CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

WATER AND SANITATION DIRECTORATE
CATCHMENT, STORMWATER AND RIVER MANAGEMENT

Gavin Martin
Catchment Planner: South District

T: +27 21 444 5552 **M**: +27 084 382 4942
E: gavin.martin@capetown.gov.za

MEMORANDUM

Date: 28 November 2024

To: Ayub Mohamed (Western Cape Government)

Subject: HOUT BAY SEWAGE - COUNCILLOR/MINISTERIAL ENQUIRY ON CITY'S PLANS FOR DEALING WITH SEWAGE

Your email dated 07 November 2024 regarding a complaint from Mr Cleeve Robertson refers.

Mr Robertson submitted a complaint to your office regarding the levels of sewage pollution in the Hout Bay River and the bay itself. He enquired whether the City has a "plan" to address this. Please find below details of the City's actions in this regard.

The City has developed a Pollution Abatement Strategy and Action Plan (PASAP) for the Hout Bay Catchment, which addresses various pollution sources, including sewage, and their associated impacts. The latest revision of the PASAP is attached for ease of reference in appendix A. The City also established the Hout Bay Catchment Management Forum, which brings together various stakeholders and role-players to address catchment-related matters, including pollution, in an integrated and collaborative manner.

Please refer to Annexure B for the memo addressed to the Hout Bay Catchment Management Forum (HBCMF). This document contains comprehensive responses to the queries regarding the Princess Road sewer pump station, as raised prior to and during the Hout Bay Forum meeting on October 15, 2024.

The City recently completed the Hout Bay Comprehensive Study, which:

- Identified the primary sources of pollution within the Hout Bay Catchment.
- Proposed short-term solutions, referred to as "quick wins," which are cost-effective and easy to implement, yielding immediate results.
- Recommended long-term interventions by various City departments to reduce pollution levels entering the Hout Bay River and, ultimately, the sea.

Some of the "quick win" initiatives that have been implemented include:

- Silt/Litter trap at Victoria Bridge
- A bend was installed on the stormwater outlet to increase pressure head on the two 100mm diversion pipes.

- The sewer line parallel to the Hout Bay River is cleaned regularly.
- An uninterruptible power supply (UPS) was installed at the Victoria Road low-flow diversion pump station.
- Sediment fore-bays were installed in ponds 1 and 2 (stormwater ponds).
- Orange bins were installed on poles. This initiative will be extended across both the formal and informal sections of Imizamo Yethu (IY).
- The low-flow diversion at the IY Clinic has been repaired.
- Removal of Illegal Sewer to Stormwater Connections in IY

Some of the "quick win" initiatives still to be implemented include:

- Rag/ Nappy Trap on adjacent sewer line is being cleaned regularly.
- Additional redundancy pump at Victoria Road low-flow diversion pump station.
- Victoria Bridge Emergency Overflow notification system.
- Benlo Stormwater Outfall (Glen Ellen Farm). Proposed end-of-line intervention to be installed.
- CCTV Inspections

The Comprehensive Study also identified potential long-term interventions. It should be noted that the proposed interventions must still be reviewed and assessed with the relevant City departments with respect to viability and possible implementation. Some of the potential long-term interventions include:

- Hinged sewer (and stormwater) manhole covers
- Retrofitted litter screens in manholes
- Backup power supplies (such as generators or invertors) at all pump stations
- Illegal sewer to stormwater cross-connections
- Additional FFT Toilets
- Sewer pipeline improvements
- Grease traps
- Low-flow diversions (Note: dependent on sewer system capacity, which is currently constrained)
- Temporary greywater decanting networks
- Litter socks
- Kerb inlet litter screens
- Solid waste skips
- Swop Shops

The City is committed to addressing pollution within the Hout Bay River and the bay, and will continue to implement various transversal actions and interventions to reduce pollution and mitigate associated impacts.

Yours sincerely,

Gavin Martin

Digitally signed by Gavin Martin
Date: 2024.11.28 10:55:55 +02'00'

Catchment Planner: South Region

WATER AND SANITATION DIRECTORATE HEAD OFFICE
8 VOORTREKKER ROAD, CNR OF MIKE PIENAAR BOULEVARD, BELLVILLE 7535
www.capetown.gov.za/thinkwater

ANNEXURE A – HOUT BAY PASAP

31 Oct. 24

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

HOUT BAY CATCHMENT POLLUTION ABATEMENT STRATEGY AND ACTION PLAN (PASAP)

Document Ref:	CSRM/PASAP/HOUT BAY CATCHMENT
Version:	Rev 12
Department:	Bulk Services (Water and Sanitation)
Branch:	Catchment, Stormwater and River Management

Document Control

Ver.	Rev.	Date	Nature of Change	Prepared by	Reviewed by
Draft	12	2024.10.31	Revision	Moegamat Abrahams	Gavin Martin
				Graduate Engineer CSRM	*Acting Head: Catchment Planning: South*

Table of Contents

List of Tables

List of Figures

1 Introduction

1.1 Purpose

The full extent of the project area is the Hout Bay catchment that is impacted by the tributaries entering the main Hout Bay River, which bisects the catchment from top to bottom. The Hout Bay River discharges into Hout Bay just north east of the harbour. The area is typical of the City of Cape Town municipal areas, including formal high income, middle income and informal settlements, commercial and industrial developments. The rivers in the catchment, though relatively small, are numerous and interacts with all these development types.

This document is to be read and used in conjunction to the comprehensive study which was concluded on June 30th, 2023. The Hout Bay Forum have undertaken the review of the comprehensive study, and have given valuable input and suggestions, which will be taken into consideration.

1.2 Catchment Description

The catchment area for the Hout Bay Rivers is well defined as a result of Hout Bay being confined by the surrounding Table Mountain range composed of the Southern Apostle Range, Constantia berg, Karbonkelberg and Hangberg.

The main Hout Bay River (also known as the Disa River) has a catchment area of approximately 37km^2. This river rises on the southern slopes of Table Mountain and flows in a South to South-Westerly direction and is joined by the Baviaanskloof River just prior to discharging into Hout Bay.

There is one fairly large informal settlement (known as Imizamo Yethu – IY for short), located on the slopes of the Constantia Berg mountains in the lower reach of the catchment. This settlement has undergone much change since a major fire in 2013 raised much of the settlement to the ground. The settlement has been re-blocked and serviced in part and is currently forms part of the Hout Bay Comprehensive Study, which is borne out of major concern for the significant increase in pollutants entering the Hout Bay catchment watercourses and especially the main Hout Bay River system. The overall effect of not addressing these concerns timeously, is that the environmental integrity of the river system, the beach and the bay will be destroyed, and that the health of the surrounding community, tourism potential and economic viability of the area will be (and is being) severely compromised.

The upper reach of the catchment is largely composed of small holdings with a large number of horse ranches in the area. The lower reach is largely commercial, industrial and residential in nature.

The physical features of the catchment area and key reference nodes are shown in **Figure 1-1** below.

The population spread and land uses in this catchment can be summarised as follows:

a) Formal areas on both sides of the Hout Bay River, comprising formal housing to small-holdings. These small-holdings are located mainly on the west side of the Hout Bay River. The small-holdings also have business operations, from offices to animal stalls, etc.
b) Formal housing with backyarders in the Imizamo Yethu (IY) and Hangberg areas.
c) Informal dwellings in IY, with limited levels of services.
d) Formal business in the business Districts, and outside the main business district. There are also restaurants at the harbour area.

e) Manufacturing including fishing businesses at and around the harbour areas.

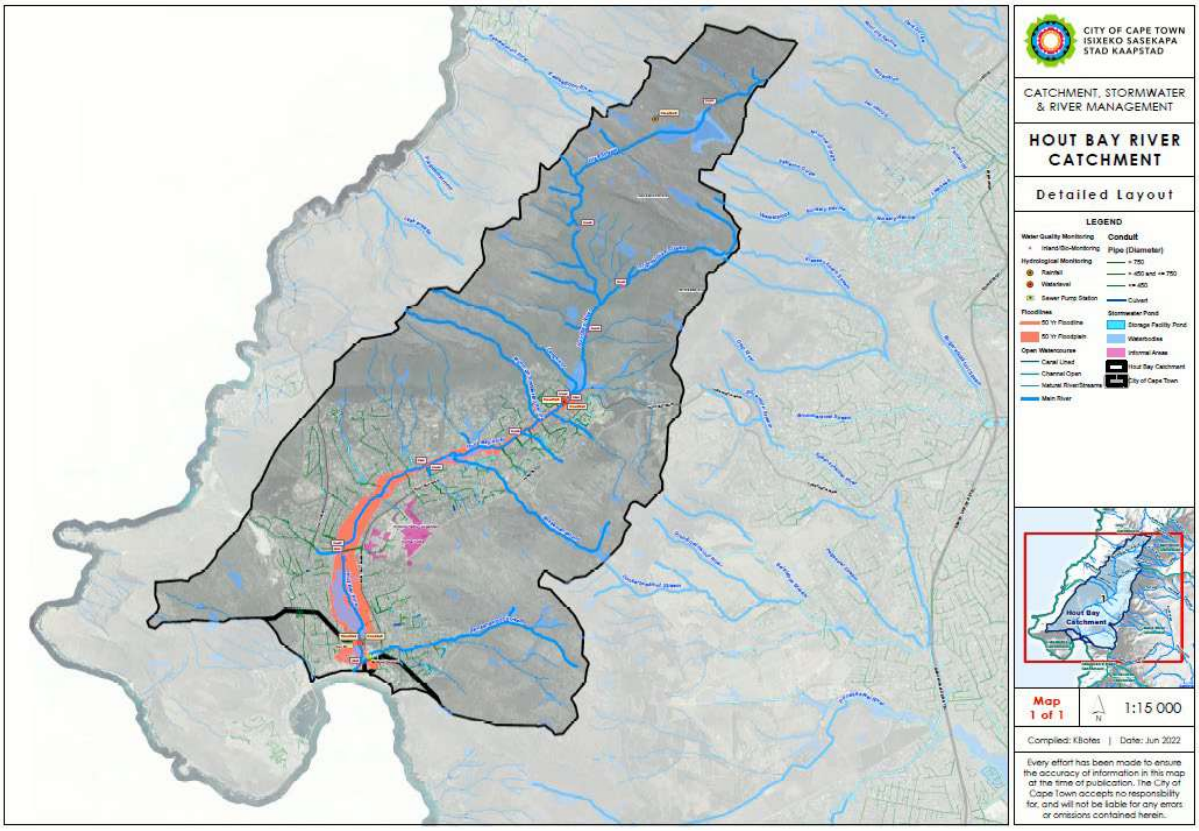

Figure 1-1: Hout Bay Catchment Locality Map

2 Ambient Water Quality Overview

The City has a monthly sampling programme, which includes various sample locations within the Hout Bay Catchment area, as shown in **Figure** 2-1.

Historical water quality monitoring points exist in the catchment; in the upper, mid and lower reaches. As may be expected, the water quality of the upper reaches is reasonable with minimal sewage spills and solid waste pollution. However, the water quality changes for the mid to lower reaches of the catchment.

Two key indicators are reviewed here, namely; Phosphorous enrichment (indicates issues such as eutrophication and the likelihood of algal blooms in standing water bodies and Escherichia coli bacteria (E. Coli) an indicator of the presence of faecal material from warm blooded animals and in urban areas can indicate sewage pollution.

The following data provides an indication of the trends with regard to Phosphorous enrichment, within the Hout Bay Rivers. The samples range commences 1990 through to 2020 (a period of 30 years).

