

# HOUSE SEWER CONNECTION INFLOW STRATEGY



*Helping to achieve the 2030 Community Vision*

## Version Control

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## 1. Executive Summary

The ongoing reduction of the improper inflows of excessive stormwater into sewers is a priority for both the current Sewer Strategy and the proposed Sewerage Strategy 2020-2050. The transportation and treatment of sewerage is expensive, hence it is necessary to limit the flows in the sewerage system to sewage only. Excessive stormwater inflows into the sewer system during rainfall events causes major cost increases, as well as property and environmental damage via sewer surcharges as the sewer system capacity is overwhelmed.

Currently the system is improperly taking stormwater inflows both from leaking sewer pipes and sewer manholes as well as directly from private property stormwater systems which have been via illegal connections to the sewer system. The total volume is then being transported and treated as sewerage at significant additional cost.

The excessive ingress of household stormwater is either by improper piped stormwater connections to the sewer system (rather than stormwater) or through poorly placed household sewer gully traps which drain stormwater from household hardstand and grassed areas directly into the sewer system

The impact of the improper stormwater flows into the sewer system is now regularly 14-18 times during some rainfall events, depending on the intensity of the rainfall

The current Sewer Strategy was adopted by Council in 2000. The Strategy strongly identified the need to address inflow for both environmental, economic and operational reasons. The Strategy detailed over \$200M worth of required sewerage capital augmentation works and the refurbishment of existing infrastructure to limit infiltration and inflow into the sewer system.

Council has already spent in the order of \$7M reducing infiltration into the sewer mains by lining leaking pipes and repairing manholes. This work is an ongoing program to keep infiltration into Council's sewer mains to a minimum. This report advises that it is recommended that significant efforts are now applied to the addressing and remediation of the impact of private property-related stormwater inflows into the sewer system as envisaged by the adopted Strategy.

The following aims and actions were included in the 2000 Strategy:

### 1.6.2.8 Refurbishment of Existing Infrastructure

#### **Strategy Aim:**

*Undertaking remedial works on sewer systems to reduce flows in wet weather, and to ensure assets are renewed or replaced so that design levels of service are maintained and NSW EPA guidelines are met.*

#### **Strategy Action:**

*The existing sewer reticulation will be refurbished as part of an ongoing program to reduce inflow and infiltration into the sewer system during wet weather. This program will reduce the flows of sewage and, in turn, the quantity of reclaimed water to be discharged through the deep sea release.*

Whilst Council is addressing the inflow and infiltration of the sewer networks for which it is responsible, there is a major issue with sewer house connections allowing the ingress of stormwater into the sewerage system.

The inflow from house stormwater connections constitutes around 50% of the total stormwater inflow into the sewer reticulation system. With Council spending significant funds and effort on correcting the leaks in the sewer mains it is necessary that inflow from house stormwater connections is addressed.

The aim of this Strategy is to reduce inflow into Council's sewer system during wet weather events to a level that is affordable and as close as possible to the design parameters for the sewer pipe network. Significant overall benefit and savings to the future operation and augmentation of the sewerage transportation and treatment system can be expected as follows:

- Reduction in future augmentation costs of sewerage transport and treatment infrastructure and extended infrastructure asset life
- Reduction in sewerage system operational costs
- Reduction of property and environmental impacts due to sewerage spills to the environment.
- Improved access to the sewer network in locating and raising buried manholes

Council's sewer reticulation, transport and treatment infrastructure is valued at approximately \$700 million, representing a significant investment for the Coffs Harbour community. This strategy aims to be responsible in the operation and maintenance of this investment and deliver the most cost effective and efficient service possible.

#### **Community Strategic Plan Alignment:**

This strategy aligns with the Community Strategic Plan as follows:

- C.2 Natural Environment Sustained for the Future  
We protect the diversity of our natural environment - (C2.1)  
*Outcomes: Council's role - Provider, Partner*
  - through collaboration, we protect and enhance our natural environment
  - we understand the challenges to our natural environment and act to mitigate them
  - community involvement in actively protecting the natural environment is increased
  - we manage public access to natural areas to enhance environmental experience and preserve ecological values
  - pollution from human activities is minimised
- D.2 We have effective use of Public Resources  
We effectively manage the planning and provision of regional public services and infrastructure - (D2.1)  
*Outcomes: Council's role - Provider, Partner, Advocate*
  - our public infrastructure is maintained for its current purpose and for future generations
  - the Pacific Highway bypass of Coffs Harbour is completed
  - public infrastructure continues to meet our community and business requirements
  - our community continues to have access to high quality public services
  - there is collaborative planning to address needs associated with projected population growth
  - accurate data is collated and used to help effectively and strategically plan for future community needs
  - infrastructure is planned for the long-term and without imposing an unfair burden on future generations
  - we embrace the introduction of new technology to help deliver better outcomes for the community

## 2018/2019 Delivery Plan Alignment

This strategy aligns with the Delivery Plan as follows:

*A key focus area for Infrastructure Construction and Maintenance is to 'Increase planned maintenance and decrease reactionary maintenance through a collaborative approach to the prioritisation, planning, scheduling, allocation and closing out of all maintenance works'*

Consistent with the implementation of the above focus is addressing the stormwater inflow in to the sewerage system. The works identified in this strategy will be planned, scheduled etc and significantly reduce the volume of reactionary maintenance undertaken on the sewer system.

The strategy also aligns with Deliverables and Ongoing Activities included in the Delivery Plan

## 2018/19 Operational Plan Alignment

This strategy aligns with the 2018/19 Operational Plan in that there is an identified project, being:

*P1168: Reduce stormwater inflow to the Sewer Reticulation Network*

It is known that stormwater inflows into the sewer system is a longstanding problem. During the planning and investigation of this project the extent of the inflow has been determined. Consequently, this report comprising the House Sewer Connection Inflow Strategy has been compiled in order to address the issue in a systematic and efficient way.

## 2. Introduction

Industry studies of sewer systems installed around the same time as Coffs Harbour was connected to sewer, have shown that household sewers are a significant contributor ie up to 50% of inflow into sewer mains during rain events. A recent inspection of house sewerage connections by Byron Council Shire showed 46% of house drains were defective and contributing to inflow into sewers. It was found that many house roof water pipes are connected directly to the sewerage system and household gully traps were draining hardstand yards and grassed areas. All of which is being drained to the sewer system.

