



2019

**REGULATORY REVIEW &
COMPLIANCE ASSESSMENT SUMMARY**
ENVIRONMENTAL MANAGEMENT ACT

MUNICIPAL WASTEWATER AUTHORIZATIONS WITHIN THE SOUTH COAST OF BC



EXECUTIVE SUMMARY

The B.C. Ministry of Environment and Climate Change Strategy (ENV) conducted a regulatory review and a compliance assessment summary (Assessment) on ENV authorizations for municipal wastewater discharges into surface and marine waters off the south coast of B.C. and Vancouver Island. The Assessment was conducted in response to findings from a report released in 2018 by the B.C. Centre for Disease Control (CDC) that concluded human sewage contamination of shellfish harvesting areas in B.C. was the most plausible cause of a prolonged norovirus outbreak in 2016 and 2017.

The Assessment evaluated the current state of municipal wastewater authorizations for discharges to surface and marine waters in the vicinity of shellfish harvesting areas by assessing whether the authorizations contain consistent fundamental requirements for the protection of human health and the environment (effluent quantity, effluent quality, monitoring and reporting) as well as disinfection requirements, and determining overall compliance rates. The regulatory review was performed on 173 municipal wastewater authorizations, and the compliance assessment summary was performed by aggregating findings and ENV responses from 222 records of compliance verification inspections conducted between January 1, 2015 and March 31, 2019 on those authorizations. Where appropriate, the Assessment was also performed with respect to facility size as categorized into five categories of maximum daily flow (effluent) (MDF) ranges. Findings of the Assessment will inform decisions to improve the degree of environmental and health protection provided by current municipal wastewater authorizations and highlight areas of improvement with regards to increasing compliance within the study area for municipal wastewater discharges.

According to the *Environmental Management Act* (EMA) and the Waste Discharge Regulation (WDR), municipal sewage management is a prescribed activity/operation; therefore, facilities require authorization under EMA to discharge waste into the environment: site-specific permits, operational certificates under a municipal liquid waste management plan, or registration under the Municipal Wastewater Regulation (MWR).

Site-specific permits comprise the largest percentage of authorizations by type at 79%; the remaining 21% were operational certificates and MWR registrations. Permits are not likely to have undergone a major permit amendment review since at least 1999 (effective date of the Municipal Sewage Regulation) and therefore may not contain the same rigor in fundamental requirements as more recent legislation. Permits also remain the most prevalent form of authorization amongst all flow ranges but are more common for smaller facilities with MDFs below 500 m³/day; 73% of all reviewed authorizations fall within this flow range.

65 out of 173 (37%) authorized municipal wastewater discharging facilities provided primary effluent treatment, such as septic tank systems which were used at 49 sites (28% of all reviewed authorizations). 56% of authorized municipal wastewater sites employed secondary treatment. Only three facilities employed advanced treatment systems.

Regulatory Review for Fundamental Requirements

The regulatory review determined that 71% (122 out of 173) of the reviewed authorizations contained all fundamental requirements (effluent quantity limits, qualitative and/or quantitative effluent quality standards, some form of monitoring, and reporting).

All 173 municipal wastewater authorizations contained requirements limiting the quantity of effluent discharge.

With regards to the fundamental requirements for effluent quality, eight authorized municipal wastewater sites only utilized preliminary treatment (large solid removal), and of these eight authorizations, four did not require the effluent to meet numerical quality standards. 29% of authorizations only required effluent to meet qualitative characteristics – these 51 authorizations were limited to preliminary and primary treatment works. 160 out of 173 authorizations (92%) did not require effluent quality to meet numerical standards for fecal coliforms (the 2018 CDC report does note that fecal coliforms do not necessarily serve as reliable indicators of enteric viruses such as norovirus in aquatic environments).

With regards to the fundamental requirements for monitoring, 28% of reviewed authorizations did not require any monitoring (flow, effluent or the receiving environment). Facilities with MDFs of less than 500 m³/day were least likely to require monitoring.

With regards to the fundamental requirements for reporting, 28% of reviewed authorizations do not require reporting of monitoring data (mainly facilities with MDFs of less than 500 m³/day).

While disinfection was not a fundamental requirement, its pathogenic deactivation capabilities necessitates consideration in the management of norovirus outbreaks. 76% of reviewed authorizations did not require disinfection of effluent prior to discharge. Overall, reviewed municipal wastewater authorizations that require fecal indicator monitoring are more likely to also require disinfection of the effluent, and vice versa; this may reflect the likelihood of effluent quality meeting certain aquatic use standards at the edge of the initial dilution zones.

Compliance Assessment Summary

Overall, 23% (50 out of 222) of inspections resulted in issuances of notices of compliance. These notices of compliances were issued to 43 facilities. 77% of all inspection records had at least one non-compliance identified during the inspection; resulting compliance responses consist of the issuance of advisories following 59% of inspections, warnings following 17% of inspections, and administrative monetary penalties (AMPs) following 1% of inspections.

Of the 165 inspections evaluating facility compliance with effluent quantity requirements, 41% confirmed compliance, 21% confirmed non-compliance, and 38% could not determine compliance due to lack of flow data, either from the failure of the discharger to meet monitoring and/or reporting requirements or from the lack of monitoring or recording requirements in the authorization.

Of the 167 inspections evaluating facility compliance with effluent quality requirements, 38% confirmed compliance, 37% confirmed non-compliance, and 25% could not determine compliance.

Of the inspections that evaluated monitoring requirements, 64% confirmed compliance with flow monitoring requirements while 23% of inspections determined non-compliance. 52% confirmed compliance with effluent monitoring requirements while 35% of inspections determined non-compliance. 51% confirmed compliance with receiving environmental monitoring requirements while 37% of inspections determined non-compliance.

Dischargers with MDFs of 500 m³/day or greater had the highest rates of compliance with monitoring requirements, at 72% to 100% of inspections evaluating flow monitoring requirements, 59% to 82% of inspections evaluating effluent monitoring requirements, and 50% to 88% of inspections evaluating receiving environmental monitoring requirements. Notably, none of the dischargers with MDFs below 10 m³/day were determined to be compliant with receiving environmental monitoring requirements.

Of the inspections that evaluated reporting requirements, 42% confirmed compliance with reporting requirements while 49% of inspections determined non-compliance. Dischargers with higher MDFs (5,000 m³/day or greater) had the highest rates of compliance with reporting requirements, at 62% to 83% of inspections evaluating those requirements. Dischargers with MDFs below 10 m³/day were determined to have the lowest demonstrated compliance rates with reporting requirements at 13%.

Overall, 71% (122 out of 173) of the reviewed authorizations contained all fundamental requirements (effluent quantity limits, qualitative and/or quantitative effluent quality standards, some form of monitoring, and reporting).

An investigation into sewerage overflows as a potential source of sewage contamination of shellfish growing areas was out of the scope of this Assessment; however, municipal wastewater authorizations under EMA often include requirements prohibiting bypasses of authorized works without prior approval from ENV. Out of 22 inspections performed on MWR registrations and OCs for bypass requirements, 20 determined the facilities were either compliant or that the requirements did not apply due to lack of bypass events.

Findings from the Assessment have highlighted opportunities of improvement for facility owner/operators and ENV to reduce the likelihood that regulated municipal wastewater dischargers are potential sources of contamination among shellfish harvesting areas.

Permits may not contain the same rigor in fundamental requirements as more recent legislation due to their age; facility owners and ENV are encouraged to prioritize review of permits to ensure they remain as protective of human health and the environment as current regulations through inclusion of fundamental requirements that are verifiable in compliance inspections.

Recommendations for ENV include:

- ❖ Updates of the 51 permits containing only qualitative effluent quality standards to require that effluent quality meets numerical standards
- ❖ Review of the authorizations of the eight facilities utilizing only preliminary (large solid) treatment to determine whether facility upgrading to secondary treatment or higher is required
- ❖ Review of the authorizations which did not require monitoring of either effluent quantity (56 authorizations), effluent quality (59 authorizations) and/or receiving environment (120 authorizations) to consider adding monitoring requirements, or verification that the lack of monitoring requirements poses minimal risk to environment and human health; there may need to be a focus on authorizations for MDFs below 500 m³/day
- ❖ Review of the 49 authorizations that do not require reporting of monitoring data to consider including requirements for submission of monitoring data to ENV; there may need to be a focus on

authorizations for MDFs below 500 m³/day

- ❖ Review of authorizations to determine whether amendments to require disinfection of effluent for norovirus (in addition to fecal coliforms) would be impactful in mitigating norovirus outbreaks; 132 authorizations do not require disinfection of effluent prior to discharge while 30 authorizations required ultraviolet (UV) disinfection and 11 required chlorination
- ❖ Compliance promotion strategies may be tailored toward facility types. For example, dischargers with MDFs from 500 m³/day to below 50,000 m³/day have the highest rate of non-compliance in failing to meet effluent quantity and quality requirements, while dischargers with MDFs below 500 m³/day had the highest rates of non-compliance with regards to monitoring and reporting; specifically, discharges with MDFs of 10 m³/day demonstrated non-compliance rates of 70 to 80% for receiving environmental monitoring and reporting requirements.
- ❖ Compliance promotion initiatives to improve awareness of the requirements to report bypasses, spills, and overflows in accordance with the Spill Reporting Regulation
- ❖ Further assessment of sewerage overflows, which may be aided by the maintenance of an overflows database/map sourced from self-reporting of non-compliances, dangerous goods incident reports (DGIRs) generated by the provincial Environmental Emergency Program, and list of authorizations for combined sewer overflow works

Facility owners are reminded to be aware of all requirements of their authorization, and meet those requirements, especially with regards to effluent quantity, quality, monitoring, and reporting obligations.