The "Inland Water Quality Monitoring Network Water Quality Summary Report" for June 2023 was circulated on the 13th July 2023. However, this report only reports on E. coli levels and will be discussed in section 2.4.

The symbols indicate the following:

● Inland WQ ● Bio-monitoring

Figure 2-1: Hout Bay Rivers Catchment - Monitoring Points

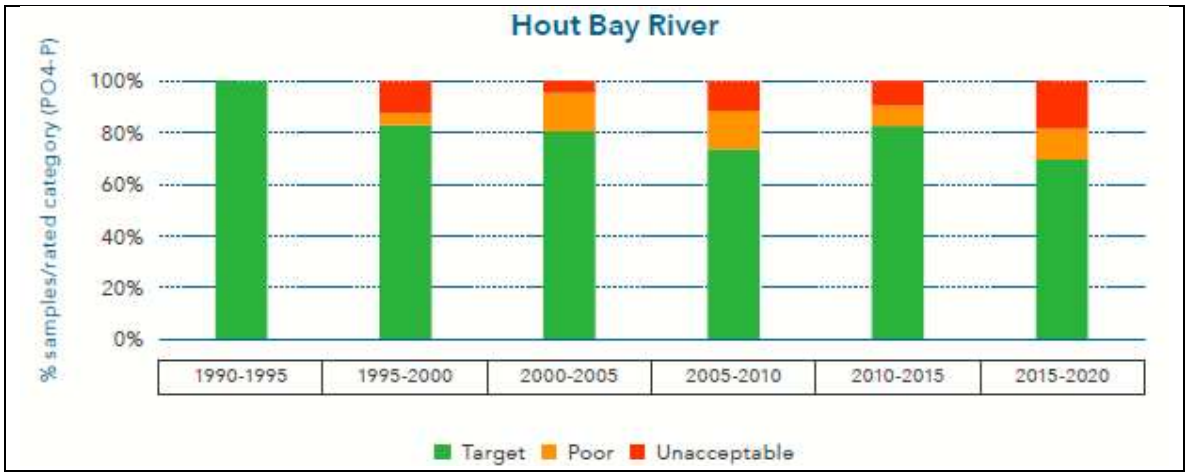

Figure 2-2: Phosphorus enrichment

An increasing proportion of samples from river sites have rated poor and unacceptable for phosphate concentration over time, even though the upper reaches of the Hout Bay River are among the least-impacted sections of river monitored by the City.

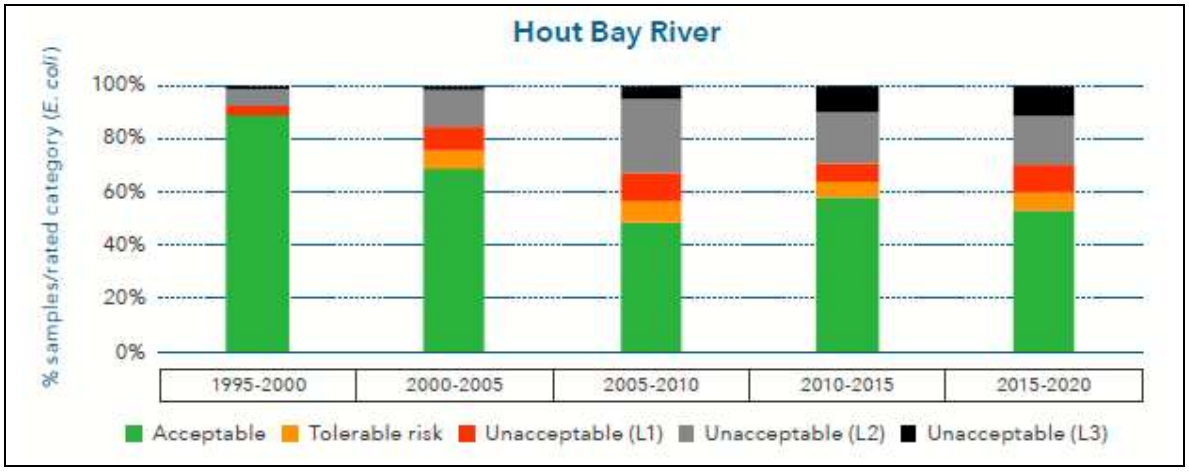

Figure 2-3: E. coli Levels

E. coli levels in the Hout Bay River have increased over time, particularly in the reach downstream of the Imizamo Yethu informal settlement. In this region, water quality fell within the unacceptable range for intermediate-contact recreation in 2019 based on mean *E. coli* concentrations. By contrast, upstream sites in this catchment fell within the target range.

2.1 Possible source(s) of water quality issues experienced:

- Presence of Imizamo Yethu informal settlement in the middle to lower reaches of the catchment
- Contaminated runoff from settlements enter the river
- Dumping of solid waste
- Runoff from highly urbanised areas with high levels of street waste and dumping
- Illegal discharges
- Discharge of grey and black water into the stormwater system

2.2 Bacterial Contamination

Water Quality sampling is taken in the catchment biweekly (every two weeks) and sent to the City's Scientific Services Laboratory for testing. Escherichia coli (E.coli) an indication of faecal material in the sample is included in these tests and results are compared to the target guideline for intermediate contact recreation (≤1000 colony-forming units per 100ml). Note that in the table below 'full contact' assumes significant and lengthy full body immersion associated with swimming and diving, while 'intermediate contact' assumes partial contact that would take place during paddling, splashing and brief immersion such as when a vessel capsizes. Swimming and diving in the City's urban water bodies and rivers are not recommended.

Table 2.2.1 and **Table 2.2.2** indicates the acceptable levels for water quality in relation to faecal coliform count (including E. coli).

The E.coli Inland Water Quality Management Guide has been developed based on both the aforementioned DWS Intermediate Contact Recreation Guideline, a study undertaken for CSRM in 2011, the Berg Resource Quality Objectives study, and the Inland Water Quality Technical Report (2019) completed by an appointed team of specialists in the field of urban water quality and ecology.

Table 2.2.1: Acceptable water quality level chart 1

Interpretation	Faecal Coliform (*including E. Coli*) CFU/100ml
'Target' Full Contact *	≤ 400
'Target' Intermediate Contact	≤ 1000
Acceptable Risk - intermediate Contact	≤ 2500
Tolerable Risk - intermediate Contact	2501-4000
Unacceptable Risk (Level 1)	4001 – 10 000
Unacceptable Risk (Level 2)	10 001 - 100 000
Unacceptable Risk (Level 3)	> 100 000

Table 2.2.2: Acceptable water quality level chart 2

"UNACCEPTABLE" CATEGORIES	INDICATIVE *E.COLI* RANGE (COUNT/100ML)	COMMENT / STRATEGIC MANAGEMENT RESPONSE
LEVEL 1	**4001 – 10 000**	• WQ trends in this range may be reflective of general urban diffuse runoff rather than a major point source of pollution • Address using stormwater / catchment management measures. • Ensure sewer spill responses are adequate and timely. • Continue to monitor to determine if additional pollution abatement intervention is necessary.
LEVEL 2	**10 001 – 100 000**	• WQ trends in this high range are likely indicative of chronic pollution possibly from multiple source/s. • If results are in this range for a single month / only during the rainy season it is possible that catchment wash-off (first flush) or surcharging sewers were causal factors. • Transversal approach to pollution abatement is necessary. • Extra budget may be required.
LEVEL 3	**> 100 000**	• WQ trends in this extreme range likely indicate chronic ongoing pollution from multiple sources &/or extreme incidents.* • Urgent management intervention to address the source/s of contamination. • Transversal approach to pollution abatement is necessary. • Significant funding likely to be required

2.3 Water Quality Analysis

The Tables below (from *City Inland WQ Report Submitted April 2024_RP2022 to 2023*), clearly indicates the decline in water quality in relation to E.coli input into river / stormwater channels and orthophosphates as an indication of river water quality. The other key pollution source is solid waste in the stormwater and sewer system. The tables below will be updated with more recent data when it is approved.

The report further states that; "Rivers and stormwater channels in the City are generally not fit for safe full contact recreational use (e.g. swimming and wading).

E. coli in water is a strong indicator of sewage or animal waste contamination. Sewage and animal waste can contain many types of disease causing organisms. Consumption may result in severe illness; young children and those with compromised immune systems, and the elderly are particularly susceptible.

The impact of too much phosphorus can result in increased growth of algae and large aquatic plants, which can result in decreased levels of dissolved oxygen, a process called eutrophication. High levels of phosphorus can also lead to algae blooms that produce algal toxins which can be harmful to human and animal health.

