

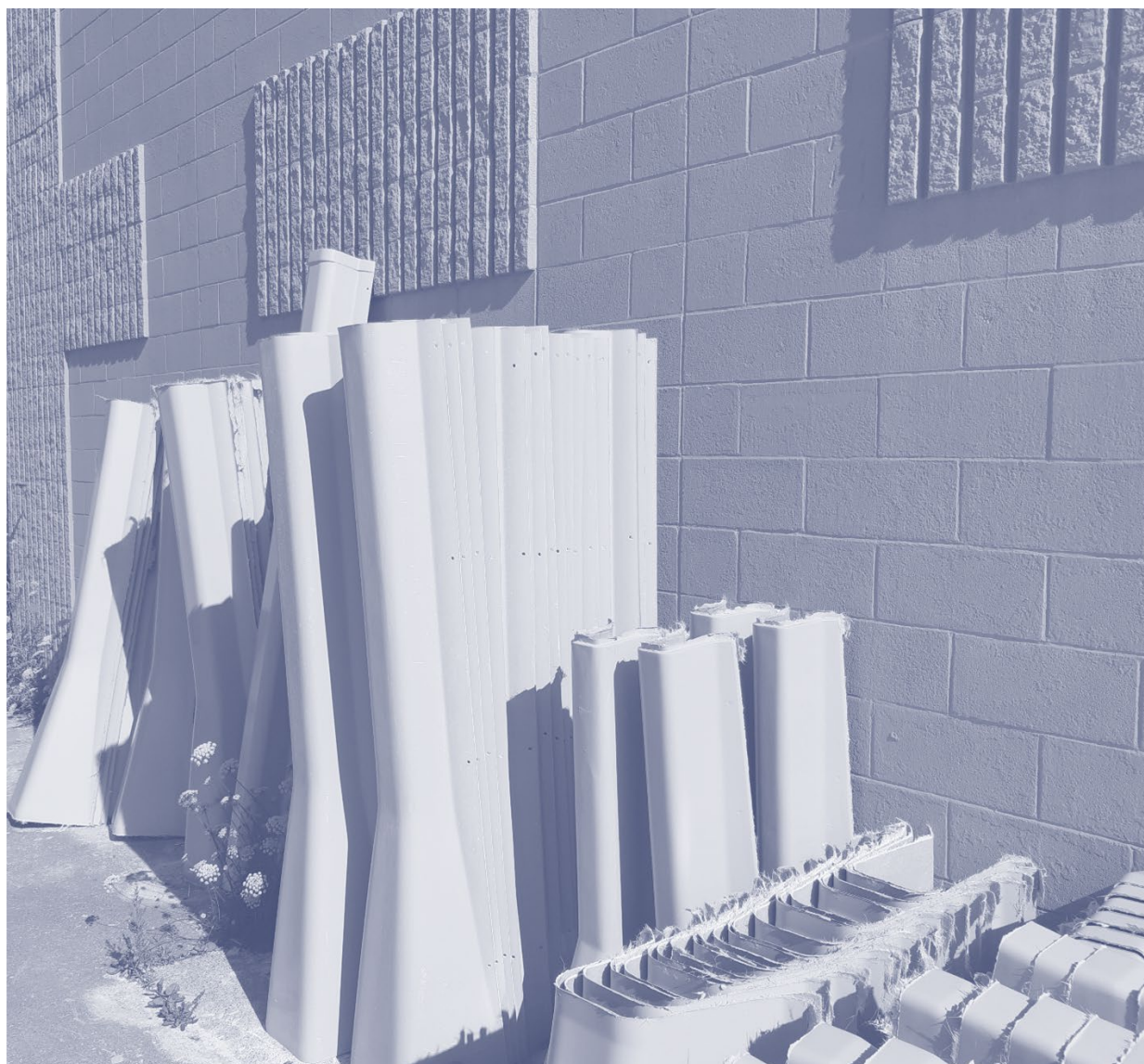


2019

# COMPLIANCE AUDIT REPORT

*ENVIRONMENTAL MANAGEMENT ACT*

## PLASTICS AND COMPOSITE PRODUCTS INDUSTRY & PLASTIC AND SYNTHETIC RESIN MANUFACTURING INDUSTRY



## EXECUTIVE SUMMARY

The B.C. Ministry of Environment and Climate Change Strategy (ENV) conducted a sector-wide compliance audit between June 1 to July 31, 2019 on select plastics and composite products (PCP) facilities and plastic and synthetic resin manufacturing (PSRM) facilities within the province of British Columbia (B.C.) to determine their level of compliance with the *Environmental Management Act* (EMA) administered by the Ministry of Environment and Climate Change Strategy (ENV). Findings of the Plastics and Composite Products Industry and Plastic and Synthetic Resin Manufacturing Industry Audit (Plastics Audit) will serve to identify compliance rates across the sector, guide strategies to improve compliance with legislative requirements, and inform regulatory improvement initiatives to ensure the protection of human health and the environment.

According to the EMA and the Waste Discharge Regulation (WDR), the PCP industry and the PSRM industry are prescribed activities/operations; therefore, facilities require a site-specific authorization/permit to discharge waste into the environment. All nine plastics (five PCP and four PSRM) facilities in B.C. with active waste authorizations under ENV were included in the Plastics Audit – all possess site-specific permits to discharge air (five facilities) or effluent (four facilities).

Inspections consisted of evaluating whether the facility was compliant with their discharge permit, and where appropriate, the Hazardous Waste Regulation (HWR) on a section-by-section basis. This was achieved via office reviews of authorization information and any required documents, reports or data submissions (dating between 2017 and 2019), and on-site walkthroughs to verify facility and operational details and review monitoring records and maintenance logs. The inspection results were compiled and analyzed to determine compliance rates.

Twelve inspection records were generated following inspections of the nine facilities included in the Plastics Audit; nine records for inspections against site-specific permit requirements, and three records for inspections against the HWR at select sites. Five notices of compliance were issued; four for permit inspections and one for HWR inspections. In total, ENV issued six advisories and one warning.