TABLE OF CONTENTS

Executive Summary.....	i
List of Abbreviations Used	vi
Introduction	1
Purpose of this Report	1
Regulatory Oversight	2
Municipal Wastewater Authorizations.....	3
Fundamental Environmental Protection Requirements.....	4
Compliance	5
Description of the Assessed Premises	6
Study Area.....	6
Regulatory Review and Compliance Assessment Summary Methodology	8
Regulatory Review Approach.....	8
Compliance Assessment Summary Approach.....	8
Inspections.....	8
Data Analysis.....	10
Summary of Findings.....	11
Regulatory Review Results and Discussion	11
Regulatory Review Results	11
Regulatory Review Discussion	16
Compliance Assessment Summary Results and Discussion.....	17
Compliance Assessment Summary Results	17
Compliance Assessment Summary Discussion	28
Recommendations and Conclusions.....	31
Appendix 1. List of Authorizations	33

LIST OF ABBREVIATIONS USED

Acronym	Definition
CDC	B.C. Centre for Disease Control
EMA	<i>Environmental Management Act</i>
ENV	B.C. Ministry of Environment and Climate Change Strategy
MDF	Maximum Daily Flow
MSR	Municipal Sewage Regulation
MWR	Municipal Wastewater Regulation
OC	Operational Certificate
SSR	Sewerage System Regulation
WDR	Waste Discharge Regulation

INTRODUCTION

PURPOSE OF THIS REPORT

Between November 2016 and May 2017, a prolonged norovirus outbreak linked to oysters harvested in British Columbia impacted over 400 Canadians as well as the livelihoods of businesses connected to shellfish harvesting areas.¹ Norovirus is highly contagious through human to human contact via stool or vomit; gastrointestinal symptoms such as vomiting and diarrhea can potentially lead to serious dehydration and related life-threatening conditions in severe cases.²

Following the outbreak, the B.C. Centre for Disease Control (CDC) formed a working group to identify the potential sources behind the outbreak as well as strategies to mitigate outbreaks in the future. In late 2018, CDC released their final report¹ concluding the most plausible cause for norovirus contamination in shellfish is human sewage released into the waters from multiple fixed and area-based sources. The report identified septic seepage from private homeowners, local wastewater treatment plants or lagoons, sewerage overflow events from combined water/sewer drainage, discharge from commercial and recreational vessels, and floating homes and float-camps to be the likeliest source of sewage contamination due to proximity to the shellfish harvesting areas. Although further away, metropolitan wastewater treatment plant effluent dischargers were also considered potential sources; this would include the wastewater treatment plants around Metro Vancouver.

The findings of the CDC report prompted the B.C. Ministry of Environment and Climate Change Strategy (ENV) to evaluate the current state of municipal wastewater authorizations for discharges to surface water. ENV conducted a regulatory review and compliance assessment summary of municipal wastewater dischargers (wastewater treatment plants and lagoons) under the provincial authority of ENV, located within the south coast of BC, which overlaps the shellfish harvesting areas.

The objectives of this regulatory review and compliance assessment summary (Assessment) are to:

1. assess whether the authorizations under EMA contain consistent fundamental requirements protective of human health and the environment: effluent quantity, effluent quality, monitoring, and reporting, and;

¹ Miller, E. Cumming, L. McIntyre and the Environmental Transmission of Norovirus into Oysters working group members. September 2018. Summary Working Group Report of the Environmental Transmission of Norovirus into Oysters following the 2016/17 national outbreak of norovirus linked to the consumption of BC oysters. Environmental Health Services, BC Centre for Disease Control. June 2018. Accessed at <<http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/ETNO%20Full%20Report.pdf>>

² BC Centre for Disease Control. March 2012. Norovirus/Norwalk-like virus. Accessed at <<http://www.bccdc.ca/health-info/diseases-conditions/norovirus-norwalk-like-virus>>

2. determine overall compliance rates among all municipal wastewater authorizations and the fundamental regulatory requirements.

The findings will inform decisions to improve environmental and health protection provided by current municipal wastewater authorizations and highlight areas of improvement with regards to increasing compliance within the study area for municipal wastewater discharges.

REGULATORY OVERSIGHT

The *Environmental Management Act* (EMA) and the Waste Discharge Regulation (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. **Municipal sewage management** is a prescribed activity/operation listed under Schedule 1 of the WDR and included in Section 6(3) of EMA.

Municipal sewage management is defined in WDR Schedule 1, Part 2 as:

The management of domestic sewage, domestic waste water or liquid waste originating primarily from residences, but that may include contributions from

- (a) holding tanks in recreational vehicles, boats and houseboats,
- (b) commercial, institutional and industrial sources, and
- (c) inflow and infiltration,

but does not include an operation exempted from EMA under section 3 of WDR

Examples include the management of domestic sewage, domestic waste water or municipal liquid waste regardless of source, septic haulers and disposal companies, sewer systems that handle a combination of municipal wastes and storm water, commercial waste, industrial wastes or other miscellaneous wastes, holding tanks and septic systems, and land-based systems serving off-shore sources (such as floating homes). Exceptions include discharges described by EMA Section 6(5)(j), and sewerage systems regulated by the Sewerage System Regulation (SSR) (see ENV’s The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite Sewerage Systems³).

Therefore, municipal wastewater dischargers require an authorization to discharge wastewater into the environment – either a registration under a regulation, a site-specific permit, or operational certificate under a municipal liquid waste management plan.

Other agencies also regulate the potential sources of sewage discharge into water closest to shellfish harvesting areas, as identified by the 2018 CDC report. Septic systems of floating homes and private homeowners are subject to B.C. Ministry of Health’s Sewerage System Regulation under the Public

³ B.C. Ministry of Environment and Climate Change Strategy. October 2017. The Sewerage System Regulation and Municipal Wastewater Regulation: Jurisdictional Flow Divide for Onsite Sewerage Systems. Accessed at <https://www2.gov.bc.ca/assets/gov/environment/waste-management/sewage/mwr/onsite_sewage_jurisdictional_flow_divide_interpretation_guideline.pdf>

Health Act. Sewage discharge from commercial and recreational vessels is regulated by Transport Canada's Vessel Pollution and Dangerous Chemicals Regulations under the Canada Shipping Act. Floating camps are regulated under Fisheries and Oceans Canada's Fisheries Act. Additionally, municipal wastewater discharges to water are also subject to Environment and Climate Change Canada (ECCC)'s Wastewater Systems Effluent Regulations (WSERs) under the Fisheries Act.

MUNICIPAL WASTEWATER AUTHORIZATIONS

Waste may be discharged into the environment in accordance with EMA and applicable authorizations. There are three types of authorizations under EMA specific to municipal wastewater discharges: (1) permit, (2) operational certificates, or (3) registration under a regulation.

Permits list site-specific legal requirements for which the activity must comply with to protect the environment. Municipal wastewater discharges were primarily regulated by permits prior to 1999. Permit requirements were initially influenced by the Pollution Control Act of 1967 and designed based on Pollution Control Objectives of 1976. Since the 1960s, permits have been issued under various environmental legislation and standards (i.e. Environment Management Act, Waste Management Act, Water Quality Guidelines or Objectives). Regulatory requirements or standards have improved over time due to developing science and research, public expectations and advancements in treatment technologies. Unless permits are subject to frequent regulatory reviews, however, permits may remain unchanged since issuance and may therefore be less reflective of current standards. Currently, no new permits are issued for municipal wastewater discharges; existing permits may undergo minor amendments only. New applicants or major amendments are required to register under the Municipal Wastewater Regulation (MWR).

Operational Certificates (OCs) are authorizations similar to permits but are only issued to municipal governments. OCs have site-specific requirements and include components from the municipality's approved Liquid Waste Management Plan. They were issued prior to 1999 and still exist but are less commonly used.

Registrations are authorizations which grant exemption from EMA Section 6(3) contingent upon compliance with requirements outlined in a specific regulation. From 1999 to 2012, municipal wastewater discharges were required to register under the Municipal Sewage Regulation (MSR), and some permits were replaced with registrations. In 2012, the MSR was replaced with the MWR, which remains the primary legislation that sets municipal wastewater discharge requirements for new discharges or existing ones seeking major permit amendments. After 2012, all registrations under the MSR were registered under the MWR through transitional provisions in the MWR. By registering under the MWR, municipal wastewater discharges are subject to consistent regulatory requirements.

FUNDAMENTAL ENVIRONMENTAL PROTECTION REQUIREMENTS

Fundamental requirements necessary for authorizations to be protective of human health and the environment are: effluent quantity limits and quality standards, monitoring of effluent quantity and quality and receiving environment quality, and reporting of results to ENV.

Effluent is a liquid substance discharged into the environment that can cause harm to the environment or human health. This Assessment focusses on treated municipal wastewater effluent discharged into marine or surface waters through an outfall.

EFFLUENT QUANTITY

Effluent quantity is regulated by setting authorized discharge rate limits to ensure treatment design capacities are not exceeded. Exceedances of the design capacity may lead to bypasses of treatment works resulting in discharges of untreated or partially treated municipal wastewater into the receiving environment.

EFFLUENT QUALITY

Effluent quality is regulated by setting standards for effluent parameters. Common parameters of concern that may impact the receiving environment include characteristics inherent to sewage such as biochemical oxygen demand (BOD), total suspended solids (TSS), pH, nutrients (e.g. nitrogen, ammonia, phosphorus), pathogens (e.g. bacteria and viruses), and pharmaceuticals, as well as characteristics arising out of treatment such as residual chlorine and chlorination by-products and elevated effluent temperatures.

Effluent quality standards correlate to one of three levels of municipal wastewater treatment at the facility: primary, secondary, and advanced. Primary treatment consists of physical screening or settling of particulates through works such as influent screening, grit and scum removal, pre-aeration facilities, and sedimentation tanks along with a single outfall for municipal wastewater discharges. Septic tank systems with a single outfall may be implemented for smaller dischargers and/or remote locations. The MWR defines primary treatment by its ability to limit concentrations of BOD and TSS to maximums of 130 mg/L each. Secondary treatment works commonly include primary treatment works with an additional biological component such as a rotating biological contactor. Effluent quality for secondary treatment facilities are required by the MWR to meet 45 mg/L for BOD and TSS (or 60 mg/L for TSS in the case of a lagoon system). Advanced treatment, also referred to as tertiary, is additional treatment that is expected by the MWR to produce an effluent quality with 10 mg/L or less of BOD and TSS.

Effluent quality requirements minimize the risk of environmental degradation resulting from treated municipal wastewater discharge.

MONITORING

Monitoring requirements in municipal wastewater authorizations may include flow measurements or sampling and analysis of effluent at point of discharge and/or in the receiving environment. Monitoring requirements enable compliance verification with the authorization and provides information to evaluate the effectiveness of the authorization at protecting human health and the environment.

REPORTING

Reporting requirements ensure municipal wastewater dischargers are providing adequate evidence to the Ministry to verify compliance and evaluate the effectiveness of the authorization at protecting human health and the environment.

DISINFECTION

While pathogens are indirectly removed during other treatment processes, deactivation of pathogens is achieved through disinfection⁴, which necessitates consideration of effluent disinfection in managing pathogen outbreaks such as norovirus. The requirement to disinfect is currently not a fundamental environmental protection requirement in all municipal wastewater authorizations; however, this requirement is included in the regulatory review in light of the norovirus outbreaks.

COMPLIANCE

ENV's mandate is to ensure protection of the environment and human health, which is initiated through setting risk-based requirements in waste discharge authorizations. It is the responsibility of the municipal wastewater dischargers to meet the requirements.

ENV verifies compliance with these requirements by conducting inspections of activities and operations and produces inspection records with compliance responses. All inspections are conducted in accordance with the Ministry's Compliance and Enforcement Policy and Procedure⁵ (CEPP) and inspector manuals. When a non-compliance occurs, inspectors consider the severity of actual or potential impact to the environment and human health, the discharger's willingness to comply, the factual circumstances of the alleged contravention, and the compliance history of the offender before deciding on the appropriate enforcement response. The Non-Compliance Decision Matrix, a component of CEPP, is a risk-based tool that provides guidance for appropriate responses to non-compliance.