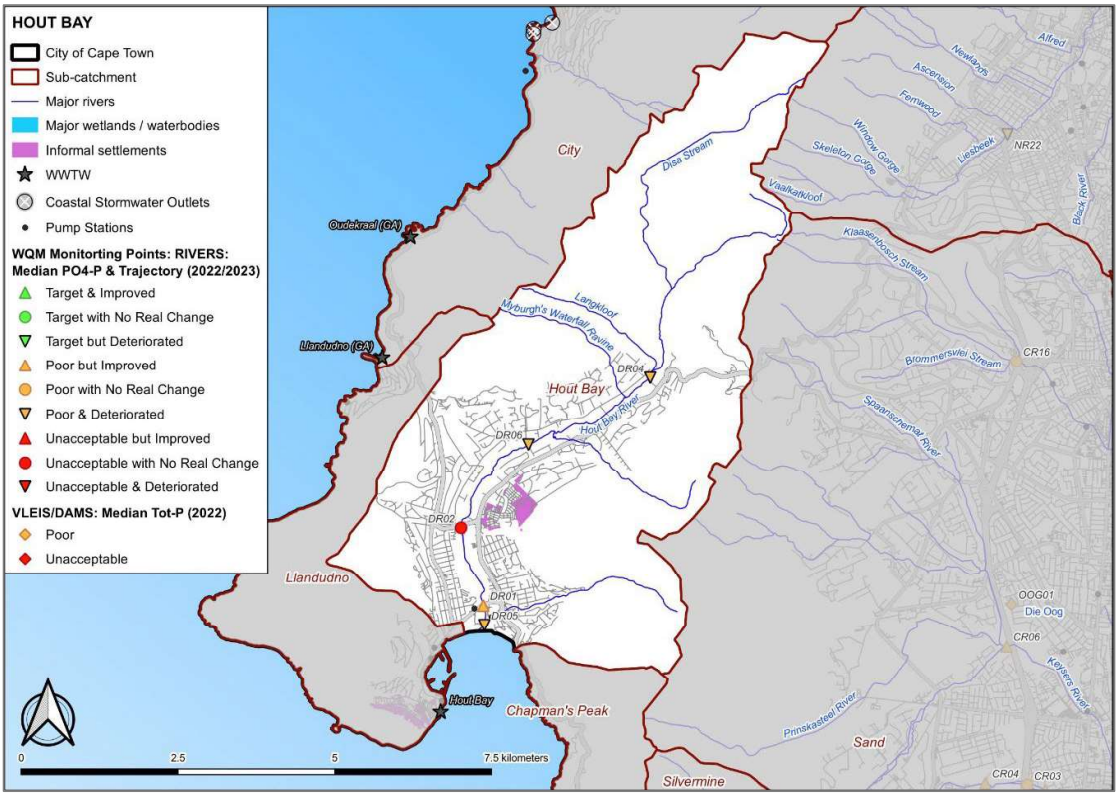

Figure 2-4: Orthophosphate Concentrations in the Hout Bay Catchment

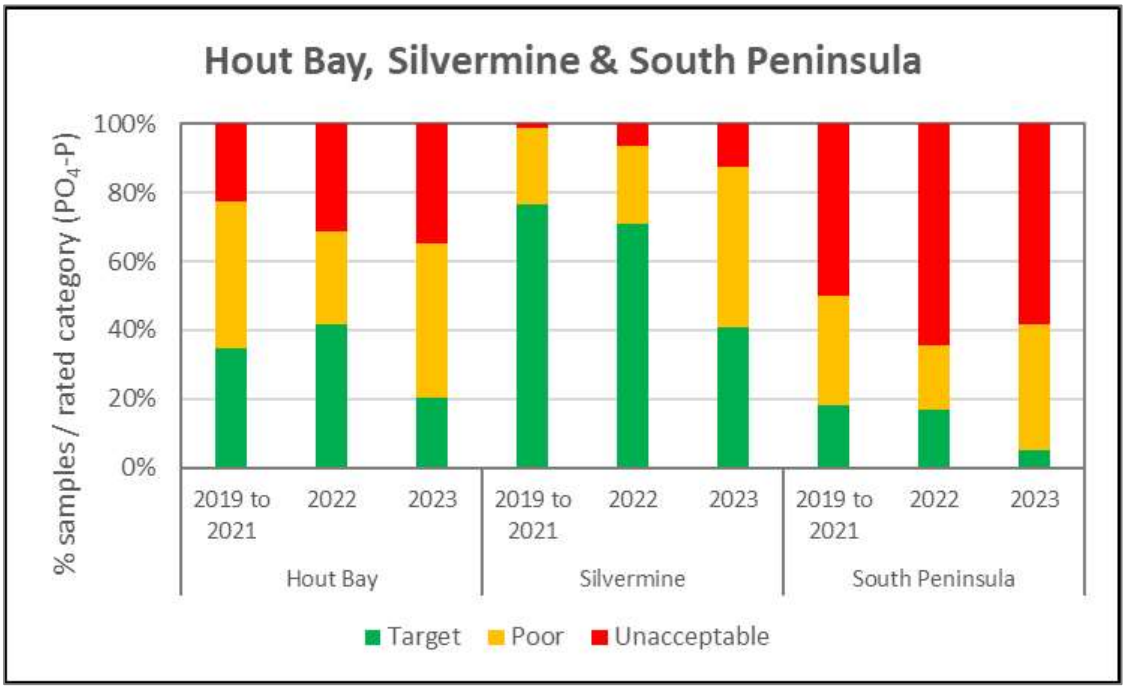

Figure 2-5: Graph - Percentage Orthophosphate Concentrations in the Hout Bay Catchment

The map in **Figure** 2-6 below indicates the E. coli status (2023) and this clearly indicated the unacceptable levels of E. coli in the lower Hout Bay catchment, downstream of the IY informal settlement.

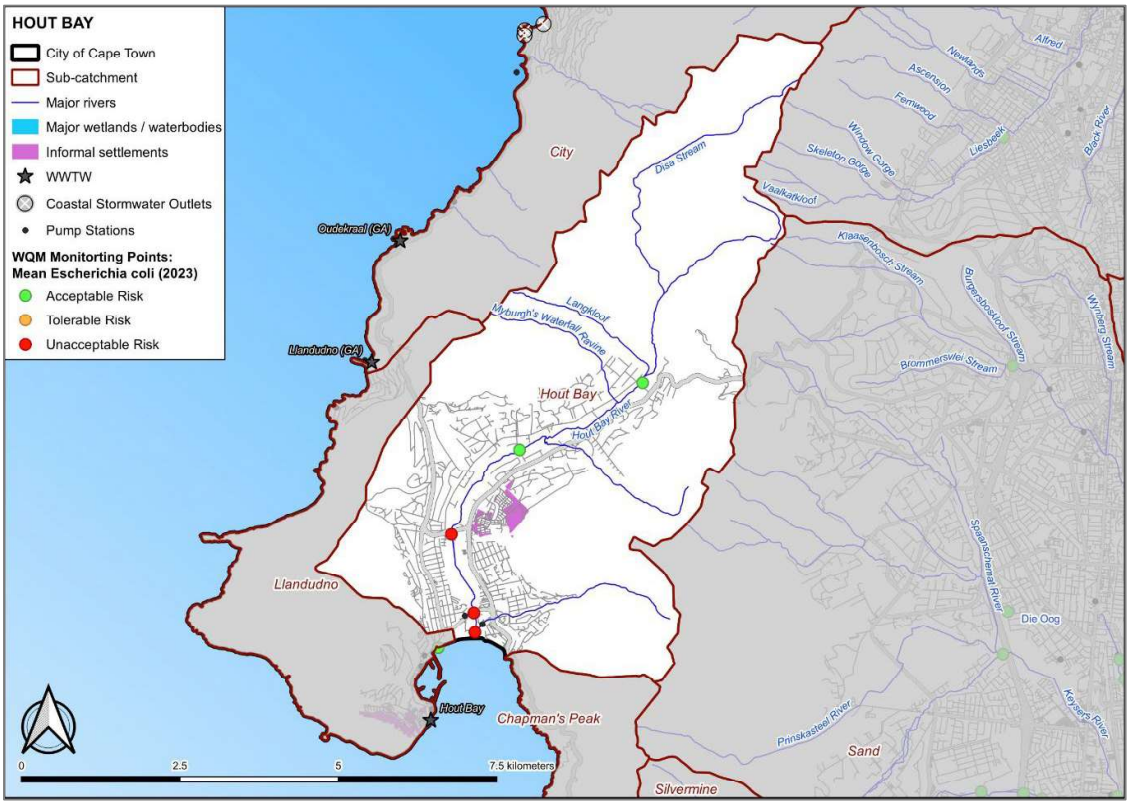

Figure 2-6: E. coli in rivers / stormwater channels

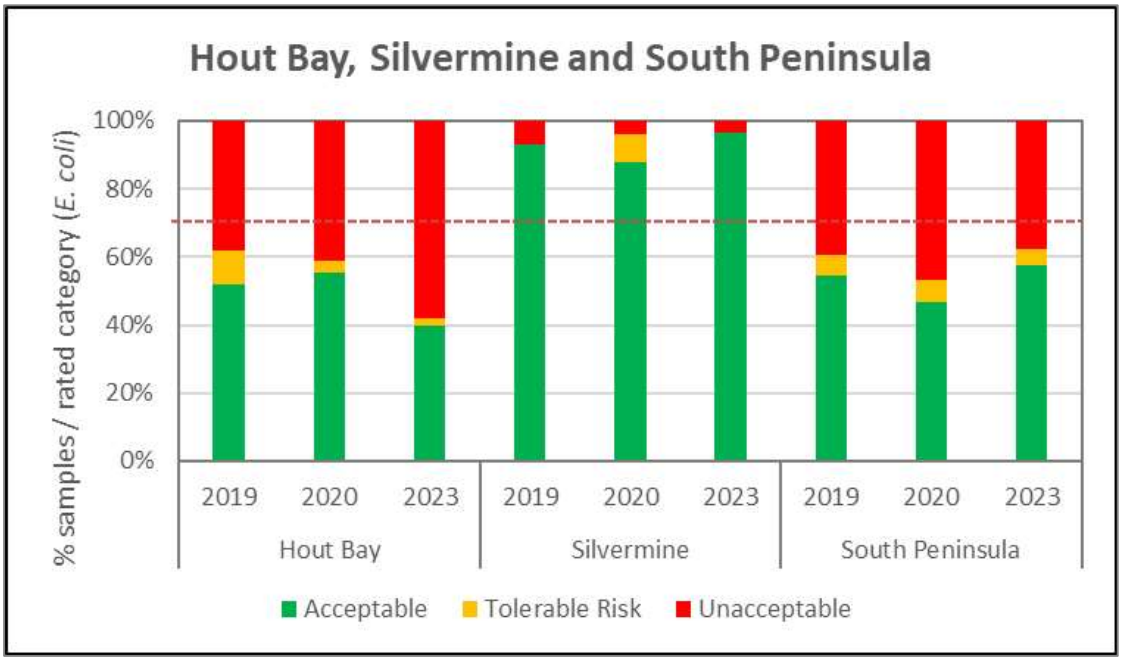

Figure 2-7: Graph - Percentage E. coli in rivers / stormwater channels

2.4 Inland Water Quality Monitoring Network Water Quality Summary Report

This section provides a summary assessment of inland water quality performance in terms of E.coli for the Hout Bay Catchment. The last 6 months from October 2023 to July 2024 that has reliable data for 10 months rolling averages that have been assessed. This is the most up to date data, at this stage, and will be updated as new data becomes available.

Table 2.4.1: Inland Water Quality Summary – July 2024 Results

Catchment	July 2024 Samples Pass Total	Ave Monthly Samples (Past 12 Months)	No of Routine Sampling Points on Database	Comment
Hout Bay	2-5	5	6	Despite a gradual improvement in IWQ from 43% in October 2023 to 49% in July 2024, the overall quality remains poor. This persistent issue is largely due to the effects of IY informal settlement in the lower reaches of the catchment. HB11 was not sampled due to no flow.

3 Primary Sources of Pollution

The area is well services with essential municipal services, however, pollution is rife within the catchment. Pollution sources are identified as existing service capacity constraints, poor service connections, solid waste and sewage spills and greywater discharges into the stormwater system. The primary sources of pollution are the Imizamo Yethu (IY) formal housing (with backyarders) and the semi-formal and the informal areas of IY, which is further expanded on below.

3.1 Informal Settlements

The largest and primary informal settlement in Hout Bay is IY. This informal settlement is located in the lower reaches of the catchment and extends up the eastern mountain slopes of Constantia Berg. Due to its location, on the slopes of the mountain, pollution (sewage, greywater and litter conveyed by surface water runoff) from the settlement finds its way down the slopes to the main road through Hout Bay. This pollution discharges across the Main Road intersection with Victoria Road (at the circle).

3.2 Sewer Pump Stations

Sewer Pump stations in the catchment are located in the lower reaches of the catchment. Pump station failures are predominantly related to: power failure, verification of telemetry reading, pump mechanical failure, pump electrical failure.

The main pump station located on the Hout Bay River is the Disa River Pump station, located in the lower reach of the river. This pump station has two functional pumps, which are generally sufficient for the task, and has not had major spillage since the second pump has come on board.

Further upstream on the Hout Bay River at Victoria Road is a Low Flow Diversion pump system. This Low Flow Division station has one pump. This pump has experienced regular failure due to the sheer volume of silt wash-down from the upstream IY catchment. However, it is envisaged that the current construction of a secondary silt trap, upstream of the Low Flow Diversion and existing silt trap, will alleviate the problem.

The Hout Bay community has suffered through years of pollution affecting the downstream system from Victoria Road Bridge to Hout Bay. The failure of this diversion system also directly affected the immediate upstream system at Hout Bay main road Circle and as a consequence, the greater Hout Bay community.

A number of sewer pump stations (indicated in **Figure 3-2**) are located in the downstream part of the catchment and failure of the pump station invariably results in sewage discharge into the Hout Bay River or Hout Bay. The shaded area on the map indicates the main area of impact from the Low Flow Diversion System.

3.3 Sewer Spills

Sewer spills occur daily in IY, as a result of solid waste blockages to the formal sewer system. Illegal connections to the stormwater system is rife in IY with constant spills. The high residential density of IY only exacerbates the problem of sewer system blockages and spills. The pollution then enters the stormwater system as surface flow and is then conveyed to the river system and is discharged to the river predominantly at the stormwater outlet downstream of the Victoria Road bridge crossing. This is also the point of the City's largest intervention in the area, being a slit and litter chamber and low-flow diversion. The current system is being enlarged, as discussed later section of this document.