Two facilities had decommissioned the authorized works and discontinued the authorized waste discharges and were recommended for permit cancellation. Two other facilities, with effluent discharge permits, had rerouted their effluent into the municipal sewerage system and are therefore no longer discharging directly into the environment. Therefore, none of the facilities with effluent discharge permits currently discharge effluent to the environment. In summary, there are only seven facilities which were still actively conducting operations described in the permit, five of which are still releasing authorized air discharges. Data analysis for this Audit was performed for these seven active facilities only.

The inspections of nine facilities for the Plastics Audit comprised a total of 337 evaluations of individual site-specific permit clauses. When facilities were evaluated for requirements for which compliance was applicable at the time of the inspection (276 evaluations), facilities were compliant in 52 percent of evaluations of applicable requirements.

Key findings are limited to compliance evaluations of clauses deemed applicable to the facilities at the time of the inspection:

ENV could not determine whether 86 percent of facilities were keeping within discharge quantity limits or quality parameters, nor in any of the facilities evaluated for receiving environmental quality requirements, mostly due to

the lack of monitoring requirements in the permits. ENV determined 65 percent of facilities discharged within permitted time periods, while compliance could not be determined for 35 percent due to lack of records required.

ENV determined 71 percent of facilities were compliant with their authorized works requirements but could not determine compliance for the remaining 29 percent of facilities due to unclear site plans or relocation of works due to rerouting of effluent into the municipal sewer infrastructure. No non-compliances were identified with the requirements to maintain and inspect authorized works. Inspection findings did not identify unapproved bypasses nor emergency or spill incidents at any of the evaluated facilities.

Sixty-seven percent of facilities performed required fugitive emission reduction measures, while ENV determined 33 percent were non-compliant due to lack of secure lids on waste receptacles or lack of maintaining negative building pressure. Fifty percent of the facilities prepared/implemented/submitted plans and specifications as required, while 50 percent failed to submit a plan.

Seventeen percent of facilities conducted required routine monitoring while 17 percent was non-compliant; ENV could not determine compliance for the remaining 67 percent. Thirty-three percent of facilities submitted routine reporting as required, while 67 percent failed to submit required reports in the inspection period. It is worth noting that while three of the seven permits for facilities analyzed in this Audit require routine monitoring of discharge quantity and quality as well as routine report submissions, the remaining four contained provisions for future monitoring and reporting as per ENV director request instead; therefore, in the event of no director requests, compliance with such conditional monitoring and reporting clauses are considered not applicable to the facilities.

Eighty percent of the facilities adhered to required procedures for sampling and lab analysis, while 20 percent was non-compliant.

Two of the four facilities maintained and/or submitted facility/operational records for ENV review as required, while the other two were determined to be out of compliance for either failing to maintain or submit records to ENV as required or for completing late submissions. Fifty percent of facilities were found to be out of compliance with notification clause requirements by utilizing unauthorized treatment works or relocating authorized works without notification to ENV.

Three facilities were evaluated for one or more of the following HWR requirements: Sections 7, 16(1)(a), 16(1)(b), 43(1), 46(1)(d), 46(3)(b), 46(5), 46(8)(1), 46(9), 50(3)(a), 50(3)(b), and 50(3)(c). Two out of those three facilities stored hazardous waste onsite meeting HWR prescribed quantities. Non-compliance was determined for Sections 16(1)(a), 46(8)(1), 46(9), 50(3)(a), 50(3)(b), and 50(3)(c), due to improper storage, labelling, and lack of manifest retention.

Findings from the 2019 Plastics Audit conducted on nine PCP and PSRM facilities in B.C. have highlighted opportunities of improvement for the PCP and PSRM sector and ENV. Facility owner/operators are reminded to ensure that required records and reports are retained and submitted on time, to notify ENV in advance of any modifications to discharge processes and infrastructure as well as administrative changes, to ensure that ENV is updated with any changes to site plans, to perform fugitive emission reduction measures as required, and to manage hazardous waste in accordance with HWR requirements. In the interests of improving permit enforceability and allowing for timely evaluation of performance in mitigating impacts to human health and the environment, ENV is recommended to consider updating permits to include requirements for routine monitoring of discharge quantity, discharge quality, and receiving environment quality (where appropriate), requirements for the maintenance of records on discharge periods, and requirements for routine reporting of monitoring results.

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## LIST OF ABBREVIATIONS USED

Acronym	Definition
EMA	<i>Environmental Management Act</i>
ENV	B.C. Ministry of Environment and Climate Change Strategy
HWR	Hazardous Waste Regulation
PCP	Plastics and Composite Products
PSRM	Plastic and Synthetic Resin Manufacturing
WDR	Waste Discharge Regulation

## INTRODUCTION

### PURPOSE OF THIS REPORT

This report presents the findings of a sector-wide compliance audit conducted between June 1 to July 31, 2019 on select plastics and composite products (PCP) facilities and plastic and synthetic resin manufacturing (PSRM) facilities within the province of British Columbia (B.C.) to determine their level of compliance with the *Environmental Management Act* (EMA) administered by the Ministry of Environment and Climate Change Strategy (ENV).

Findings of the Plastics and Composite Products Industry and Plastic and Synthetic Resin Manufacturing Industry Audit (Plastics Audit) will serve to identify compliance rates across the sector, guide strategies to improve compliance with legislative requirements, and inform regulatory improvement initiatives to ensure the protection of human health and the environment. ENV expects that the plastics industry sector will use the report to identify and address compliance areas of improvement for not only individual operations, but also across the overall sector.

### ABOUT THE INDUSTRY SECTOR

#### SELECTION

Industry sectors targeted by the ENV's annual audit program are selected based on their inclusion in the Waste Discharge Regulation (WDR), as well as existing policy and direction such as Environmental Protection Department Inspection Policy and the 2018 B.C. Service Plan.

#### DESCRIPTION

Plastics are a ubiquitous material in everyday modern life.