The 2000 Coffs Harbour Sewer Strategy recognised this problem and proposed measures to eliminate household stormwater inflow. However due to the conflicting priorities the strategy was not resourced and failed to deliver the desired outcomes.

Studies have shown that, by adopting an ongoing house drainage inflow strategy, storm flows into the sewer system can be reduced by up to 50%. An active strategy can achieve 30-40% storm flow improvements with the implementation of an Inflow Strategy being the most cost effective in reducing inflow. A Council north of Coffs Harbour is achieving similar results over their catchments.

In the last 12 months specific monitoring of flows in some catchments has shown that the wet weather flows are 14 times higher than the average dry weather flow. Systems including pipes, pump stations and treatment plants are designed to take a flow of 6-7 times the average dry weather flow. Obviously the sewer system was not designed to cope with such high wet weather flows and will require either a major upgrade or the inflow issue to be addressed. When significant wet weather events occur, the Coffs Harbour Treatment Plant comes close to its Hydraulic Capacity. The plant operates under stress for the days following

a wet weather event dealing with the wet weather overflow storage. Attached is data showing flows at Coffs WWTP in a typical wet weather events refer Appendix A.

To start to address this matter Council engaged RAIN Contracting between 2009 and 2013 to undertake several catchment investigations in order to scope the problem and identify the extent of defective house connections. A total of 10 catchments were investigated at Corindi, Woolgoolga and Coffs Harbour. The results showed that the catchments with the highest wet weather flows also had the most defective house connections. **Generally, 50% of properties have a house service connection that improperly allows stormwater to flow into the sewer system.** The proposed program of works will commence in the older areas first where inflow is highest.

Council has attempted to address the inflow issue previously, however there was a change in legislation in 2005 which hindered progress. Council has 14,280 sewer manholes in the reticulation system. Many of these manholes are on private properties and over time they have been buried causing the inflow of ground water. Buried manholes cause significant maintenance issues when seeking access to the network to clear blockages, conduct CCTV works or to reline and repair broken pipes.

The number of buried manholes on private property is significant. During the work undertaken by RAIN it was found that 15-20% of manholes either need raising or could not be located at all, 41% of manholes had some inflow issue and 75% of the manholes surveyed over 5 catchments have defects that require rectification. This is obviously a significant problem and is responsible for stormwater inflow into the network.

### 3. Legislative Framework

In 2005 the State Government amended the Local Government Act, effectively removing Councils' powers to enforce property owners to maintain their sewerage connections to prevent inflow. After much lobbying by the Water Authorities in August 2013 the State Government introduced changes to the Local Government Act to once again enable Councils to serve notice on landholders to repair their household sewer connections to prevent stormwater inflow.

The Local Government General Regulation (2005) has regulations pertaining to the Local Government Act (1993) and is the legislation that defines the obligations of Councils in regards to the enforcement powers and public services. A major section in this legislation relates to the provisions for sewage and stormwater drainage. The key requirements and provisions that relate to inflow from house stormwater drains include:

- **16A Approvals for water supply or sewerage work subject to compliance with Plumbing and Drainage Act 2011, standards and requirements**

It is a condition of an approval allowing water supply or sewerage work that the activity approved, and any building or work associated or carried out in connection with the activity, complies with:

- any applicable requirements of the *Plumbing and Drainage Act 2011* or the regulations made under that Act, and
- any applicable standards or requirements set out or referred to in this Regulation or any other regulation under the Act or the *Environmental Planning and Assessment Act 1979*

- **21 Inspection and certification of water supply, sewerage and stormwater drainage work**

An approval referred to in item 1, 4, 5 or 6 of Part B of the Table to section 68 of the Act is subject to the following conditions:

- (a) a person must not put into use a soil, waste or house drain pipe, or cover up or conceal from view an underground or enclosed water supply, sewerage or stormwater drainage work or put into use such a work, until the work has been inspected and certified:
  - (i) by the council or a suitably qualified person determined by the council, or
  - (ii) if the work is of a type for which the approval of the Minister for Utilities is required under section 60 of the Act - in accordance with subparagraph (i) or, if that Minister has specifically authorised inspection and certification by another suitably qualified person, by that person, as having been constructed in accordance with the Act and this Regulation,
- (b) any such inspection and certification must be carried out in accordance with the Plumbing Code of Australia and the requirements of the council,
- (c) a person undertaking the construction of a water supply, sewerage or stormwater drainage work must provide every reasonable facility and all necessary information to enable inspection of the work for the purposes of paragraph (a), (d) in particular, such a person must, if required to do so by a person carrying out an inspection for the purposes of paragraph (a), produce the plan (if any) of the work for that person to look at, (e) a person carrying out water supply, sewerage or stormwater drainage work must immediately rectify to the satisfaction of the council any defect revealed by an inspection under paragraph (a).

- **143 Inspection of pipes and drains and measurement of water and sewage**

- (1) The council may, at any reasonable time:
  - (a) inspect any service pipe connected to a water main, and
  - (b) inspect any drain connected to a sewer main, and
  - (c) install meters or other devices for measuring the quantity of water supplied to, or the quantity of sewage discharged from, premises,
  - (d) measure the quantity of water supplied to, or the quantity of sewage discharged from, premises.
- (2) The occupier of the relevant premises must provide to the council such information as it requires to enable it to estimate the quantity of water actually supplied to, or the quantity of sewage actually discharged from, the premises.

- **151 Water supply, sewerage and stormwater drainage work to comply with applicable standards and requirements**

- (1) Water supply work and sewerage work that is plumbing and drainage work within the meaning of the Plumbing and Drainage Act 2011 must comply with any requirements of that Act or the regulations made under that Act.
- (2) Any other water supply work or sewerage work, and any stormwater drainage work, must comply with any applicable standards or requirements set out or referred to in the Act or this Regulation.



- **Local Government Act 1993 No 30 - Chapter 16 Part 3 Section 638**  
**638 - Discharge of prohibited matter into sewer or drain, a person who discharges any prohibited matter (being matter prescribed by the regulations for the purposes of this section) into:**
  - (a) a public sewer, or
  - (b) a fitting connected to a public sewer, or
  - (c) a public drain, or
  - (d) a gutter of a council,is guilty of an offence.  
Maximum penalty: 20 penalty units.