The below reference maps indicates the various areas experiencing pollution in the Hout Bay area. The Heat Map below (**Figure 3-1**) clearly indicates the informal settlement of Imizamo Yethu as a key pollution area. This is confirmed, on the ground by the constant discharge of sewage due to blockages, overflows and polluted greywater discharges night soil and solid waste emanating from the Imizamo Yethu settlement resulting in chronic pollution of the stormwater systems. Due to service function stormwater is a gravity system and thus any surface pollution will find its way into to the lowest point in the catchment, invariably the stormwater network, and hence the stormwater network becomes the carrier for all pollution types within the catchment. During periods of high rainfall the stormwater system then acts as a carrier for all Pollution types, including solid waste (i.e. tyres, discarded house furniture, rags, trees, fencing etc.), which then blocks the system causing local flooding to be quite extensive at times.

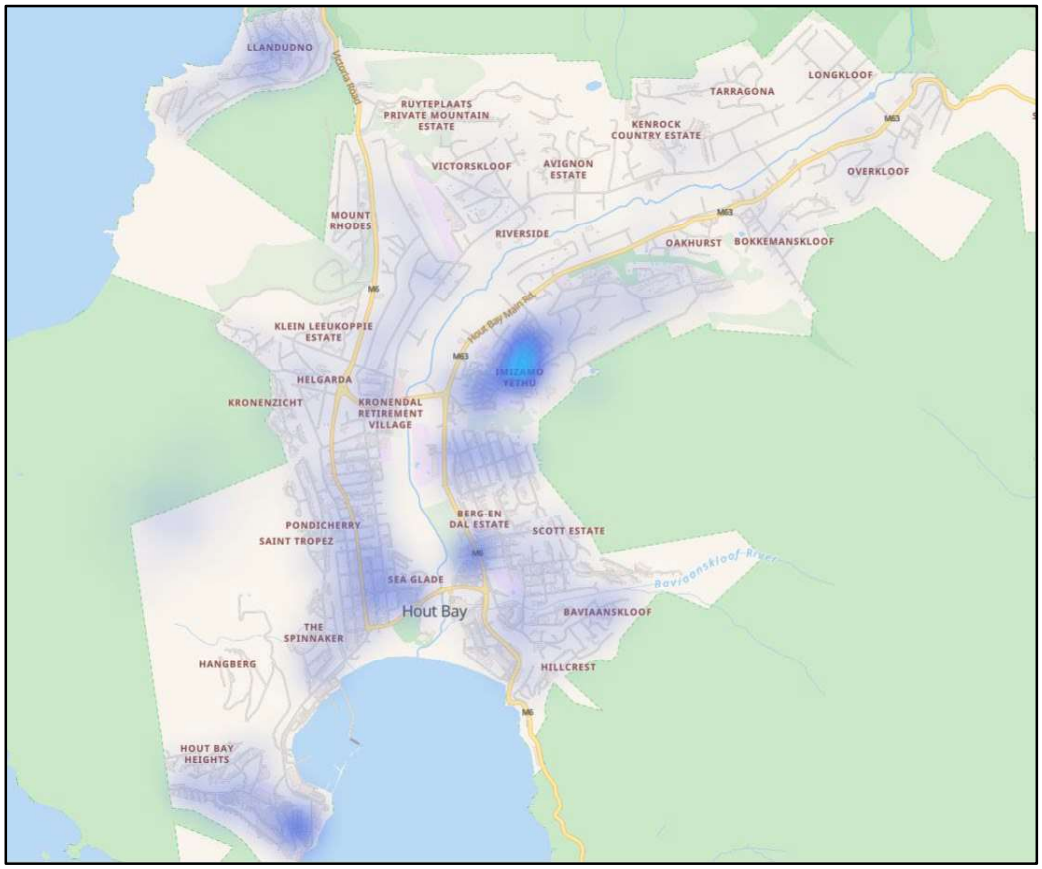

Figure 3-1: Pollution Heat Map

3.4 Farming

The upper slopes of Hout Bay holds a large horse farming community (as small holdings) that experience excessive pollution from the surrounding catchment, this as a result of illegal sewer to stormwater connections and sewer blockages. Horse owners also have the responsibility to minimise the impact of horse management and horse waste on the stormwater system. The nutrients contained in manure, phosphorus and nitrogen, can be carried by runoff to the nearest water body, such as a pond, stream or lake. The nutrients then fertilize aquatic weeds and accelerate weed growth in rivers, lakes and ponds. The aquatic plants deplete oxygen levels, reducing the amount of oxygen available for other aquatic species such as fish. When the weeds die, additional oxygen is required for decomposition, further stressing oxygen stores and aquatic life. Direct manure entry into the water resource can also cause oxygen starvation due to increased biological oxygen demand (BOD), and result in fish kills. Algae blooms are another result of excess nutrients in rivers, the lake or pond.

Other farming options also holds risk to stormwater runoff if not managed or controlled effectively, such as the use of certain fertilizers. Fertilizer wash off if not controlled effectively will end up in the stormwater system and rivers and pond and could lead to eutrophication and algal growth.

3.5 Commercial, Industrial & Formal Residential

The commercial, Industrial and formal residential area of Hout Bay is located predominantly in the lower reach of the catchment with the larger small holding developments in the mid to upper reaches. Pollution issues experienced in the lower reaches are largely influenced by pollution emanating from the mid to upper reaches. Thus, the key to addressing these problems is to deal with it at source, in order to prevent the lower reaches from being severely impacted.
Further, certain cross connections between sewer and stormwater were identified relating to some of the small holdings. These cross connections have been noted and forwarded to the relevant department for corrective action.

In addition, the problem experienced in the mid reaches of the Hout Bay River is silt wash-down from the fairly steep mountainous slopes. The nature of this catchment is that the catchment is contained in a well-defined area hemmed in by the slopes of the Constantia berg and Hout Bay Mountains. Winter runoff from these slope carry a large amount of sediment which ends up in the streams and main river and when not managed effectively results in large volumes of silt in the flatter downstream areas of the catchment.

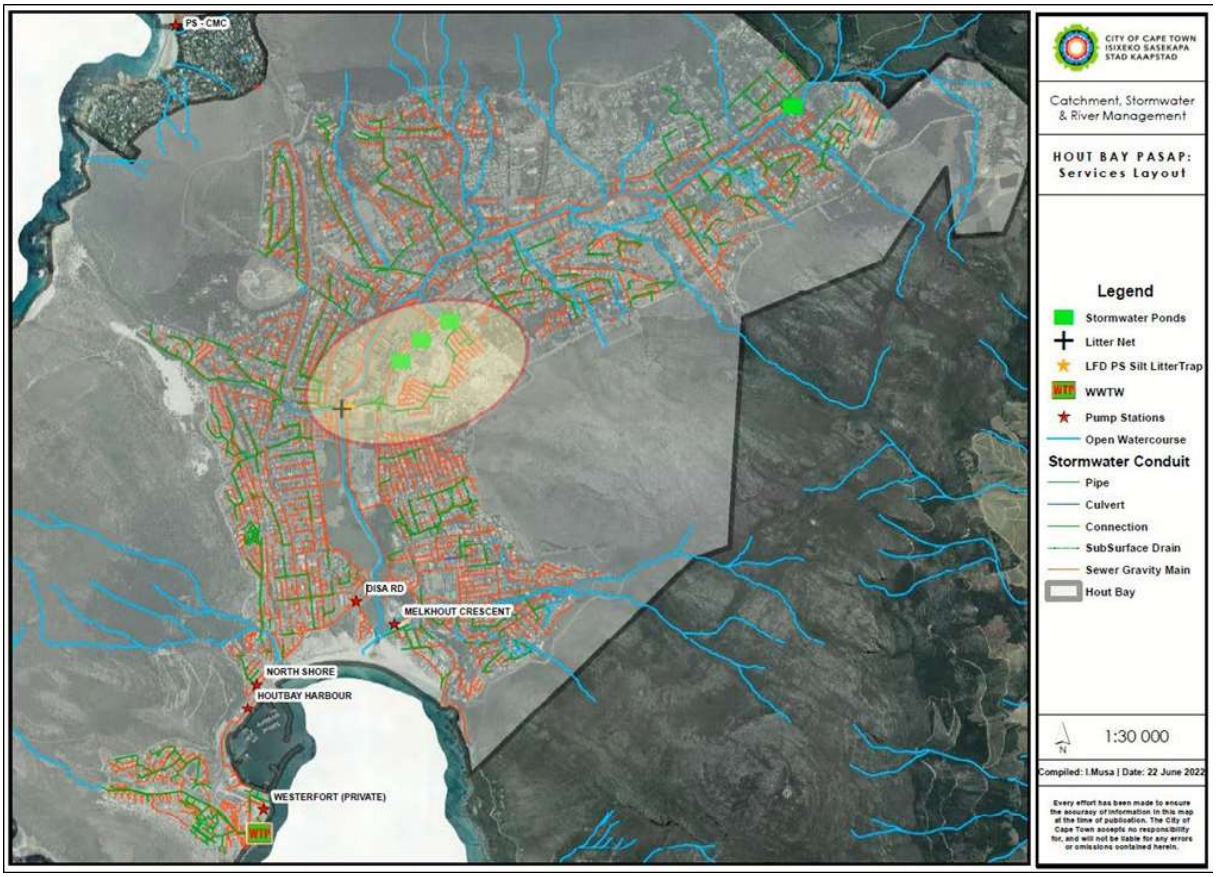

Figure 3-2: Hout Bay Catchment Services Map

4 Comprehensive Study

Pollutants may be identified as emanating from various sources within the catchment (discussed in more detail in section3) and may impact the environment and also people in different ways. The overall Scope of Services for the Hout Bay Comprehensive Study project is to create a comprehensive integrated report, to guide a professional plan of action to address the chronic sewage pollution affecting Hout Bay. The various stakeholders in the process for the comprehensive study is indicated in **Figure 4-1** below.

This report was completed by Lukhozi Engineering on the 30th of June 2023. A presentation have been done by Lukhozi to discuss content of the report with the community. In addition, a public open day was undertaken by the CCT with all the relevant departments as part of the transversal efforts, and to communicate directly to the Hout Bay Community. This open day was more focused on the I.Y. community as part of the continued efforts to work together with the community and be more transparent.