Plastics (also known as polymers) are carbon (or less commonly, silicon) based compounds with hydrogen, oxygen, nitrogen, chlorine, and sulphur, synthesized from primary chemicals sourced most commonly from oil, natural gas or wood. The manufacturing of plastics starts with the creation of monomers from raw materials; the monomers then undergo chemical polymerization to form polymers. Additives such as antioxidants, colorants, foaming agents, plasticizers, lubricants, anti-stats, antimicrobials and flame retardants may be incorporated into the polymers. There are two types of plastics: thermoplastics (plastics that can be melted for reshaping, e.g. acrylonitrile butadiene styrene, polyethylene, polypropylene, polyvinyl chloride, polystyrene, and polycarbonate, etc.) and thermoset plastics (plastics that cannot be melted for reshaping, e.g. polyurethanes, unsaturated polyesters, epoxies, phenol formaldehyde, vinyl esters, etc.). Polymers are formed into a variety of products

through processes such as extrusion, calendering, film blowing, injection molding, blow molding, expanded bead blowing, rotational molding, compression molding, casting, and thermoforming.<sup>1</sup>

Plastic composites, which are also known as fiber reinforced plastics (FRPs), are materials comprised of resin matrices reinforced with fibers and other additives to enhance attributes such as strength, efficiency, versatility and durability. The matrix portion of FRPs most commonly consist of thermoset resins such as unsaturated polyesters, vinyl ester, epoxy and polyurethane, and, less commonly, thermoplastics, while fibers most commonly consist of glass, carbon, aramid/polyaramids, and polyester and nylon thermoplastic. Additives and fillers aid in the manufacturing stage and expand product usefulness. Additives may act as thixotropes (e.g. silica and clays), colourants (e.g. pigments), fire retardants (e.g. alumina trihydrate, bromine, chlorine, borate, phosphorus), emission suppressants, UV inhibitors and stabilizers, electrical conductors, release agents (e.g. zinc stearate, waxes, silicones), and reaction initiators (e.g. organic peroxides), promoters (e.g. cobalt naphthenate) and inhibitors (e.g. tertiary butyl catechol). Common fillers include calcium carbonate, kaolin, alumina trihydrate, and calcium sulfate. Processes involved in composite production include open molding (hand lay-up, spray-up, casting, filament winding), closed molding (vacuum bag molding, vacuum infusion processing, resin transfer molding, compression molding, pultrusion, reinforced reaction injection molding, centrifugal casting, continuous lamination), and cast polymers molding (gel coated cultured stone molding, and solid surface molding). Composite materials are used to manufacture products in a wide variety of sectors such as consumer products (sports and recreation, home fixtures, appliances), aircraft/aerospace, architecture, automotive, energy, marine (e.g. vessels), infrastructure (e.g. pipes and tanks, construction), and industrial etc.<sup>2</sup>

## REGULATORY OVERSIGHT

The EMA and the WDR are the principal pieces of legislation that protect soil, air and water quality in British Columbia. Under this legislation, the introduction of waste into the environment from identified “prescribed” industries, trades, businesses, operations, and activities requires authorization from ENV.

**Plastics and Composite Products Industry** is a prescribed activity/operation listed under Schedule 2 of the WDR and included in Section 6(2) of EMA. Therefore, PCP facilities require a site-specific authorization/permit to discharge waste into the environment.

The PCP industry as defined under WDR are:

“establishments, except home-based businesses, educational facilities and establishments of hobbyists or artisans, engaged in using synthetic resins to fabricate shapes or forms of plastic”

Examples include the manufacture of products using synthetic resins, products that are rigid or flexible, plastics such as polystyrene or polyurethane, styrofoam, lawn furniture, building materials, boats,

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<sup>1</sup> American Chemistry Council, Inc. 2020. How Plastics are Made. Accessed at < <https://plastics.americanchemistry.com/How-Plastics-Are-Made/>>.

<sup>2</sup> American Composites Manufacturers Association. 2016. Composites Lab. Accessed at <<http://compositeslab.com/>>.



bathtubs, truck canopies, containers and other products, plastic film, plastic sheeting, plastic bags, and vinyl coated wallpaper, as well as the use of recycled plastic to manufacture plastic lumber, garbage cans, toys, pipes, tanks and other products.

Examples do not include the assembly of pre-formed plastic products or “chemical and chemical products industry” as defined in Schedule 1 of the WDR.

Home-based business, educational facilities, hobbyists, or artisans are as defined in the Waste Discharge Regulation Implementation Guide (Version Date: September 10, 2007):

Artisan	a trained or skilled person who creates an object or performs a task that has aesthetic value and who, generally in a small business, produces arts and crafts for retail or wholesale trade
Home-based Business	a small business that operates from a (residential) home base including a family farm
Hobbyist	a person who conducts a pursuit outside of their regular occupation for recreation without expectation of commercial benefit
Educational Facility	a facility where teachers provide academic or practical education to students

The **Plastic and Synthetic Resin Manufacturing Industry** are identified as a “prescribed” industry within the Schedule 1 Table of the WDR, but no definition of the industry is provided.

The Hazardous Waste Regulation (HWR) addresses the proper handling and disposal of hazardous wastes, under the EMA.

## DESCRIPTION OF THE AUDITED PREMISES

All nine plastics (five PCP and four PSRM) facilities in the province of B.C. with active waste authorizations under ENV were included in the Plastics Audit.

The PCP and PSRM facilities have site-specific permits to discharge air or effluent waste; five are authorized to discharge air emissions, while four are authorized to discharge effluent, either to ground or to surface water (Hyland Creek and Nicomekl River).

The plastics facilities included in this Audit, the inspection record numbers for inspections conducted against their permit and the HWR, their respective waste discharge authorization numbers, their discharge types, and their locations are as listed in Table 1.



