available.
Dermal Exposure Route	No data available.
Inhalation (Dust/Mist) Exposure Route	No data available.
Inhalation (Vapor) Exposure Route	No data available.
Inhalation (Gas) Exposure Route	No data available.

**Ingredient Specific Target Organ Toxicity Repeat Exposure Data**

Oral Exposure Route	If available, see data below
Dermal Exposure Route	If available, see data below
Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

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**Product Carcinogenicity Data**

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available

**Ingredient Carcinogenicity Data**

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium hydroxide	1310-73-2	-	-	-	-

**Legend**

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

Oral Exposure Route	If available, see data below
Dermal Exposure Route	If available, see data below
Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

**Product Germ Cell Mutagenicity *invitro* Data**

No data available.

**Ingredient Germ Cell Mutagenicity *invitro* Data**

No data available

**Product Germ Cell Mutagenicity *invivo* Data**

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available

**Ingredient Germ Cell Mutagenicity *invivo* Data**

Oral Exposure Route	If available, see data below
Dermal Exposure Route	If available, see data below
Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

**Product Reproductive Toxicity Data**

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available

**Ingredient Reproductive Toxicity Data**

Oral Exposure Route	If available, see data below
Inhalation (Dust/Mist) Exposure Route	If available, see data below
Inhalation (Vapor) Exposure Route	If available, see data below
Inhalation (Gas) Exposure Route	If available, see data below

**12. ECOLOGICAL INFORMATION**

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## Ecotoxicity

### Product Ecological Data

#### Aquatic toxicity

<b>Fish</b>	No data available
<b>Crustacea</b>	No data available
<b>Algae</b>	No data available

### Ingredient Ecological Data

#### Aquatic toxicity

**Fish** If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	96 hours	<i>Oncorhynchus mykiss</i>	LC <sub>50</sub>	45.4 mg/L	IUCLID (The International Uniform Chemical Information Database)

**Crustacea** If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	48 Hours	<i>Daphnia sp.</i>	EC <sub>50</sub>	40.4 mg/L	IUCLID (The International Uniform Chemical Information Database)

**Algae** If available, see ingredient data below

### Other Information

### Persistence and degradability

**Product Biodegradability Data**  
 If available, see ingredient data below.

### Ingredient Biodegradability Data

Test data reported below

Chemical name	Test method	Biodegradation	Exposure time	Results
Butanedioic acid, 2,3-dihydroxy-[R-(R*, R*)]-, disodium salt (7 - 13%) CAS#: 868-18-8	None reported	73%	14 days	Readily biodegradable
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	None reported	None reported	None reported	Readily biodegradable

### Bioaccumulation

**Product Bioaccumulation Data** No data available.

**Partition Coefficient (n-octanol/water)** No information available

**Ingredient Bioaccumulation Data** No data available

Chemical name	Partition Coefficient (n-octanol/water)	Method
Sodium hydroxide (3 - 7%)	log K <sub>ow</sub> ~ 0	No information available



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CAS#: 1310-73-2		
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#### Mobility

#### Product Information

**Soil Organic Carbon-Water Partition Coefficient** No data available

#### Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

#### Ingredient Information

<u>Chemical name</u>	<u>Soil Organic Carbon-Water Partition Coefficient</u>	<u>Method</u>
Sodium hydroxide (3 - 7%) CAS#: 1310-73-2	log K <sub>oc</sub> ~ 0	No information available

<u>Chemical name</u>	<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water solubility temperature °C</u>	<u>Water solubility temperature °F</u>
Sodium hydroxide CAS#: 1310-73-2	Completely soluble	420000 mg/L	0 °C	32 °F

#### Other adverse effects

No information available.

### 13. DISPOSAL CONSIDERATIONS

#### Waste treatment methods

**Disposal of wastes** Disposal should be in accordance with applicable regional, national, and local laws and regulations.

**Contaminated packaging** Do not reuse container.

**Special instructions for disposal** Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.

### 14. TRANSPORT INFORMATION

**U.S. DOT** Not regulated

**TDG** Not regulated

**IATA** Not regulated

**IMDG** Not regulated

#### Additional information

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There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.  
If the item is part of a reagent set or kit the classification would change to the following:  
UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.  
If the item is not regulated, the Chemical Kit classification does not apply.

## 15. REGULATORY INFORMATION

### National Inventories

**TSCA** Complies  
**DSL/NDSL** Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

### International Inventories

**EINECS/ELINCS** Complies  
**ENCS** Complies  
**IECSC** Complies  
**KECL** Complies  
**PICCS** Complies  
**TCSI** Complies  
**AICS** Complies  
**NZIoC** Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**TCSI** - Taiwan Chemical Substances Inventory  
**AICS** - Australian Inventory of Chemical Substances  
**NZIoC** - New Zealand Inventory of Chemicals

### US Federal Regulations

#### SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

#### SARA 311/312 Hazard Categories

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	Yes
<b>Fire hazard</b>	No
<b>Sudden release of pressure hazard</b>	No
<b>Reactive Hazard</b>	No

#### CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hydroxide 1310-73-2	1000 lb	-	-	X

#### CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and

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Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium hydroxide 1310-73-2	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ

### US State Regulations

#### California Proposition 65

This product does not contain any Proposition 65 chemicals

### U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium hydroxide 1310-73-2	X	X	X

### U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium hydroxide	180.0910	21 CFR 184.1763

## 16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

### Special Comments

None

### Additional information

#### Global Automotive Declarable Substance List (GADSL)

Not applicable

### NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

### Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH                      Immediately Dangerous to Life or Health  
ACGIH                              ACGIH (American Conference of Governmental Industrial Hygienists)  
NDF                                  no data

### Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA                      TWA (time-weighted average)                      STEL                      STEL (Short Term Exposure Limit)  
MAC                      Maximum Allowable Concentration                      Ceiling                      Ceiling Limit Value



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X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

**Prepared By** Hach Product Compliance Department

**Issue Date** 27-Nov-2017

**Revision Date** 27-Nov-2017

**Revision Note** None

**Disclaimer**

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

**HACH COMPANY©2017**

**End of Safety Data Sheet**







**Be Right™**

# SAFETY DATA SHEET

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## 1. IDENTIFICATION

### Product identifier

**Product Name** DPD Free Chlorine Reagent

### Other means of identification

**Product Code(s)** 1407028

**Safety data sheet number** M00109

**HMRIC #** HMIRA Registry Number 9935 Filed 2016-04-11

### Recommended use of the chemical and restrictions on use

**Recommended Use** Laboratory Use. Determination of Free Chlorine.

**Uses advised against** None.

**Restrictions on use** None.

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

#### **Emergency telephone number**

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

## 2. HAZARDS IDENTIFICATION

### Classification

#### **Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

### Hazards not otherwise classified (HNOC)

Not applicable

### Label elements

**Signal word** - Warning



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#### **Hazard statements**

H315 - Causes skin irritation  
H319 - Causes serious eye irritation

#### **Precautionary statements**

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water  
P332 + P313 - If skin irritation occurs: Get medical advice/attention  
P362 - Take off contaminated clothing and wash before reuse  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P337 + P313 - If eye irritation persists: Get medical advice/attention

#### **Other Hazards Known**

Not applicable

### **3. COMPOSITION/INFORMATION ON INGREDIENTS**

#### **Substance**

Not applicable

#### **Mixture**

**Chemical Family** Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sodium phosphate dibasic	7558-79-4	30 - 40%	-
DPD Salt	-	1 - 5%	-
Disodium EDTA	139-33-3	1 - 5%	-

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Remove to fresh air. Get medical attention immediately if symptoms occur.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.
<b>Self-protection of the first aider</b>	Avoid contact with skin, eyes or clothing.

### Most important symptoms and effects, both acute and delayed

<b>Symptoms</b>	Burning sensation.
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### Indication of any immediate medical attention and special treatment needed

<b>Note to physicians</b>	Treat symptomatically.
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## 5. FIRE-FIGHTING MEASURES

<b>Suitable Extinguishing Media</b>	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Unsuitable Extinguishing Media</b>	Caution: Use of water spray when fighting fire may be inefficient.
<b>Specific hazards arising from the chemical</b>	No information available.
<b>Hazardous combustion products</b>	Carbon monoxide, Carbon dioxide. Phosphorus oxides. Nitrogen oxides.
<b>Special protective equipment for fire-fighters</b>	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

## 6. ACCIDENTAL RELEASE MEASURES

<b>U.S. Notice</b>	Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.
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### Personal precautions, protective equipment and emergency procedures

<b>Personal precautions</b>	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.
<b>Other Information</b>	Refer to protective measures listed in Sections 7 and 8.



#### Environmental precautions

**Environmental precautions** Prevent further leakage or spillage if safe to do so.

#### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

**Reference to other sections** See section 8 for more information. See section 13 for more information.

## 7. HANDLING AND STORAGE

#### Precautions for safe handling

**Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

#### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep containers tightly closed in a dry, cool and well-ventilated place.

**Flammability class** Not applicable

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Control parameters

**Exposure Guidelines** This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

#### Appropriate engineering controls

**Engineering Controls** Showers  
Eyewash stations  
Ventilation systems.

#### Individual protection measures, such as personal protective equipment

**Respiratory protection** No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

**Hand Protection** Wear suitable gloves. Impervious gloves.

**Eye/face protection** If splashes are likely to occur, wear safety glasses with side-shields.

**Skin and body protection** Wear suitable protective clothing. Long sleeved clothing.

**General Hygiene Considerations** Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing.

**Environmental exposure controls** Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

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Thermal hazards None under normal processing.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

Physical state	Solid		
Appearance	powder	Color	White to light pink
Odor	Odorless	Odor threshold	No data available

Property	Values	Remarks • Method
Molecular weight	No data available	
pH	6.3	1% Solution
Melting point/freezing point	No data available	
Boiling point / boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Vapor density (air = 1)	Not applicable	
Specific gravity (water = 1 / air = 1)	1.76	
Partition Coefficient (n-octanol/water)	log K <sub>ow</sub> ~ 0	
Soil Organic Carbon-Water Partition Coefficient	log K <sub>oc</sub> ~ 0	
Autoignition temperature	No data available	
Decomposition temperature	110 °C / 230 °F	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

### Solubility(ies)

#### Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

#### Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

### Other Information

#### Metal Corrosivity

Steel Corrosion Rate	Not applicable
Aluminum Corrosion Rate	Not applicable

Volatile Organic Compounds (VOC) Content  
Not applicable

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Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium phosphate dibasic	7558-79-4	No data available	-
DPD Salt	-	Not applicable	-
Disodium EDTA	139-33-3	No data available	-

#### Explosive properties

Upper explosion limit No data available  
Lower explosion limit No data available

#### Flammable properties

Flash point Not applicable  
Method No information available

#### Flammability Limit in Air

Upper flammability limit: No data available  
Lower flammability limit: No data available

#### Oxidizing properties

No data available.

#### Bulk density

No data available

Particle Size No information available

Particle Size Distribution No information available

## 10. STABILITY AND REACTIVITY

#### Reactivity

Not applicable.

#### Chemical stability

Stability Stable under normal conditions.

#### Explosion data

Sensitivity to Mechanical Impact None  
Sensitivity to Static Discharge None.

#### Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

#### Hazardous polymerization

None under normal processing.

#### Conditions to avoid

Conditions to avoid None known based on information supplied.

#### Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

#### Hazardous Decomposition Products

Carbon dioxide. Carbon monoxide. Phosphorus oxides. Nitrogen oxides.

## 11. TOXICOLOGICAL INFORMATION



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#### Information on Likely Routes of Exposure

##### **Product Information**

**Inhalation** May cause irritation of respiratory tract.

**Eye contact** Causes serious eye irritation.

**Skin contact** Causes skin irritation.

**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

**Symptoms** Redness. May cause redness and tearing of the eyes.

**Aggravated Medical Conditions** Skin disorders. Eye disorders.

**Toxicologically synergistic products** None known.

**Toxicokinetics, metabolism and distribution** See ingredients information below.

Chemical name	Toxicokinetics, metabolism and distribution
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
Disodium EDTA (1 - 5%) CAS#: 139-33-3	EDTA and related compounds are poorly absorbed by the digestive system.

#### Product Acute Toxicity Data

**Oral Exposure Route** No data available

**Dermal Exposure Route** No data available

**Inhalation (Dust/Mist) Exposure Route** No data available

**Inhalation (Vapor) Exposure Route** No data available

**Inhalation (Gas) Exposure Route** No data available

#### Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

#### **Acute Toxicity Estimations (ATE)**

The following values are calculated based on chapter 3.1 of the GHS document

<b>ATEmix (oral)</b>	19,881.00 mg/kg
<b>ATEmix (dermal)</b>	No information available
<b>ATEmix (inhalation-dust/mist)</b>	No information available
<b>ATEmix (inhalation-vapor)</b>	No information available
<b>ATEmix (inhalation-gas)</b>	No information available

#### Ingredient Acute Toxicity Data

##### **Oral Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
DPD Salt (1 - 5%) CAS#: -	Rat LD <sub>50</sub>	695 mg/kg	None reported	None reported	Outside testing
Disodium EDTA (1 - 5%)	Rat LD <sub>50</sub>	2000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical

CAS#: 139-33-3					Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Rat LD <sub>50</sub>	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Rabbit LD <sub>50</sub>	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Product Specific Target Organ Toxicity Single Exposure Data**

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

**Ingredient Specific Target Organ Toxicity Single Exposure Data**

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Aspiration toxicity**

If available, see data below

**Kinematic viscosity**

Not applicable

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%)	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)



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CAS#: 7558-79-4						
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

#### Sensitization Information

##### Product Sensitization Data

**Skin Sensitization Exposure Route**

No data available.

**Respiratory Sensitization Exposure Route**

No data available.

##### Ingredient Sensitization Data

**Skin Sensitization Exposure Route**

If available, see data below.

**Respiratory Sensitization Exposure Route**

If available, see data below.

#### Chronic Toxicity Information

##### Product Specific Target Organ Toxicity Repeat Dose Data

**Oral Exposure Route**

No data available.

**Dermal Exposure Route**

No data available.

**Inhalation (Dust/Mist) Exposure Route**

No data available.

**Inhalation (Vapor) Exposure Route**

No data available.

**Inhalation (Gas) Exposure Route**

No data available.

##### Ingredient Specific Target Organ Toxicity Repeat Exposure Data

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

##### Product Carcinogenicity Data

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

##### Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4	-	-	-	-
DPD Salt	-	-	-	-	-
Disodium EDTA	139-33-3	-	-	-	-

#### Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

##### Product Germ Cell Mutagenicity *invitro* Data

No data available.

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#### Ingredient Germ Cell Mutagenicity *invitro* Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Cytogenetic analysis	Hamster lung	200 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

#### Product Germ Cell Mutagenicity *in vivo* Data

Oral Exposure Route No data available  
 Dermal Exposure Route No data available  
 Inhalation (Dust/Mist) Exposure Route No data available  
 Inhalation (Vapor) Exposure Route No data available  
 Inhalation (Gas) Exposure Route No data available

#### Ingredient Germ Cell Mutagenicity *in vivo* Data

Oral Exposure Route If available, see data below  
 Dermal Exposure Route If available, see data below  
 Inhalation (Dust/Mist) Exposure Route If available, see data below  
 Inhalation (Vapor) Exposure Route If available, see data below  
 Inhalation (Gas) Exposure Route If available, see data below

#### Product Reproductive Toxicity Data

Oral Exposure Route No data available  
 Dermal Exposure Route No data available  
 Inhalation (Dust/Mist) Exposure Route No data available  
 Inhalation (Vapor) Exposure Route No data available  
 Inhalation (Gas) Exposure Route No data available

#### Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below  
 Inhalation (Dust/Mist) Exposure Route If available, see data below  
 Inhalation (Vapor) Exposure Route If available, see data below  
 Inhalation (Gas) Exposure Route If available, see data below

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Product Ecological Data

#### Aquatic toxicity

Fish No data available  
 Crustacea No data available  
 Algae No data available

#### Ingredient Ecological Data

#### Aquatic toxicity

Fish If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	96 hours	<i>Lepomis macrochirus</i>	LC <sub>50</sub>	159 mg/L	Vendor SDS

Crustacea If available, see ingredient data below

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Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
DPD Salt (1 - 5%) CAS#: -	48 Hours	<i>Daphnia magna</i>	EC <sub>50</sub>	10.8 mg/L	Internal Data

**Algae** If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	72 Hours	None reported	EC <sub>50</sub>	10 mg/L	Vendor SDS

#### Other Information

##### Persistence and degradability

##### Product Biodegradability Data

No data available.

##### Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
DPD Salt (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

##### Bioaccumulation

##### Product Bioaccumulation Data

No data available.

##### Partition Coefficient (n-octanol/water)

log K<sub>ow</sub> ~ 0

##### Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
DPD Salt (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined

##### Mobility

##### Soil Organic Carbon-Water Partition Coefficient

log K<sub>oc</sub> ~ 0

##### Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

##### Other adverse effects

No information available.

### 13. DISPOSAL CONSIDERATIONS



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#### Waste treatment methods

<b>Waste from residues/unused products</b>	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
<b>Contaminated packaging</b>	Do not reuse empty containers.

### 14. TRANSPORT INFORMATION

<b>U.S. DOT</b>	Not regulated
<b>TDG</b>	Not regulated
<b>IATA</b>	Not regulated
<b>IMDG</b>	Not regulated
<b>Note:</b>	No special precautions necessary.

#### **Additional information**

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.  
If the item is part of a reagent set or kit the classification would change to the following:  
UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.  
If the item is not regulated, the Chemical Kit classification does not apply.

### 15. REGULATORY INFORMATION

#### National Inventories

<b>TSCA</b>	Complies
<b>DSL/NDSL</b>	Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

#### International Inventories

<b>EINECS/ELINCS</b>	Complies
<b>ENCS</b>	Complies
<b>IECSC</b>	Complies
<b>KECL</b>	Complies
<b>PICCS</b>	Complies
<b>TCSI</b>	Complies
<b>AICS</b>	Complies
<b>NZIoC</b>	Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**TCSI** - Taiwan Chemical Substances Inventory  
**AICS** - Australian Inventory of Chemical Substances  
**NZIoC** - New Zealand Inventory of Chemicals

#### US Federal Regulations

**SARA 313**

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Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

**SARA 311/312 Hazard Categories**

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

**CWA (Clean Water Act)**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	-	-	X

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic 7558-79-4	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals

**New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.**

**U.S. State Right-to-Know Regulations**

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic 7558-79-4	X	X	X

**U.S. EPA Label Information**

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778, 21 CFR 182.6290, 21 CFR 182.6778, 21 CFR 182.8778
Disodium EDTA	180.0940	-

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## 16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

### Special Comments

None

### Additional information

#### **Global Automotive Declarable Substance List (GADSL)**

Not applicable

### NFPA and HMIS Classifications

<b>NFPA</b>	<b>Health hazards - 2</b>	<b>Flammability - 0</b>	<b>Instability - 0</b>	<b>Physical and Chemical Properties -</b>
<b>HMIS</b>	<b>Health hazards - 2</b>	<b>Flammability - 0</b>	<b>Physical Hazards - 0</b>	<b>Personal protection - X</b> - See section 8 for more information

### Key or legend to abbreviations and acronyms used in the safety data sheet

<i>NIOSH IDLH</i>	<i>Immediately Dangerous to Life or Health</i>
<i>ACGIH</i>	<i>ACGIH (American Conference of Governmental Industrial Hygienists)</i>
<i>NDF</i>	<i>no data</i>

### Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

**Prepared By** Hach Product Compliance Department

**Issue Date** 09-Aug-2016

**Revision Date** 12-Feb-2018

**Revision Note** None

### Disclaimer

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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**End of Safety Data Sheet**







**Be Right™**

# SAFETY DATA SHEET

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## 1. IDENTIFICATION

### Product identifier

**Product Name** DPD Total Chlorine Reagent

### Other means of identification

**Product Code(s)** 1406499

**Safety data sheet number** M00110

**HMRIC #** HMIRA Registry Number 9936 Filed 2016-04-11

### Recommended use of the chemical and restrictions on use

**Recommended Use** Laboratory reagent. Indicator for total chlorine.

**Uses advised against** None.

**Restrictions on use** None.

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

#### **Emergency telephone number**

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

## 2. HAZARDS IDENTIFICATION

### Classification

#### **Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

### Hazards not otherwise classified (HNOC)

Not applicable

### Label elements

**Signal word** - Warning



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#### **Hazard statements**

H315 - Causes skin irritation  
H319 - Causes serious eye irritation

#### **Precautionary statements**

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water  
P332 + P313 - If skin irritation occurs: Get medical advice/attention  
P362 - Take off contaminated clothing and wash before reuse  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P337 + P313 - If eye irritation persists: Get medical advice/attention

#### **Other Hazards Known**

Not applicable

### **3. COMPOSITION/INFORMATION ON INGREDIENTS**

#### **Substance**

Not applicable

#### **Mixture**

**Chemical Family** Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sodium phosphate dibasic	7558-79-4	20 - 30%	-
Potassium iodide (KI)	7681-11-0	20 - 30%	-
DPD Salt	-	1 - 5%	-
Glycine, N,N-1,2-ethanediylbis[N-(carboxymethyl)-, disodium salt, dihydrate	6381-92-6	<1%	-

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Remove to fresh air. Get medical attention immediately if symptoms occur.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.
<b>Self-protection of the first aider</b>	Avoid contact with skin, eyes or clothing.

### Most important symptoms and effects, both acute and delayed

<b>Symptoms</b>	Burning sensation.
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### Indication of any immediate medical attention and special treatment needed

<b>Note to physicians</b>	Treat symptomatically.
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## 5. FIRE-FIGHTING MEASURES

<b>Suitable Extinguishing Media</b>	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Unsuitable Extinguishing Media</b>	Caution: Use of water spray when fighting fire may be inefficient.
<b>Specific hazards arising from the chemical</b>	No information available.
<b>Hazardous combustion products</b>	Carbon monoxide, Carbon dioxide. Iodine compounds. Phosphorus oxides. Potassium oxides. Sodium monoxide. Nitrogen oxides.
<b>Special protective equipment for fire-fighters</b>	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

## 6. ACCIDENTAL RELEASE MEASURES

<b>U.S. Notice</b>	Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.
--------------------	--

### Personal precautions, protective equipment and emergency procedures

<b>Personal precautions</b>	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.
<b>Other Information</b>	Refer to protective measures listed in Sections 7 and 8.