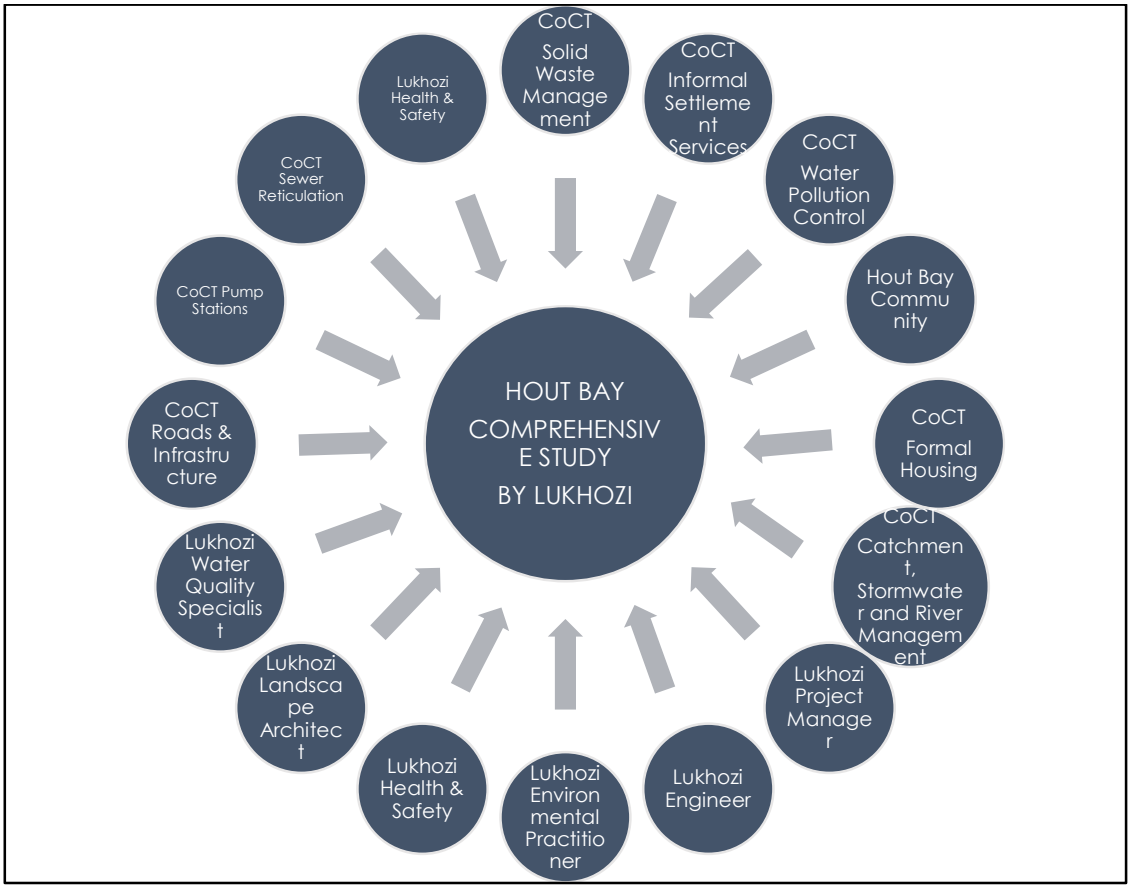

Figure 4-1: Hout Bay Comprehensive Study Stakeholders

Some of the more visible sources of pollution degrading the environment and impacting on the quality of aquatic habitats and potentially resulting in contamination of the water, if they contain harmful chemicals include; litter, domestic refuse, garden clippings and building rubble. Sewage on the other hand contains a range of dissolved chemicals, bacteria and other potentially pathogenic organisms, which are extremely harmful to humans and may be the source of many diseases and illnesses within the community. Because of these extreme pollution sources, drinking from these urban rivers is not advisable.

Due to the high levels of pollution, from sources mentioned above, these rivers are extremely nutrient rich resulting in the rapid and prolific growth of invasive, opportunistic aquatic plants, reeds and algae. The consequences of this prolific growth include a loss of biodiversity, habitat changes and increased environmental management costs. In some cases, prolific plant growth can affect river hydraulics and may increase flood risks due to increased sedimentation and blockages at bridges and culverts.

Bacteria such as E.coli and other pathogenic organisms are present in human sewage and animal waste. While not generally harmful to the environment, they can pose health risks to people and cause illnesses such as diarrhoea, skin infections etc.

Nutrients (nitrogen and phosphorus) are not only present in sewage, but are also key components of fertilizer. Farmers and gardeners should take care that they do not over-fertilize their crops and plants. Excess fertilizer will be simply wasted as it washes away with rain or irrigation runoff.

Phosphates may also be present in soap, liquid detergents and washing powders, although there are initiatives within the industry to reduce or entirely remove phosphates from their products which is a positive step for the environment.

Toxic chemicals such as **heavy metals, hydro-carbons,** oils, organic-chlorines etc. are present in a myriad of both household and industrial products. These chemicals can cause death of aquatic life or may affect the growth rate and reproduction of these organisms.

Urban sources of pollution include the following:

- Illegal discharge of effluent from factories and other industries or businesses.
- Rubbish and litter dumped into stormwater pipes, canals and rivers or wetlands.
- Windblown rubbish and litter end up in the stormwater system.
- Overflows of raw sewage from pump stations due to blockages, vandalism and mechanical / electrical faults / lack of maintenance or replacement of pumps.
- Overflows of raw sewage from manholes due to blockages, vandalism and backlog in replacement or upgrades to the network.
- Overflows of raw sewage from manholes and pump stations during very heavy rain due to capacity limits (surcharging).
- Runoff from roads, pavements and other impermeable surfaces during rain, irrigation or washing activities washed down street gutters in to the stormwater network and ultimately into rivers, wetlands and the sea.
- Animal waste (pets, birds, livestock, urban farming practices).
- Runoff from informal trading and animal slaughter areas.
- Dirty wash water (dishes, clothes, nappies) when it is poured out into the street rather than being disposed of down the sewer (formal settlements).
- Dirty water (dishes, clothes, nappies, night soil) is poured into the canal / stream or river because no formalised systems exist as illegal informal settlements are not yet serviced or unable to service as it is in a floodplain.
- Washing out of rubbish bins and hosing down shop or restaurant loading areas.
- Cleaning of tools and other dirty equipment.
- Runoff from vehicle washing areas.
- Careless use and disposal of chemicals such as household detergents, paints, herbicides, pesticides, fertilizer, oils etc.

Figure 4-2 to Figure 4-7 below illustrates the various Sources of Pollution in the Hout Bay Catchment.

Figure 4-2: Overflowing sewer manhole connected directly to the Hout Bay River

Figure 4-3: Overflowing sewer manhole

Figure 4-4: Impacts of sewer blockages and foreign objects dumped into the sewer manhole

Figure 4-5: Highly Polluted water flowing from one of the stormwater outfalls

Figure 4-6: Litter cage

Figure 4-7: Inadequately managed solid waste, resulting in solid waste landing in the stormwater and sewer networks

5 Strategic Approach and Recommendations

This report clearly indicates that the Hout Bay catchment, is severely impacted by various forms of pollution and this pollution is increasing year–on-year.

The Hout Bay Rivers Catchment Forum is a strategic partner in informing the City of pollution incidents and in addressing the issue of pollution in the catchment. Ongoing engagement with this partner is crucial to the success in addressing and managing pollution in this catchment. Addressing the issue of pollution in this catchment will entail a multifaceted approach and key in this approach is the aspect of education and awareness in the communities that impact this systems. The key areas of education and awareness includes; dumping, vandalism of infrastructure, dumping, theft, grey and black water discharge, litter etc. It is noted that the Hout Bay Comprehensive Study does look into number of this issues with the added benefit of suitable solutions that may be implemented catchment wide.

The City's RIM and CSRM, repair and maintenance sections are key in keeping the system functional and clean from natural impacts such and siltation and excessive vegetation growth, however, as a result of the high nutrient levels the regular maintenance schedules have to be increased substantially in order to keep up with the excessive growth, siltation and degradation of the system.

Pump stations must have sufficient pumps to allow alternate us redundancy for repair and maintenance. Further, all pump stations must be fitted with an effectively functioning telemetry system meeting the needs of the pump station and response required. The greywater pump station to be fitted with UPS system. This to form part of the drive by the city to fit all high risk pump stations with UPS systems to aid with the problems which arises as a direct result of load shedding.

All existing grey water connections incorrectly connected to the stormwater infrastructure must be eliminated and correctly connected to sewer. An on-site study have been done by technical services with regards to the illegal connection with findings. This information will be scrutinized and incorporated in a future revision of this report.

Further, the elimination of solid waste dumping must be addressed through sufficient formal solid waste collection centres, swop-shops and recycling centres.

This approach will require input and coordination from each affected department within the City, which has some sphere of influence in addressing the causes of pollution and the means to influence positive change, now and in the future. The focus must be to address pollution sources, at source within the affected catchment.

A proposed bulk stormwater line have been proposed along the Hout Bay Main Road. A new consultant have been appointed to undertake the design and installation of this pipeline, among other infrastructure to be constructed. A meeting will need to be held with Housing Implementation Human Settlements department and the new consultants, OWS Consulting.

A meeting was held by various CCT departments in conjunction with members of the Hout Bay Forum. The possible use of detention pond 1 as a proposed temporary holding facility for highly polluted water was discussed as a possible interim solution while the recommended long term solutions are constructed or installed. This proposed solution to be investigated further.

The Strategic Action Plan, included in Annexure A, is an integral part of addressing pollution in the catchment, by itemising the pollution source, identifying the affected / responsible City department and the actions and interventions required. The plan also indicates the current, short, medium or long term actions and interventions to address the specific pollution issue. It is imperative that these identified interventions be implemented within the given timeframe in order to address the identified pollution issue and to continue a rolling programme of implementing work to address the identified issues of pollution in the catchment.

In addition to the action plan matrix, Annexure B is a list of quick wins that was compiled by Lukhozi Consultants. The original list can be found in the Comprehensive Study, for the Hout Bay Catchment, which was concluded at the end of June 2023. This report plays an integral part against the continues fight against pollution in the Hout Bay Catchment, and set long term systems in place that will bring the water bodies in this catchment to much more acceptable levels and create a fresh start that will be protected by the greater community, as allies of the CCT.

Annexure A: Strategic Action Plan

HOUT BAY RIVERS CATCHMENT ACTION PLAN MATRIX: AS AT 30 OCTOBER 2024

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2022/23 to 2023/24)	Medium term (financial years, 2024/25, 2025/6 2026/27)	LONG TERM (1 JULY 2027 ONWARDS)
	CATEGORY A: EDUCATION AND AWARENESS & CATCHMENT WIDE INVESTIGATIONS INTO SOURCES OF POLLUTION					
1	Ongoing transversal engagement with the Hout Bay Rivers Catchment Forum (in accordance with the National Water Act, Act 36 of 1998). Forum recognised as an essential body that assist the City wrt to monitoring of services that potentially have a negative impact of the Hout Bay Rivers stormwater quality. Forum meetings	Catchment Stormwater and River Management (CSRM) Branch CSRM, Cllr Roberto Quintas, various line departments responsible for transversal pollution mitigation programs and the HBRCF	Ongoing. Transversal engagement with Catchment Forum ongoing Hout Bay Rivers Catchment Forum meetings held on 26 October 2021, 24 March 2022 and March 2023	Ongoing	Ongoing	Ongoing
2	Ongoing education and awareness programs wrt general health and the impact of dumping of all types of solid and liquid waste into the sewer and stormwater system. Ongoing education and awareness of the appropriate use of especially sanitation facilities. Ongoing education and awareness of the impact of theft and vandalism of sewer infrastructure (toilets, sewer reticulation including sewer manhole covers, sewer pump stations, wash water decanting facilities, water pipes etc.	Transversal efforts by City Health, Solid Waste, Water & Sanitation (Public Awareness, Water Pollution Control, Basic Services), Corporate Communications, and Housing: (Basic Services)	To date, 2 education and awareness programs rolled out in the 2021/22 financial year. Covid pandemic restrictions implemented. Two more transversal education and awareness program to take place under the auspicious of the Hout Bay Rivers Comprehensive Study by December 2022 and by and another 1 by end June 2023. One education and awareness focusing specifically on the improper use and disposal of sanitary material and ablution material into the sewer system.	Ongoing	Ongoing	Ongoing
3	Catchment wide investigations into the various sources of pollution in the Hout Bay catchment, that have an impact on the stormwaters of the Hout Bay catchment	Transversal efforts by Water & Sanitations CSRM, Water Pollution Control, City Health, Solid Waste and Roads and Infrastructure Management (RIM), under the umbrella of the Hout Bay Rivers Comprehensive Study	Comprehensive Study commenced on 1 February 2022 and to be completed by end of June 2023. Catchment wide analyses commenced and target date for completion is 30 Oct 2022. Current quick wins identified and other quick wins in the process of being identified. Some of the quick wins already implemented (low-flow diversion works, catch pits repaired). To be identified quick wins (including modified new catch pits) will be implemented going forward. As the quick wins annitative is expanding, based on the data from comprehensive study being done by Lukhozi, this will remain ongoing.	Comprehensive Study to be completed by 30 June 2023 (for the latest) Ongoing implementation of quick wins (current) and short term mitigation interventions	Ongoing	Ongoing