**Local Government (General) Regulation 2005**  
**Part 6 Division 1 Clause 137A**

**137A Substances prohibited from being discharged into public sewers**

- (1) For the purposes of section 638 of the Act (Discharge of prohibited matter into sewer or drain), roof, rain, surface, seepage or ground water is prescribed as prohibited matter.

The supporting Legislative Framework for this strategy is very strong with the Local Government Act and Regulations identifying the importance of keeping Council's sewer networks free of stormwater.

Furthermore, it should be noted the reticulation system has a series of constructed sewerage overflows which discharge into waterways during storm events. In addition to these constructed structures, overflows are common through manholes and house drains due to high inflow creating surcharging from these points. To date the NSW Environment Protection Authority has no target requirement for when these discharges may be allowed to occur. The Victorian Environment Protection Authority are proposing to meet a 1 in 5 year storm target. To date this has met with limited success however they are continuing to aim at a 1 in 5 year frequency target.

The overflow frequency that Victoria is proposing is likely to be adopted by other states. This will result in Coffs Harbour City Council being unable to comply with its current high level of stormwater inflow.

## **4. Benchmarking with other Authorities**

To better understand how the industry is currently approaching this problem SMEC was engaged to survey other like councils and their approach to this issue. Key findings are:

- All Authorities have problems with inflow from house drains
- There is no consistent approach in dealing with this problem and their approaches vary from "Doing Nothing" to having a "Managed Focused Strategy"
- All agree that to manage this problem dedicated fully funded resources are needed.
- Initial selection of properties, community communication and inspections of properties is managed by the inflow team with the actual works generally carried out by a mix of specialist contractors and Council staff
- Serving of defect notices, follow up inspection and serving of further notices on those who don't comply with initial notices is required
- The land holders seem to be more responsive when they can see council also repairing their infrastructure

This report also includes a document called Management of Wastewater System Infiltration and Inflow Good Practice Guideline the “How To” by the Water Services Association of Australia (WSAA) which gives a best practice overview for the management of Inflow and Infiltration into Sewers.

Discussions with other North Coast Councils, who are addressing house stormwater inflow reveal that they have been successful when they have dedicated a specific resource to manage the inflow reduction. Staff roles are considered further in Resources Required.

## 5. Strategy Outcomes

This strategy will generally offer the community improved environmental and economic benefits whilst informing the property owners they have a responsibility to maintain their house drains for the whole community betterment.

Key benefits are as follows:

### Economic Outcomes

- Reduced pumping costs during wet weather events
- Reduced operator call outs and clean-ups during overflow events
- Reduced likelihood of EPA imposing penalties on Council for unlawful discharge
- Extended life of pumping equipment
- Potential to defer augmentation needs of both pump stations and mains because of reduced flows
- Potential to have reduced storage needs and treatment plant augmentation
- Inspections will identify system maintenance needs that would have not been identified with current maintenance programs resulting in more efficient programing and cost effective scheduled maintenance
- Of the options available to reduce infiltration ie house drains vs Council sewer the house drain option will generate a significant infiltration reduction for a limited outlay compared with the expensive relining, replacing mains and manhole options required for Council mains. Council may find it can slow down its mains lining strategy for example when a cost benefit analysis is carried out
- Reduced treatment costs due to reduced volume of water being treated
- Extended life of existing plants with reduced peak flows
- Reduced discharge costs via the deep sea release.

### Environmental Benefits

- Reduced sewer overflows during wet periods resulting in improvements to the water quality of creeks and beaches
- Reduced volumes of sewage requiring pumping, resulting in reduced energy costs and green-house gas emissions
- Reduced chemical usage, less discharge to the environment via the Deep Sea Release
- The latest trend in the treatment industry is to produce climate neutral plants by reducing nitrous oxide and methane discharges. By reducing flows and delaying significant augmentations it gives Council the opportunity to investigate changes in treatment processes to achieve climate neutral waste treatment
- Reduced impact on marine environment resulting from decreased discharge

## 6. Financial Implications

To assess the investment viability of this strategy it is necessary to consider the cost implications of the 'no action' option as well as the strategy implementation costs.

### Option 1 - Maintaining the Status Quo (No Action)

By not addressing house drainage inflow into the sewer system there are additional major capital investment costs and ongoing operational expenditure that will require funding.

#### Additional CAPEX Costs From Not Acting:

##### 1. Additional Overflow Storage

With the Coffs Harbour treatment plant reaching its hydraulic capacity during wet weather events it will be necessary to augment the storage capacity to cater for the overflow. In 2010 a new overflow storage pond was constructed to take the increased flows however in time this will not be sufficient. The new pond was constructed at a cost of \$550,000 on a cleared site. The additional pond would be constructed north of this pond at an estimated cost of \$950,000. It is planned that this pond will be required by 2023 at the current rate of inflow, allowing for continued increases in flows.

##### 2. Coffs Harbour Waste Water Treatment Plant

The Coffs Harbour treatment plant was constructed with 2 treatment streams with room for a third when required. Without being addressed, high inflows will result in the Coffs Harbour WWTP requiring upgrade within the next 10 years. The cost of an upgrade will be in the order of \$200 million, which will include significant inlet, treatment and deep sea release works.

##### 3. Coffs Harbour Growth Strategy

Coffs Harbour's current growth strategy increases the density of existing development in certain areas of the City. With the current inflow into the system, this would necessitate very expensive augmentation of existing infrastructure. Reducing Inflow will delay or possibly eliminate the need for reticulation augmentation. The cost of the reduction of sewer augmentation has not been undertaken at this time, but is expected to be in the tens of millions of dollars

#### Summary of CAPEX

Item	Capital Investment	Timing
Additional Overflow Storage	\$950,000	2023
Upgrade of Coffs WWTP	\$200,000,000	2030
Reticulation Augmentation for Growth	\$20,000,000	2035

#### OPEX Costs:

##### 1. Excessive Pump Run Times

Analysis of three major pump stations has shown that compared to an average month a rain event increases the power costs by around \$70,000 per month. Allowing for 4 wet months in the year the power cost to transport the additional stormwater inflow is in the order of \$240,000 per annum. This cost is relevant to only three of the larger pump stations. Given there is a total of 128 pump stations the additional imposed cost is highly

significant. There are another four major pump stations that will have similar high run hours due to inflow. Allowing for these four stations the total additional power costs to transport stormwater is likely to be in the order of \$560,000 per annum.