### Environmental precautions

**Environmental precautions** Prevent further leakage or spillage if safe to do so.

### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

**Reference to other sections** See section 8 for more information. See section 13 for more information.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep containers tightly closed in a dry, cool and well-ventilated place.

**Flammability class** Not applicable

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Potassium iodide (KI) CAS#: 7681-11-0	TWA: 0.01 ppm	NDF	NDF

### Appropriate engineering controls

**Engineering Controls** Showers  
Eyewash stations  
Ventilation systems.

### Individual protection measures, such as personal protective equipment

**Respiratory protection** No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

**Hand Protection** Wear suitable gloves. Impervious gloves.

**Eye/face protection** If splashes are likely to occur, wear safety glasses with side-shields.

**Skin and body protection** Wear suitable protective clothing. Long sleeved clothing.

**General Hygiene Considerations** Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing.

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**Environmental exposure controls** Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

**Thermal hazards** None under normal processing.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Physical state</b>	Solid
<b>Appearance</b>	powder
<b>Color</b>	White to light pink
<b>Odor</b>	Odorless
<b>Odor threshold</b>	No data available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	No data available	
pH	No data available	
Melting point/freezing point	145 °C / 293 °F	
Boiling point / boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Vapor density (air = 1)	Not applicable	
Specific gravity (water = 1 / air = 1)	1.79	
Partition Coefficient (n-octanol/water)	log K <sub>ow</sub> ~ 0	
Soil Organic Carbon-Water Partition Coefficient	log K <sub>oc</sub> ~ 0	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

### Solubility(ies)

#### **Water solubility**

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

#### **Solubility in other solvents**

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
None reported	No information available	No data available	No information available

### Other Information

#### **Metal Corrosivity**

<b>Steel Corrosion Rate</b>	0.97 mm/yr / 0.04 in/yr
<b>Aluminum Corrosion Rate</b>	0.15 mm/yr / 0.01 in/yr



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#### **Volatile Organic Compounds (VOC) Content**

Not applicable

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium phosphate dibasic	7558-79-4	No data available	-
Potassium iodide (KI)	7681-11-0	No data available	-
DPD Salt	-	Not applicable	-
Glycine, N,N-1,2-ethanediyldis[N-(carboxymeth yl)-, disodium salt, dihydrate	6381-92-6	Not applicable	-

#### **Explosive properties**

**Upper explosion limit**  
**Lower explosion limit**

No data available  
No data available

#### **Flammable properties**

**Flash point**  
**Method**

Not applicable  
No information available

#### **Flammability Limit in Air**

**Upper flammability limit:**  
**Lower flammability limit:**

No data available  
No data available

#### **Oxidizing properties**

No data available.

#### **Bulk density**

No data available

#### **Particle Size**

No information available

#### **Particle Size Distribution**

No information available

## **10. STABILITY AND REACTIVITY**

#### **Reactivity**

Not applicable.

#### **Chemical stability**

##### **Stability**

Stable under normal conditions.

#### **Explosion data**

**Sensitivity to Mechanical Impact** None  
**Sensitivity to Static Discharge** None.

#### **Possibility of Hazardous Reactions**

**Possibility of Hazardous Reactions** None under normal processing.

#### **Hazardous polymerization**

None under normal processing.

#### **Conditions to avoid**

##### **Conditions to avoid**

None known based on information supplied.

#### **Incompatible materials**

##### **Incompatible materials**

Strong acids. Strong bases. Strong oxidizing agents.

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**Hazardous Decomposition Products**

Carbon dioxide. Carbon monoxide. Iodine compounds. Phosphorus oxides. Potassium oxide. Nitrogen oxides.

**11. TOXICOLOGICAL INFORMATION**

**Information on Likely Routes of Exposure**

**Product Information**

**Inhalation** May cause irritation of respiratory tract.

**Eye contact** Causes serious eye irritation.

**Skin contact** Causes skin irritation.

**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

**Symptoms** Redness. May cause redness and tearing of the eyes.

**Aggravated Medical Conditions** Skin disorders. Eye disorders.

**Toxicologically synergistic products** None known.

**Toxicokinetics, metabolism and distribution** See ingredients information below.

Chemical name	Toxicokinetics, metabolism and distribution
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	May cross placenta and be excreted in breast milk. May react synergistically with mercury.
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	EDTA and related compounds are poorly absorbed by the digestive system.

**Product Acute Toxicity Data**  
**Oral Exposure Route**

Test data reported below

Endpoint type	Reported dose	Toxicological effects	Key literature references and sources for data
Rat LD <sub>50</sub>	4700 mg/kg	<b>Behavioral</b> Flaccid muscle tone Lethargy Prostration <b>Eye</b> Chromodacryorrhea Ptosis <b>Gastrointestinal</b> Abnormalities of the gastrointestinal tract Diarrhea <b>Liver</b> Abnormalities of the liver <b>Lungs, Thorax, or Respiration</b> Abnormalities of the lungs Dyspnea Red or brown staining of the nose/mouth area <b>Nutritional and Gross Metabolic</b> Soiling of the anogenital area Wetness of the anogenital area <b>Reproductive</b> <b>Skin and Appendages</b> Piloerection	Outside testing

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

#### Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

#### Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

#### Ingredient Acute Toxicity Data

Oral Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Rat LD <sub>50</sub>	2779 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)



DPD Salt (1 - 5%) CAS#: -	Rat LD <sub>50</sub>	695 mg/kg	None reported	None reported	Outside testing
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Rat LD <sub>50</sub>	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
<b>Chemical name</b>	<b>Endpoint type</b>	<b>Reported dose</b>	<b>Exposure time</b>	<b>Toxicological effects</b>	<b>Key literature references and sources for data</b>
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Rat LD <sub>50</sub>	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Mouse LD <sub>50</sub>	1000 mg/kg	None reported	None reported	Vendor SDS

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Product Specific Target Organ Toxicity Single Exposure Data**

**Oral Exposure Route**

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

**Ingredient Specific Target Organ Toxicity Single Exposure Data**

**Oral Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Mouse LD <sub>Lo</sub>	1862 mg/kg	None reported	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Aspiration toxicity**

If available, see data below

**Kinematic viscosity**

Not applicable

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI)	Standard Draize	Rabbit	None	None	Skin irritant	No information

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(20 - 30%) CAS#: 7681-11-0	Test		reported	reported		available
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	None reported	Rabbit	None reported	None reported	Eye irritant	HSDB (Hazardous Substances Data Bank)
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

**Sensitization Information**

**Product Sensitization Data**

**Skin Sensitization Exposure Route**

No data available.

**Respiratory Sensitization Exposure Route**

No data available.

**Ingredient Sensitization Data**

**Skin Sensitization Exposure Route**

If available, see data below.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Patch test	Human	Not confirmed to be a skin sensitizer	ERMA (New Zealand's Environmental Risk Management Authority)

**Respiratory Sensitization Exposure Route**

If available, see data below.

**Chronic Toxicity Information**

**Product Specific Target Organ Toxicity Repeat Dose Data**

**Oral Exposure Route**

No data available.

**Dermal Exposure Route**

No data available.

**Inhalation (Dust/Mist) Exposure Route**

No data available.

**Inhalation (Vapor) Exposure Route**

No data available.

**Inhalation (Gas) Exposure Route**

No data available.

**Ingredient Specific Target Organ Toxicity Repeat Exposure Data**

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below



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**Inhalation (Vapor) Exposure Route**  
**Inhalation (Gas) Exposure Route**

If available, see data below  
If available, see data below

**Product Carcinogenicity Data**

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

**Ingredient Carcinogenicity Data**

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4	-	-	-	-
Potassium iodide (KI)	7681-11-0	-	-	-	-
DPD Salt	-	-	-	-	-
Glycine, N,N-1,2-ethanediylbis[N-(c arboxymethyl)-, disodium salt, dihydrate	6381-92-6	-	-	-	-

**Legend**

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Product Germ Cell Mutagenicity *invitro* Data**

No data available.

**Ingredient Germ Cell Mutagenicity *invitro* Data**

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Cytogenetic analysis	Rat ascites tumor	500 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Cytogenetic analysis	Hamster lung	200 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

**Product Germ Cell Mutagenicity *invivo* Data**

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

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**Ingredient Germ Cell Mutagenicity *in vivo* Data**

**Oral Exposure Route**

If available, see data below

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**Product Reproductive Toxicity Data**

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

No data available

**Inhalation (Vapor) Exposure Route**

No data available

**Inhalation (Gas) Exposure Route**

No data available

**Ingredient Reproductive Toxicity Data**

**Oral Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Human TD <sub>Lo</sub>	2700 mg/kg	39 weeks	<b>Specific Developmental Abnormalities</b> Endocrine System	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Human TD <sub>Lo</sub>	3240 mg/kg	39 weeks	<b>Effects on Newborn</b> Other neonatal measures or effects Physical <b>Specific Developmental Abnormalities</b> Endocrine system	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

Not considered to be harmful to aquatic life

**Product Ecological Data**

**Aquatic toxicity**

**Fish**

No data available

**Crustacea**

No data available

**Algae**

No data available

**Ingredient Ecological Data**

**Aquatic toxicity**

**Fish**

If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	96 hours	<i>Oncorhynchus mykiss</i>	LC <sub>50</sub>	896 mg/L	PEEN (Pan European Ecological Network)
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-,	96 hours	<i>Lepomis macrochirus</i>	LC <sub>50</sub>	159 mg/L	Vendor SDS

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disodium salt, dihydrate (<1%) CAS#: 6381-92-6					
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**Crustacea** If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
DPD Salt (1 - 5%) CAS#: -	48 Hours	<i>Daphnia magna</i>	EC <sub>50</sub>	10.8 mg/L	Internal Data

**Algae** If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	72 Hours	None reported	EC <sub>50</sub>	10 mg/L	Vendor SDS

**Other Information**

**Persistence and degradability**

**Product Biodegradability Data**

No data available.

**Ingredient Biodegradability Data**

Chemical name	Test method	Biodegradation	Exposure time	Results
DPD Salt (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

**Bioaccumulation**

**Product Bioaccumulation Data**

No data available.

**Partition Coefficient (n-octanol/water)**

log K<sub>ow</sub> ~ 0

**Ingredient Bioaccumulation Data**

Chemical name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
DPD Salt (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	None reported	None reported	None reported	None reported	Not determined

**Mobility**



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**Soil Organic Carbon-Water Partition Coefficient**

log K<sub>oc</sub> ~ 0

**Water solubility**

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

**Other adverse effects**

No information available.

### 13. DISPOSAL CONSIDERATIONS

**Waste treatment methods**

**Waste from residues/unused products**

Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

**Contaminated packaging**

Do not reuse empty containers.

### 14. TRANSPORT INFORMATION

**U.S. DOT**

Not regulated

**TDG**

Not regulated

**IATA**

Not regulated

**IMDG**

Not regulated

**Note:**

No special precautions necessary.