**Table 1. Facilities Inspected for the Plastics Audit**

Authorization Number	Permit Inspection Record	HWR Inspection Record	Authorization Holder	Discharge	Location	Industry	Facility Description
2361	130939	-	Polybottle Group Limited (acquired by Altium Packaging Canada Inc.)	Effluent	Surrey	PCP	Plastic container manufacturing and filling plant
4413	131894	135840	Airfoam Industries Ltd. (formerly Mansonville Plastics B.C. Ltd.)	Effluent	Surrey	PSRM	Polystyrene foam manufacturing plant
4433	130929	-	Gwil Industries Inc., (formerly Fiberplast Products Ltd.)	Effluent	Winfield	PSRM	Polyester resin manufacturing plant (the site was sold to Ashland Canada Inc, and closed since 2014)
5143	122467	-	Flex-Lox Pipe Ltd. (now NAPCO Royal Pipe & Fittings)	Air	Abbotsford	PSRM	Plastic pipe manufacturing plant
5612	126482	-	Kohler Ltd.	Air	Spallumcheen	PCP	Fibreglass fixture manufacturing facility
6355	130920	-	St. Anthony's Property Ltd. (recently purchased by Richmond Property Group)	Effluent	Colwood	PCP	X-Ray Film Processor (authorized works have been decommissioned since at least 2009)
106268	129741	-	Barski Industries (1985) Ltd.	Air	West Kelowna	PCP	Fabrication of fiberglass pipes and tanks
107664	136388	139036	CIF Composites Inc.	Air	Saanichton	PSRM	Fiberglass manufacturing plant
108940	136923	137699	Interwrap Inc. (acquired by Owens Corning)	Air	Mission	PCP	Extrusion coating and laminating facility

## POTENTIAL ENVIRONMENTAL ISSUES AND KEY METHODS OF POLLUTION CONTROL

The discharges of contaminants of concern from PCP and PSRM facilities vary with processes and products.

According to O.N.C St. Quinton's 1994 Technical Assessment Report on Emissions from Facilities Manufacturing Reinforced Plastics/Composites prepared for ENV<sup>3</sup>, facilities that manufacture products from composites (such as manufacturing parts, industrial and transportation equipment, and home/recreational products) release four main types of emissions:

<sup>3</sup> St. Quinton, O.N.C., February 1994. *Technical Assessment Report on Emissions from Facilities Manufacturing Reinforced Plastics/Composites*. Envirochem Associate. Prepared for: Ministry of Environment, Lands and Parks: Industrial Waste and Hazardous Contaminants Branch

1. Volatile organic compounds (VOCs) from storage, handling, application and curing of process materials – most commonly, styrene
2. VOCs from storage, handling, use and disposal of cleaning materials – most commonly acetone, but may include methyl ethyl ketone, methanol, and methylene chloride
3. Particulates from workpiece finishing operations, and
4. Fibres from handling and application of fibrous reinforcing materials.

Pollution control strategies listed in the 1994 technical report include utilizing materials with lower emission rates where feasible, employing alternative technologies or equipment to minimize emissions, and proper handling and disposal practices. Alternative materials may include low-monomer resin formulations, substituted monomer resins, vapour suppressed resins, low VOC cleaning materials, and cleaning materials with high boiling points. Alternative systems include closed mould systems, atmospheric distillation for acetone recovery, high efficiency spray applicators (e.g. airless, air-assisted airless, high-volume low-pressure, or electrostatic), add-on emission capture technology (e.g. absorption, adsorption, condensation, incineration or corona destruction where feasible for styrene and VOCs, and cyclones, inertial separators, wet scrubbers, electrostatic precipitators, and fabric filters for particulates), and solvent reclamation systems. Best operational practices include closed container storage of solvents and wastes and proper disposal.

Process and cleaning residues may also be released into effluent, resulting in elevated levels of contaminants such as total suspended solids, oil and grease, chlorine, styrene, and toxicity, and altering the pH and temperature of the receiving waters.

## PLASTICS AUDIT METHODOLOGY

### PRE-AUDIT ACTIVITIES

ENV regional compliance officers were responsible for scheduling and coordinating on-site inspections.

### INSPECTIONS

Inspections included office reviews and on-site visits.

#### OFFICE REVIEW / DESKTOP INSPECTION

ENV reviewed office records required for each facility that was inspected in the Plastics Audit. The office review included authorization information within ENV's Authorization Management System (AMS) database and any other documents, reports, or data submissions required under their permits between January 2017 and October 2019. The office review inspection may also have included direct communication with the authorization holder to ask questions as needed to gather additional information necessary to complete the inspection.

#### ON-SITE INSPECTION

ENV conducted on-site inspections on all facilities inspected in the Plastics Audit except for one, which had discontinued operations, closed the site and transferred ownership. During each on-site inspection, ENV conducted a walkthrough of the site to verify facility and operational details and review monitoring records and maintenance logs. Site personnel were questioned on site history and operation details as necessary in order to verify permit compliance. Photographs of the authorized works and discharges were taken as necessary.

Additionally, the waste handling, storage, transportation and disposal activities of facilities were also inspected against the HWR where appropriate.

#### INSPECTION RESULTS REPORTING

Inspections consisted of evaluating whether the authorization holder was compliant with their discharge permit and, for select sites, the HWR on a section-by-section basis. Compliance findings for each section were one of four outcomes:

In	ENV determined that the authorization holder is in compliance with the regulatory requirement at the time of the inspection
Out	ENV determined that the authorization holder is out of compliance with the regulatory requirement at the time of the inspection

Not determined	There was not enough information for ENV to determine whether the authorization holder is in compliance with the regulatory requirement at the time of the inspection
Not applicable	Compliance with the regulatory requirement did not apply to the authorization holder at the time of the inspection

ENV determined the appropriate administrative response based on the compliance verification findings of the inspection using the non-compliance decision matrix contained in ENV's Compliance and Enforcement Policy and Procedure<sup>4</sup>. A detailed description of some common administrative responses is included below:

Notice	A notice of compliance is a written confirmation that ENV determined that the authorization holder is in compliance with all of the regulatory requirements evaluated at the time of the inspection
Advisory	An advisory notifies the non-compliant party in writing that they are not in compliance with a specific regulatory requirement and often recommends a course of action that is expected to achieve compliance. An advisory is often the first enforcement response taken in cases of minor to moderate non-compliance when there is a high likelihood of achieving compliance.
Warning	Similar to an advisory, a warning notifies the non-compliant party in writing that they are not in compliance with a specific regulatory requirement; however, the warning differs from an advisory in that it warns of the possibility of an escalating response should non-compliance continue. Warnings are generally used when it is determined that an exchange of information alone would not be sufficient in achieving compliance.

The response of a notice of compliance is only issued if none of the assessed sections are found to be out of compliance. If a single non-compliance was found during an inspection, the minimum compliance response was an advisory, regardless of how many sections were compliant or how minor the non-compliance.