⁴ Metcalf and Eddy. 2003. Wastewater engineering: treatment and reuse. New York, NY, USA: McGraw-Hill.

⁵ Ministry of Environment and Climate Change Strategy. January 2018. Compliance and Enforcement Policy and Procedure: Version 4. 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>

DESCRIPTION OF THE ASSESSED PREMISES

STUDY AREA

The municipal wastewater authorizations in the study area, as shown in Figure 1, discharge to the marine environment or to watersheds on the south coast of B.C. and Vancouver Island. The study range extends from municipal wastewater discharges on Bramham Island, situated north of the west end of Vancouver Island, to discharges into the Fraser River as far east as the municipality of Hope. Since the Fraser River contributes to the currents in the Strait of Georgia⁶, discharges into the Fraser River have the potential to affect the marine environment near and around shellfish harvesting areas.

The regulatory review and compliance assessment summary were performed on 173 municipal wastewater authorizations (included in Appendix 1. List of Authorizations) in the study area which were inspected at least once by ENV between January 2015 and March 2019. Figure 1 shows the geographical distribution of all authorizations reviewed.



Figure 1: Distribution of 173 Municipal Wastewater Authorizations within Study Area

⁶ Ages, Alard and Woollard, Anne. 1976. The Tides in the Fraser Estuary, UNPUBLISHED MANUSCRIPT. Institute of Ocean Sciences. Accessed at <<http://www.dfo-mpo.gc.ca/Library/54832.pdf>>.

During both the regulatory review and compliance assessment summary, five maximum daily flow (MDF) ranges (derived from the MWR) were considered to explore whether there is consistency between facility size and authorization requirement rigor and compliance patterns. The ranges are:

1. Less than 10 m³/day;
2. 10 m³/day and higher, but less than 500 m³/day;
3. 500 m³/day and higher, but less than 5000 m³/day;
4. 5000 m³/day and higher, but less than 50 000 m³/day;
5. 50 000 m³/day and higher.

REGULATORY REVIEW AND COMPLIANCE ASSESSMENT SUMMARY METHODOLOGY

REGULATORY REVIEW APPROACH

The regulatory review assessed whether the study group of 173 municipal wastewater authorizations contained the fundamental requirements (effluent quantity and quality, monitoring and reporting) for the protection of human health and the environment. The assessment was performed with respect to facility size (as indicated by maximum daily flow rate) and authorization type where available. Additionally, authorizations were also evaluated for requirements mandating effluent disinfection, as viral deactivation treatment of municipal wastewater may mitigate future norovirus outbreaks.

COMPLIANCE ASSESSMENT SUMMARY APPROACH

The compliance assessment summary aggregated data from individual inspection records for a sector to identify common issues of non-compliances to better inform appropriate action(s) such as policy or legislation changes, amendments to authorizations, increased compliance activity or compliance promotion.

The compliance assessment summary evaluated the compliance rate of facilities with the requirements of the 173 municipal wastewater authorizations under which their effluent is being discharged. The assessment consisted of aggregating compliance findings and ENV compliance responses from 222 inspections records produced between January 2015 and March 2019 to determine overall compliance rates.

INSPECTIONS

All inspection records were completed by ENV inspectors. Compliance verification was accomplished via office reviews, on-site visits, or a combination of both. The office review included reviewing records such as authorization information within ENV's Authorization Management System (AMS) database and any other required documents, reports, or data submissions. On-site inspections consisted of a walkthrough of the site to verify facility and operational details and review maintenance logs; site personnel were questioned on site history and operation details as necessary, and photographs of the authorized works and discharges were taken as necessary.

Inspections consisted of evaluating whether the authorization holder was compliant with their authorization on a section-by-section basis. Compliance findings for each section (requirement) were one of four outcomes:

In	ENV determined that the authorization holder is compliant 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 at the time of the inspection for ENV to determine whether the authorization holder is compliant with the regulatory requirement
Not applicable	The regulatory requirement was not relevant at the time of the inspection

Two other inspection finding categories were added for the purposes of the compliance assessment summary:

No requirement	The authorization did not have a regulatory requirement pertaining to the analyzed compliance area. For example, a permit did not have a requirement to monitor flow.
Not inspected	Although the authorization did have a regulatory requirement pertaining to the analyzed compliance area, the scope of the inspection did not include assessment of the requirement and was therefore not included in the inspection record.

If a single non-compliance was found during an inspection, the whole inspection was marked out of compliance, regardless of how many items were checked or how minor the non-compliance was.

ENV determined the appropriate administrative response based on the compliance verification findings of the site inspection. 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 compliant with all 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.
Administrative Monetary Penalty	Issuance of financial penalties up to \$75,000 for regulatory contravention

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 sanctions, etc., within ENV's enforcement toolkit can be found in ENV's Compliance and Enforcement Policy and Procedure.⁷

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

ENV compiled the results of the 222 inspections for the 173 municipal wastewater facilities included in the compliance assessment summary to determine compliance rates with fundamental requirement categories and identify opportunities for improvement.

Due to the variety of authorization types and the varying scope of inspections, assessable requirements were also variable across all authorizations. For standardization and evaluation purposes, compliance determinations were summarized based on the four fundamental environmental protection requirements (effluent quantity, effluent quality, monitoring, and reporting). The assessment was also performed with respect to facility size (as indicated by maximum daily flow rate) and authorization type where available.

In the event that a fundamental requirement was evaluated in multiple instances in the same inspection and resulted in different compliance findings, non-compliance was considered dominant over in-compliance and other findings for the purposes of data analysis in this assessment summary ("out of compliance" would trump "in compliance" which would trump "not required" and "not inspected" findings). For example, if an authorization had two different requirements pertaining to effluent monitoring, and the facility was "In Compliance" with one and "Out of Compliance" with the other, the facility would be considered "out of compliance" for effluent monitoring for that inspection record. It must be emphasized that inspection records will remain unaltered, only that this approach is to allow simplification of varied data sets for macroscopic data analysis purposes.

⁷ 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.pdf>.

SUMMARY OF FINDINGS

Results and findings from the regulatory review and compliance assessment summary are presented in the sections below.

REGULATORY REVIEW RESULTS AND DISCUSSION

REGULATORY REVIEW RESULTS

TYPES OF AUTHORIZATIONS

Three types of municipal wastewater authorizations were identified in the regulatory review: permits, registrations under the MWR, and operational certificates. Table 1 illustrates the distribution of municipal wastewater authorization types within the study group. Comprising 137 of the 173 (79%) reviewed authorizations, permits remain the most prevalent form of authorization currently used for municipal wastewater discharges under EMA in the study area. This implies 79% of the reviewed authorizations have not undergone a major permit amendment review since at least 1999 when the MSR came into effect (although it should be noted that any treatment or effluent quality improvements may not necessarily trigger a major permit amendment review).

The authorizations were additionally sorted into the five maximum daily flow (effluent) ranges in Table 1 as indications of facility size. Permits remain the most prevalent form of authorization amongst all flow ranges but are more common for MDFs less than 500 m³/day (i.e., smaller facilities). Authorizations with MDFs below 500 m³/day comprise 73% of all reviewed authorizations.

Table 1: Types of authorizations and their distribution among flow ranges

Type of Authorization	Authorization Type		Maximum Daily Flow Ranges (m ³ /day)									
			Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Permit	137	79%	44	86%	64	85%	12	63%	10	71%	7	50%
OC	9	5%	0	0	0	0	2	11%	2	14%	5	36%
MWR	27	16%	7	14%	11	15%	5	26%	2	14%	2	14%
Total Number of Authorizations	173		51	29%	75	43%	19	11%	14	8%	14	8%

EFFLUENT QUANTITY

All 173 municipal wastewater authorizations in the regulatory review contained requirements limiting the quantity of effluent discharge. Permits and operational certificates contained requirements explicitly

stating the maximum authorized discharge rate. For MWR registrations, the maximum daily flow rates were either included in the registration letter or supplemental registration documents.

EFFLUENT QUALITY

Effluent quality requirements in municipal wastewater authorizations set parameter limits in accordance with the level of treatment as defined in MWR. Table 2 shows the distribution of treatment levels of the 173 authorized municipal wastewater discharges in the study area.

Table 2: Summary of treatment levels among municipal wastewater authorizations

Treatment Levels	Tally of Facilities	Percentage of Facilities
Preliminary	8	5%
Primary	65	37%
Septic Tank/Outfall	49	28%
Sedimentation Tanks or Lagoons	16	9%
Secondary	97	56%
Advanced	3	2%
Total	173	100%

Eight authorized municipal wastewater sites only utilized preliminary treatment, which is limited to large solid removal via screening before discharge, and of these eight authorizations, four did not require the effluent to meet numerical quality standards.

The regulatory review performed for the fundamental requirement of effluent quality limits revealed that 71% of authorizations contained numerical standards for effluent quality parameters. The remaining 29% of authorizations (which offered preliminary to primary treatment works) required effluent to meet qualitative characteristics instead: i.e. “typical of septic tank effluent” (only in authorizations for MDFs of less than 500 m³/day) or “equivalent to or better than preliminary treated sewage”. Table 3 depicts the distribution of authorizations for quantitative versus qualitative effluent characterization requirements as well as flow ranges.

Table 3: Summary of effluent quality requirement

		Total		Maximum Daily Flow Ranges (m ³ /day)									
				Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
Number of Authorizations		173		51		75		19		14		14	
Effluent Quality Requirement		Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Quantitative	Numerical limits specified for BOD/TSS	122	71%	19	37%	60	80%	18	95%	13	93%	12	86%
	“typical of septic tank effluent”	44	25%	31	61%	13	17%	0	0%	0	0%	0	0%
Qualitative	“equivalent to or better than preliminary treated sewage”	7	4%	1	2%	2	3%	1	5%	1	7%	2	14%

Additionally, 160 out of 173 authorizations (92%) did not require effluent quality to meet numerical standards for fecal coliforms. The 2018 CDC report did note that fecal coliforms do not necessarily serve as reliable indicators of enteric viruses such as norovirus in aquatic environments.

MONITORING

The review of the 173 municipal wastewater authorizations for inclusion of monitoring requirements indicated that 72% of authorizations (125 out of 173) required at least some form of monitoring of effluent quantity (flow measurements), effluent quality, or the receiving environment, while 28% (48 out of 173) of authorizations did not require monitoring.

Flow measurements – which enables verification of discharge quantity – was a requirement in 68% (117 out of 173) of reviewed authorizations. The bulk (51 out of 56) of the remaining 32% of reviewed authorizations that did not require flow monitoring were authorizations for discharges of less than 500 m³/day.

Table 4 depicts the distribution of authorization types and flow ranges with respect to inclusion of flow measurement requirements.