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2022/23 to 2023/24)	Medium term (financial years, 2024/25, 2025/6 2026/27)	LONG TERM (1 JULY 2027 ONWARDS)
CATEGORY B: OPERATIONAL (STORMWATER QUALITY MONITORING, REPAIR AND MAINTENANCE)						
4	Monitoring of stormwater quality in the Hout Bay Rivers catchments	Water & Sanitation (CSRM and Scientific Services)	Ongoing monitoring by routine and ad-hoc sampling of the stormwater quality for human and ecosystem health	Ongoing monitoring by routine and ad-hoc sampling of the stormwater quality for human and ecosystem health	Ongoing monitoring by routine and ad-hoc sampling of the stormwater quality for human and ecosystem health	Ongoing monitoring by routine and ad-hoc sampling of the stormwater quality for human and ecosystem health
5	Clearing of vegetation and installation of litter socks.	Transversal Partnership between Catchment, Stormwater and River Management (CSRM) and Invasive Species unit and the Roads and Infrastructure Management Branches	Note: Dredging was completed in May / June 2020. Not necessary to dredge in the near future. With CSRM's Repair and Maintenance Tender in place, cleaning of the Hout Bay River from the most upstream weir section and towards the Hout Bay River mouth commenced on 1 July 2021. Cleaning undertaken using CSRM tender, and assisted by the City's Invasive Species Unit, using hand mainly hand labour. Mechanical plant avoided to maintain ecological sensitivity. 1 litter sock installed in the Hout Bay River by Victoria Bridge in December 2021. Another 2 litter socks to be installed by 31 August 2022 onto two stormwater bulk pipes (before the main river course)	Outstanding work from previous financial year as well as planned future work to be completed during these financial years. Littersock at Victoria Bridge emergency outlet to be reinstated. Damaged sock has been removed.	Outstanding work from previous financial year as well as planned future work to be completed during these financial years. Dredging of certain sections of the Hout Bay River to be planned and executed during the medium term.	Outstanding work from previous financial year as well as planned future work to be completed during these financial years.
6	Cleaning and maintaining, including repairs of Roads and associated stormwater infrastructure (stormwater catch pits, pipes, ponds, low flow diversion works etc.)	Roads and Infrastructure Management (RIMS)	Repair & Maintenance Tender finally in place as at 1 July 2021 Undertaken using mechanical plant and hand cleaning labour. Frequency of cleaning increased, due to ongoing theft, vandalism and dumping in the RIM stormwater infrastructure. Polluted stormwater regularly pumped from stormwater infrastructure including catch pits, detention ponds to the nearest sewer infrastructure. This include detention pond number 2, where large scale inflow of grey water into detention pond no. 2 is taking place. 2 low-flow stormwater to sewer diversions constructed by September 2021. At least 3 additional small low-flow diversion works identified though the comprehensive study and to be implemented by June 2022.	Old Detention pond - mern constructed to trap litter within coffer section. 2 plugs to be replaced with gate valve as plugs constantly gets stolen. Damaged entrance gates replaced at pond 2. Platform constructed at Victoria bridge pumption emergenc outlet to assist with litter shock. Litter sock to be replaced. Damaged litter sock was removed. Possible linking of the ponds. Survey to be done to determine if it is possible.	Outstanding work from previous financial year as well as planned future work to be completed during these financial years.	Outstanding work from previous financial year as well as planned future work to be completed during these financial years.
7	Cleaning and maintaining, including repairs of basic services in all the informal areas of Hout Bay (toilets, wash water bays other decanting facilities etc)	Water & Sanitation: Informal Settlements Basic Services	Undertaken in accordance with proactive and reactive interventions	Ongoing	Ongoing	Ongoing

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2021/22 to 2022/23)	Medium term (financial years, 2023/24, 2024/5 2025/26)	LONG TERM (1 JULY 2026 ONWARDS)
CATEGORY B: OPERATIONAL (STORMWATER QUALITY MONITORING, REPAIR AND MAINTENANCE) - continued						
8	Planned Maintenance and improvements of existing sewer reticulation	Water & Sanitation: Sewer Reticulation Branch	Cleaning of key bulk sewer lines commenced on 1 March 2002 and was completed by 31 May 2022, using a combination of bucket and jet cleaning. Assessment of the viability of implementing and rolling out of lockable sewer manhole covers to be undertaken by end August 2022. Should the assessment indicate that it is viable, then funding will be applied for, to install lockable sewer manhole covers soonest. This will be finalised based on final submision of the comprehensive study.	Proactive cleaning on hold since December 2023 due to budget constraints. Sewer Retic have a combination unit that is assisting with reactive cleaning and conduction daily inspections.	Outstanding work from previous financial year as well as planned future work to be completed during these financial years.	Outstanding work from previous fin year and planned future work to be completed during these fin years.
9	CCTV inspection of sewer lines Mitigation measures of finding of CCTV inspections to be implemented	Water & Sanitation: Sewer Reticulation Branch	In process of completing CCTV inspection of the sewer reticulation lines in the River Terraces area. Inspection of video footage commenced already, and will be completed when the CCTV footage of the remainder of the sewer line is undertaken (by December 2022).	CCTV is ongoing. 8.75km of pipeline have been cleaned	Ongoing (depends on budget)	Ongoing (depends on budget)
10	All Hout Bay sewer pump stations to be investigated, for areas of risk: Respective improvements to be tabulated	Water & Sanitation: Sewer Pump Stations Branch	Risk assessment of all sewer pump station to be completed by 31 August 2022. Princess Road risk investigation to be undertaken urgently, including recommendation of short term, medium and long term mitigation measures. Victoria Road low-flow diversion works - investigated, and additional silt/sediment/litter forebay to be constructed by 31 August 2022. Victoria Road pumpstation to be fitted with UPS system. In final stages of procurement. An Inveter was installed this year 2024 at Victoria	Outcomes of more detailed pump station investigations and associated recommendations to minimise risk to be tabled to senior management for consideration for capital funding	Ongoing (depends on budget)	Ongoing (depends on budget)
11	Telemetry systems at the sewer pump stations including the Victoria Rd stormwater to sewer low-flow diversion works to be maintained accordingly. A UPS system to be installed at this pumpstation.	Water & Sanitation: Engineering and Asset Management	A steel cage around the telemetry box at the Victoria Rd stormwater to sewer low-flow diversion works was completed in April 2022. The UPS system has been procured, and is planned to be installed by latest end of November 2023. The encasing for the UPS is currently being manufactured.	UPS has been installed November 2023. Telemetry system at Victoria low-flow has been updated. System to be monitored	Ongoing	Ongoing
12	Project to eliminate illegal stormwater to sewer connections	Water & Sanitation: Water pollution Control, in collaboration with the Stormwater Branch Roads and Infrastructure Management (RIM)	Commenced 1 March 2021. Now being supported by the Comprehensive Study. Approximately 5 illegal stormwater to sewer connections identified, and notices issued to the property owners. Water pollution control have undergone a new drive to identify the illegal connections. The findings will be shared with RIM. If illegal connections are not removed by the owners, RIM department to remove.	Ongoing	Additional work dependant on outcomes and success of work completed in previous fin year	Additional work dependant on outcomes and success of work completed in previous fin year
13	Maintain a satisfactory level of solid waste cleaning and solid waste collections and removal of solid waste services in the Hout Bay Rivers Catchment Informal Settlements areas Low income formal areas with back yarders Higher income formal areas	Basic Services provided (2 waste bags provided to each informal dwelling. Collected twice a week Minimum level of services provided (1 wheelie min per formal dwelling Minimum level of services provided (1 wheelie bin per formal dwelling)	A request was tabled by the HBRCF to pilot an additional wheelie bin to the low income area of Imizamo Yethu. The Comprehensive Study is assisting with this task. Additional green bins placed along the Hout Bay Main Rd (especially in the area of the AstroTurf sports field and the MyCity bus route	Ongoing transversal discussion between CSRM, HBRCF and Solid Waste Area Cleaning and Solid Waste Collections to improve Solid Waste Services in especially the informal areas, and the formal areas with backyarders in and around the informal areas of Hout Bay (Imizamo Yethu and Hangberg)]	Ongoing	Ongoing
14	Recycling opportunities increased in the Hout Bay catchment	Solid Waste: Waste Minimisation	Swop Shop in the process of being piloted in Hangberg. Motivation to role out the "Swop Shop" to Imizamo Yethu tabled as part of the Comprehensive Study	Potential for the additional "Waste for Coupons" project and other waste minimisation projects to be implemented in the Hout Bay Rivers catchment	Ongoing	Ongoing

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2022/23 to 2023/24)	Medium term (financial years, 2024/25, 2025/6 2026/27)	LONG TERM (1 JULY 2027 ONWARDS)
CATEGORY C: CONSTRUCTION (CAPITAL) PROJECTS: KEY POLLUTION MITIGATION						
15	Roads upgrade RIM in IY	Roads and Infrastructure Management (RIM) in collaboration with CSRM and Sewer Retic	Commenced in September 2021. Additional catch pits included as part of this roads rehabilitation project Emphasis on routing surface water to nearest catch pit	Roads upgrade RIM in IY to be completed by June 2024	Ongoing and to be reviewed	Ongoing and to be reviewed
16	Design and construction of additional stormwater to sewer low-flow diversions works	Roads and Infrastructure Management (RIMS) in collaboration with CSRM and Sewer Retic	In addition to the existing three stormwater to sewer low-flow diversion works, the Hughenden Rd stormwater to sewer low-flow diversion works, as well as the low-flow diversion works from Detention pond no. 2 to the nearest sewer manhole completed by September 2021. At least 5 additional low- flow diversions identified and to be implemented by 31 August 2022.	Ongoing and to be reviewed	Ongoing and to be reviewed	Ongoing and to be reviewed
17	Design and construction of new sand/silt/sediment forebay just before the Victoria Rd stormwater to sewer low-flow diversions works	Roads and Infrastructure Management (RIMS) in collaboration with CSRM and Sewer Retic	Design completed. Funding approved. Additional forebay to be constructed by 31 August 2022.	Depending on efficiency and efficacy of the silt/sediment trap, an upgrade to the entire low-flow stormwater to sewer diversion works at Victoria Road might be required and budgeted for. Should it be necessary, construction of this upgrade should be completed during this medium term horizon.	Complete	Complete
18	Elimination of all existing grey water infrastructure incorrectly connected to the stormwater infrastructure	Roads and Infrastructure Management (RIMS) in collaboration with CSRM, Sewer Retic, and Informal Services Basic Services	Assessment of the number of grey water infrastructure incorrectly connected to the stormwater infrastructure	Completion of the assessment of the number of grey water infrastructure incorrectly connected to the stormwater infrastructure. Funding granted and all grey water incorrectly connected to the stormwater infrastructure corrected accordingly	Ongoing as and where necessary	Ongoing as and where necessary