**Additional information**

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

### 15. REGULATORY INFORMATION

**National Inventories**

**TSCA**

Complies

**DSL/NDSL**

Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**International Inventories**

**EINECS/ELINCS**

Complies

**ENCS**

Complies

**IECSC**

Complies

**KECL**

Complies

**PICCS**

Complies

**TCSI**

Complies

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**AICS** Complies  
**NZIoC** Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**TCSI** - Taiwan Chemical Substances Inventory  
**AICS** - Australian Inventory of Chemical Substances  
**NZIoC** - New Zealand Inventory of Chemicals

### US Federal Regulations

#### **SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

#### **SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	No
<b>Fire hazard</b>	No
<b>Sudden release of pressure hazard</b>	No
<b>Reactive Hazard</b>	No

#### **CWA (Clean Water Act)**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	-	-	X

#### **CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic 7558-79-4	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

### US State Regulations

#### **California Proposition 65**

This product does not contain any Proposition 65 chemicals

**New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.**



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#### U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic 7558-79-4	X	X	X

#### U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778, 21 CFR 182.6290, 21 CFR 182.6778, 21 CFR 182.8778
Potassium iodide (KI)	180.0940	21 CFR 184.1634

### 16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

#### Special Comments

None

#### Additional information

#### **Global Automotive Declarable Substance List (GADSL)**

Not applicable

#### NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 2	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

#### Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH                      Immediately Dangerous to Life or Health  
ACGIH                              ACGIH (American Conference of Governmental Industrial Hygienists)  
NDF                                  no data

#### Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

**Prepared By** Hach Product Compliance Department

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**Revision Date** 12-Feb-2018

**Revision Note** None

**Disclaimer**

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2017

**End of Safety Data Sheet**





Scroll down for all Safety Data Sheets (SDS) for this product.

Total Enclosures: 2







Simplicity in Water Analysis

## Cover Page for Safety Data Sheet

Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

**SDS No.:** R9402

**Version No.:** 3.6

**Product Name:** Double-Tipped Ampoules for Detergents CHEMets® Kit and Refill and for Detergents Instrumental Test

**Components of water analysis reagent sets:** Refills R-9400, R-9423; and Kits I-2017, K-9400

### Product Descriptions:

*Double-Tipped Ampoules:* Glass ampoules with dual tapered tips. Each double-tipped ampoule in K-9400 and R-9400 contains approximately 4 mL of liquid reagent. Each double-tipped ampoule in R-9423 contains approximately 9.5 mL of liquid reagent. Refills and test kits contain 20 double-tipped ampoules.

### Addendum to Section 14 Transport Information:

Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

- CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
- CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

### Additional Information:

- "Print Date" = Revision Date (expressed as DD/MM/YYYY)
- Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).

*CHEMets®, VACUettes®, Vacu-vials®, and Titrets® are registered trademarks of CHEMetrics Inc.*



## Double-Tipped Ampoules for Detergents CHEMetrics Kit and Refill and for Detergents Instrumental Test

CHEMetrics, Inc.

Chemwatch: 9-87557

SDS No: R9402

Version No: 3.6

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Chemwatch Hazard Alert Code:

Issue Date: 03/02/2018

Print Date: 03/02/2018

Initial Date: 03/02/2018

S.GHS.USA.EN

### SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

#### Product Identifier

Product name	Double-Tipped Ampoules for Detergents CHEMetrics Kit and Refill and for Detergents Instrumental Test
Synonyms	Not Available
Proper shipping name	Chemical kits; First aid kits
Chemical formula	Not Applicable
Other means of identification	Not Available
CAS number	Not Applicable

#### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Component of water analysis reagent sets: Refills R-9400, R-9423 and Kits I-2017, K-9400
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#### Details of the supplier of the safety data sheet

Registered company name	CHEMetrics, Inc.
Address	4295 Catlett Road, Midland VA 22728 - United States
Telephone	1-540-788-9026
Fax	1-540-788-4856
Website	www.chemetrics.com
Email	technical@chemetrics.com

#### Emergency telephone number

Association / Organisation	ChemTel, Inc.
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	+01-813-248-0585

### SECTION 2 HAZARDS IDENTIFICATION

#### Classification of the substance or mixture

Classification	Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage Category 1, Carcinogenicity Category 2, Reproductive Toxicity Category 2, Specific target organ toxicity - repeated exposure Category 2
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#### Label elements

Hazard pictogram(s)	
---------------------	--

SIGNAL WORD **DANGER**

#### Hazard statement(s)

H302	Harmful if swallowed.
H331	Toxic if inhaled.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.

Continued...



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

### Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P271	Use in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P270	Do not eat, drink or smoke when using this product.

### Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P310	Immediately call a POISON CENTER or doctor/physician.
P362	Take off contaminated clothing and wash before reuse.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P330	Rinse mouth.
P332+P313	If skin irritation occurs: Get medical advice/attention.

### Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

### Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
------	---

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

### Substances

See section below for composition of Mixtures

### Mixtures

CAS No	%[weight]	Name
67-66-3	71	<u>chloroform</u>
7732-18-5	26	<u>water</u>
13472-35-0	2	<u>sodium phosphate, monobasic, dihydrate</u>
7664-93-9	1	<u>sulfuric acid</u>
61-73-4	<0,1	<u>methylene blue</u>
Not Available	<0,1	Proprietary ingredient

## SECTION 4 FIRST AID MEASURES

### Description of first aid measures

General	
Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
Inhalation	<ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor, without delay.</li> </ul>
Ingestion	<p>NOTE: IN massive chloroform overdose, DO NOT INDUCE EMESIS because of the rapid onset of CNS depression and the risk of aspiration.</p> <p>If poisoning occurs, contact a doctor or Poisons Information Centre.</p> <ul style="list-style-type: none"> <li>▶ Avoid giving milk or oils.</li> <li>▶ Avoid giving alcohol.</li> <li>▶ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.</li> </ul>

Continued...

## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

- ▶ If swallowed do **NOT** induce vomiting.
- ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- ▶ Observe the patient carefully.
- ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- ▶ Seek medical advice.

### Most important symptoms and effects, both acute and delayed

See Section 11

### Indication of any immediate medical attention and special treatment needed

For chloroform intoxications:

Chloroform concentrations may be determined in blood.

Treat irritation symptomatically.

#### Oral Management:

Chloroform is radiopaque and X-rays confirm ingestion.

DO NOT INDUCE EMESIS because of the rapid onset of CNS depression and the risk of aspiration.

Consider gastric lavage within 1 hour of ingestion because of very rapid absorption of chloroform (use cuffed ET tube to protect airway)

Contact a poisons information service for further guidance on gut decontamination.

#### Systematic Management.

All patients initially require at least 24 hours observation with ECG monitoring.

Patients should be kept at complete bed rest, the use of stimulants (including adrenaline and noradrenaline) should be avoided because of the risk of sensitisation of the myocardium.

In symptomatic patients the hepatic and renal function should be monitored for at least 3-days post-exposure.

Chest X-rays will be necessary to monitor development of respiratory complications.

Chloroform depletes glutathione stores; N-acetylcysteine (used in the treatment of paracetamol overdose) has been suggested as a possible antidote for hepatotoxic organic solvents (success in carbon tetrachloride intoxications has been reported).

for intoxication due to Freons/ Halons;

#### A: Emergency and Supportive Measures

- ▶ Maintain an open airway and assist ventilation if necessary
- ▶ Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- ▶ Monitor the ECG for 4-6 hours

#### B: Specific drugs and antidotes:

- ▶ There is no specific antidote

#### C: Decontamination

- ▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- ▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

#### D: Enhanced elimination:

- ▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

**POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition**

- ▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- ▶ No specific antidote.
- ▶ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- ▶ If lavage is performed, suggest endotracheal and/or esophageal control.
- ▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- ▶ Treatment based on judgment of the physician in response to reactions of the patient

For acute or short term repeated exposures to strong acids:

- ▶ Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- ▶ Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- ▶ Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- ▶ Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

#### INGESTION:

- ▶ Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- ▶ **DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.**
- ▶ Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- ▶ Charcoal has no place in acid management.
- ▶ Some authors suggest the use of lavage within 1 hour of ingestion.

#### SKIN:

- ▶ Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- ▶ Deep second-degree burns may benefit from topical silver sulfadiazine.

#### EYE:

- ▶ Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT use neutralising agents or any other additives.** Several litres of saline are required.
- ▶ Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- ▶ Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology]

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

- ▶ Water spray or fog.
- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

### Special hazards arising from the substrate or mixture

#### Fire Incompatibility

- ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

### Advice for firefighters

Continued...



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> <li>▶ <b>DO NOT</b> approach containers suspected to be hot.</li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> <li>▶ If safe to do so, remove containers from path of fire.</li> <li>▶ Equipment should be thoroughly decontaminated after use.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered to be a significant fire risk.</li> <li>▶ Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ May emit corrosive, poisonous fumes. May emit acid smoke.</li> </ul> <p>carbon dioxide (CO<sub>2</sub>) hydrogen chloride phosgene other pyrolysis products typical of burning organic material. May emit poisonous fumes.</p>

### SECTION 6 ACCIDENTAL RELEASE MEASURES

#### Personal precautions, protective equipment and emergency procedures

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with sand, earth, inert material or vermiculite.</li> <li>▶ Wipe up.</li> <li>▶ Place in a suitable, labelled container for waste disposal.</li> </ul>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ No smoking, naked lights or ignition sources.</li> <li>▶ Increase ventilation.</li> <li>▶ Stop leak if safe to do so.</li> <li>▶ Water spray or fog may be used to disperse / absorb vapour.</li> <li>▶ Contain or absorb spill with sand, earth or vermiculite.</li> <li>▶ Collect recoverable product into labelled containers for recycling.</li> <li>▶ Collect solid residues and seal in labelled drums for disposal.</li> <li>▶ Wash area and prevent runoff into drains.</li> <li>▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.</li> <li>▶ If contamination of drains or waterways occurs, advise emergency services.</li> </ul>
	Personal Protective Equipment advice is contained in Section 8 of the SDS.