This does not allow for the initial costs transporting the inflow to the major stations. This figure is difficult to calculate but is assessed to be a substantial additional cost. Also the additional wear on pumps and mechanical components in the system is not accounted for.

## 2. Treatment of High Flows

The analysis undertaken to determine the inflow transport costs was also applied to treatment. To treat the inflow from a wet weather event costs around \$30,000 per month. Again assuming four wet months the treatment costs of inflow is in the order of \$120,000 per annum.

## 3. Attending and Managing Overflows

Currently Coffs Harbour City Council is on a level 2 warning with the NSW Environmental Protection Authority. This is due to the occurrence of uncontrolled sewer spills in both wet and dry weather. Dry weather spills are generally caused by equipment failure. Wet weather spills are due to high flows (caused by stormwater inflow) and occur routinely in many catchments. Each spill requires water quality testing and monitoring, reporting to the EPA, management of the community, callout and cleanup costs. If inflow is managed at the house connections the frequency of wet weather spills will reduce. An estimated \$10,800 per significant rain is currently expended on sewer spill management. Assuming four significant events, an expenditure on spill management of around \$43,000 is assessed to be incurred annually.

### Summary of Stormwater-related OPEX Costs Assessed to be Incurred Annually

Item	OPEX Costs	Timing
Excessive Pump Run Times	\$560,000	Yearly
Treatment of High Flows	\$120,000	Yearly
Attending and Managing Overflows	\$43,000	Yearly
<b>Total:</b>	<b>\$723,000</b>	<b>Yearly</b>

## Option 2 - Implementing the Strategy

By implementing the strategy there are significant savings in Capex and Opex expenditure to Council. The majority of future capital renewal and upgrade expenditure (\$223m in total) will be deferred more than 15 years.

The Strategy, if implemented, can also reduce Annual Opex expenditure by around \$723,000 annually.

## Financial Summary

An annual investment of \$1,364,734 to implement the strategy will result in the following financial outcomes:

- A decrease in Opex expenditure of \$540,000 per annum, ongoing (75% of existing additional costs due to inflow)
- A capital upgrade of the Coffs WWTP being deferred, saving \$200M expenditure for a further 15 years

- The elimination of the need for another Sewerage Overflow Pond at the Coffs WWTP, saving \$950,000 in the next 5 years
- The reduction of the quantity and cost of required augmentation works for existing reticulation infrastructure necessary for growth within the next 15 years by approximately \$20M

Funding is available within the Sewer Fund to undertake these works.

*“The internal Financial Assessment for this project states: The cost of the future required sewer system CAPEX works (assuming stormwater inflows continue) is very substantial and any postponement of them due to efficiency gains in the network will be beneficial. The annual repayment of a \$200,000,000 loan at a very conservative rate of 4.5% per annum would be \$21.2 million. The depreciation charge on the upgraded STP would increase by \$6.7 million per annum.*

*This results in a total cost of approximately \$28million per annum to fund the capital renewal of the Waste Water Treatment Plant alone.”*

## 7. Resources Required

Council has 25,000 properties connected to the sewerage system. Inspections undertaken to date show more recent connections have as many defects as the older house drains. An example of the extent of the problem can be seen from the results of the 1995 De Groot Benson Inspections which identified 153 potential inflow defects from 350 properties. More recent RAIN inspections detected similar levels of defects. This is consistent with other Authorities finding that around half of all properties require some rectification work.

Given the number of properties sewered and the amount of investigation carried out it indicates there will be a requirement for ongoing inspection and corrective actions.

### Contract Resources

The initial inspection works will be carried out by specialist contractors engaged by council.

Contractors will perform the following tasks:

- Serve notices on property owners /occupiers of pending inspections
- Advise fire brigade of testing locations for smoke testing
- Locate manholes
- Smoke test mains
- Visual inspection of property and recording defects observed and recording potential defects that require further detailed investigation.
- Preparation of report of test results and defects observed and recommended further inspection requirements.
- The inspections will generate a significant defects list in the council sewers such as manhole relining and tree root intrusion clearing which is likely to be carried out by contractors.

### Council Resources

Council resources will be required for the following:

- Design in conjunction with our assets group standard spread sheet to be used for data collection and establishment of method of recording data and actions taken against individual properties.
- Preparation of Contract documents and tendering inspection works.
- Preparation of Project Management Plan and Project Management.
- Finalise Community Consultation, Communication, and Education Plan.
- Re-inspection of properties inspected to date where defects have been identified.
- Ensuring property owners are served the appropriate notices.
- Ensuring the fire brigade is advised of smoke testing on an ongoing basis.
- Analysing data from inspections.
- Preparation of notices to owners with defective house drains and to those whose sewers are defect free.
- Ensuring operations and Asset Strategist have details of faulty council sewers identified as a result of inspections to enable repair works to be scheduled.
- Log all defects on private and council sewers.
- Map and monitor progress of defect rectification.
- Package works, engage and manage subcontracts for manhole lining, junction and pipe patching and root clearing.
- Re inspection of properties that were served notices once their prescribed period to repair defective house drains has expired.
- Call for expression of interests from licensed Plumbers who are prepared to carry out repair works to pass on to owners or use if owners fail to repair defects.
- Prepare and have served Notices of Intention to give an Order No. 5(h) requiring the disconnection of the inflow of Council's sewer mains and follow up with fine and organising work to be done by licenced plumber.
- Nominate a Council contact point for owners suffering hardship and wishing to take up Council's hardship provisions to enable repairs to be carried out.
- Ensuring all defects and repairs are recorded in the Asset system against the property.
- In conjunction with operations, staff analyse inflow improvements within catchments as a result of these works and report these results to management.
- Measure decreased overflows, pumping costs, treatment costs and identify where augmentation is put off as a result of decreased flows having to be managed.
- Repair broken mains junctions.
- Line corroded manholes.
- Raise buried manholes and seal all joints.
- Install new surrounds and gas tight lids where needed.

Resources required to manage and carry out these works consist of a Water/Sewer Engineer, Inflow Reduction Supervisor, Project Officer and a 2 man field crew. The establishment of this team will commence with the appointment of the Engineer and then be filled as the program demands build.