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2022/23 to 2023/24)	Medium term (financial years, 2024/25, 2025/6 2026/27)	LONG TERM (1 JULY 2027 ONWARDS)
CATEGORY C: CONSTRUCTION (CAPITAL) PROJECTS: KEY POLLUTION MITIGATION continued						
19	Construction of sustainable urban drainage systems (SuDS), to divert additional polluted stormwater to these SuDS, as end of pipe treatment	CSRM, in collaboration with RIM and City Environment	Currently, collating catchment wide relevant information through the Comprehensive Study. Extensive public participation to take place	Completion of the assessment, and appropriate SuDS recommended and designed. Example, bio-retention pond/s, swale/s, infiltration ponds etc Various National and Provincial Departments requirements applied for (WUA, DEADP etc)	Construction of SuDS (subject to budget allocation)	Ongoing repair and maintenance in accordance to an approved repair and maintenance plan/schedule
20	Sanitation related infrastructure for the informal areas implemented and additional infrastructure to be implemented	Housing: Engineering Services to Formal and Informal Settlements and Water & Sanitation: Informal Settlements Basic Services	New Toilets and taps: Commenced with the installation of 77 new flush toilets, together with taps and wash troughs, following super blocking project by human settlements currently underway. Then a number of ad-hoc interventions including porta-loos and septic toilets were provided with varying degree of success. However, the rate of theft, vandalism and destruction of these sanitation services very problematic.	Additional waste water receptacles planned for the informal areas of Imizamo Yethu and in the Hangberg areas. To be accompanied by ongoing intensive education and awareness programs wrt the correct usage of these waste water receptacles. Assessment to be undertaken after the super-blocking exercise has taken place, and dependent on the rate of growth of the informal areas of Imizamo Yethu	Highly dependent on the super blocking exercise and the formal housing projects	Highly dependent on the super blocking exercise and the formal housing projects
21	Formal Housing projects	Planning, Informal Settlements	Imizamo Yethu Phase 3 formal housing development: A-grade civil engineering services and 492 top structures at "Forestry" project site underway. A-grade roads and associated stormwater works Two detention ponds as part of Imizamo Yethu Phase 3 development is 100% complete Hand over of completed service sites to Informal Settlements, to prioritise the construction of alternative building technology (ABT) Top structures to to aid de-densification requirements related to the informal settlement area.	To be completed: 1. The bulk stormwater link downstream from the detention ponds to the Hout Bay Main Rd> 2. Design and construction of ABT structures for the purpose of de-densification related to the informal settlements area. 3. Completion of the first increment (super blocking) of upgrading related to the informal settlement.	Next phase of Formal Housing development is dependent on the incremental upgrading processes of the settlement, including additional land required for de-densification.	Depends on success of superblocking and proposed housing phase for the medium term horizon
22	Additional drop off facility near Imizamo Yethu	Solid Waste: Waste Minimisation	CSRM to engagement with Solid Waste	Design and application for financial resources to be considered, based on priority and urgency	New drop-off facility constructed (subject to approval of budget)	Ongoing repair and maintenance in accordance to an approved repair and maintenance plan/schedule

No.	STRATEGIC INTERVENTIONS	DEPARTMENT/S RESPONSIBLE	PREVIOUS (THIS FINANCIAL YEAR ENDING 30 June 2022)	SHORT TERM (FINANCIAL YEARS 2022/23 to 2023/24)	Medium term (financial years, 2024/25, 2025/6 2026/27)	LONG TERM (1 JULY 2027 ONWARDS)
CATEGORY C: CONSTRUCTION (CAPITAL) PROJECTS: KEY POLLUTION MITIGATION continued						
23	Bulk Stormwater Pipeline Along Hout Bay Main road	Housing: Engineering Services to Formal and Informal Settlements and Water & Sanitation: Informal Settlements Basic Services	-	1. CSRM to engage with Housing Implementation Human Settlements. Lukhozi has no more part in this project. New consultant, OWS Civils to be consulted with regards to this proposed pipeline. 2. Installation of bulk stormwater line along Hout Bay Main Road 3. Discussed with housing at site meeting. Housing to give feedback on when they will commence.	Pricing of professional team almost concluded. Appointment to be made at end of September 2024. - Detailed design will require approval, procurement and ultimately construction.	Ongoing
24	Re-alignment of 90-degree bends in existing sewer reticulation above Mandela Drive	Water and Sanitation: Sewer Reticulation	-	2024/06/01. Date and action discussed at meeting on Plumstead with RIM, Retic, CSRM on 23 August 2023. - No further movement yet.	-	-
25	Alternate the cleaning activities on the rag and siltation chambers on both the sewer and stormwater systems between the two depts on a weekly basis	Water and Sanitation: Sewer Reticulation in conjunction with RIM	-	September 2023 - Ongoing	Ongoing	Ongoing
26	Scientific services to look at possible remedial solutions for polluted ponds	Scientific Services	-		This to possibly be used as a trail/pilot at pond 1 of Hout Bay. SSB is in process of obtaining proposals for remedial solutions for other polluted sites. The same process will be applied to Hout Bay Ponds once funding has been sourced. - Director Hilton Scholtz agreed to use 3 ponds as pilot project. The process is on hold and will proceed again when sufficient funds have been sourced. Various branches within W&S are being consulted to help find the money. The ED and Directors are aware of this item and budget constraints.	-
27	Look at possibility of installing a low flow bio treatment channel at Victoria road pump station to mitigate against pump failure or load shedding - under investigation with input of the Hout Bay Catchment Forum	Hout Bay Forum in conjunction with RIM and CSRM	-	Innitial design to be done to determine viability. - Hout Bay forum becoming more involved with a overall layout, including the proposal of a treatment channel.	Ongoing	Ongoing
28	Installation of rag and silt trap downstream of the IY and Hout Bay sewer confluence	Sewer Reticulation	-	To be determined if EIA is require prior to commencement.	Ongoing	Ongoing

Annexure B: Quick Wins and Interventions

No. (old)	No. (new)	Area Description	Descripting of Issue	Possible Quick Win Solution	Required LCE Actions	Required CoCT Actions / CoCT department	Progress/ Status
2	1	Old Detention Pond Outlet Structure	Litter grid frequently blocks.	Add additional grid on opening at bottom of outlet structure to prevent bottles entering. Also, sewer line in street blocking and surcharging through greywater diversion back into Old Pond (possible solution is a non-return valve).		RIMs are maintaining silt trap chamber. Being frequently cleaned. Frequency may have to be increased during rainy season.	NRV installed
7	2	Victoria Bridge Grey-water Pump Station	Surcharging due to power failures (loadshedding & tripping breaker-switch).		Tripping breaker-switch has been repaired. Abongile Duna to confirm that the promised UPS is to be installed.	UPS to be installed.	UPS System has been installed and telemetry system updated. New system to be monitored.
10	3	Hughenden Street Stormwater Main	Community is using high end of stormwater pipe network as decanting facility and contaminated water ends up in Hout Bay River	Low-flow diversion			Installed
12	4	Water Leak Upstream of Detention Pond 3	When the water network was previously shut down for maintenance it was established that there seems to be a constant water leak upstream of the Old Detention Pond	Applicable line department has been notified and are to investigate/rectify.			Resolved
14	5	Solid Waste/Litter Within IY.	Solid Waste/Litter Within IY.	Orange Bins on poles are being installed in informal settlement portion of IY; Contract in place for door-to-door collections of refuse bags.			Resolved
22	6	Stormwater Pond 1	Sewer outfall line flowing into pond 1 from Mandela Drive to be blocked off			Sewer Retic	Sewer outlet into pond sealed off. Resolved,
24	7	Stormwater Pond 1	Install gabions in pond to act as temporary holding areas to allow sediment to settle before grey water leaves pond				Installed with ongoing maintenance
10A	8	Hughenden Street Solid Waste	Solid waste in street and stormwater.	Wall was erected around the solid waste and decanting facility. Urban Waste Department collects waste twice per day.	This would be a good position for a waste skip.		Installed. Effectiveness to be reviewed.
13b	9	Benlo Stormwater Outfall (Glen Ellen Farm)	Outfall from the Old Detention Pond; solid waste & greywater.	End of Line Intervention/s.	Option 2: Redirect Stormwater Through Existing Ponds.	New gabion walls constructed in pond to better manage silt and solid waste entering downstream low-flow diversion chamber. U-bends and NON return flaps to be installed by End of October 2023.	Gabions, U-bends and NRV installed.
16	10	Princess Street Pump Station	Status of backup generator and backup pump to be verified.	Inputs required from Ingerop (as part of their sewer masterplan appointment) on efficiency of the pumpstation.		Backup Power (generator or invertor) likely required.	Outstanding. **Note:** Very high impact if pump station fails. 2024_02_28 - Princess Street Pumpstation has a generator that is working. In addition, there is currently one pump in working order. Mechanical is busy repairing the second pump.
19	11	Illegal Sewer to Stormwater Connections (8No.)	When sewerage system blockages & flooding occurs, sewage flows directly/ indirectly into the River.	Overflow pipes to be removed once the cause of frequent flooding resolved.		Water pollution control in conjunction with RIM	Water pollution control have undergone a new drive to identify the illegal connections. The findings will be shared with RIM. If illegal connections are not removed by the owners, Ongoing 2024_02_28 - RIM to obtain labout to undertake the work.
25	12	Victoria Bridge Grey-water Pump Station	Surcharging due to power failures (loadshedding & tripping breaker-switch).		Spare pump to be installed	Spare pump purchased & in stores	Ongoing. Information to be obtained from discussion had with contractor. 2024_02_28 - Pump packed up. Pumpstation department installed new pump in store. Overalling pump that packed up to be kepted in storage as spare pump. In addition,the PS department confirmed second pump will not be installed in addition to existing. 2024_04_01 - Installation of second pump as a redundancy pump back on the table.
21	13	New Sewage Spill onto Hout Bay International School's Playing Field	School Principal Gavin Budd - "blockages on the 300mm diameter bulk line on the external side. Informal settlement along river adjacent to school - blocked open drain. Ongoing issue since October 2021".			Urgent CCTV Report Required. Access Road required.	Outstanding 2024_02_28 - Access is a hindrance, but what has been determined is that the line running along the school up to DISA PS is not a problem. The line was dipped for bucketing, but it was determined none was needed. A few manhole repairs had been done and some raised as well as manhole frames and covers replaced. We are in the process with sister departments to establish a defined access road. A large amount of stormwater pumped into this line adding to the capacity issues. Another issue highlighted is the cleaning of the handrake screens at DISA PS. - 2024_03_09 - Access Obtained by owner. Further meeting to be held with owner with regards to way forward.