### SECTION 7 HANDLING AND STORAGE

#### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT</b> enter confined spaces until atmosphere has been checked.</li> <li>▶ <b>DO NOT</b> allow material to contact humans, exposed food or food utensils.</li> <li>▶ Avoid contact with incompatible materials.</li> <li>▶ <b>When handling, DO NOT</b> eat, drink or smoke.</li> <li>▶ Keep containers securely sealed when not in use.</li> <li>▶ Avoid physical damage to containers.</li> <li>▶ Always wash hands with soap and water after handling.</li> <li>▶ Work clothes should be laundered separately. Launder contaminated clothing before re-use.</li> <li>▶ Use good occupational work practice.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> <li>▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</li> </ul> <p><b>Wear impact- and splash-resistant eyewear.</b></p>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul> <p><b>For optimum analytical performance, store in the dark and at room temperature.</b></p>

#### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ <b>DO NOT</b> use aluminium or galvanised containers</li> <li>▶ Lined metal can, lined metal pail/ can.</li> <li>▶ Plastic pail.</li> <li>▶ Polyliner drum.</li> <li>▶ Packing as recommended by manufacturer.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul>
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## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

	<p>For low viscosity materials</p> <ul style="list-style-type: none"> <li>Drums and jerricans must be of the non-removable head type.</li> <li>Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> </ul> <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <ul style="list-style-type: none"> <li>Removable head packaging;</li> <li>Cans with friction closures and</li> <li>low pressure tubes and cartridges</li> </ul> <p>may be used.</p> <p>-</p> <p>Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.</p> <p>-</p> <p>In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.</p> <p>-</p> <p>* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.</p> <p>All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.</p>
Storage incompatibility	<p>Chloroform</p> <ul style="list-style-type: none"> <li>decomposes in the presence of excess water, high temperature, including hot surfaces, evolving phosgene and hydrogen chloride</li> <li>on contact with warm water may form hydrogen chloride</li> <li>decomposes at ordinary temperatures in sunlight, in the absence of air, and in the dark in the presence of air</li> <li>may form explosive materials when mixed with strong bases, alkali metals, lithium, sodium, potassium, sodium-potassium alloys; these may be heat-, friction-, and/or impact sensitive</li> <li>reacts violently with light metals, aluminium, magnesium or titanium powder, disilane, potassium tert-butoxide, methylates (methoxides), potassium acetylene-1,2-dioxide, sodium amide, uranium(III) hydride</li> <li>reacts violently with (acetone + a base), (perchloric acid + phosphorous pentoxide), (KOH + methanol) and (NaOH + methanol).</li> <li>is incompatible with acetone, beryllium, decaborane, methanol, nitrogen tetroxide, strong oxidisers, fluorine, oxygen, potassium, sodium, strong mineral acids, triisopropylphosphine, chemically active metals (Li, NaK alloy), zinc</li> <li>attacks many plastics and rubber</li> <li>attacks iron and other metals in the presence of moisture and elevated temperatures</li> <li>may generate electrostatic charges due to low conductivity</li> </ul> <p>Haloalkanes:</p> <ul style="list-style-type: none"> <li>are highly reactive: some of the more lightly substituted lower members are highly flammable; the more highly substituted may be used as fire suppressants, not always with the anticipated results.</li> <li>may react with the lighter divalent metals to produce more reactive compounds analogous to Grignard reagents.</li> <li>may produce explosive compounds following prolonged contact with metallic or other azides</li> <li>may react on contact with potassium or its alloys - although apparently stable on contact with a wide range of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact; severity generally increases with the degree of halocarbon substitution and potassium-sodium alloys give extremely sensitive mixtures.</li> </ul> <p>BRETHERRICK L.: Handbook of Reactive Chemical Hazards</p> <ul style="list-style-type: none"> <li>react with metal halides and active metals, eg. sodium (Na), potassium (K), lithium (Li), calcium (Ca), zinc (Zn), powdered aluminium (Al) and aluminium alloys, magnesium (Mg) and magnesium alloys.</li> <li>may react with brass and steel.</li> <li>may react explosively with strong oxidisers</li> <li>may degrade rubber, and plastics such as methacrylate polymers, polyethylene and polystyrene, paint and coatings</li> <li>Avoid strong bases.</li> </ul>

### PACKAGE MATERIAL INCOMPATIBILITIES

Not Available

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	chloroform	Methane trichloride, Trichloromethane	Not Available	9.78 mg/m3 / 2 ppm	Not Available	Ca See Appendix A
US ACGIH Threshold Limit Values (TLV)	chloroform	Chloroform	10 ppm	Not Available	Not Available	TLV® Basis: Liver & embryo/fetal dam; CNS impair
US OSHA Permissible Exposure Levels (PELs) - Table Z1	chloroform	Chloroform (Trichloromethane)	Not Available	Not Available	240 mg/m3 / 50 ppm	Not Available
US NIOSH Recommended Exposure Limits (RELs)	sulfuric acid	Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	1 mg/m3	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	sulfuric acid	Sulfuric acid	0.2 mg/m3	Not Available	Not Available	TLV® Basis: Pulm func
US OSHA Permissible Exposure Levels (PELs) - Table Z1	sulfuric acid	Sulfuric acid	1 mg/m3	Not Available	Not Available	Not Available

#### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
chloroform	Chloroform	2 ppm	Not Available	Not Available
sulfuric acid	Sulfuric acid	Not Available	Not Available	Not Available


Ingredient	Original IDLH	Revised IDLH
chloroform	500 ppm	Not Available
water	Not Available	Not Available

Continued...

## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

sodium phosphate, monobasic, dihydrate	Not Available	Not Available
sulfuric acid	15 mg/m <sup>3</sup>	Not Available
methylene blue	Not Available	Not Available
Proprietary ingredient	Not Available	Not Available

### Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure.	
	Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.	
	Type of Contaminant:	Air Speed:
	solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
	aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)	
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)	
Within each range the appropriate value depends on:		
Lower end of the range	Upper end of the range	
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents	
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity	
3: Intermittent, low production.	3: High production, heavy use	
4: Large hood or large air mass in motion	4: Small hood-local control only	
Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.		
Personal protection		
Eye and face protection	<ul style="list-style-type: none"><li>▶ Safety glasses with side shields.</li><li>▶ Chemical goggles.</li><li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]</li></ul>	
Skin protection	See Hand protection below	
Hands/feet protection	<ul style="list-style-type: none"><li>▶ Wear chemical protective gloves, e.g. PVC.</li><li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li></ul>	
Body protection	See Other protection below	
Other protection	<ul style="list-style-type: none"><li>▶ Overalls.</li><li>▶ Eyewash unit.</li><li>▶ Barrier cream.</li><li>▶ Skin cleansing cream.</li></ul>	
Thermal hazards	Not Available	

### Recommended material(s)

#### GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

### Respiratory protection

Type AB-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection

Continued...



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Material	CPI
BUTYL	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
PE	C
PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23	C
TEFLON	C
VITON	C

\* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

**NOTE:** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

\* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AB-AUS P2	-	AB-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AB-AUS / Class 1 P2	-
up to 100 x ES	-	AB-2 P2	AB-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

Appearance	Two phase: Blue / Colorless		
Physical state	Liquid	Relative density (Water = 1)	1.49 (chloroform layer)
Odour	Characteristic	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	1.35 (aqueous layer)	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Partly miscible	pH as a solution	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

## SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

Continued...



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Inhaled	<p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects. The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Exposure to vapours of some rare earth salts can cause sensitivity to heat, itching, and increased sensitivity of smell and taste. Other effects include inflamed airways and lung, emphysema, regional narrowing of terminal airways and cell changes. Chloroform concentrations of 1000-2000 parts per million (ppm) may cause dizziness, headache, fatigue, salivation and nausea. 4000 ppm may cause vomiting, serious disorientation and a fainting feeling. 14000-16000 ppm may cause rapid loss of consciousness. More than 20000 ppm may cause breathing failure, heart rhythm disturbances and death. If death does not immediately occur from stoppage of breathing or heart beat, it may occur later from liver and kidney damage.</p> <p>Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.</p> <p>Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved.</p> <p>Depression of the central nervous system is the most outstanding effect of most halogenated aliphatic hydrocarbons. Inebriation and excitation, passing into narcosis, is a typical reaction. In severe acute exposures there is always a danger of death from respiratory failure or cardiac arrest due to a tendency to make the heart more susceptible to catecholamines (adrenalin)</p>	
Ingestion	<p>The material is not thought to produce adverse health effects following ingestion (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum.</p> <p>Symptoms of chloroform ingestion include burning of the mouth, throat, gullet and stomach; diarrhoea and abdominal/lower chest pain; cold, clammy skin, blueness of the extremities and face, muscle cramps, dilated pupils, low blood pressure, blood vessel dilatation on the periphery, irregular breathing, respiratory failure, unconsciousness and liver damage.</p> <p>Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.</p>	
Skin Contact	<p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.</p>	
Eye	<p>If applied to the eyes, this material causes severe eye damage.</p> <p>Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.</p>	
Chronic	<p>Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems.</p> <p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.</p> <p>Long term exposure to chloroform may produce dizziness, fatigue, drowsiness, memory impairment, increased dreams, loss of appetite, palpitations, liver and kidney damage. There may be depression, confusion, negative changes in behaviour and passive mood states. Chronic abuse of chloroform may cause psychotic behaviour. Repeated exposure may also cause dullness, urinary frequency, gastrointestinal disturbances, dry mouth, thirst, headache, general unwellness, blurred vision, pins and needles, loss of sense of balance, tremors, memory and anaemia. It may be dangerous to the foetus (unborn baby). It has been shown to induce liver, kidney, intestinal and urinary bladder tumours, including cancer.</p>	
Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	TOXICITY	IRRITATION
Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	TOXICITY	IRRITATION
CHLOROFORM	<p>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.</p> <p><b>WARNING:</b> This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.</p> <p>Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program; U.S. Dep. of Health &amp; Human Services 2002]</p>	
WATER	No significant acute toxicological data identified in literature search.	
SODIUM PHOSPHATE, MONOBASIC, DIHYDRATE	Data for anhydride	
SULFURIC ACID	<p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.</p>	

## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

**WARNING:** For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**

Occupational exposures to strong inorganic acid mists of sulfuric acid:

### METHYLENE BLUE

The substance is classified by IARC as Group 3:

**NOT** classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

After i.v. administration Methylene Blue may cause nausea, vomiting, abdominal and chest pain, headache, dizziness, mental confusion, profuse sweating, and hypertension; with very high doses methaemoglobinemia and ahemolysis may occur. Methylene Blue activates a normally dormant reductase enzyme system which reduces the methylene blue to leucomethylene blue, which in turn is able to reduce methaemoglobin to haemoglobin. Methylene Blue is absorbed from the gastrointestinal tract. It is believed to be reduced in the tissues to the leuco form which is slowly excreted, mainly in the urine together with some unchanged drug. Methylene Blue imparts a blue color to urine and faeces. In large doses Methylene Blue can produce methaemoglobinaemia. Although intra-amniotic injection of Methylene Blue has been used to diagnose premature rupture of fetal membranes or to identify separate amniotic sacs in twin pregnancies, there have been several reports of hemolytic anemia (Heinz-body anemia) and hyperbilirubinemia in neonates exposed to Methylene Blue in the amniotic cavity. In most cases, exchange transfusions and/or phototherapy are required to control the jaundice. Methylene Blue should be used with caution in the treatment of toxic methemoglobinemia; high doses can cause hemolytic anemias and patients with glucose-6-phosphate dehydrogenase (G6PD) deficiencies are particularly susceptible. A rapid disappearance of cyanosis in response to Methylene Blue would be expected within one hour but might not occur if the patient has erythrocyte G6PD or NADPH-diaphorase deficiency or if methemoglobinemia is due to the ingestion of compounds such as aniline or dapson. A second dose has been recommended if cyanosis does not disappear within 1 hour of Methylene Blue administration but results of a study in animals and of a patient with aniline poisoning indicated that an increased dosage of Methylene Blue might be of no additional benefit and could be potentially dangerous in that it could enhance Heinz body formation. Methylene Blue should not be injected s.c. as it may cause necrotic abscesses. It should not be given by intrathecal injection as neural damage has occurred. Methylene Blue should be used with caution in patients with glucose-6-phosphate dehydrogenase deficiency.