Both advisories and warnings serve as a formal record of the alleged non-compliance and form an important element of the compliance history of the party in question. Other responses such as orders, administrative monetary penalties, etc., within ENV's enforcement toolkit can be found in ENV's Compliance and Enforcement Policy and Procedure.

The results of each inspection, along with the administrative responses, were summarized in an inspection record, a copy of which was provided to the authorization holder.

## DATA ANALYSIS

<sup>4</sup> B.C. Ministry of Environment and Climate Change Strategy. May 2014. Compliance and Enforcement Policy and Procedure, Version 3. Accessed at <[https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/reporting/reporting-documents/environmental-enforcement-docs/ce\\_policy\\_and\\_procedure\\_2018.pdf](https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/reporting/reporting-documents/environmental-enforcement-docs/ce_policy_and_procedure_2018.pdf)>.

ENV compiled the results of the inspections for each of the nine facilities included in the Plastics Audit to determine compliance rates with the requirements of their site-specific permits and the HWR and identify opportunities for improvement.

Data analysis was performed separately for inspections conducted against permits and against the HWR.

Compliance evaluation findings for each individual permit clause were tallied and aggregated to obtain statistics on sector performance in different compliance categories (such as compliance with discharge quantity and quality requirements, compliance with maintaining authorized works, etc.). Each facility was given equal weight when tallying sector performance results for a compliance category; therefore, if more than one clause evaluation for a compliance category was conducted for a facility, the weights given to each of those facility's multiple evaluations summed up to one for that compliance category. This is to ensure that the sector performance is reflective of all facilities and not disproportionately impacted by facilities with multiple requirements. For example, if a facility had a permit with four requirements related to discharge quantity, the compliance findings on each requirement will be given a fractional weight (one-quarter) when the results are tallied to evaluate sector performance for the compliance category of discharge quantity. Results are therefore often presented as equivalent percentages of facilities.

## SUMMARY OF FINDINGS

Twelve inspection records were generated following inspections of the nine facilities included in the Plastics Audit; nine records for inspections against permit requirements, and three records for inspections against the HWR at select sites.

Table 2 details the compliance outcomes of the inspections conducted for the Plastics Audit.

**Table 2. Tally of Compliance Outcomes for Plastics Audit Inspections**

Compliance Response	Number of Responses Issued for Inspections Against Permit	Percentage of Responses Issued for Inspections Against Permit	Number of Responses Issued for Inspections Against HWR	Percentage of Responses Issued for Inspections Against HWR	Total
Notice of Compliance	4	44%	1	33%	5
Advisory	4	44%	2	67%	6
Warning	1	11%	0	0%	1
Total	9		3		12

Forty-four percent of authorized plastics facilities were found to be compliant with their permits and were issued notices of compliance. Three plastics facilities were inspected against the HWR and one was determined to be compliant with all inspected HWR requirements.

In total, ENV issued six advisories and one warning for non-compliances that were administrative deficiencies or considered to pose, at most, minor temporary impacts to environment, human health, or safety (Levels 1 or 2 ratings of impact based on ENV's Compliance Decision Making Matrix in ENV's Compliance and Enforcement Policy and Procedure<sup>5</sup>).

Two facilities had decommissioned and/or removed the authorized works and discontinued the authorized waste discharges and were recommended for permit cancellation. Two other facilities with effluent discharge permits had rerouted their effluent into the municipal sewerage system and are therefore no longer discharging directly into the environment. Therefore, none of the facilities with effluent discharge permits currently discharge effluent directly to the environment due to the decommissioning of authorized works and rerouting of effluent to local municipal sewerage systems.

In summary, there are only seven facilities which were still actively conducting operations described in the permit, five of which are still releasing authorized discharges.

The inspections of nine facilities for the Plastics Audit comprised a total of 337 evaluations of individual site-specific permit clauses. In 144 of the 337 evaluations (43 percent), the facility was determined to be complying with the evaluated permit requirement. Facilities were determined to be non-compliant in six percent of clause evaluations. Compliance could not be determined in 33 percent of overall evaluations,

<sup>5</sup>BC Ministry of Environment and Climate Change Strategy. How Compliance Is Assessed. Accessed at < <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-law-enforcement/environmental-compliance/how-compliance-is-assessed> >

and compliance with the evaluated permit requirement was deemed not applicable at the time of the inspection in 18 percent of evaluations (61 evaluations).

When facilities were evaluated for requirements for which compliance was applicable at the time of the inspection (276 evaluations), facilities were compliant in 52 percent of evaluations of applicable requirements. Table 3 illustrates the overall compliance findings for overall aggregated clause evaluations in the Plastics Audit.

**Table 3. Overall Compliance with Permit Clauses Evaluated in the Plastics Audit**

Compliance Findings		Tally of All Evaluations of Permit Clauses in the Audit	Percentage of All Evaluations of Permit Clauses in the Audit	Percentage of All Evaluations of Applicable Permit Clauses in the Audit
Compliance with clause is applicable at the time of inspection	<b>In Compliance</b>	144	43 %	52 %
	<b>Out of Compliance</b>	20	6 %	7 %
	<b>Compliance Not Determined</b>	112	33 %	41 %
	Subtotal	276	82 %	100 %
Compliance with clause <b>not applicable</b> at the time of inspection		61	18 %	-
Total		337	-	-

## COMPLIANCE WITH PERMIT REQUIREMENTS

The following sections present the inspection results grouped together by similar clauses and evaluated together to assess compliance based on like requirements of the site-specific permits. Thus, the data analysis excludes the statistics on clauses that were not evaluated.

The two facilities that were decommissioned and no longer discharging were not included in the analyses.

### PERMITTED DISCHARGE QUANTITY, QUALITY, AND DISCHARGE PERIOD

All seven permits with active sites analyzed in this Audit set requirements limiting discharge quantities for air and effluent, depending on site operations. The weighted aggregated compliance findings of all the discharge quantity requirements inspected for the seven active plastics facilities in this Audit indicated that in 73 percent of evaluated facilities, ENV could not determine whether facilities were keeping within discharge quantity limits – most commonly due to the lack of monitoring requirements. The clause was not applicable at the time of the inspection to 15 percent of evaluated facilities due to lack of effluent discharge. Compliance could only be determined for one of the evaluated sites, which had multiple discharges and represented the in-compliance rate of equivalent 8 percent of sites and non-compliance rate of equivalent 4 percent of sites.