Table 4: Summary of flow measurement requirements among all authorizations

		Total		Maximum Daily Flow Ranges (m ³ /day)									
				Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
Number of Authorizations		173		51		75		19		14		14	
Flow Measurement Requirement Inclusion		Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Yes		117	68%	18	35%	57	76%	19	100%	13	93%	10	71%
No		56	32%	33	65%	18	24%	0	0%	1	7%	4	29%

Effluent and/or receiving environmental monitoring was required in 70% (121 out of 173) of reviewed authorizations. 114 reviewed authorizations (66% of the total 173 reviewed authorizations) required effluent monitoring (sample collection and analysis of effluent prior to outfall discharge). Effluent BOD and TSS were the most prevalent parameters among the variety of required sampling parameters. 53 reviewed authorizations (31% of the total 173 reviewed authorizations) required monitoring of the receiving environment monitoring. 46 reviewed authorizations (27% of the total 173 reviewed authorizations) required both effluent and receiving environment monitoring.

Table 5 presents the distribution of authorizations which require monitoring of effluent and/or the receiving environment.

Table 5: Summary of effluent and receiving environment monitoring among authorizations requiring some form of monitoring

	Total		Maximum Daily Flow Ranges (m ³ /day)									
			Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Number of authorizations with effluent/receiving environmental monitoring requirements	121		20		59		19		13		10	
Required effluent monitoring	114	94%	15	75%	59	100%	18	95%	12	92%	10	100%
Required receiving environment monitoring	53	44%	7	35%	20	34%	14	74%	5	38%	7	70%
Required monitoring of both effluent and receiving environment	46	38%	2	10%	20	34%	13	68%	4	31%	7	70%

Reviewed municipal wastewater authorizations that required flow monitoring may not necessarily require effluent monitoring, and vice versa. Eight authorizations (all secondary treatment facilities) with requirements for effluent monitoring did not include a requirement for flow monitoring. Conversely, four authorizations (all for septic tanks outfitted with an outfall) required flow monitoring but no effluent or receiving environment monitoring.

REPORTING

The review of the 173 municipal wastewater authorizations for the inclusion of requirements to report or submit data to ENV indicated that 72% of authorizations (124 out of 173) contained reporting requirements. The majority of the remaining 28% of authorizations that do not require reporting are for discharges of less than 500 m³/day.

Table 6 presents the distribution of authorizations which require reporting of data to ENV.

Table 6: Summary of reporting requirement among all authorizations

	Total		Maximum Daily Flow Ranges (m ³ /day)									
			Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
Number of Authorizations	173		51		75		19		14		14	
Reporting Requirement Inclusion	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Yes	124	72%	23	45%	59	79%	18	95%	14	100%	10	71%
No	49	28%	28	55%	16	21%	1	5%	0	0%	4	29%

The four permits with MDFs of at least 50,000 m³/day with no reporting requirements also did not require monitoring; all belonged to a single municipal authorization holder for the purposes of intermittent emergency discharge (municipal storm overflow).

DISINFECTION

Disinfection as a treatment stage for municipal wastewater was not a common requirement in reviewed wastewater authorizations. 76% (132 out of 173) municipal wastewater authorizations did not require disinfection of effluent prior to discharge. Of the 41 authorizations requiring disinfection, 30 required ultraviolet (UV) disinfection while 11 required chlorination. Roughly half of facilities discharging maximum daily flows between 500 and 50,000 cubic metres required disinfection; less than half of the authorizations in the remaining flow categories required effluent disinfection, as shown in Table 7.

Table 7: Summary of disinfection requirement among all authorizations

	Total		Maximum Daily Flow Ranges (m ³ /day)									
			Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
Number of Authorizations	173		51		75		19		14		14	
Disinfection Requirement Inclusion	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%	Tally	%
Yes	41	24%	0	0%	19	25%	10	53%	7	50%	5	36%
No	132	76%	51	100%	56	75%	9	47%	7	50%	9	64%
Breakdown of disinfection methods among authorizations requiring disinfection												
Number of Authorizations Requiring Disinfection	41		0		19		10		7		5	
UV	30	73%	0	0%	15	79%	9	90%	5	71%	1	20%
Chlorination	11	27%	0	0%	4	21%	1	10%	2	29%	4	80%

All authorizations with disinfection requirements were either issued or amended after 1994.

Table 8 presents the tallies of authorizations by type that require disinfection, and/or monitoring of fecal indicators such as fecal coliforms and/or enterococci.

Table 8. Types of authorizations and disinfection and fecal indicator requirements

		Requires disinfection		Does not require disinfection		Total	
		Tally	%	Tally	%	Tally	%
All Authorizations	Requires fecal indicator monitoring	32	78%	22	17%	54	31%
	Does not require fecal indicator monitoring	9	22%	110	83%	119	69%
	Total	41		132		173	
Permits	Requires fecal indicator monitoring	17	85%	16	14%	33	24%
	Does not require fecal indicator monitoring	3	15%	101	86%	104	76%
	Total	20		117		137	
Operational Certificate	Requires fecal indicator monitoring	7	100%	1	50%	8	89%
	Does not require fecal indicator monitoring	0	0%	1	50%	1	11%
	Total	7		2		9	
MSR/MWR Registration	Requires fecal indicator monitoring	8	57%	5	38%	13	48%
	Does not require fecal indicator monitoring	6	43%	8	62%	14	52%
	Total	14		13		27	

Operational certificates had the highest rate of requiring disinfection (78% of operational certificates) among the authorization types, while permits had the lowest (15% of permits).

Overall, reviewed municipal wastewater authorizations that require fecal indicator monitoring are more likely to also require disinfection of the effluent, and vice versa; 64% (110 out of 173) of all authorizations required neither indicator monitoring nor disinfection, followed by 18% (32 out of 173) of all authorizations which required both indicator monitoring and disinfection. The remainder 18% of authorizations required one but not the other.

Overall, 71% (122 out of 173) of the reviewed authorizations contained all fundamental requirements (effluent quantity limits, qualitative and/or quantitative effluent quality standards, some form of monitoring, and reporting).

REGULATORY REVIEW DISCUSSION

79% of the 173 reviewed authorizations (i.e. permits) for municipal wastewater discharges under EMA in the study area have not undergone a major permit amendment review since at least 1999 (effective date of the MSR) and therefore may not contain the same rigor in fundamental requirements as more recent legislation.

With regards to the fundamental requirements for effluent quantity, all 173 municipal wastewater authorizations in the regulatory review contained requirements limiting the quantity of effluent discharge.

With regards to the fundamental requirements for effluent quality, eight authorized municipal wastewater sites only utilized preliminary treatment (large solid removal), and of these eight authorizations, four did not require the effluent to meet numerical quality standards. 29% of authorizations only required effluent to meet qualitative characteristics – these 51 authorizations were limited to preliminary and primary treatment works. 160 out of 173 authorizations (92%) did not require effluent quality to meet numerical standards for fecal coliforms (the 2018 CDC report does note that fecal coliforms do not necessarily serve as reliable indicators of enteric viruses such as norovirus in aquatic environments). The inclusion of numerical effluent quality standards in municipal wastewater authorizations is necessary to facilitate compliance verification and ensure that effluent discharges do not result in environmental degradation nor risk to human health.

With regards to the fundamental requirements for monitoring, 28% of reviewed authorizations did not require any monitoring (flow, effluent or the receiving environment). Facilities with MDFs of less than 500 m³/day were least likely to require monitoring. Monitoring is necessary to determine whether effluent quantity or quality limits are being met, which indicates whether facilities are functioning properly and allows for inspectors to verify environmental and human health protection.

With regards to the fundamental requirements for reporting, 28% of reviewed authorizations do not require reporting of monitoring data (mainly facilities with MDFs of less than 500 m³/day). Without a reporting requirement, inspectors are unable to verify if other requirements such as effluent quantity or quality limits are being met to ensure protection of the environment.

While disinfection was not a fundamental requirement, it is an important consideration in the management of norovirus outbreaks. 76% of reviewed authorizations did not require disinfection of effluent prior to discharge. Overall, reviewed municipal wastewater authorizations that require fecal indicator monitoring are more likely to also require disinfection of the effluent, and vice versa; this may reflect the likelihood of effluent quality meeting certain aquatic use standards at the edge of the initial dilution zones.

COMPLIANCE ASSESSMENT SUMMARY RESULTS AND DISCUSSION

COMPLIANCE ASSESSMENT SUMMARY RESULTS

INSPECTIONS

Between January 2015 and March 2019, 222 inspections were conducted on 173 municipal wastewater authorizations.

Table 9 presents the number of inspection records produced and administrative responses issued in each of the years included in the compliance summary.

Table 9. Number of inspections conducted, and administrative responses issued per year for reviewed municipal wastewater authorizations

Year	Annual Total	Notice		Advisory		Warning		AMP	
		Tally	% of annual total	Tally	% of annual total	Tally	% of annual total	Tally	% of annual total
2015	8	1	13%	7	88%	0	0%	0	0%
2016	26	7	27%	15	58%	4	15%	0	0%
2017	95	26	27%	54	57%	12	13%	3	3%
2018	59	11	19%	37	63%	11	19%	0	0%
2019	34	5	15%	19	56%	10	29%	0	0%

42% of the inspection records included in the compliance assessment summary were conducted during the most recent years of 2018 and 2019.

Table 10 presents tallies of follow-up inspections conducted throughout the inspection years included in the assessment, as well as their administrative responses. Note that follow-up inspections are defined here as inspections at facilities that have already been previously inspected during the assessed timeline (2015 to 2019); although follow-up inspections occur at the same facility, inspection scope may differ and may not evaluate the same requirements each time.

Table 10. Number of follow-up inspections conducted throughout the years and their administrative responses

Year	Annual Total of Follow-ups	Notice		Advisory		Warning		AMP	
		Tally	% of annual total	Tally	% of annual total	Tally	% of annual total	Tally	% of annual total
2015	0	0	-	0	-	0	-	0	-
2016	2	2	100%	0	0%	0	0%	0	0%
2017	23	2	9%	15	65%	3	13%	3	13%
2018	20	6	30%	10	50%	4	20%	0	0%
2019	4	0	0%	3	75%	1	25%	0	0%
Total	49	10		28		8		3	

20% of follow-up inspections resulted in the issuance of notices of compliance. 57% of follow-up inspections resulted in advisories, while the remaining 22% of follow-up inspections resulted in escalated administrative responses such as warnings or AMPs.

Table 11 provides the distribution of inspections (follow-ups and overall) of authorized municipal wastewater facilities by facility size (maximum daily flow ranges).

Table 11. Distribution of inspections conducted for different facility sizes (flow ranges)

Maximum Daily Flow Ranges (m ³ /day)	Inspections Overall		Follow-Up Inspections	
	Tally	% of Inspections overall	Tally	% of inspections per flow range
Less than 10	56	25%	5	9%
10 to < 500	86	39%	11	13%
500 to < 5,000	27	12%	8	30%
5,000 to < 50,000	23	10%	9	39%
50,000 or more	30	14%	16	53%

64% of inspections were conducted for facilities with MDFs below 500 m³/day. 51% of follow-up inspections were conducted for facilities with at least 5,000 m³/day maximum daily flow.