Acute Toxicity	✓	Carcinogenicity	✓
Skin Irritation/Corrosion	✓	Reproductiveity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	⊘
Respiratory or Skin sensitisation	⊘	STOT - Repeated Exposure	✓
Mutagenicity	⊘	Aspiration Hazard	⊘

Legend: ✓ – Data available to make classification

✗ – Data available but does not fill the criteria for classification

⊘ – Data Not Available to make classification

### CMR STATUS

Not Applicable

REPROTOXIN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
CARCINOGEN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
MUTAGEN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
EYE	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
RESPIRATORY	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
SKIN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

#### NOT AVAILABLE

Ingredient	Endpoint	Test Duration (hr)	Effect	Value	Species	BCF
Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
chloroform	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
water	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
sodium phosphate, monobasic, dihydrate	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
sulfuric acid	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
methylene blue	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

For Haloalkanes:

Atmospheric Fate: Fully, or partially, fluorinated haloalkanes released to the air can restrict heat loss from the Earth's atmosphere by absorbing infrared emissions from the surface. The major fate of haloalkanes in the atmosphere is via breakdown by hydroxyl radicals. These substances react with atmospheric ozone and nitrates, which also causes them to change, (transform).

Chlorofluorocarbons, (CFC), haloalkanes can break down into chlorine atoms in the air, which also contribute to ozone destruction.

Terrestrial Fate: Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. However, because haloalkane-degrading microorganisms are not easily found, biological breakdown of these substances is rare. Several methane-utilizing bacteria have been identified that may use haloalkanes. Biological breakdown may occur through various pathways.

Aquatic Fate: Haloalkanes do not easily break down in water. Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. In general, alpha- and alpha, omega-chlorinated haloalkanes are de-halogenated by water. Alpha- and alpha, omega-haloalkanes with longer chains, may be de-halogenated by the addition of oxygen, (oxidized). Haloalkanes may break down in water, if certain sulfur ions are present, such as bisulfide ions.

Continued...



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Ecotoxicity: Haloparaffins C12 to C18 may be incorporated into fatty acids in bacteria, yeasts, and fungi, resulting in their build up in the food chain. Haloalkanes are persistent and toxic to fish and wildlife.

### Ecotoxicity:

The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5

For Chloroform:

log Kow: 1.97; Koc: 34; Half-life (hr) air: 1920; Half-life (hr) H<sub>2</sub>O surface water: 28 744; Henry's atm m<sup>3</sup>/mol: 4.35E-03; BOD 5: 0.02; ThOD: 0.33, 1.346; BCF: 1.9-10.35. Drinking Water Standard - Hydrocarbon total: 10 ug/l (UK max.); Chloroform: 200 ug/l (WHO guideline); Soil Guidelines - Dutch criteria: 0.001 mg/kg.

Atmospheric Fate: Chloroform will generally evaporate to atmosphere; however, transportation may occur over long distances and photo-oxidation will occur (half-life 80 days). Chloroform is expected to exist almost entirely in the vapor phase in the atmosphere. Large amounts of chloroform in the atmosphere may be removed during precipitation; however, most chloroform removed in precipitation is likely to re-enter the atmosphere by volatilization. Long-range atmospheric transport of chloroform is possible. The major degradation process in the air involves reactions with free radicals such as hydroxyl groups. Breakdown products include phosgene and hydrogen chloride. Chloroform is more reactive in photochemical smog conditions where the approximate half-life is 11 days.

Aquatic Fate: Direct photolysis of chloroform will not be a significant degradation process in surface waters and the dominant fate process for chloroform in surface waters is volatilization.

Chloroform present in surface water is expected to volatilize rapidly to the atmosphere. A half-life of 44 hours for volatilization has been estimated.

Terrestrial Fate: Spills and releases on land will evaporate quickly or leach into groundwater where they persist for long periods. Chloroform is not expected to adsorb significantly to sediment or suspended organic matter in surface waters. In soil, the dominant transport mechanism for chloroform near the surface will probably be volatilization with relatively constant rates over a wide variety of soil types.

Ecotoxicity: Chloroform is not expected to concentrate in the food chain. Chloroform does not appear to bioconcentrate in higher aquatic organisms including bluegill sunfish but, has a moderate tendency to concentrate in nonvascular aquatic plants such as green algae. Significant degradation of chloroform under aerobic conditions has been reported in tests. Under the proper conditions, chloroform appears to be much more susceptible to anaerobic biodegradation. Above certain dosage levels, chloroform becomes toxic to anaerobic and aerobic microorganisms. This is especially noticeable for biological treatment facilities that use anaerobic digestion systems, where sustained inputs with chloroform concentrations approaching 100 mg/L can all but eliminate methane fermenting bacteria.

For Cerium:

Environmental Fate: Despite their name, rare earth elements are relatively plentiful in the Earth's crust, with cerium being the 25th most abundant element. Cerium compounds include cerium oxide, cerium carbonate, and cerium chloride.

Atmospheric Fate: Cerium oxidizes very readily at room temperature, especially in moist air. Except for europium, cerium is the most reactive of the rare-earth metals.

Terrestrial Fate: Soil ♦ Cerium is found in minerals including allanite, monazite, cerite, and bastnaesite. Plants ♦ Crops can take up cerium.

Aquatic Fate: Cerium oxide and cerium carbonate are insoluble in water, while cerium chloride is soluble in water. Cerium has affinity for humic substances, which may alter its availability in aquatic systems. The substance slowly decomposes in cold water, and rapidly decomposes in hot water. Alkali solutions and dilute/concentrated acids attack the metal rapidly.

Ecotoxicity: Current fate and transport studies are limited and may not adequately address long term environmental exposure risks to both humans and other living organisms. Although cerium has low acute toxicity, long term health and environmental effects are less well understood. The form cerium takes can also influence its biological and environmental fate. Oxides and hydroxides of cerium are poorly soluble in body fluids thus are slow to clear from the organism. Cerium can affect the respiratory tract and associated lymph nodes, (inhalation exposure), and, once in the circulatory system, can partition to the skeleton, liver, kidney and spleen. Studies subjecting animals to large dosages of cerium show evidence of neurological effects, possibly due to cerium competing with calcium binding sites in the brain. Long term human exposure to cerium is correlated with rare earth pneumoconiosis, but, the precise role of cerium in this disease is not well characterized.

**DO NOT discharge into sewer or waterways.**

### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
chloroform	HIGH (Half-life = 1800 days)	HIGH (Half-life = 259.63 days)
water	LOW	LOW

### Bioaccumulative potential

Ingredient	Bioaccumulation
chloroform	LOW (BCF = 13)
water	LOW (LogKOW = -1.38)

### Mobility in soil

Ingredient	Mobility
chloroform	LOW (KOC = 35.04)
water	LOW (KOC = 14.3)


## SECTION 13 DISPOSAL CONSIDERATIONS

### Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> <li>▶</li> <li>▶</li> <li>▶ Dispose of according to federal, state, and local regulations.</li> <li>▶</li> </ul>
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## SECTION 14 TRANSPORT INFORMATION

### Labels Required

	
Marine Pollutant	NO



## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

### Land transport (DOT)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kits; First aid kits
Environmental hazard	No relevant data
Transport hazard class(es)	Class 9
Special precautions for user	Hazard Label 9 Special provisions 15

### Air transport (ICAO-IATA / DGR)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kit; First aid kit
Environmental hazard	No relevant data
Transport hazard class(es)	ICAO/IATA Class 9 ICAO / IATA Subrisk Not Applicable ERG Code 9L
Special precautions for user	Special provisions A44 A163 Cargo Only Packing Instructions 960 Cargo Only Maximum Qty / Pack 10 kg Passenger and Cargo Packing Instructions 960 Passenger and Cargo Maximum Qty / Pack 10 kg Passenger and Cargo Limited Quantity Packing Instructions Y960 Passenger and Cargo Limited Maximum Qty / Pack 1 kg

### Sea transport (IMDG-Code / GGVSee)

UN number	3316
Packing group	II
UN proper shipping name	CHEMICAL KIT or FIRST AID KIT
Environmental hazard	Not Applicable
Transport hazard class(es)	IMDG Class 9 IMDG Subrisk Not Applicable
Special precautions for user	EMS Number F-A , S-P Special provisions 251 340 Limited Quantities See SP251

### Transport in bulk according to Annex II of MARPOL and the IBC code

Source	Ingredient	Pollution Category
	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	

## SECTION 15 REGULATORY INFORMATION

### Safety, health and environmental regulations / legislation specific for the substance or mixture

chloroform(67-66-3) is found on the following regulatory lists	"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs","US - Alaska Limits for Air Contaminants","US - California - Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity","US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)","US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)","US - California Permissible Exposure Limits for Chemical Contaminants","US - California Proposition 65 - Carcinogens","US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens","US - California Proposition 65 - Reproductive Toxicity","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Massachusetts - Right To Know Listed Chemicals","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Permissible exposure limits of air contaminants","US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)","US Clean Air Act - Hazardous Air Pollutants","US CWA (Clean Water Act) - List of Hazardous Substances","US CWA (Clean Water Act) - Priority Pollutants","US CWA (Clean Water Act) - Toxic Pollutants","US EPA Carcinogens Listing","US EPA Section 313 Chemical List","US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule","US National Toxicology Program (NTP) 14th Report Part B. Reasonably Anticipated to be a Human Carcinogen","US NIOSH Recommended Exposure Limits (RELs)","US Office of Environmental Health Hazard Assessment Proposition 65 No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity","US
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Continued...

## Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

	OSHA Permissible Exposure Levels (PELs) - Table Z1", "US SARA Section 302 Extremely Hazardous Substances", "US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances", "US TSCA New Chemical Exposure Limits (NCEL)"
<b>water(7732-18-5) is found on the following regulatory lists</b>	"US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
<b>sodium phosphate, monobasic, dihydrate(13472-35-0) is found on the following regulatory lists</b>	"US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
<b>sulfuric acid(7664-93-9) is found on the following regulatory lists</b>	"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft", "US - Alaska Limits for Air Contaminants", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts - Right To Know Listed Chemicals", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US CWA (Clean Water Act) - List of Hazardous Substances", "US Drug Enforcement Administration (DEA) List I and II Regulated Chemicals", "US EPCRA Section 313 Chemical List", "US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US National Toxicology Program (NTP) 14th Report Part A Known to be Human Carcinogens", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
<b>methylene blue(61-73-4) is found on the following regulatory lists</b>	"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"
<b>Proprietary ingredient() is found on the following regulatory lists</b>	"Not Applicable"

### SECTION 16 OTHER INFORMATION

#### Other information

#### Ingredients with multiple cas numbers

Name	CAS No
Not Available	Not Available

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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Simplicity in Water Analysis

## Cover Page for Safety Data Sheet

Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

**SDS No.:** R1001

**Version No.:** 2.2

**Product Name:** CHEMetrics® Ampoules for Filming Amines CHEMetrics® Kit & Refill (R-1001) and for Detergents CHEMetrics® Kit & Refill (R-9401)

**Component of water analysis reagent sets:** Refills R-1000, R-1000E, R-9400, R-9404 and Test Kits K-1001, K-1001E, K-9400, K-9404

### Product Descriptions:

*CHEMetrics Ampoules:* Sealed glass ampoules, 7 mm OD, for visual colorimetric water analysis. Each CHEMet™ ampoule contains approximately 0.25 mL of liquid reagent sealed under vacuum. The refills and kits contain 20 CHEMetrics ampoules.