No. (old)	No. (new)	Area Description	Descripting of Issue	Possible Quick Win Solution	Required LCE Actions	Required CoCT Actions / CoCT department	Progress/ Status
26	14	Stormwater Pond 1	Through pipe plugs are being stolen regularly	RIM to undertake installing a gate valve between current plug positions		RIM	2024_02_28 - To be installed by end April 2024 - 2024_04_24 - Documentation to be sorted with contractor. No further movement.
6	15	Newly Constructed Silt/Litter Trap at Victoria Bridge	Functionality to be verified.	Functions well when pumps are running.		Continuous feedback required	Installed. Maintenance ongoing
4A	16	SW Pipeline at 21A Riverside Terrace; Erf 6102 (Linda Schmiedeke's property).	SW pipeline (600mm diam.) frequently blocked with gravel from gravel road.	SW line to be cleaned regularly - Proactive maintenance schedule required (increased during rainy season).		Jet-cleaning of pipe recently done.	Ongoing 2024_02_28 - City Officials Struggle to get access to premisses as gate is locked. Details of owner to be obtained.
1	17	Old Detention Pond	A great deal of contaminated water and litter enters the detention pond.	Rag/ Nappy Trap on adjacent sewer line is being cleaned regularly by RIMs. Proactive maintenance schedule by Sewer Reticulation required.		RIMs are maintaining pond and being frequently cleaned. Frequency may have to be increased during rainy season. To be monitored on going.	New gabion walls constructed in pond to better manage silt and solid waste entering downstream low-flow diversion chamber. To monitor effectiveness, ongoing maintenance
3	18	Diversion Structure Between Old Detention Pond and Hout Bay Main Rd	Diversion structure is overloaded since the connection pipes to the sewer line is under capacity and contaminated water ends up in the Hout Bay River.	Install a bend on the stormwater outlet to created head on the 2 x 100 mm diversion pipes. Capacity of these pipes are insufficient.		Install a bend on the stormwater outlet to created head on the 2 x 100 mm diversion pipes. Capacity of these pipes are insufficient. CCTV survey urgently required of the sewer line (possible roots from large tree). RIMs to add grey water deviation. - Non return valve to be added on sewer line. - 2 Vertical bends to be added at the start of the greywater lines.	Solution Decided. Action Outstanding - Contractor is appointed & is to be done in the 2023/24 FY.
8	19	Victoria Bridge Emergency Overflow System Non-existent/Not Effective	When the sewerage system fails, sewage overflows into the River. The community Forum recommended a bioswale/ filter system to manage and treat sewerage during emergencies	Continuous feedback required.	Option 1: In-Line Intervention Chamber & Skimmer.		Solution Decided. Action Outstanding. Effectiveness of skimmers in ponds to be concluded.
4	20	Sewer Manhole at 21A Riverside Terrace; Erf 6102 (Linda Schmiedeke's property).	Sewer manhole frequently floods, and diversion structure allows sewage spills into the river. Linda Schmiedeke reported having previously seen a CCTV report that the pipe has a sag in it.	Sewer line to be cleaned regularly - Proactive maintenance schedule by Sewer Retic required.	Modelling outcomes indicate capacity is okay. Recommended intervention concept; Dual Sewer Pipe. Once done the illegal connection can be removed.	Previous CCTV Report received; new CCTV report required. Ingerop Report received. CCTV to be done of all problematic lines.	Solution Decided. Sewer Retic agreed on Starting point of October 2023 and will be ongoing.
5	21	Sewer Gravity Main Parallel to Hout Bay River.	Frequent Sewer blockages and flooding.	Sewer line to be cleaned regularly - Proactive maintenance schedule by Sewer Reticulation required.	Modelling outcomes indicate capacity is okay. Recommended intervention concept; Dual Sewer Pipe.	Regular CCTV inspections & cleaning required.	Solution Decided. Sewer Retic agreed on Starting point of October 2023 and will be ongoing.
11	22	Detention Pond 3 Outflow	Contaminated water is almost constantly flowing through the outlet structure onto Hout Bay Main Road	Efficiency of the low flow diversion must be increased. Possible level issue.	Install skimmer in pond for low-flow diversion to sewer.	RIMs changed grid as 25x25 kept blocking. Added gully grid and added sandbags and channel water. Low flow and grid have been tended to. Sandbags are temporary.	Pond has been upgraded. As there is not sufficient standing water in pond, skimmer option is questionable. Alternative to be recommended.
17	23	Hangberg Stormwater Outlets	Greywater & solid waste is discharging directly into the sea from stormwater outlets.	Low-flow diversion structures & litter socks recommended. EPWP are active on litter collection.	Line Intervention Chamber & Skimmer.		Solution Decided. Action Outstanding.
18	24	World of Birds	Possible polluted water discharging into sewer manhole through hand formed swale and partially opened lid on manhole.	To be further investigated by CoCT.		CoCT to investigate & resolve.	Outstanding
23	25	Mandela Drive at pond 1	Proposed inline low flow in Mandela drive above pond 1.				To be installed in 23/24 fy.
8	26	Victoria Bridge Emergency Overflow System Non-existent/Not Effective	When the sewerage system fails, sewage overflows into the River. The community Forum recommended a bioswale/ filter system to manage and treat sewerage during emergencies	Continuous feedback required.	Options 2: Redirect Stormwater + In-Line Intervention & Skimmer & Submerged in Gravel Wetland.		Solution Decided. Action Outstanding. Bio swale effectivety and design to be concluded and determined if it is viable.
9	27	Low-Flow Diversion Chamber at IY Waste Drop Off Facility - Wood Chipper Yard.	Large volumes of contaminated water enter the facility from the mountain/eastern side and the whereabouts of the stormwater pipe system is unknown. The community Forum believes the stormwater pipe system takes this contaminated water to the River.	As-build information not available to allow the effectiveness evaluation of the low flow diversion system.	Intervention proposed; In-Line Intervention Chamber & Skimmer.	As-built drawings not available.	Solution Decided. Action Outstanding. As-builts to be obtained by contractor. As-builts of additional in-line that have been installed by contractor. Bergstan Consultants.
20	28	Berg en Dal Forrest Sewage Spills - the Riding Centre; 59 HB Main Road; Erf 9794 (Kim Wallace); 09-02-2023 (13-09-2022)	Regularly blocks/floods sewer manholes (over many years) to open channel cross-connection; sewage "swamp" in horse paddocks and forest; flows along SW channel in forest into river.		Modelling outcomes indicate capacity is okay. Recommended intervention concept; Dual Sewer Pipe.	Urgent CCTV Report Required	Outstanding

No. (old)	No. (new)	Area Description	Descripting of Issue	Possible Quick Win Solution	Required LCE Actions	Required CoCT Actions / CoCT department	Progress/ Status
15	29	IY Clinic Low-Flow Diversion	Frequent blockages by solid waste.	Short term - brick wall with gaps. Long term solution is a more "formal" solution incl. fenced off.	Line Intervention Chamber & Skimmer.	Remedials to be constructed in First Quarter of 2023/24 FY.	Intake modified. Not anough standing water for skimmer to be effective. RIM have upgraded the system to eleviate blockages.
13a	30	Benlo Stormwater Outfall (Glen Ellen Farm)	Outfall from the Old Detention Pond; solid waste & greywater.	End of Line Intervention/s.	Option 1: In-Line Intervention Chamber & Skimmer & Infiltration Trench for emergency overflows from outfall		Unlikely to happen due to alternative methods making it redundant. CCT to provide additional comment on effectiveness of alternative measures taken. Ongoing
8A	31	Low-Flow Diversion at Victoria Road Open Channel to Victoria Silt/ Solid Waste Trap	Diversion is not formulised to divert channel low flow from open channel.	Weir/ forebay required inside the channel.		RIMs have built in the pipe and an opening added on the side of the pipe. This would deviate the flow into a by-pass stream that flows past the school and enters the Hout Bay river at a different point closer to the school. However, this pipe silts up at the weir and as a result the water does not get into the by-pass stream and flows directly into chamber.	Ongoing investigation. Suitability of installing a weir is questionable. Additional design suggestions may be needed. Survey to be done. Part of survey to determine if pond 1 can be connected to pond 2. Pond 2 will be the outfall of pond 1, and will make Benlo outfall redundant.

ANNEXURE B – MEMO TO HBCMF REGARDING PRINCESS ROAD SEWER PUMP STATION

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

WATER AND SANITATION
DISTRIBUTION SERVICES

Etienne Hugo
Director: Distribution Services

T: 021 444 2769
E: Etienne.Hugo@capetown.gov.za

M E M O R A N D U M

DATE : 25 November 2024

TO : Houtbay Catchment Management Forum

SUBJECT : Princess Road Sewer Pumpstation, Hout Bay

Introduction

The Water and Sanitation Department is continuously working to improve current operations. New operational tools, techniques and methods are being investigated explored as well. This is in order to deliver an effective water and sanitation service to the residents of the City.

Responses

This correspondence aims to address the questions raised by the Houtbay Catchment Management Forum. The email titled; *Princess Road Sewer Pump Hout Bay*, received on the 11th of October 2024, from the Catchment Management Forum Chairperson, refers.

Details of interventions undertaken to address an incident that took place on the sewer network and inlet section of Princess Road sewer pump station (also termed Disa River Pump Station) are provided. An engagement between the City of Cape Town's Water and Sanitation Department and The Hout Bay Catchment Management Forum took place on 15 October 2024. The answers below respond to the questions brought forward by the forum.

1. **What were the cause/s of the challenges experienced at the Princess Road sewer pump station towards the end of last week?**

   Sand ingress, along with foreign objects have been identified as the reason for the sewer system challenge experienced. The build up of this foreign material at the pumpstation inlet section and subsequently, in the sewer network, created a restriction for sewer water entering the pumpstation.

   Clearing and cleaning of the affected infrastructure started and concluded on the 9th and 10th of October 2024. Material found in the Pumpstation manhole is in the picture that follows (Figure 1).

Figure 1. Material found at the inlet section of Disa Pumpstation

2. **Are there back-up pumps at the sewer pump stations in Hout Bay?**

   Disa River Pump Station is designed to have two pumps, each sized at 55kW with a total maximum duty flow of 160l/s. One pump is used as the duty pump while the second pump is used during high flow periods to keep wet well levels low. The maximum inflow for the catchment is meant to be 52.1l/s, giving the pump station a spare capacity of 67.4%.

3. **Have rag traps been installed before the inlet of the sewer pump station, and additional inline/offline waste interceptor structures?**

   There are two small mechanical screen installations in place. An investigation is in progress to install a bigger mechanical screen before the pump station to collect foreign debris before entering the wet well and blocking up pumps. Design & Contracts have met on site and in the process of designing the upgraded screen. The expected installation date will be in April 2025.

4. **Did human error exacerbate the situation (in terms of response time for repairs)?**

   Because the blockage occurred before the pump station, the wet well levels never reached maximum capacity and therefore could not trigger the telemetry alarms for the pump station. The telemetry alarms are linked to the wet well levels and pumps tripping. In this instance, the wet well levels were low and the pumps were operational.

5. **What volume of sewage was surcharged into the natural environment including the Hout Bay River, the estuary and into the beach area?**

   Undetermined due to no flow meter installation before the pump station but can be roughly estimated to 1 800 kl a day on the Eastern network. The duration of the spill was approximately 3.72 hours, causing a spill of approximately 279 kl.

Statement

The major pollution should have been avoided, as there was a pledge by Water and Sanitation Directorate (Reticulation Branch) to adhere to the recommendations presented in the Hout Bay Comprehensive Study.

The Water and Sanitation Department remains committed to ensuring that major pollution is avoided. Current measures are being looked at continuously for relevance and effectiveness. Additional interventions are being looked at in efforts to improve on what is currently being done. These are all efforts aimed at staying true to the commitment made.

As part of the short term interventions proactive maintenance along the sewer line in question has since been intensified. Approximately 10 184m of sewer network has been proactively cleaned. This is in the form of pressure jet cleaning and is linked to the network servicing the greater part of Imizamo Yethu down Victoria Road and then along eastern stretch of river leading towards Disa River Pump Station.

Manhole covers were replaced on manholes found to have missing manhole covers, on the section traversing the Eastern boundary of the Disa River. Some manholes were raised and where root intrusion was seen in the sewer line, the roots were removed.

There are on-going daily spot checks conducted by internal and contractor teams at the nodal points denoted in attached Annexure A. The sewer reticulation teams as well as CSRM officials have good communication with the local forums. This enables quicker responses as activated teams respond when alerted of spillage incidents affecting the nearby watercourse.

Yours sincerely

Pierre Maritz
Digitally signed by Pierre Maritz
Date: 2024.11.25 15:47:40 +02'00'

Pierre Maritz
Manager: Reticulation

Date

Etienne Hugo
Digitally signed by Etienne Hugo
Date: 2024.11.25 16:58:30 +02'00'

Etienne Hugo
Director: Distribution Services

Date