Of the 222 inspections, 173 were performed on permits, 32 were performed on MWR registrations, and 17 were performed on operational certificates.

OVERALL COMPLIANCE RATE OF MUNICIPAL WASTEWATER AUTHORIZATIONS

Overall, 23% (50 out of 222 inspection records) of inspections conducted between January 2015 and March 2019 on the 173 authorized municipal wastewater facilities resulted in issuances of notices of compliance. These notices of compliances were issued to 43 facilities.

77% of all inspection records had at least one non-compliance identified during the inspection; resulting compliance responses include the issuance of advisories following 59% of inspections, warnings following 17% of inspections, and administrative monetary penalties (AMPs) following 1% of inspections.

Table 12 summarizes the compliance responses issued for all inspection records in this compliance assessment summary.

Table 12: Summary of compliance responses for all inspection records

	Compliance Response	Number of Inspection Records	Percentage
Compliance Response	Notice of Compliance	50	23%
	Advisory	132	59%
	Warning	37	17%
	Administrative Monetary Penalty	3	1%
	Investigation Referral	0	0%
Total Number of Inspections		222	100%

Table 13 provides a breakdown of the administrative compliance responses issued to facilities of different maximum daily flow (MDF) ranges.

Table 13: Summary of administrative compliance responses for all inspection records based on maximum daily flow ranges

Administrative Responses		Maximum Daily Flow Ranges (m ³ /day)				
		Less than 10	10 to < 500	500 to < 5,000	5,000 to < 50,000	50,000 or more
Notice of Compliance		27%	20%	11%	4%	47%
Non-Compliance Responses	Advisory	57%	65%	48%	70%	50%
	Warning	16%	14%	33%	26%	3%
	AMP	0%	1%	7%	0%	0%
	Subtotal	73%	80%	88%	96%	53%
Number of Inspections out of 222		56	86	27	23	30

Except for facilities with MDFs of 50,000 m³/day or more, higher rates of non-compliance were observed to increase with facility size. Facilities with the MDFs between 500 and 50,000 m³/day had the lowest occurrences of notices and highest occurrences of warnings – notably, facilities with MDFs between 500 and 5,000 m³/day had the highest occurrence of escalated administrative responses (warnings and AMPs) at up to 40% of responses.

OVERALL COMPLIANCE RATE FOR EFFLUENT QUANTITY

The compliance outcomes resulting from inspections of authorized municipal wastewater facilities for effluent quantity requirements are presented in Table 14.

Table 14: Summary of compliance outcomes in inspections against effluent quantity requirements

Compliance Outcomes for Effluent Quantity Requirements	Number of Inspections	Percentage of Inspections Overall	Percentage of Inspections That Evaluated Requirement
In	68	31%	41%
Out	35	16%	21%
Not Determined	62	28%	38%
Not Applicable	5	2%	-
No Requirement	26	12%	-
Not Inspected	26	12%	-

31% of inspection records for authorized municipal wastewater facilities in this compliance assessment summary indicated compliance with effluent quantity requirements, while 16% indicated non-compliance. 28% of inspections could not determine compliance due to lack of flow data, either from the failure of the discharger to meet monitoring and/or reporting requirements or from the lack of monitoring or recording requirements in the authorization. In the remaining 26% of inspections, effluent quantity requirements were either not applicable, not included in the authorization, or not inspected.

In other words, of the 165 inspections in which compliance with effluent quantity requirements were evaluated, 41% confirmed compliance, 21% confirmed non-compliance, and 38% could not determine compliance.

Table 15 shows the distribution of compliance outcomes from inspections against effluent quantity requirements based on the maximum daily flow range.

Table 15: Summary of compliance outcomes for effluent quantity based on maximum daily flow ranges

Compliance Outcomes for Effluent Quantity Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	4%	7%	33%	43%	41%	46%	43%	50%	57%	65%
Out	2%	3%	9%	12%	44%	50%	39%	45%	17%	19%
Not Determined	48%	90%	34%	45%	4%	4%	4%	5%	13%	15%
Not Applicable	5%	-	2%	-	0%	-	0%	-	0%	-
No Requirement	13%	-	13%	-	11%	-	13%	-	7%	-
Not Inspected	29%	-	9%	-	0%	-	0%	-	7%	-
Total Number of Inspections	56		86		27		23		30	

% Overall – means percentage of all inspections conducted for that MDF bracket

% Eval – means percentage of inspections conducted for that MDF bracket that evaluated compliance with effluent quantity requirements

Inspections of facilities with MDFs of below 500 m³/day had the highest rate of undeterminable compliance at 45% to 90% of inspections. Dischargers with MDFs from 500 m³/day to below 50,000 m³/day had the highest demonstrable non-compliance rates at 45% to 50% of inspections.

OVERALL COMPLIANCE RATE FOR EFFLUENT QUALITY

The compliance outcomes resulting from inspections of authorized municipal wastewater facilities for effluent quality requirements are presented in Table 16.

Table 16: Summary of compliance outcomes in inspections against effluent quality requirements

Compliance Outcomes for Effluent Quality Requirements	Number of Inspections	Percentage of Inspections	Percentage of Inspections That Evaluated Requirement
In	64	29%	38%
Out	61	27%	37%
Not Determined	42	19%	25%
Not Applicable	3	1%	-
No Requirement	0	0	-
Not Inspected	52	23%	-

29% of inspections determined compliance while 27% determined non-compliance with effluent quality requirements. 23% of inspections did not assess effluent quality because there was no monitoring and/or reporting requirement imposed, limiting data availability for desktop reviews.

In other words, of the 167 inspections in which compliance with effluent quality requirements were evaluated, 38% confirmed compliance, 37% confirmed non-compliance, and 25% could not determine compliance.

Table 17 takes a closer look at the breakdown of compliance outcomes from inspections against effluent quality requirements based on maximum daily flow ranges.

Table 17: Summary of compliance outcomes for effluent quality based on maximum daily flow ranges

Compliance Outcomes for Effluent Quality Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	16%	36%	30%	38%	33%	36%	26%	30%	47%	50%
Out	9%	20%	26%	32%	48%	52%	57%	65%	27%	29%
Not Determined	20%	44%	24%	30%	11%	12%	4%	5%	20%	21%
Not Applicable	2%	-	2%	-	0%	-	0%	-	0%	-
No Requirement	0%	-	0%	-	0%	-	0%	-	0%	-
Not Inspected	54%	-	17%	-	7%	-	13%	-	7%	-
Total Number of Inspections	56		86		27		23		30	

% Overall – means percentage of all inspections conducted for that MDF bracket

% Eval – means percentage of inspections conducted for that MDF bracket that evaluated compliance with effluent quantity requirements

Dischargers with MDFs between 500 m³/day to less than 50,000 m³/day had the highest rate of non-compliance with effluent quality requirements at between 52% and 65% of inspections which evaluated

those requirements. Conversely, dischargers with MDFs of 50,000 m³/day and higher had the highest rates of demonstrated compliance at 50% of inspections which evaluated effluent quality requirements.

Table 18 presents a closer look at sector compliance with effluent quality requirements for the select parameters of BOD, TSS and fecal coliforms.

Table 18. Compliance Outcomes for Effluent Quality Requirements for BOD, TSS and Fecal Coliforms

Compliance Outcomes for Effluent Quality Requirements	BOD			TSS			Fecal Coliforms		
	Tally	% Overall	% Eval	Tally	% Overall	% Eval	Tally	% Overall	% Eval
In	76	34%	47%	71	32%	44%	5	2%	31%
Out	45	20%	28%	48	22%	30%	7	3%	44%
Not Determined	42	19%	26%	42	19%	26%	4	2%	25%
Not Evaluated (Not Applicable, No Requirement, Not Inspected)	59	27%	-	61	27%	-	206	93%	-
Total Number of Inspections	222	100%	-	222	100%	-	222	100%	-
% Overall – means percentage of all inspections conducted									
% Eval – means percentage of inspections conducted that evaluated compliance with effluent quantity requirements									

Respective 47% and 44% of all inspections which evaluated compliance with effluent quality requirements for BOD and TSS determined compliance. Compliance with fecal coliform requirements was evaluated in 7% of all inspections (fecal coliform analysis is not required in 91% of inspections); 31% of these inspections determined compliance.

OVERALL COMPLIANCE RATE FOR MONITORING

Overall compliance of authorized municipal wastewater facilities with requirements for flow monitoring, effluent monitoring, and receiving environmental monitoring was evaluated in this compliance assessment summary.

Compliance Rates for Flow Monitoring

Overall, of the inspections that evaluated flow monitoring requirements, 64% confirmed compliance with flow monitoring requirements while 23% of inspections determined non-compliance.

Compliance outcomes resulting from inspections of authorized municipal wastewater facilities for flow monitoring requirements are presented in Table 19.

Table 19: Summary of compliance outcomes in inspections against flow monitoring requirements

Compliance Outcomes for Flow Monitoring Requirements	Number of Inspections	Percentage of Inspections	Percentage of Inspections That Evaluated Requirement
In	88	40%	64%
Out	32	14%	23%
Not Determined	18	8%	13%
Not Applicable	4	2%	-
No Requirement	55	25%	-
Not Inspected	25	11%	-

Table 20 provides the breakdown of compliance outcomes from inspections against flow monitoring requirements based on maximum daily flow ranges.

Table 20: Summary of compliance outcomes for flow monitoring based on maximum daily flow ranges

Compliance Outcomes for Flow Monitoring Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	5%	20%	35%	51%	78%	84%	57%	72%	70%	100%
Out	11%	40%	21%	31%	11%	12%	22%	28%	0%	0%
Not Determined	11%	40%	13%	19%	4%	4%	0%	0%	0%	0%
Not Applicable	2%	-	3%	-	0%	-	0%	-	0%	-
No Requirement	57%	-	19%	-	0%	-	13%	-	13%	-
Not Inspected	14%	-	9%	-	7%	-	9%	-	17%	-
Total Number of Inspections	56	-	86	-	27	-	23	-	30	-

% Overall – means percentage of all inspections conducted for that MDF bracket
 % Eval – means percentage of inspections conducted for that MDF bracket that evaluated effluent quantity requirements

Dischargers with MDFs of 500 m³/day or greater had the highest rates of compliance with flow monitoring requirements, at 72% to 100% of inspections evaluating those requirements.

Compliance Rates for Effluent Monitoring

Overall, of the inspections that evaluated effluent monitoring requirements, 52% confirmed compliance with effluent monitoring requirements while 35% of inspections determined non-compliance.

Compliance outcomes resulting from inspections of authorized municipal wastewater facilities for effluent monitoring requirements are presented in Table 21.