All seven permits analyzed in this Audit set requirements for quality of air and effluent discharge. Evaluations of compliance with discharge quality requirements indicated similar findings to above; compliance could not be determined for 73 percent of evaluated facilities due mostly to lack of monitoring requirements, while the clause was not applicable to 15 percent of facilities at the time of the inspection due to lack of discharge into the environment. Again, compliance could only be determined for one of the evaluated sites which represented the in-compliance rate of equivalent 11 percent of sites and non-compliance rate of equivalent 1 percent of sites. Three facilities were evaluated for receiving environment quality requirements; compliance could not be determined for any of these evaluations due to lack of monitoring requirements.

Of the three facilities evaluated for discharge period requirements, 64 percent of facilities were icompliant, while compliance could not be determined for 35 percent due to lack of records required.

Table 4 illustrates the aggregated and weighted compliance findings for discharge quantity, quality, and timing requirements evaluated for permitted facilities in this Audit.

**Table 4. Compliance Findings for Discharge Quantity, Quality, and Discharge Period Requirements**

Permitted Facilities	Discharge Quantity Clauses				Discharge Period Clauses				Discharge Quality Clauses				Receiving Environment Quality Clauses			
	In	Out	ND	NA	In	Out	ND	NA	In	Out	ND	NA	In	Out	ND	NA
Tally of Findings																
2361	-	-	-	2	-	-	-	-	-	-	-	2	-	-	-	-
4413	-	-	2	-	-	-	-	-	-	-	2	-	-	-	-	-
5143	-	-	10	-	-	-	-	-	-	-	10	-	-	-	1	-
5612	15	8	4	1	26	-	1	1	22	1	4	1	-	-	1	-
106268	-	-	7	-	-	-	7	-	-	-	6	-	-	-	2	-
107664	-	-	5	-	5	-	-	-	-	-	1	-	-	-	-	-
108940	-	-	9	-	-	-	-	-	-	-	10	-	-	-	-	-
Weighted Tally of Findings																
2361	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-
4413	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
5143	-	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-
5612	0.5	0.3	0.1	0.0	0.9	-	0.0	0.0	0.8	0.0	0.1	0.0	-	-	1	-
106268	-	-	1	-	-	-	1	-	-	-	1	-	-	-	1	-
107664	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
108940	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
Weighted Total	0.5	0.3	5.1	1.0	1.9	0	1.0	0.0	0.8	0.0	5.1	1.0	0	0	3	0
Weighted Percentage [%]	8	4	73	15	64	0	35	1	11	1	73	15	0	0	100	0
Weighted Percentage (Applicable Findings Only) [%]	9	5	86	-	65	0	35	-	14	1	86	-	0	0	100	-
<b>In</b>	In Compliance															
<b>Out</b>	Out of Compliance															
<b>ND</b>	Compliance Not Determinable															
<b>NA</b>	Compliance with Clause Not Applicable															

If compliance evaluations with non-applicable findings at the time of the inspection are excluded from the analysis, in-compliance rates for discharge quantity and quality related clauses range from nine percent (discharge quantity) to 65 percent (discharge period), non-compliance rates range from zero percent (discharge period and quality) to five percent (discharge quantity), and undeterminable

compliance rates range from 35 percent (discharge period) to 100 percent (receiving environment quality).

## **AUTHORIZED WORKS AND OPERATIONAL PRACTICES**

All seven permits analyzed in this Audit describe the details and locations of authorized works and processes on the site, which were verified during inspections. To summarize the aggregated compliance findings of all the authorized works verification for facilities in this Audit:

- Sixty-five percent of facilities were assigned “In Compliance” findings for authorized works clause evaluations
- Zero percent of facilities were assigned “Out of Compliance” findings for authorized works clause evaluations
- Twenty-three percent of facilities were assigned “Compliance Not Determined” findings for authorized works clause evaluations
- Twelve percent of facilities were assigned “Compliance with Clause Not Applicable” findings for authorized works clause evaluations

The undeterminable compliance findings at three facilities result from unclear site plans or relocation of works due to rerouting of effluent into the municipal sewer infrastructure. The non-applicability findings were due to the decommissioning of the authorized works and/or discharge being re-routed to an authorized municipal treatment system.

No non-compliances were identified with the requirements to maintain and inspect authorized works; 50 percent of facilities were found to be complying while the remaining 50 percent received undeterminable compliance findings or non-applicability findings respectively due to lack of records and lack of discharge.

Fifty percent of facilities evaluated for compliance with requirements outlining best management practices for fugitive emission reduction measures were found to be compliant, while 25 percent were determined to be non-compliant due to lack of secure lids on waste receptacles or lack of maintaining negative building pressure. The requirements for the remaining 25 percent were deemed not applicable at the time of the inspection as they were dependent on ENV request, and no director requests had been made.

Twenty-five percent of the facilities evaluated for compliance with requirements outlining the preparation, implementation and/or submission of plans and specifications such as upgrades to authorized works, emission reduction plans, and emergency response plans were determined to be compliant. Twenty-five percent were out of compliance due to failure to submit a plan. The requirements for the remaining 50 percent were deemed not applicable at the time of the inspection for reasons such as no works upgrades and plan submission deadlines falling outside of the inspection period.

Table 5 illustrates the aggregated and weighted compliance findings for authorized works verification, inspection and maintenance, best management practices, and plans and specifications requirements evaluated for facilities in this Audit.