This is the point at which previous attempts to address the inflow issue failed in that trying to allocate resources away from the business as usual activities was not successful. Additionally, this has been a major contributing factor to the success of the program at other Authorities, most notably Tweed Council.

## Implementation Costs

Item	Resource	When Required - Commencing	Amount	
1	Operational plant and staff costs	3 <sup>rd</sup> Qtr 2018/19	\$369,800	Annual
2	Operational plant and staff costs	4 <sup>th</sup> Qtr 2018/19	\$194,934	Annual
3	Connection Testing and Inspections 2000 @ \$200/Property - Contractor	1 <sup>st</sup> Qtr 2019/20	\$400,000	Annual
4	Repairs to Council infrastructure	4 <sup>th</sup> Qtr 2018/19	\$400,000	Annual
<b>Total:</b>			<b>\$1,364,734</b>	

## Capital Renewal / Operational Expenditure and Yearly Allocation

Item	Resource	2018/2019		2019/2020		Ongoing	
		Renewal	Operational	Renewal	Operational	Renewal	Operational
1	Operational plant and staff costs	\$171,066	\$15,750	\$502,934	\$61,800	\$502,934	\$61,800
2	Connection Testing and Inspections			\$400,000		\$400,000	
3	Repairs to Council infrastructure	\$100,000		\$400,000		\$400,000	
	<b>Total:</b>	<b>\$271,066</b>	<b>\$15,750</b>	<b>\$1,302,934</b>	<b>\$61,800</b>	<b>\$1,302,934</b>	<b>\$61,800</b>

*Note: All amounts are present values*

As previously stated, Council the value of the Sewerage Assets is over \$700M. The annual expenditure of approximately \$1.3m represents a 0.2% renewal ratio. Considering the high value of the assets, the funding of this strategy is an appropriate and measured response to the inflow issue. Fortunately, the Sewerage Fund can afford to fund this strategy and a favourable outcome can be delivered which addresses the risk to the assets from inflow.

## 8. Project Duration

### With Proposed Resources

It is envisaged that no more than four catchments will be worked on at once. Catchments will be prioritised so that high flow areas are addressed first. Not every catchment will need full investigations and defect rectification at this stage. From the inflow measurements at the pump stations it is estimated that it will take up to 10 years to resolve the high flow areas, with completion due in 2029. By this time the existing newer areas will need investigation and are likely to require defect rectification. In summary inflow management will become an ongoing routine operational activity.

### Accelerating the Program

To have a significant impact on the problem a 10 year horizon is too long. After 1 year's operation the procedures will be established, community engagement practice implemented and there should be some measurable results evident in the catchments. Subsequently a review will be conducted to assess the viability of accelerating the works. A report will be presented to Executive Leadership Team for information and consideration at that time.

## 9. Community Impact

Council has accepted that household sewers commence at the inspection opening just inside the property. Most councils define the house drain as the pipework right up to the junction of the sewer main. This leads to numerous neighbour disputes and access issues which are avoided by Council accepting the responsibility for the house drain from the inspection opening to the sewer main. House drains are significant contributors to inflow and in accepting this portion of the house drain Council accepts the cost for repair of damaged drains up to the inspection opening. A diagram is attached showing the limits of responsibility between the householder and Council, refer Appendix B.

The main areas where house drains cause inflow are as follows:

- Illegal connections of storm water downpipes to sewer drains.
- Broken or intentionally removed IO caps with overland flows directed towards them.
- Gully traps not constructed to code and overland water draining to them.
- Unroofed industrial wash downs with large hardstand areas draining directly to the sewer.
- Damage to house drains due to landscaping eg trees.
- Most house drains built pre 1980 are constructed with clay pipes. Some have mortar joints and some have rubber rings. Most would have failed allowing infiltration.
- Buried manholes in yards allow inflow of groundwater and maintenance difficulties in the system.

Council will be requesting residents rectify defects on their house connections at their cost. To ensure householders are informed, an outline of the Draft Communication and Education Strategy has been compiled targeting the relatively small number of households inspected annually. This document will be developed by the Engineer once engaged. There will be community information pamphlets and door knocks to explain the proposed works to ensure property owners are correctly informed of the aims and intention of the program and their responsibilities. An Outline of the Communication and Education Strategy is attached, refer Appendix C.

Investigations undertaken by RAIN Contracting found that 15-20% of manholes need either raising or could not be located, 41% of manholes had some inflow issue and 75% of the manholes surveyed over 5 catchments have defects that require rectification. Considering that there are 14,280 sewer manholes in the reticulation system this is a considerable issue. Inaccessible manholes cause significant maintenance issues when seeking access to the network to clear blockages, CCTV lines or reline and repair broken pipes. Furthermore a buried manhole is a major source of inflow into the system through ground water entering through the gap between the concrete lid and surround.

Defects associated with manholes are generally Council's responsibility to rectify, except when the property owner has either buried or built a structure over the manhole. Unfortunately to raise a manhole is expensive and can be specialised work. RAIN Contracting found that manholes had been buried between 200mm and 800mm deep. The cost to raise the manholes will vary from around \$800 to \$2,500 each and more if there a structure has been built over the manhole.

The issue of who raises buried manholes will be contentious for the following reasons:

- Many property owners will be unaware that there is a buried manhole on their property as a previous owner would have covered the manhole and at the time of purchase the existence of a buried manhole was not disclosed.



- The cost will be significant and not a part of the property owners planned expenditure.
- Manhole work is not something that Plumbers usually undertake and are likely to charge more than necessary, increasing the cost to the property owner.
- Any work on manholes will require inspection and approval by Council staff as the structure is part of the reticulation network.

Considering that Council will be requiring the property owner to pay for the rectification of defects on house service lines and gully traps it could be difficult to also expect them to pay for the raising of manholes. In situations where the manhole has been damaged or use restricted, prior to 2009, by environmental factors or by a previous property owner, the defect rectification works associated with manholes is proposed to become Council's responsibility.

Where the current property owner has buried a manhole and in effect restricted the use, post 2009, of a Council owned asset, that property owner will be held responsible for the rectification costs associated with the manhole.

Council has developed a Guideline for Cost Recovery Associated with Repair and Raising of Manholes in private property, which reflects the position adopted in this strategy.