Table 21: Summary of compliance outcomes in inspections against effluent monitoring requirements

Compliance Outcomes for Effluent Monitoring Requirements	Number of Inspections	Percentage of Inspections	Percentage of Inspections That Evaluated Requirement
In	73	33%	52%
Out	49	22%	35%
Not Determined	18	8%	13%
Not Applicable	4	2%	-
No Requirement	59	27%	-
Not Inspected	19	9%	-

Table 22 provides the breakdown of compliance outcomes from inspections against effluent monitoring requirements based on maximum daily flow ranges.

Table 22: Summary of compliance outcomes for effluent monitoring based on maximum daily flow ranges

Compliance Outcomes for Effluent Monitoring Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	5%	18%	31%	46%	56%	60%	43%	59%	60%	82%
Out	14%	47%	27%	39%	26%	28%	30%	41%	13%	18%
Not Determined	11%	35%	10%	15%	11%	12%	0%	0%	0%	0%
Not Applicable	0%	-	3%	-	4%	-	0%	-	0%	-
No Requirement	57%	-	19%	-	4%	-	26%	-	13%	-
Not Inspected	13%	-	9%	-	0%	-	0%	-	13%	-
Total Number of Inspections	56	-	86	-	27	-	23	-	30	-

% Overall – means percentage of all inspections conducted for that MDF bracket

% Eval – means percentage of inspections conducted for that MDF bracket that evaluated effluent quantity requirements

Similar to the analysis of compliance rates with flow monitoring requirements, dischargers with MDFs of 500 m³/day or greater had the highest rates of compliance with effluent monitoring requirements, at 59% to 82% of inspections evaluating those requirements.

Compliance Rates for Receiving Environmental Monitoring

Overall, of the inspections that evaluated receiving environmental monitoring requirements, 51% confirmed compliance with receiving environmental monitoring requirements while 37% of inspections determined non-compliance.

Compliance outcomes resulting from inspections of authorized municipal wastewater facilities for receiving environmental monitoring requirements are presented in Table 23.

Table 23: Summary of compliance outcomes in inspections against receiving environment monitoring requirements

Compliance Outcomes for Receiving Environmental Monitoring Requirements	Number of Inspections	Percentage of Inspections	Percentage of Inspections That Evaluated Requirement
In	21	9%	51%
Out	15	7%	37%
Not Determined	5	2%	12%
Not Applicable	8	4%	-
No Requirement	147	66%	-
Not Inspected	26	12%	-

Table 24 provides the breakdown of compliance outcomes from inspections against receiving environmental monitoring requirements based on maximum daily flow ranges.

Table 24: Summary of compliance for receiving environment based on maximum daily flow ranges

Compliance Outcomes for Receiving Environmental Monitoring Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	0%	0%	3%	30%	33%	64%	9%	50%	23%	88%
Out	7%	80%	7%	60%	15%	29%	4%	25%	0%	0%
Not Determined	2%	20%	1%	10%	4%	7%	4%	25%	3%	13%
Not Applicable	0%	-	5%	-	7%	-	9%	-	0%	-
No Requirement	88%	-	72%	-	26%	-	61%	-	50%	-
Not Inspected	4%	-	12%	-	15%	-	13%	-	23%	-
Total Number of Inspections	56	-	86	-	27	-	23	-	30	-

% Overall – means percentage of all inspections conducted for that MDF bracket

% Eval – means percentage of inspections conducted for that MDF bracket that evaluated effluent quantity requirements

Similar to the analysis of compliance rates with flow and effluent monitoring requirements, dischargers with MDFs of 500 m³/day or greater had the highest rates of compliance with receiving environment monitoring requirements, at 50% to 88% of inspections evaluating those requirements. Notably, none of the dischargers with MDFs below 10 m³/day were determined to be compliant with receiving environmental monitoring requirements.

OVERALL COMPLIANCE RATE FOR REPORTING

Overall, of the inspections that evaluated reporting requirements, 42% confirmed compliance with reporting requirements while 49% of inspections determined non-compliance.

Compliance outcomes resulting from inspections of authorized municipal wastewater facilities for receiving environmental monitoring requirements are presented in Table 25.

Table 25: Summary of compliance in inspections against reporting requirements

Compliance Outcomes for Reporting Requirements	Number of Inspections	Percentage of Inspections	Percentage of Inspections That Evaluated Requirement
In	65	29%	42%
Out	76	34%	49%
Not Determined	14	6%	9%
Not Applicable	6	3%	-
No Requirement	47	21%	-
Not Inspected	14	6%	-

Table 26 provides the breakdown of compliance outcomes from inspections against receiving environmental monitoring requirements based on maximum daily flow ranges.

Table 26: Summary of compliance for reporting based on maximum daily flow ranges

Compliance Outcomes for Reporting Requirements	Maximum Daily Flow Ranges (m ³ /day)									
	Less than 10		10 to < 500		500 to < 5,000		5,000 to < 50,000		50,000 or more	
	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval	% Overall	% Eval
In	5%	13%	21%	29%	41%	46%	57%	62%	67%	83%
Out	29%	70%	45%	62%	44%	50%	26%	29%	10%	13%
Not Determined	7%	17%	7%	10%	4%	4%	9%	10%	3%	4%
Not Applicable	5%	-	3%	-	0%	-	0%	-	0%	-
No Requirement	50%	-	17%	-	0%	-	0%	-	13%	-
Not Inspected	4%	-	6%	-	11%	-	9%	-	7%	-
Total Number of Inspections	56	-	86	-	27	-	23	-	30	-

% Overall – means percentage of all inspections conducted for that MDF bracket

% Eval – means percentage of inspections conducted for that MDF bracket that evaluated effluent quantity requirements

Similar to the analysis of compliance rates with monitoring requirements, dischargers with higher MDFs (5,000 m³/day or greater) had the highest rates of compliance with reporting requirements, at 62% to 83% of inspections evaluating those requirements. Dischargers with MDFs below 10 m³/day were determined to have the lowest demonstrated compliance rates with reporting requirements at 13%.

COMPLIANCE ASSESSMENT SUMMARY DISCUSSION

Between January 2015 and March 2019, 222 inspections were conducted on 173 municipal wastewater authorizations. Overall, 23% (50 out of 222 inspection records) of inspections conducted between 2015 and March 2019 on the 173 authorized municipal wastewater facilities resulted in issuances of notices of compliance. These notices of compliances were issued to 43 facilities. 77% of all inspection records had at least one non-compliance identified during the inspection; resulting compliance responses consist of the issuance of advisories following 59% of inspections, warnings following 17% of inspections, and administrative monetary penalties (AMPs) following 1% of inspections.

Except for facilities with MDFs of 50,000 m³/day or more, higher rates of non-compliance were observed to increase with facility size. Facilities with the MDFs between 500 and 50,000 m³/day had the lowest occurrences of notices and highest occurrences of warnings – notably, facilities with MDFs between 500 and 5,000 m³/day had the highest occurrence of escalated administrative responses (warnings and AMPs) at up to 40% of responses.

With regards to compliance with effluent quantity requirements:

Of the 165 inspections evaluating facility compliance with effluent quantity requirements, 41% confirmed compliance, 21% confirmed non-compliance, and 38% could not determine compliance due to lack of flow data, either from the failure of the discharger to meet monitoring and/or reporting requirements or from the lack of monitoring or recording requirements in the authorization

Inspections of facilities with MDFs of below 500 m³/day had the highest rate of undeterminable compliance at 45% to 90% of inspections. Dischargers with MDFs from 500 m³/day to below 50,000 m³/day had the highest demonstrable non-compliance rates at 45% to 50% of inspections.

With regards to compliance with effluent quality requirements

Of the 167 inspections evaluating facility compliance with effluent quality requirements, 38% confirmed compliance, 37% confirmed non-compliance, and 25% could not determine compliance.

Dischargers with MDFs between 500 m³/day to less than 50,000 m³/day had the highest rate of non-compliance with effluent quality requirements at between 52% and 65% of inspections which evaluated those requirements. Conversely, dischargers with MDFs of 50,000 m³/day and higher had the highest rates of demonstrated compliance at 50% of inspections which evaluated effluent quality requirements.

With regards to compliance with monitoring

64% of the inspections that evaluated flow monitoring requirements confirmed compliance with flow monitoring requirements while 23% of inspections determined non-compliance. 52% of the inspections that evaluated effluent monitoring requirements confirmed compliance with effluent monitoring requirements while 35% of inspections determined non-compliance.

51% of the inspections that evaluated receiving environmental monitoring requirements confirmed compliance with receiving environmental monitoring requirements while 37% of inspections determined non-compliance. Notably, none of the dischargers with MDFs below 10 m³/day were determined to be compliant with receiving environmental monitoring requirements.

Dischargers with MDFs of 500 m³/day or greater had the highest rates of compliance with monitoring requirements at 72% to 100% of inspections evaluating flow monitoring requirements, 59% to 82% of inspections evaluating effluent monitoring requirements, and 50% to 88% of inspections evaluating receiving environmental monitoring requirements.

With regards to compliance with reporting

Overall, of the inspections that evaluated reporting requirements, 42% confirmed compliance with reporting requirements while 49% of inspections determined non-compliance.

Similar to the analysis of compliance rates with monitoring requirements, dischargers with higher MDFs (5,000 m³/day or greater) had the highest rates of compliance with reporting requirements, at 62% to 83% of inspections evaluating those requirements. Dischargers with MDFs below 10 m³/day were determined to have the lowest demonstrated compliance rates with reporting requirements at 13%.

NOTE ON SEWERAGE OVERFLOWS

The 2018 CDC report additionally indicated sewerage overflow events from combined water/sewer drainage as a potential source of sewage contamination of shellfish growing areas, including combined sewer overflows (CSOs), sanitary sewer overflows (SSOs) and storm tank overflows (STOs):

“Overflows are events in which raw sewage enters the environment via accidental or planned discharges from municipal sewer systems, storm drains, or via seepage from damaged sewage pipes. CSOs occur during wet weather events when the volume of rainfall overwhelms a combined sewer’s capacity, and sewage is released into the environment. SSOs occur when sanitary sewers, containing only grey water and sewage, are damaged or begin leaking for any reason. SSOs can occur anytime, arising from blocked pipes, pump failures and inflow and infiltration (I&I). I&I can be caused by groundwater or rainwater entering damaged infrastructure or through deliberate or accidental cross connection with storm water collection systems. Storm tanks may be attached to WWTPs or at other points within a sewage network in order to collect excess rainfall or CSO discharge prior to treatment, thus preventing overload of the plant. STOs occur when rainfall exceeds these tanks’ capacity, but they are rare in BC.”

An investigation into sewerage overflows was out of the scope of this Assessment; however, municipal wastewater authorizations under EMA often include requirements on prohibiting bypasses of authorized works without prior approval from ENV, such as Section 49 of the MWR. Additionally, Sections 21 and

42(1) of the MWR requires measures to address overflow risk via environmental impact studies and liquid waste management plans, while Section 42 mandates the preparation of a decennial report on overflow events (on the request of a director). Furthermore, all unauthorized bypasses, overflows and spills must be reported in accordance with the provincial Spill Reporting Regulation, B.C. Reg. 263/90.