**Table 5. Compliance Findings for Authorized Works Verification, Inspection and Maintenance, Best Management Practices, and Plans and Specifications Requirements**

Permitted Facilities	Authorized Works Verification Clauses				Authorized Works Inspection and Maintenance Clauses				Best Management Practices Clauses				Plans and Specifications			
	In	Out	ND	NA	In	Out	ND	NA	In	Out	ND	NA	In	Out	ND	NA
Tally of Findings																
2361	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
4413	-	-	3	2	-	-	1	-	-	-	-	-	-	-	-	-
5143	-	-	20	-	1	-	-	-	-	-	-	-	-	-	-	-
5612	27	-	1	1	1	-	-	-	1	1	-	-	-	-	-	1
106268	7	-	-	-	-	-	1	-	1	1	-	-	-	1	-	-
107664	5	-	-	2	-	-	-	-	3	-	-	-	2	-	-	-
108940	10	-	-	1	1	-	-	-	-	-	-	1	-	-	-	1
Weighted Tally of Findings																
2361	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
4413	-	-	0.6	0.4	-	-	1	-	-	-	-	-	-	-	-	-
5143	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
5612	0.9	-	0.0	0.0	1	-	-	-	0.5	0.5	-	-	-	-	-	1
106268	1	-	-	-	-	-	1	-	0.5	0.5	-	-	-	1	-	-
107664	0.7	-	-	0.3	-	-	-	-	1	-	-	-	1	-	-	-
108940	0.9	-	-	0.1	1	-	-	-	-	-	-	1	-	-	-	1
Weighted Total	4.6	0	1.6	0.8	3	0	2	1	2	1	0	1	1	1	-	2
Weighted Percentage [%]	65	0	23	12	50	0	33	17	50	25	0	25	25	25	0	50
Weighted Percentage (Applicable Findings Only) [%]	71	0	29	-	60	0	40	-	67	33	0	-	50	50	0	-
<b>In</b>	In Compliance															
<b>Out</b>	Out of Compliance															
<b>ND</b>	Compliance Not Determinable															
<b>NA</b>	Compliance with Clause Not Applicable															

If compliance evaluations with non-applicable findings at the time of the inspection are excluded from the analysis, in-compliance rates for authorized works and operations related clauses range from 50 percent (plans and specifications) to 71 percent (authorized works), non-compliance rates range from zero percent (authorized works and facility maintenance) to 50 percent (plans and specifications), and undeterminable compliance rates range from zero percent (best management practices and plans and specifications) to 40 percent (facility maintenance).

## MONITORING OF DISCHARGE QUANTITY AND QUALITY AND SAMPLING METHODOLOGY

Three of the seven permits for facilities analyzed in this Audit require routine monitoring of air or effluent discharge quantity and quality, while the remaining four contain provisions for future monitoring as deemed necessary by ENV (as per director request). To summarize the aggregated compliance findings of all the authorized works verification for facilities in this Audit:

- Three percent of facilities were assigned “In Compliance” findings for monitoring clause evaluations
- Three percent of facilities were assigned “Out of Compliance” findings for monitoring clause evaluations
- Fourteen percent of facilities were assigned “Compliance Not Determined” findings for monitoring clause evaluations
- Eighty percent of facilities were assigned “Compliance with Clause Not Applicable” findings for monitoring clause evaluations, due to either lack of discharge or lack of ENV director requests.

Twenty-two percent of the facilities evaluated for compliance with adherence to required procedures for sampling and lab analysis were compliant, while 6 percent was non-compliant. The requirements were deemed not applicable to 72 percent of evaluated facilities at the time of the inspection due to lack of discharge or, in cases of monitoring prompted by ENV direction, lack of director requests.

Table 6 illustrates the aggregated and weighted compliance findings for monitoring and sampling and analytical procedure requirements evaluated for facilities in this Audit.

**Table 6. Compliance Findings for Monitoring and Sampling and Analytical Procedures Requirements**

Permitted Facilities	Monitoring Clauses				Sampling and Analytical Procedure Clauses			
	In	Out	ND	NA	In	Out	ND	NA
Tally of Findings								
2361	-	-	-	3	-	-	-	3
4413	-	-	-	2	-	-	-	-
5143	-	-	1	1	-	-	-	-
5612	1	1	-	3	4	1	-	1
106268	-	-	-	3	-	-	-	3
107664	-	-	1	1	-	-	-	-
108940	-	-	-	1	-	-	-	-
Weighted Tally of Findings								
2361	-	-	-	1	-	-	-	1
4413	-	-	-	1	-	-	-	-
5143	-	-	0.5	0.5	-	-	-	-
5612	0.2	0.2	-	0.6	0.7	0.2	-	0.2
106268	-	-	-	1	-	-	-	1
107664	-	-	0.5	0.5	-	-	-	-
108940	-	-	-	1	-	-	-	-
Weighted Total	0.2	0.2	1	5.6	0.7	0.2	0	2.2
Weighted Percentage [%]	3	3	14	80	22	6	0	72
Weighted Percentage (Applicable Findings Only) [%]	17	17	67	-	80	20	0	-
In Out ND NA	In Compliance Out of Compliance Compliance Not Determinable Compliance with Clause Not Applicable							

If compliance evaluations with non-applicable findings at the time of the inspection are excluded from the analysis, 17 percent of facilities conduct required monitoring, 17 percent failed to conduct required

monitoring, and compliance was not determinable for 67 percent. Additionally, 80 percent of facilities follow required sampling and analytical procedures while 20 percent were not compliant.

## REPORTING, RECORDS AND NOTIFICATIONS TO ENV

Three of the seven permits for facilities analyzed in this Audit require routine reporting of monitoring results, while the remaining four contain provisions for future reporting as deemed necessary by ENV (as per director request). Seventeen percent of facilities were compliant with these requirements, while 33 percent were determined to be out of compliance by failure to submit required reports in the inspection period. The reporting requirements were deemed not applicable to 50 percent of facilities at the time of the inspection; their permits require reporting only on a director request basis and there was a lack of director requests.

Two of the four facilities evaluated for requirements on maintaining and/or submitting records for ENV review (documentation of reagent and raw material consumption and/or facility upkeep) were determined to be compliant, while the other two were determined to be out of compliance by either failing to maintain or submit records to ENV as required or completing late submissions.

All seven permits included in this Audit analysis require notification to ENV on any deviation from authorized activities, whether it be prior notification of process modifications that may result in adverse environmental effects or notification of non-compliance with permit requirements, or name and ownership changes. Twenty-nine percent of facilities were found to be out of compliance with notification clause requirements by utilizing unauthorized treatment works or relocating authorized works without notification to ENV. Fifty percent of facilities were assigned “Compliance Clause Not Applicable” findings as there were no facility changes that required a notification at the time of the inspection.

Table 7 illustrates the aggregated and weighted compliance findings for routine reporting, record maintenance, and notification requirements evaluated for facilities in this Audit.