It is anticipated there will be some property owners experiencing genuine hardship who will be able to access the provisions in accordance with Council's Hardship Policy.

As part of this strategy a Communication and Education Plan will be developed prior to on-ground implementation of the works to ensure relevant stakeholders are informed. The plan will be targeted to the catchments being worked on so there will not be a large amount of residents affected at any one time.

## 10. Implementation Timeline

Item	Project Milestones	Completion Date
1	Council Briefing	Feb 2019
2	Council Adopt Strategy	Feb 2019
3	Advertise and appoint a supervising Engineer	Feb/Mar 2019
4	Refine Project Plan, Comms Strategy and processes	Apr/May 2019
5	Advertise and appoint Inflow Reduction Supervisor	Apr 2019
6	Review Current Inspection data and prioritise works	May 2019
7	Implement a targeted Communication/Education Strategy	June 2019
8	Commence property inspections	Aug 2019
9	Prepare and serve Notices of Intention and follow through until repairs are completed.	Sept 2019
10	Prepare contract documents and tender a further 2000 house inspections and appoint contractor	Oct 2019
11	Develop procedures for inspecting properties when ownership occurs and charge policy for inspections	Dec 2019
12	Report back to Executive Leadership Team (ELT) on progress	Feb 2020

## 11. Strategy Actions

### 1. Resourcing

Dedicate permanent resources in the operational area to manage and carry out the Inflow Reduction Program. This team would consist of a Water Engineer, Inflow Reduction Supervisor, Project Officer and field crew. The establishment of this team will commence with the appointment of the Engineer and then be filled as the program demands.

### 2. Develop the Project Plan

Develop a Project Plan to establish process, timelines, targets and outcome measures. This will be undertaken by the Engineer for approval by the Group Leader before commencing works. The Project Plan will be compiled in consultation with the Asset Strategist - Water to ensure best whole of life catchment management is achieved.

The Project Plan will include reporting protocols agreed by the Director of Sustainable Infrastructure for reporting to Executive as required.

### 3. Consultation, Communication, and Education Plan

Compile a Communication and Education Plan for implementation as part of the project implementation.

### 4. Contractor Funding

Allocate \$400,000 annually commencing in 2019/20 for the engagement of a contractor to undertake catchment investigations.

### 5. Capital Renewal/Operational Funding

Dedicate permanent resources in the operational area to manage and carry out the Inflow Reduction Program. This team would consist of a Water Engineer, Inflow Reduction Supervisor, Project Officer and field crew. The establishment of this team will commence with the appointment of the Engineer and then be filled as the program demands.

5.1 Allocate \$564,734 for operational team project wages and plant to fund the Water Engineer, Inflow Reduction Supervisor, Project Officer and field crew.

5.2 Allocate \$400,000 annually for the rectification of defects found on Council's side of the IO and associated with the sewer mains and manholes.

### 6. Inflow Inspection Service

Develop a policy and communication strategy that enables Council to provide a paid inspection service for sewer defects where properties exchange ownership or upon request of ratepayers.

### 7. Review of Inflow Strategy

After 1 year of operation present to the Executive Leadership Team a review of the effectiveness of the strategy implementation and progress to date. Flows will be measured in rainfall events greater than 20mm to compare flows in catchments after the implementation of the strategy to quantify the reduction in flows achieved.

## 12. Risks

<b>Risk</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Mitigation Strategy</b>
Community objection to inspection of property	Medium	Possible	Develop and implement ongoing Communication and Education Strategy
Property owners claiming financial hardship and inability to pay for repair works	Medium	Likely	Develop and Implement Hardship financing strategy
Property owners failing to repair defects in time nominated	High	Possible	Serve notice of intention
Council carrying out repairs on council infrastructure in properties after notices of intention served	High	Possible	Ensure council works are completed before notices of intention served

Impact Ratings:

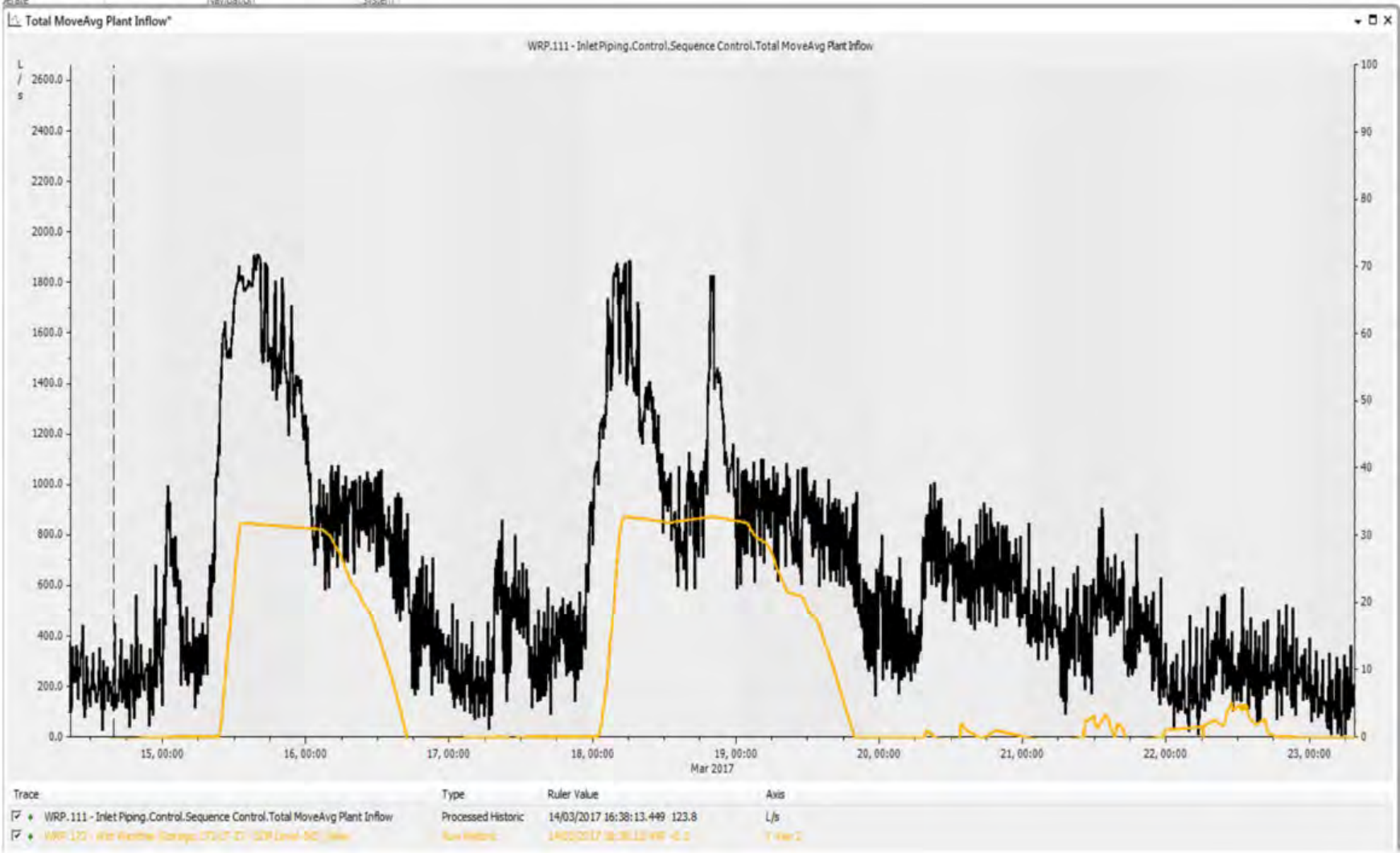
*Low / Medium / High*

Likelihood Ratings:

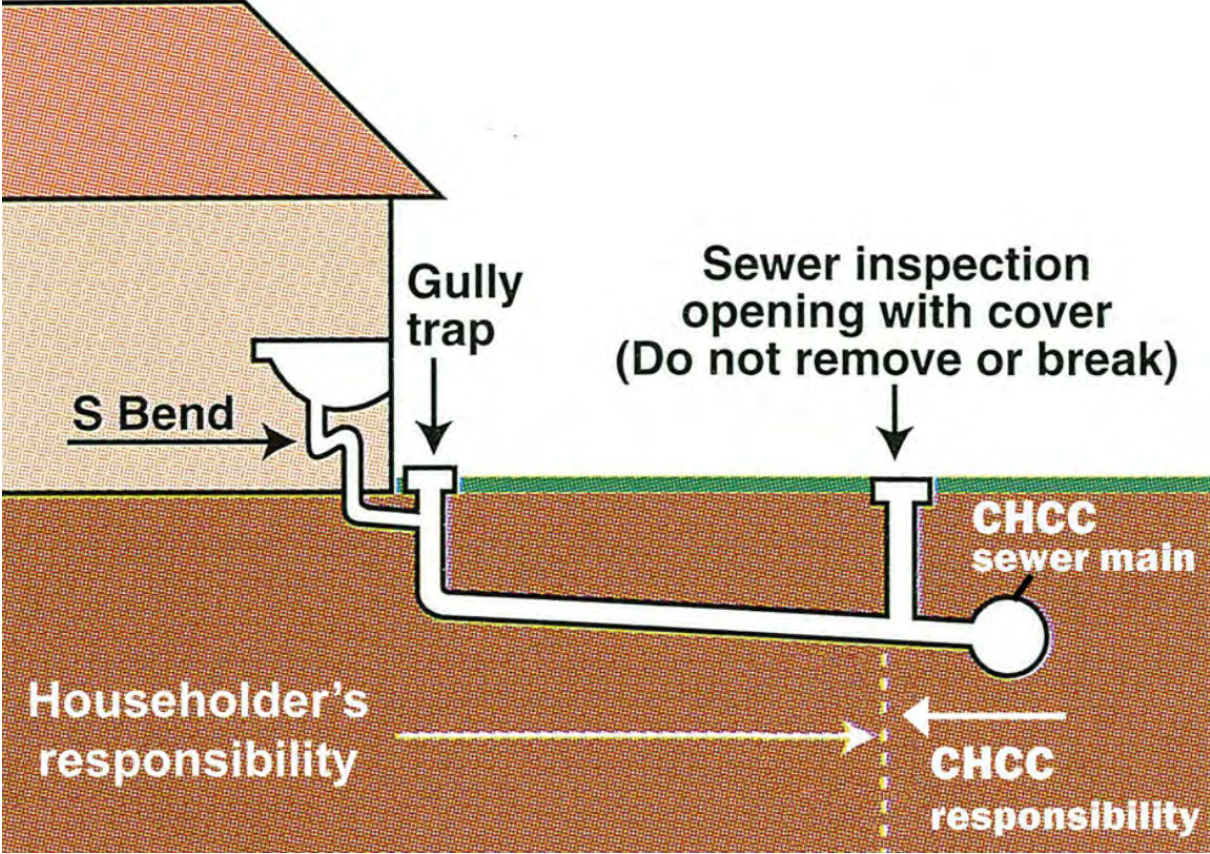
*Unlikely / Possible / Likely*

# Appendix A

## INFLOW AT COFFS WWTP – 250mm RAINFALL EVENT, over 4 days.



**Appendix B  
DELINEATION OF HOUSE DRAIN RESPONSIBILITY**



## Appendix C

# OUTLINE OF PROPOSED COMMUNICATION AND EDUCATION STRATEGY

## COMMUNICATION AND EDUCATION STRATEGY

### 1. Introduction

The issue of stormwater inflow and infiltration into sewer networks is a state wide problem facing most Council authorities. Earlier this year Council commissioned an investigation into this issue and a report was produced which examined the strategies and approaches of other Council authorities in dealing with this issue. The information obtained from other Councils has been used to assist Coffs Harbour City Council in developing and implementing a successful strategy to reduce this problem.

Council is about to implement a comprehensive strategy to address the problem of stormwater inflow and infiltration of the sewerage system network from domestic sources. This strategy will address the issue on several fronts.