Table 27 presents the compliance rate of registrations under the MWR with Section 49 requirements, as well as operational certificates and their bypass requirements.

Table 27. Summary of Compliance with Section 49 Requirements in MWR Registrations and Bypass Requirements in Operational Certificates

Compliance Outcomes for Reporting Requirements	MWR Registrations			Operational Certificates		
	Tally	% Overall	% Eval	Tally	% Overall	% Eval
In	2	6%	67%	4	24%	80%
Out	0	0%	0%	1	6%	20%
Not Determined	1	3%	33%	0	0%	0%
Not Applicable	8	25%	-	6	35%	-
Not Inspected	21	66%	-	6	35%	-
Total Number of Inspections	32	1	-	17	1	-
% Overall – means percentage of all inspections conducted for that MDF bracket						
% Eval – means percentage of inspections conducted for that MDF bracket that evaluated effluent quantity requirements						

Three out of 32 inspections performed on MWR registrations evaluated compliance with Section 49 and found it to be applicable to the facility at the time of the inspection – two determined compliance with Section 49's requirements. Five out of 17 inspections performed on operational certificates evaluated compliance with bypass requirements and found it to be applicable to the facility at the time of the inspection; four determined compliance with the requirements. Eight MWR registrations and six OCs determined the requirements were not applicable due to lack of bypass events.

Compliance evaluation of bypass requirements are largely reliant on and limited to non-compliance self-reporting and spill reporting submitted by authorization holders as well as possibly third-party complaints.

RECOMMENDATIONS AND CONCLUSIONS

Findings from the 2019 Regulatory Review and Compliance Assessment Summary of Municipal Wastewater Authorizations within the South Coast of BC conducted using 222 inspection records completed between 2015 to 2019 for 173 authorizations have highlighted opportunities of improvement for facility owner/operators and ENV to reduce the likelihood that regulated municipal wastewater dischargers are potential sources of contamination among shellfish harvesting areas.

Permits may not contain the same rigor in fundamental requirements as more recent legislation due to their age; facility owners and ENV are encouraged to prioritize review of permits to ensure they remain as protective of human health and the environment as current regulations through inclusion of fundamental requirements that are verifiable in compliance inspections.

Recommendations for ENV include:

- ❖ Updates of the 51 permits containing only qualitative effluent quality standards to require that effluent quality meets numerical standards
- ❖ Review of the authorizations of the eight facilities utilizing only preliminary (large solid) treatment to determine whether facility upgrading to preliminary treatment is required
- ❖ Review of the authorizations which did not require monitoring of either effluent quantity (56 authorizations), effluent quality (59 authorizations) and/or or receiving environment (120 authorizations) to consider adding monitoring requirements, or verification that the lack of monitoring requirements poses minimal risk to environment and human health; there may need to be a focus on authorizations for MDFs below 500 m³/day
- ❖ Review of the 49 authorizations that do not require reporting of monitoring data to consider including requirements for submission of monitoring data to ENV; there may need to be a focus on authorizations for MDFs below 500 m³/day
- ❖ Review of authorizations to determine whether amendments to require disinfection of effluent for norovirus (in addition to fecal coliforms) would be impactful in mitigating norovirus outbreaks; 132 authorizations do not require disinfection of effluent prior to discharge while 30 authorizations required ultraviolet (UV) disinfection and 11 required chlorination
- ❖ Compliance promotion strategies may be tailored toward facility types. For example, dischargers with MDFs from 500 m³/day to below 50,000 m³/day have the highest rate of non-compliance in failing to meet effluent quantity and quality requirements, while dischargers with MDFs below 500 m³/day had the highest rates of non-compliance with regards to monitoring and reporting; specifically, discharges with MDFs of 10 m³/day demonstrated non-compliance rates of 70 to 80% for receiving environmental monitoring and reporting requirements.

- ❖ Compliance promotion initiatives to improve public awareness of the requirements to report bypasses, spills, and overflows in accordance with the Spill Reporting Regulation
- ❖ Further assessment of sewerage overflows, which may be aided by the maintenance of an overflows database/map sourced from self-reporting of non-compliances, dangerous goods incident reports (DGIRs) generated by the provincial Environmental Emergency Program, and list of authorizations for combined sewer overflow works

Facility owners are reminded to be aware of all requirements of their authorization, and meet those requirements, especially with regards to effluent quantity, quality, monitoring, and reporting obligations.

APPENDIX 1. LIST OF AUTHORIZATIONS

Authorizations and Authorization Holders Included in the Assessment, their Authorization Numbers, Dates of Inspection and Inspection Record Numbers

#	AUTH NUMBER	AUTHORIZATION HOLDER	INSPECTION RECORD	DATE OF INSPECTION
1	23	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT	25252	2016-01-27
			76712	2018-01-29
			90804	2018-07-05
2	27	MT. SEYMOUR RESORTS LTD.	73187	2017-11-21
			48945	2017-03-13
			48946	2017-03-13
3	30	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT	90803	2018-08-02
			74045	2017-11-22
			49346	2017-03-13
4	39	CITY OF CHILLIWACK	49380	2017-03-13
			25385	2016-01-27
			79179	2018-02-22
5	73	CITY OF POWELL RIVER	48924	2017-03-07
			26107	2016-02-25
			104441	2018-09-26
6	82	DISTRICT OF NORTH COWICHAN	46134	2017-01-09
			77867	2018-02-06
			49294	2017-02-28
7	96	CHEMTRADE ELECTROCHEM INC.	27008	2016-04-06
			46882	2017-01-09
			74368	2017-12-07
8	101	VILLAGE OF SAYWARD	47236	2017-01-12
			106324	2018-09-26
			46137	2016-12-14
9	118	CITY OF POWELL RIVER	76276	2018-01-11
			27007	2016-04-06
			46362	2016-12-22
10	120	TOWN OF LADYSMITH	77925	2018-02-06
			49292	2017-02-28
			26988	2016-04-06
11	137	THE CORPORATION OF THE DISTRICT OF KENT	106599	2018-09-29
			46139	2016-12-14
			76837	2017-12-06
12	142	DISTRICT OF NORTH COWICHAN	74102	2017-12-06
			45572	2016-11-28
			79505	2018-03-02
13	171	CITY OF POWELL RIVER	25947	2016-02-23
			52791	2017-04-11
			45561	2016-11-23
14	197	THE CORPORATION OF THE VILLAGE OF CUMBERLAND	45561	2016-11-23
			21188	2015-07-22
			61529	2017-07-21
15	233	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT	20992	2015-07-15
			99048	2018-08-27
			53714	2017-05-02
16	237	OAK BAY MARINA (1992) LTD.	26290	2016-04-06
			47597	2017-02-09
			51233	2017-04-03
17	242	CAPITAL REGIONAL DISTRICT	108086	2018-11-13
			117106	2019-02-12
			47592	2017-01-20
18	247	TOWN OF LAKE COWICHAN	53715	2017-05-02
			53717	2017-05-02
			53718	2017-05-02
19	270	CAPITAL REGIONAL DISTRICT	53719	2017-05-02
20	297	CITY OF PORT ALBERNI		
21	312	CAPITAL REGIONAL DISTRICT		
22	321	VILLAGE OF TAHSIS		
23	323	SILVA BAY RESORT & MARINA LTD.		
24	324	VILLAGE OF PORT ALICE		
25	331	CITY OF PORT ALBERNI		
26	332	CITY OF PORT ALBERNI		
27	333	CITY OF PORT ALBERNI		
28	334	CITY OF PORT ALBERNI		

#	AUTH NUMBER	AUTHORIZATION HOLDER	INSPECTION RECORD	DATE OF INSPECTION
			115087	2019-02-06
29	338	NANAIMO REGIONAL DISTRICT	76992	2018-01-24
			49967	2017-03-08
			26588	2016-03-01
30	351	CITY OF ABBOTSFORD	118663	2019-02-27
			48790	2017-03-09
31	363	TOWN OF GIBSONS	64694	2017-07-21
32	375	SUNSHINE COAST REGIONAL DISTRICT	59527	2017-07-18
33	385	DISTRICT OF PORT HARDY	74370	2017-12-08
34	387	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT	80055	2018-03-06
35	1497	DUNCAN-NORTH COWICHAN JOINT UTILITIES BOARD	18450	2016-10-12
36	1512	DISTRICT OF SQUAMISH	77592	2018-01-24
			50505	2017-03-21
37	1640	BRENTWOOD COLLEGE ASSOCIATION	47293	2017-01-13
38	1693	CAPITAL REGIONAL DISTRICT	87150	2018-05-24
			47532	2017-01-19
39	1784	GOLD RIVER, VILLAGE OF	100987	2018-08-24
			20993	2015-07-15
40	1877	CAPITAL REGIONAL DISTRICT	47591	2017-02-09
			77356	2018-02-22
41	2334	WOODFIBRE LNG LIMITED	57619	2017-06-21
			48750	2017-02-14
42	2338	POETS COVE RESORT & SPA LTD.	87153	2018-05-24
43	2583	BRITISH COLUMBIA FERRY SERVICES INC.	56051	2017-06-28
			48010	2017-01-31
44	2689	LESTER B. PEARSON COLLEGE OF THE PACIFIC	67291	2017-09-20
45	2701	WESTERN FOREST PRODUCTS INC.	53013	2017-07-10
46	2784	DAYBREAK POINT BIBLE CAMP SOCIETY	55688	2017-06-01
47	2813	BRITISH COLUMBIA FERRY SERVICES INC.	56247	2017-06-27
48	2988	HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, AS REPRESENTED BY THE MINISTER OF ENVIRONMENT	55161	2017-07-19
49	3601	VILLAGE OF TAHSIS	51213	2017-04-03
50	4125	DISTRICT OF HOPE	48101	2017-02-01
51	4186	THE OWNERS STRATA PLAN VR270	55160	2017-05-25
52	4187	BRITISH COLUMBIA FERRY SERVICES INC.	95249	2018-08-01
53	4188	BRITISH COLUMBIA FERRY SERVICES INC.	95253	2018-08-09
			76236	2018-01-09
54	4200	NANAIMO REGIONAL DISTRICT	27028	2016-04-06
55	4477	WEST VANCOUVER, THE CORPORATION OF THE DISTRICT OF	58021	2017-09-25
56	4523	MA-MOOK NATURAL RESOURCES LTD.	106699	2019-02-28
57	4617	INTERNATIONAL FOREST PRODUCTS LIMITED	75241	2018-02-27
58	4678	DENNIS JAMES SIEMENS	117462	2019-02-20
59	4728	SUNDOWNER INN LTD.	54403	2017-05-17
60	4769	SUNSHINE COAST REGIONAL DISTRICT	53735	2017-05-17
61	4878	MA-MOOK NATURAL RESOURCES LTD.	107227	2019-02-28
62	5188	LIONS BAY, THE MUNICIPALITY OF THE VILLAGE OF	77593	2018-01-24
63	5521	CAPITAL REGIONAL DISTRICT	45640	2016-11-23
64	5779	SUNSHINE COAST REGIONAL DISTRICT	59572	2017-07-18
65	5856	COMOX VALLEY REGIONAL DISTRICT	112459	2018-12-21
66	5987	SATNAM EDUCATION SOCIETY OF BRITISH COLUMBIA	46930	2017-01-03
67	5989	REGIONAL DISTRICT OF NANAIMO	51125	2017-03-24
68	5999	THE OUTPOST AT WINTER HARBOUR LTD.	109161	2018-12-14
69	6041	RICHARD AND MICHAEL, BERNARD WILHELM KAPITZA	59538	2017-07-18
70	6286	THE OWNERS STRATA PLAN NW-2245	55464	2017-06-20
71	6420	STRATA CORPORATION #1238	120268	2019-03-13
72	6443	THE OWNERS, STRATA PLAN VIS 6264 DOING BUSINESS AS GALIANO OCEANFRONT INN & SPA	109779	2018-11-28
73	6490	BOYS AND GIRLS CLUB OF GREATER VANCOUVER	67232	2017-09-19
74	6533	BACKEDDY MARINE LTD.	59852	2017-07-19
75	6568	CITY OF CAMPBELL RIVER	120201	2019-03-12
76	6585	R. MORGAN ENTERPRISES LTD.	21436	2015-07-10