**Table 7. Compliance Findings for Routine Reporting, Records and Notifications Requirements**

Permitted Facilities	Routine Reporting Clauses				Records Clauses				Notification Clauses			
	In	Out	ND	NA	In	Out	ND	NA	In	Out	ND	NA
Tally of Findings												
2361	-	1	-	-	-	-	-	-	-	-	-	2
4413	-	1	-	-	-	-	-	-	1	-	-	-
5143	-	-	-	1	-	-	-	-	-	1	-	-
5612	1	-	-	-	-	1	-	-	-	1	-	-
106268	-	-	-	-	-	1	-	-	-	-	-	1
107664	-	-	-	1	2	-	-	-	-	-	-	2
108940	-	-	-	1	2	-	-	-	-	-	1	1
Weighted Tally of Findings												
2361	-	1	-	-	-	-	-	-	-	-	-	1
4413	-	1	-	-	-	-	-	-	1	-	-	-
5143	-	-	-	1	-	-	-	-	-	1	-	-
5612	1	-	-	-	-	1	-	-	-	1	-	-
106268	-	-	-	-	-	1	-	-	-	-	-	1
107664	-	-	-	1	1	-	-	-	-	-	-	1
108940	-	-	-	1	1	-	-	-	-	-	0.5	0.5

Weighted Total	1	2	0	3	2	2	0	0	1	2	0.5	0.5
Weighted Percentage [%]	17	33	0	50	50	50	0	0	14	29	7	50
Weighted Percentage (Applicable Findings Only) [%]	33	67	0	-	50	50	0	-	25	50	25	-
<b>In</b>	In Compliance											
<b>Out</b>	Out of Compliance											
<b>ND</b>	Compliance Not Determinable											
<b>NA</b>	Compliance with Clause Not Applicable											

If compliance evaluations with non-applicable findings at the time of the inspection are excluded from the analysis, in-compliance rates for clauses related to submissions of report, records and notifications range from 25 percent (notifications) to 50 percent (records), non-compliance rates range from 50 percent (records and notifications) to 67 percent (routine reporting), and undeterminable compliance rates range from zero percent (routine report and records) to 25 percent (notifications).

## **BYPASSES, EMERGENCIES AND SPILLS**

Six out of the seven permits included in this Audit analysis set requirements regarding prohibition of unapproved bypasses and/or required actions for emergency and spill incidents.

Inspection findings did not identify unapproved bypasses nor emergency or spill incidents at any of the evaluated facilities.

## **COMPLIANCE WITH HWR REQUIREMENTS**

Three facilities were evaluated for one or more of the following HWR requirements: Sections 7, 16(1)(a), 16(1)(b), 43(1), 46(1)(d), 46(3)(b), 46(5), 46(8)(1), 46(9), 50(3)(a), 50(3)(b), and 50(3)(c).

Two out of those three facilities stored hazardous waste onsite in amounts that met the threshold for classification as an HWR prescribed quantity of hazardous waste, such as waste oil, waste adhesives, waste laminates, car batteries, waste paint and waste oil filters, and flammable liquid N.O.S. (Not Otherwise Specified).

Sections 7, 16(1)(b), 46 (1)(d), 46 (3)(b), 46 (5) were evaluated once (inspected in one of three facilities – not necessarily the same one for all of them), and the evaluated facility was determined to be compliant.

Section 43(1) was evaluated in three facilities; one was determined to be in compliance while the requirement was determined to be not applicable to the other two at the time of the inspection since volumes of hazardous waste on-site were less than the respective registration quantities listed in Column II of Schedule 6 of the HWR.

Table 8 lists the evaluated HWR sections for which there were non-compliances determined during the inspections.

**Table 8. Non-Compliances Identified During HWR Inspections**

HWR Section	Non-Compliance Findings
16 (1)(a)	One facility was evaluated for this requirement and determined to be out of compliance as the storage of flammable liquid (N.O.S) did not provide space for manual and visual inspections for leaks on all sides of the containers.
46 (8)(1)	One facility was evaluated for this requirement and determined to be out of compliance as they failed to notify the director that the consignor was unable to obtain the applicable manifest copies with Parts A, B and C completed from the consignee, within 10 days of providing the manifest to a carrier.
46 (9)	One facility was evaluated for this requirement and determined to be out of compliance as although manifests for removal of all HW from the site were reported by facility staff to be retained, copies were not produced when requested by ENV.
50 (3)(a)	Two facilities were evaluated for this requirement and determined to be out of compliance as vessels storing hazardous waste were open at the time of the inspection
50 (3)(b)	One facility was evaluated for this requirement and determined to be in compliance. One facility was evaluated for this requirement and determined to be out of compliance as vessels containing hazardous waste were observed to be stored in a manner which could leak or rupture.
50 (3)(c)	Two facilities were evaluated for this requirement and determined to be out of compliance as vessels containing hazardous waste were not properly labelled with their contents as observed during the inspection



## CONCLUSIONS AND RECOMMENDATIONS

Findings from the 2019 Plastics Audit conducted on nine PCP and PSRM facilities in B.C. have highlighted opportunities of improvement for the PCP and PSRM sector and ENV. Facility owner/operators are reminded to ensure that facility staff are aware of and comply with all permit requirements as well as HWR requirements.

Facility owner/operators are reminded of the following:

- Ensure that required records are retained and submitted on time along with monitoring reports as required.
- Ensure that ENV must be notified in advance of any modifications to discharge processes and infrastructure, as well as changes to ownership and permittee names or administrative details.
- Ensure fugitive emission reduction measures are taken as required, such as ensuring waste receptacles in storage are kept closed with secure lids and maintaining negative building pressure as required.
- Ensure hazardous waste is managed accordingly with HWR requirements, such as proper container labelling and storage conditions.
- Ensure that ENV is updated with any changes to site plans.

In the interests of improving permit enforceability and allowing for timely evaluation of performance in mitigating impacts to human health and the environment, ENV is recommended to consider updating permits to include requirements for routine monitoring of discharge quantity, discharge quality, and receiving environment quality (where appropriate), requirements for the maintenance of records on discharge periods, and requirements for routine reporting of monitoring results.