### Addendum to Section 14 Transport Information:

Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

- CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
- CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

### Additional Information:

- "Print Date" = Revision Date (expressed as DD/MM/YYYY)
- Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).

*CHEMetrics®, VACUettes®, Vacu-vials®, and Titrets® are registered trademarks of CHEMetrics Inc.*





## CHEMetrics Ampoules for Filming Amines CHEMetrics Kit & Refill (R-1001) and for Detergents CHEMetrics Kit & Refill (R-9401)

CHEMetrics, Inc.

Chemwatch: 9-92655

SDS No: R1001

Version No: 2.2

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Chemwatch Hazard Alert Code: 3

Issue Date: 03/11/2014

Print Date: 12/03/2015

Initial Date: 05/11/2014

S.GHS.USA.EN

### SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

#### Product Identifier

Product name	CHEMetrics Ampoules for Filming Amines CHEMetrics Kit & Refill (R-1001) and for Detergents CHEMetrics Kit & Refill (R-9401)
Synonyms	Not Available
Proper shipping name	Chemical kits First aid kits
Chemical formula	Not Applicable
Other means of identification	Not Available
CAS number	Not Applicable

#### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Component of water analysis reagent sets: refills R-1000, R-1000E, R-9400, R-9404 and test kits K-1001, K-1001E, K-9400, K-9404
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#### Details of the manufacturer/importer

Registered company name	CHEMetrics, Inc.
Address	4295 Catlett Road, Midland, VA. 22728 United States
Telephone	1-540-788-9026
Fax	1-540-788-4856
Website	www.chemetrics.com
Email	technical@chemetrics.com

#### Emergency telephone number

Association / Organisation	ChemTel Inc.
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	+01-813-248-0585

### SECTION 2 HAZARDS IDENTIFICATION

#### Classification of the substance or mixture

GHS Classification	Flammable Liquid Category 3, Serious Eye Damage Category 1, STOT - SE (Narcosis) Category 3
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#### Label elements

GHS label elements	
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SIGNAL WORD	DANGER
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#### Hazard statement(s)

H226	Flammable liquid and vapour
H318	Causes serious eye damage
H336	May cause drowsiness or dizziness

#### Precautionary statement(s) Prevention

Continued...

## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P240	Ground/bond container and receiving equipment.

### Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician/first aider
P370+P378	In case of fire: Use alcohol resistant foam or fine spray/water fog for extinction.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.

### Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

### Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration
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## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

### Substances

See section below for composition of Mixtures

### Mixtures

CAS No	%[weight]	Name
71-23-8	98	<a href="#">n-propanol</a>
7732-18-5	2	<a href="#">water</a>

## SECTION 4 FIRST AID MEASURES

### Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>Transport to hospital or doctor without delay.</li> <li>Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>Flush skin and hair with running water (and soap if available).</li> <li>Seek medical attention in event of irritation.</li> </ul>
Inhalation	<ul style="list-style-type: none"> <li>If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>Other measures are usually unnecessary.</li> </ul>
Ingestion	<ul style="list-style-type: none"> <li>Immediately give a glass of water.</li> <li>First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> <li>If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.</li> </ul>

### Indication of any immediate medical attention and special treatment needed

To treat poisoning by the higher aliphatic alcohols (up to C7):

- Gastric lavage with copious amounts of water.
- It may be beneficial to instill 60 ml of mineral oil into the stomach.
- Oxygen and artificial respiration as needed.
- Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5]

### BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for shock.
- Monitor and treat, where necessary, for pulmonary oedema.
- Anticipate and treat, where necessary, for seizures.

Continued...

## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- ▶ Give activated charcoal.

### ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

### EMERGENCY DEPARTMENT

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- ▶ Acidosis may respond to hyperventilation and bicarbonate therapy.
- ▶ Haemodialysis might be considered in patients with severe intoxication.
- ▶ Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.
- ▶ Water spray or fog - Large fires only.

### Special hazards arising from the substrate or mixture

#### Fire Incompatibility

- ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

### Advice for firefighters

#### Fire Fighting

- ▶ Alert Fire Brigade and tell them location and nature of hazard.
- ▶ Wear full body protective clothing with breathing apparatus.
- ▶ Prevent, by any means available, spillage from entering drains or water course.
- ▶ Use water delivered as a fine spray to control fire and cool adjacent area.
- ▶ Avoid spraying water onto liquid pools.

#### Fire/Explosion Hazard

- ▶ Combustible.
- ▶ Slight fire hazard when exposed to heat or flame.
- ▶ Heating may cause expansion or decomposition leading to violent rupture of containers.
- ▶ On combustion, may emit toxic fumes of carbon monoxide (CO).
- ▶ May emit acid smoke.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

#### Minor Spills

- ▶ Remove all ignition sources.
- ▶ Clean up all spills immediately.
- ▶ Avoid breathing vapours and contact with skin and eyes.
- ▶ Control personal contact with the substance, by using protective equipment.
- ▶ Contain and absorb small quantities with vermiculite or other absorbent material.

#### Major Spills

- Moderate hazard.
- ▶ Clear area of personnel and move upwind.
  - ▶ Alert Fire Brigade and tell them location and nature of hazard.
  - ▶ Wear breathing apparatus plus protective gloves.
  - ▶ Prevent, by any means available, spillage from entering drains or water course.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

#### Safe handling

- ▶ **DO NOT** allow clothing wet with material to stay in contact with skin
- ▶ Avoid all personal contact, including inhalation.
- ▶ Wear protective clothing when risk of exposure occurs.
- ▶ Use in a well-ventilated area.
- ▶ Prevent concentration in hollows and sumps.
- ▶ **DO NOT** enter confined spaces until atmosphere has been checked.



## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

	<p><b>Wear impact- and splash-resistant eyewear. Break the ampoule tip only when it is completely immersed in sample. Breaking the tip in air may cause the glass ampoule to shatter.</b></p>
Other information	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> </ul> <p><b>For optimum analytical performance, store in the dark and at room temperature.</b></p>

### Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> <li>▶ Metal can or drum</li> <li>▶ Packaging as recommended by manufacturer.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul>
Storage incompatibility	<p>Alcohols</p> <ul style="list-style-type: none"> <li>▶ are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents.</li> <li>▶ reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen</li> <li>▶ react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium</li> <li>▶ should not be heated above 49 deg. C. when in contact with aluminium equipment</li> </ul>

### PACKAGE MATERIAL INCOMPATIBILITIES

Not Available

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Levels (PELs) - Table Z1	n-propanol	n-Propyl alcohol	500 mg/m <sup>3</sup> / 200 ppm	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	n-propanol	n-Propanol (n-Propyl alcohol)	100 ppm	Not Available	Not Available	TLV® Basis: Eye & URT irr
US NIOSH Recommended Exposure Limits (RELs)	n-propanol	Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol	500 mg/m <sup>3</sup> / 200 ppm	625 mg/m <sup>3</sup> / 250 ppm	Not Available	[skin]


#### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
n-propanol	Propyl alcohol, n-; (n-Propanol)	250 ppm	250 ppm	4000 ppm

Ingredient	Original IDLH	Revised IDLH
n-propanol	4,000 ppm	800 ppm
water	Not Available	Not Available

### Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly.</p>
Personal protection	
Eye and face protection	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience.</li> </ul>
Skin protection	See Hand protection below
Hands/feet protection	<p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:</p> <ul style="list-style-type: none"> <li>▶ frequency and duration of contact,</li> <li>▶ chemical resistance of glove material,</li> <li>▶ glove thickness and</li> <li>▶ dexterity</li> </ul>

Continued...

## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

	Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C. apron.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> </ul>
<b>Thermal hazards</b>	Not Available

### Recommended material(s)

#### GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

**"Forsberg Clothing Performance Index".**

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

Material	CPI
NEOPRENE	A
VITON	B
BUTYL	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PVA	C
PVC	C
TEFLON	C

\* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

**NOTE:** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

\* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

### Respiratory protection

Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	Air-line*	A-2	A-PAPR-2 ^
up to 20 x ES	-	A-3	-
20+ x ES	-	Air-line**	-

\* - Continuous-flow; \*\* - Continuous-flow or positive pressure demand

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Appearance</b>	colorless, may contain black particles		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	0.8
<b>Odour</b>	Characteristic	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	413
<b>pH (as supplied)</b>	Not Available	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	-127	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	97	<b>Molecular weight (g/mol)</b>	Not Available
<b>Flash point (°C)</b>	23	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Flammable.	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	13.5	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	2.1	<b>Volatile Component (%vol)</b>	Not Available
<b>Vapour pressure (kPa)</b>	Not Available	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Miscible	<b>pH as a solution</b>	8.5
<b>Vapour density (Air = 1)</b>	Not Available	<b>VOC g/L</b>	Not Available

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
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## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul>
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

### SECTION 11 TOXICOLOGICAL INFORMATION

#### Information on toxicological effects

<b>Inhaled</b>	<p>The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.</p> <p>Subjects unacclimatised to n-propanol exposure experienced mild irritation of the eyes, nose and throat at a concentration of 400 parts per million.</p>
<b>Ingestion</b>	<p>Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma.</p> <p>The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.</p>
<b>Skin Contact</b>	<p>The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.</p> <p>The calculated human skin permeability coefficient for n-propanol by the U.S. Environment Protection Agency is 1.3 x 10<sup>-3</sup> cm/hr.</p> <p>Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.</p>
<b>Eye</b>	If applied to the eyes, this material causes severe eye damage.
<b>Chronic</b>	<p>Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.</p> <p>N-propanol is shown to cause dose dependent severe liver injury, malignant tumours (blood and liver cancers) and benign tumours in rats.</p> <p>There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.</p>

<b>CHEMets Ampoules for Filming Amines CHEMets Kit &amp; Refill (R-1001) and for Detergents CHEMets Kit &amp; Refill (R-9401)</b>	TOXICITY	IRRITATION
<b>CHEMets Ampoules for Filming Amines CHEMets Kit &amp; Refill (R-1001) and for Detergents CHEMets Kit &amp; Refill (R-9401)</b>	TOXICITY	IRRITATION

<b>CHEMets Ampoules for Filming Amines CHEMets Kit &amp; Refill (R-1001) and for Detergents CHEMets Kit &amp; Refill (R-9401)</b>	<p>No significant acute toxicological data identified in literature search.</p> <p>The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.</p>
<b>N-PROPANOL</b>	<p>The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.</p>
<b>WATER</b>	No significant acute toxicological data identified in literature search.