- 1.1 Since the adoption of the current Sewer Strategy by Council in 2000, Council has carried out over \$200M worth of sewage capital augmentation works and the refurbishment of existing infrastructure to limit infiltration and inflow into the system. Council has also spent in the order of \$7M, reducing infiltration into the sewer mains by lining leaking pipes and repairing manholes. This work is an ongoing program to keep infiltration into Council mains to a minimum.
- 1.2 The inflow from house stormwater connections constitutes around 50% of the total stormwater inflow into the sewer reticulation system. With Council spending significant funds and effort on correcting the leaks in the sewer mains it is necessary that inflow from house stormwater connections is also addressed. Whilst inflow into the system is contributed to by illegal stormwater connections directly into the sewer, there are also issues inside properties which contribute to infiltration such as damage to sewer pipes and buried man-holes. Council is about to undertake a comprehensive House Drain Inspection Program to check for non-compliant connections to the sewer system, infrastructure problems and, where appropriate, will be directing property owners to rectify any issues identified.

To support this initiative a comprehensive Communications and Education Strategy will be implemented to provide essential information to property owners/householders as the program progresses. The strategy acknowledges that a number of catchments will be selected for the first years' implementation of the program and that these will be divided into lots. Delivery of certain components of the communications action plan will be matched to meet the delivery timeframes for each lot.

### 2. Objectives

- 2.1 To identify the key stakeholders impacted by the program.
- 2.2 To foster an understanding within the general community that the stormwater and sewerage systems are separate networks and should not be interconnected.
- 2.3 To raise awareness within the general community of the need to reduce inflow and infiltration into the sewerage system
- 2.4 To assist householders understand why Council is undertaking this program and what benefits it will afford.

- 2.5 To provide information up front in anticipation of frequently asked questions from householders.
- 2.6 To provide householders with information to encourage proactive practices which they can undertake to minimise the incidence of inflow and infiltration inside property boundaries.
- 2.7 To provide clear information to the householders of the delineation of house drain responsibility.
- 2.8 To provide information about the inspection and rectification process to facilitate a clear understanding by householders of their responsibilities.
- 2.9 To provide timely notification to other stakeholders who may be affected by the program once it is underway.
- 2.10 To provide an ongoing education campaign to maintain awareness of the program.
- 2.11 To report the progress of the program at key milestones to both the general community and to Council.
- 2.12 To identify a range of opportunities to further promote the program once it is underway.
- 2.13 To monitor and identify risks to the program's implementation and to take appropriate action to mitigate.

### **3. Methodology and Draft Action Plan**

As this program is a new initiative the Communication and Education Strategy (CAE) will be a living document which will need to be responsive to issues and circumstances that arise as a consequence of the program delivery. Furthermore, it will need to ensure that milestones are identified and that a review is undertaken at these key points to:

- check progress
- identify issues
- assess opportunities to address issues
- determine and implement response measures

#### **3.1 The Key Messages** which will be initially communicated are:

- The sewerage network is not meant for stormwater.
- During wet weather inflow and infiltration can overload the sewerage network increasing the chances of sewage backing up and potentially spilling into streets, parks, waterways, beach and even homes.
- It is important that all community members make an effort to prevent stormwater from entering the sewerage network where possible.
- Council is implementing the program to deliver significant public health, environmental and operational cost benefits.
- Both Council and householders have responsibility for different sections of sewer infrastructure in relation to private property.

#### **3.2 Stakeholders**

- 3.2.1 Councillors and Council staff
- 3.2.2 General community

- 3.2.3 Property owners/Householder group identified for roll out of program
- Need to identify absent owners to include in notifications.
  - Need to identify process for notifying resident non-owners.
- 3.2.4 Industry, Business and other organisations.
- Need to identify groups: for example
    - Real Estate industry which may present opportunities for education of property buyers/sellers.
    - Schools for education programs.
    - Real estate property managers and body corporate for notification to tenants of impending inspections.

### 3.3 Managing Risk

In addition to regular reviews of the program any major issues should be assessed in terms of risk using a similar format to that shown here. This an adaption from the IAP2 Consultation model used as a framework for much of Council's consultative process. This can be consolidated into the risk assessment in section 12 of the main strategy document.

STAKEHOLDERS AND ISSUES RISK ASSESSMENT WORKSHEET	ASSESSMENT RATING		STAKEHOLDER GROUP
	None / Low / Moderate / High / Unknown		
ACTION / EVENT / ISSUE	LEVEL OF CONCERN	LEVEL OF IMPACT	MITIGATION MEASURES

### 3.4 Draft Action Plan – Stage 1 roll out

The draft action plan below sets out to key mechanisms to be used to deliver the communication and education aspects to support the program. This plan is also a living document and needs to respond to issue arising and circumstances accordingly.

ACTION	COMMUNICATIONS (COMMS)	STAKEHOLDERS
Report to Council for adoption	<ul style="list-style-type: none"> <li>• CHCC internal comms</li> </ul>	<ul style="list-style-type: none"> <li>• CHCC Internal staff</li> <li>• Councillors</li> </ul>
Identify stakeholders involved in roll out of the program	<ul style="list-style-type: none"> <li>• CHCC internal comms</li> </ul>	To be determined by delivery criteria
Announcement of House Drain Inspection Program	<ul style="list-style-type: none"> <li>• Press release to the Advocate announcing the program</li> <li>• 3MMM news read</li> <li>• CHCC internal comms</li> <li>• Customer Resolution briefing sheet</li> </ul>	<ul style="list-style-type: none"> <li>• General community</li> <li>• All Council staff</li> <li>• Customer Resolution staff</li> </ul>
Activation of initial information package	<ul style="list-style-type: none"> <li>• Distribution of fact sheet #1</li> </ul>	ALL
Engage householders identified for initial roll out of program	Notifications of Intent sent out to property owners and /or householders	As per lot schedule
Inspections and follow up on issues/defects found	Notification letters and door knocks	As per lot schedule



ACTION	COMMUNICATIONS (COMMS)	STAKEHOLDERS
Review and assessment at first milestone or as needed	Feedback from site inspectors/contractors and householders	<ul style="list-style-type: none"> <li>• Inspectors/contractors and householders</li> <li>• Customer Resolution staff</li> <li>• CHCC staff</li> <li>• Councillors</li> <li>• General community</li> </ul>
Identify opportunities for refinement and reiteration of key messages	<ul style="list-style-type: none"> <li>• CHCC internal comms</li> <li>• Possible Media release and/or radio spot</li> <li>• Revised fact sheet or FAQ sheet</li> </ul>	<ul style="list-style-type: none"> <li>• Customer Resolution Staff</li> <li>• CHCC sewer staff</li> </ul>