#	AUTH NUMBER	AUTHORIZATION HOLDER	INSPECTION RECORD	DATE OF INSPECTION
77	6692	FAREWELL HARBOUR LODGE LTD.	64143	2017-08-17
78	6794	SCHOOL DISTRICT NO. 72 CAMPBELL RIVER	53395	2017-04-27
79	6819	WESTSHORE TERMINALS LIMITED PARTNERSHIP	76581	2018-01-24
80	6942	LAURIE DIAN CRAIG	57576	2017-07-19
81	7002	PACCAR OF CANADA LTD	54441	2017-05-15
82	7058	DISTRICT OF TOFINO	120381	2019-03-14
83	7100	TELEGRAPH COVE RESORTS LTD.	56434	2017-06-12
84	7214	NANAIMO REGIONAL DISTRICT	101339	2017-08-22
85	7261	GOD'S POCKET RESORT (1997) LTD	61245	2017-07-26
86	7288	GLADYS JEAN CAMPBELL	91979	2018-07-06
87	7447	PACCAR OF CANADA LTD	106562	2018-11-02
88	7859	BOWEN ISLAND MUNICIPALITY	54593	2017-05-17
89	7958	CAPE MUDGE BAND COUNCIL	21485	2015-07-10
90	7969	0793938 B.C. LTD. DOING BUSINESS AS CAMP LATONA	67289	2017-09-20
91	7975	MCNEIL HOLDINGS LTD	120321	2019-03-14
92	8008	THE HESQUIAHT INDIAN BAND	90981	2018-07-02
93	8011	BROWN'S BAY MARINA LTD., DIV. OF 0414152 B.C. LTD.	54599	2017-06-22
94	8035	EVANGELICAL LAYMEN'S CHURCH OF CANADA (VANCOUVER)	118899	2019-03-13
95	8038	SALLY ANDERSON NORDSTROM	86433	2018-05-08
96	8065	BRUCE LINTFIELD MCMORRAN	55159	2017-05-25
97	8066	KINGCOME ENTERPRISES, LTD.	73174	2017-11-23
98	8152	SHERRY HARRISON AND ANDREAS STREICHSBIER	49617	2017-03-13
99	8273	NOOTKA ISLAND FISH CAMP LTD.	49622	2017-03-13
100	8274	SUNSHINE BAY RESORT (2014) LTD.	21945	2015-07-10
101	8384	JH MARINA & RESORT INC.	57752	2017-06-22
102	8401	M. M. & E. HOLDINGS LTD.	57753	2017-06-22
103	8409	BRIAN JOHN MCKAY	119903	2019-03-08
104	8436	THE OWNERS, STRATA PLAN NO. LMS 2429	76155	2018-01-09
105	8519	MONTAGUE GRANT AND MARLYN LUCILLE SPARKS	110578	2018-12-05
106	8590	KWICKSUTAINUEK BAND COUNCIL	95620	2018-08-08
107	8713	BEAR COVE ICE LTD.	61075	2017-07-19
108	8718	0792993 B.C. LTD.	112899	2019-01-21
109	8719	SEABEAM LODGE LTD.	108639	2018-11-19
110	8832	MINSTREL ISLAND ADVENTURES LTD.	55632	2017-06-28
111	8838	DOUBLE BAY RESORT LTD	89439	2018-06-06
112	8865	ECHO BAY DEVELOPMENTS LTD.	106760	2018-11-16
113	8876	BROWN'S BAY MARINA LTD.	113281	2019-01-23
114	10683	SULLIVAN BAY MARINA LTD.	109126	2018-12-17
115	10721	SWANESSET BAY GOLF COURSE LTD.	108301	2018-11-15
116	10751	DUVAL POINT LODGE LTD.	64584	2017-08-22
117	10767	MARK ORLAND AND DOBBELAERE, JENNIFER NICHOL DBA SEASCAPE RE WANSTALL	118801	2019-03-20
118	10768	SAILCONE WILDERNESS FISHING LTD.	58155	2017-06-26
119	10825	THE OWNERS, STRATA PLAN NO. LMS 483	87040	2018-05-17
120	11007	TOWN OF PORT MCNEILL	87402	2018-06-18
121	11016	THE OWNERS, STRATA PLAN VIS6384	25767	2016-02-15
122	11158	INLAND PROPERTIES LTD.	107567	2018-11-07
123	11845	THE CHATTAHOOCHEE LODGE INC.	119207	2019-02-28
124	11933	SECHLT INDIAN GOVERNMENT DISTRICT	107625	2018-11-07
125	11994	PENDER HARBOUR LANDING LTD.	58253	2017-06-26
126	12026	CORIX UTILITIES INC.	115081	2019-01-23
127	12176	ALBERNI CONSTRUCTION LTD.	109966	2018-11-27
128	12359	BATHGATE EGMONT ENTERPRISES (1988) LTD.	21585	2015-07-10
129	12781	BEAR COVE PARKING AND STORAGE LTD.	68787	2017-11-10
130	12849	IRENE TE HENNEPE	120271	2019-03-19
			103462	2018-11-27
			29913	2016-09-14
			115019	2018-01-18
			59860	2017-07-19
			110799	2018-12-04
			58231	2017-06-26

#	AUTH NUMBER	AUTHORIZATION HOLDER	INSPECTION RECORD	DATE OF INSPECTION
131	12860	POWELL RIVER REGIONAL DISTRICT	102265	2018-09-26
			60261	2017-07-18
132	12947	TIM MAGUIRE	26529	2016-04-07
			26268	2016-03-01
			26528	2016-03-01
133	12964	THE OWNERS, STRATA PLAN VIS 4676	57737	2017-06-22
134	13155	463539 B.C. LTD.	28170	2016-06-06
135	13208	HARBOURSIDE LODGE BAMFIELD LTD.	109164	2018-11-22
136	13209	HPI ASSEMBLY INC.	120099	2019-03-11
137	13331	RODNEY VERNON ARNOLD SMITH AND RAE-ANNE MARIE SCHINKELWITZ	59827	2017-07-19
138	13428	RENATE AND SCOTT HARVEY	76016	2018-01-05
139	13446	FARRER COVE WASTE WATER MANAGEMENT ASSOC.	73160	2017-12-13
140	13847	BROWN, PETER WILLIAM, D.B.A. BAMFIELD KINGFISHER MARINA	121754	2019-03-22
141	13879	MARVINAS BAY HOLDINGS INC.	109923	2018-11-27
142	14310	NORDON APARTMENTS LTD.	25646	2016-02-12
143	14515	DISTRICT OF UCLUELET	120727	2019-03-26
144	14721	ECHO BAY DEVELOPMENTS LTD.	113620	2018-12-19
145	14725	TELEGRAPH COVE UTILITIES LTD.	69612	2017-09-11
146	14770	REGIONAL DISTRICT OF MOUNT WADDINGTON	116660	2019-02-12
147	14781	SALMON POINT RESORT TRAILER PARK & MARINA LTD.	119384	2019-02-28
148	14842	BARBARA D., & FRASER, DOROTHY K. BAIRD	118765	2019-02-27
149	14865	TSI TERMINAL SYSTEMS INC.	68762	2017-11-07
150	15243	CAMP QWANOES	20114	2015-03-25
151	15445	CAPITAL REGIONAL DISTRICT	106761	2018-11-14
152	15573	LIVING PLANET EXPERIENCES UN-LIMITED	70996	2017-10-27
153	15641	642385 B.C. LTD.	116810	2019-02-07
154	16534	WESTSHORE TERMINALS LTD.	113400	2019-01-21
			61518	2017-07-24
155	16938	QUADRA MANAGEMENT LTD.	117199	2019-02-19
156	17300	DISTRICT OF SOOKE	107627	2018-11-07
			49767	2017-03-07
157	17306	NAMGIS FIRST NATION	12341	2016-07-25
158	17425	GREEN ISLAND ENERGY LTD.	111359	2018-12-05
159	17565	MIKE AND BEVERLY STRUKOFF	55634	2017-05-31
160	17652	COWAN POINT SEWAGE TREATMENT INC.	120413	2019-03-14
161	17711	UTOPIA BAY LODGE LTD.	117107	2019-02-20
162	17766	COAST MOUNTAIN EXPEDITIONS LTD.	116600	2019-03-08
163	17778	DAVID ANDREW PETERSON	56716	2017-06-30
164	17835	NOOTKA SOUND OUTPOST LTD.	113282	2019-01-19
165	18213	SQUAMISH-LILLOOET REGIONAL DISTRICT	77483	2018-01-24
166	100023	SUNSHINE COAST REGIONAL DISTRICT	62098	2017-07-21
167	100033	THE CORPORATION OF THE DISTRICT OF NORTH COWICHAN	115840	2019-03-13
168	103748	COWICHAN VALLEY REGIONAL DISTRICT	56244	2017-06-14
169	103861	HARRISON RIVER LODGE LTD.	112465	2019-01-04
			74369	2017-12-08
170	105299	DISTRICT OF PORT HARDY	31408	2016-11-14
171	105309	BRITISH COLUMBIA FERRY SERVICES INC.	62323	2017-07-18
172	107414	STEEP ISLAND LODGE, INC.	106759	2018-12-12
173	107475	LANDUS DEVELOPMENT GROUP INC.	118891	2019-03-07