<b>Acute Toxicity</b>	⊘	<b>Carcinogenicity</b>	⊘
<b>Skin Irritation/Corrosion</b>	⊘	<b>Reproductivity</b>	⊘
<b>Serious Eye Damage/Irritation</b>	✓	<b>STOT - Single Exposure</b>	✓
<b>Respiratory or Skin sensitisation</b>	⊘	<b>STOT - Repeated Exposure</b>	⊘
<b>Mutagenicity</b>	⊘	<b>Aspiration Hazard</b>	⊘

Legend: ✓ – Data required to make classification available  
 ✗ – Data available but does not fill the criteria for classification  
 ⊘ – Data Not Available to make classification

#### CMR STATUS

<b>SKIN</b>	n-propanol	US - Hawaii Air Contaminant Limits - Skin Designation US NIOSH Recommended Exposure Limits (RELs) - Skin US - Washington Permissible exposure limits of air contaminants - Skin US - California Permissible Exposure Limits for Chemical Contaminants - Skin	X [skin] S
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Continued...



## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

### SECTION 12 ECOLOGICAL INFORMATION

#### Toxicity

For n-Propanol: log Kow: 0.25-0.34;  
 Half-life (hr) air: 6.7;  
 Half-life (hr) H<sub>2</sub>O surface water: 6.5;  
 Henry's atm m<sup>3</sup>/mol: 6.85E-06;  
 BOD 5: 1.43-1.6 g O<sub>2</sub>/g;  
 BOD 20: <2 g O<sub>2</sub>/g;  
 COD : 91%;  
 ThOD : 1.8 g;  
 O<sub>2</sub>/gBCF: 0.7.

Aquatic Fate: High biochemical oxygen demand and a potential to cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism. n-Propanol is expected to biodegrade and is not expected to persist for long periods in aquatic environments. When diluted with a large amount of water, n-propanol is not expected to have a significant impact.

**DO NOT discharge into sewer or waterways.**

#### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
n-propanol	LOW	LOW
water	LOW	LOW

#### Bioaccumulative potential

Ingredient	Bioaccumulation
n-propanol	LOW (LogKOW = 0.25)
water	LOW (LogKOW = -1.38)

#### Mobility in soil

Ingredient	Mobility
n-propanol	HIGH (KOC = 1.325)
water	LOW (KOC = 14.3)


### SECTION 13 DISPOSAL CONSIDERATIONS

#### Waste treatment methods

Product / Packaging disposal	Dispose of according to federal, state, and local regulations.
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### SECTION 14 TRANSPORT INFORMATION

#### Labels Required

	
Marine Pollutant	NO

#### Land transport (DOT)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kits; First aid kits
Environmental hazard	No relevant data
Transport hazard class(es)	Class 9
Special precautions for user	Special provisions 15

#### Air transport (ICAO-IATA / DGR)

UN number	3316		
Packing group	II		
UN proper shipping name	Chemical kit †; First aid kit †		
Environmental hazard	No relevant data		
Transport hazard class(es)	ICAO/IATA Class	9	
	ICAO / IATA Subrisk	Not Applicable	
	ERG Code	9L	

## CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

<b>Special precautions for user</b>	Special provisions	A44 A163
	Cargo Only Packing Instructions	960
	Cargo Only Maximum Qty / Pack	10 kg
	Passenger and Cargo Packing Instructions	960
	Passenger and Cargo Maximum Qty / Pack	10 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Y960
	Passenger and Cargo Limited Maximum Qty / Pack	1 kg

### Sea transport (IMDG-Code / GGVSee)

<b>UN number</b>	3316	
<b>Packing group</b>	II	
<b>UN proper shipping name</b>	CHEMICAL KIT or FIRST AID KIT	
<b>Environmental hazard</b>	Not Applicable	
<b>Transport hazard class(es)</b>	IMDG Class	9
	IMDG Subrisk	Not Applicable
<b>Special precautions for user</b>	EMS Number	F-A , S-P
	Special provisions	251 340
	Limited Quantities	See SP251

### Transport in bulk according to Annex II of MARPOL 73 / 78 and the IBC code

Source	Ingredient	Pollution Category
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk	n-propanol	Y

## SECTION 15 REGULATORY INFORMATION

### Safety, health and environmental regulations / legislation specific for the substance or mixture

<b>n-propanol(71-23-8) is found on the following regulatory lists</b>	"US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Idaho - Limits for Air Contaminants", "US - Hawaii Air Contaminant Limits", "US - California Permissible Exposure Limits for Chemical Contaminants", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Michigan Exposure Limits for Air Contaminants", "US NIOSH Recommended Exposure Limits (RELs)", "US - Alaska Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Minnesota Permissible Exposure Limits (PELs)", "US ACGIH Threshold Limit Values (TLV)", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US OSHA Permissible Exposure Levels (PELs) - Table Z1"
<b>water(7732-18-5) is found on the following regulatory lists</b>	"US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

## SECTION 16 OTHER INFORMATION

### Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references)

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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## APPENDIX E

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- Catchment Investigation Summary Report Form



## CATCHMENT INVESTIGATION SUMMARY EXAMPLE REPORTING FORM

Date:		Completed By:	
Catchment (aka Outfall / interconnection) Location Description:		Catchment I.D.	
		Catchment Rank:	<input type="checkbox"/> Problem <input type="checkbox"/> High <input type="checkbox"/> Low
Waterbody Name:		Waterbody MassDEP AU ID:	
Dates of Catchment Investigation:	Date Began: _____ Date Ended: _____	Type of Investigation (Check all that Apply)	<input type="checkbox"/> Dry Weather <input type="checkbox"/> Wet Weather
Manhole Types Present/Investigated (ck all that apply):	<input type="checkbox"/> Key Junction <input type="checkbox"/> Junction <input type="checkbox"/> Outfall Only		
Description of Investigation:	<u>Example text:</u> Medium sized catchment in residential area. No indications of illicit discharge at outfall. Opened and inspected one key junction manhole and two junction manholes. Found indications of elevated surfactants and visual soap in MH 6753, but no ammonia and no visual or olfactory sewage indicators. Performed visual survey of neighborhood upstream and saw wet spot on street, apparent single family car wash. No system vulnerability factors were discovered. Needed corrections to system map were noted and will be sent to GIS Team. Conclusion: no indications of illicit discharge found and catchment marked complete.		
System Vulnerability Factors (SVFs)	(Check any known or discovered. Must wet screen if one or more required SVF)  <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> History of SSOs  <input type="checkbox"/> Common or twin-invert manhole  <input type="checkbox"/> Common trench sewer and drains  <input type="checkbox"/> Crossings of drain and sewer alignments  <input type="checkbox"/> Known or suspected underdrain  <input type="checkbox"/> Inadequate LOS, surcharge, backups, complaints </div> <div style="width: 48%;"> <input type="checkbox"/> Formerly CSO area  <input type="checkbox"/> Sewer defects or cross connection  <input type="checkbox"/> Pump station, siphon or constriction*  <input type="checkbox"/> Sewer or drain &gt;40 yr old*  <input type="checkbox"/> Septic failures*  <input type="checkbox"/> Other (describe) </div> </div> <p style="text-align: center;">* Recommended but not required SVF</p>		
Investigation status and next steps (check all that apply):	<input type="checkbox"/> Non illicit discharge / SSO concerns noted, conduct targeted outreach <input type="checkbox"/> SVFs identified, schedule wet weather screening (do not mark complete until wet screen finished) <div style="margin-left: 20px;"> <input type="checkbox"/> Wet weather outfall screening / catchment investigation complete  <input type="checkbox"/> Schedule revisit, further investigation, or advanced testing. </div> <input type="checkbox"/> Investigation complete, no problems found. Schedule follow up screening in 5 years <input type="checkbox"/> Investigation complete, but inconclusive. <input type="checkbox"/> Investigation complete, awaiting repair. Problem isolated. Schedule re-investigation post repair.		
Description of Potential Illicit Discharge:	(Discharge or Indicator type, volume, indications of source, etc. or none)		

Town of Upton

## RESPONSE ACTION(S)

Description of Next Steps	<u>Example text:</u> Refer neighborhood to NSP for targeted education about car washing. Update GIS with mapping information. Mark absence of SVF's in catchment inventory.		
Next Steps were completed on:	Date: _____	Confirmed By:	
Attach sketch or supporting documentation as needed			
Additional Notes:			

Town of Upton

## CATCHMENT INVESTIGATION SUMMARY REPORTING FORM

Date:		Completed By:	
Catchment (aka Outfall / interconnection) Location Description:		Catchment I.D.	
		Catchment Rank:	<input type="checkbox"/> Problem <input type="checkbox"/> High <input type="checkbox"/> Low
Waterbody Name:		Waterbody MassDEP AU ID:	
Dates of Catchment Investigation:	Date Began: _____ Date Ended: _____	Type of Investigation (Check all that Apply)	<input type="checkbox"/> Dry Weather <input type="checkbox"/> Wet Weather
Manhole Types Present/Investigated (ck all that apply):	<input type="checkbox"/> Key Junction <input type="checkbox"/> Junction <input type="checkbox"/> Outfall Only		
Description of Investigation:			
System Vulnerability Factors (SVFs)	(Check any known or discovered. Must wet screen if one or more required SVF)  <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> History of SSOs  <input type="checkbox"/> Common or twin-invert manhole  <input type="checkbox"/> Common trench sewer and drains  <input type="checkbox"/> Crossings of drain and sewer alignments  <input type="checkbox"/> Known or suspected underdrain  <input type="checkbox"/> Inadequate LOS, surcharge, backups, complaints         </div> <div style="width: 48%;"> <input type="checkbox"/> Formerly CSO area  <input type="checkbox"/> Sewer defects or cross connection  <input type="checkbox"/> Pump station, siphon or constriction*  <input type="checkbox"/> Sewer or drain &gt;40 yr old*  <input type="checkbox"/> Septic failures*  <input type="checkbox"/> Other (describe)         </div> </div> <p style="text-align: center;">* Recommended but not required SVF</p>		
Investigation status and next steps (check all that apply):	<input type="checkbox"/> Non illicit discharge / SSO concerns noted, conduct targeted outreach <input type="checkbox"/> SVFs identified, schedule wet weather screening (do not mark complete until wet screen finished) <div style="margin-left: 20px;"> <input type="checkbox"/> Wet weather outfall screening / catchment investigation complete  <input type="checkbox"/> Schedule revisit, further investigation, or advanced testing.           </div> <input type="checkbox"/> Investigation complete, no problems found. Schedule follow up screening in 5 years <input type="checkbox"/> Investigation complete, but inconclusive. <input type="checkbox"/> Investigation complete, awaiting repair. Problem isolated. Schedule re-investigation post repair.		
Description of Potential Illicit Discharge:	(Discharge or Indicator type, volume, indications of source, etc. or none)		



Town of Upton

## RESPONSE ACTION(S)

Description of Next Steps			
Next Steps were completed on:	Date: _____	Confirmed By:	
Attach sketch or supporting documentation as needed			
Additional Notes:			

## APPENDIX F

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- IDDE Employee Training Record

EMPLOYEE TRAINING RECORD

Topic: \_\_\_\_\_ Date: \_\_\_\_\_ Duration: \_\_\_\_\_ Sheet \_\_\_\_ of \_\_\_\_.

Name	Title	Signature



## APPENDIX G

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- Illicit Discharge Incident Tracking Form

## APPENDIX H

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- SSO Inventory

## SANITARY SEWER OVERFLOWS (SSOs) INVENTORY

[illegible]