City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	May 30, 2016
From:	John Irving, P.Eng. MPA Director, Engineering	**File:**	10-6060-03-01/2016-Vol 01
Re:	**Grease Management Program Update**		

Staff Recommendation

That the report titled "Grease Management Program Update" from the Director, Engineering dated May 30, 2016 be received for information.

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Sewerage & Drainage Community Bylaws	☑ ☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** DW	**APPROVED BY CAO**

Staff Report

Origin

At the May 18, 2011 Public Works and Transportation Committee, Committee introduced the following referral:

> *That staff further investigate initiatives around the elimination of grease in sewer pipes.*

At the September 26, 2011 Regular Council Meeting, Council adopted the following motion:

> *That the five year Sanitary Pump Station and Forcemain Assessment and Upgrading Program (2012 to 2016) which includes forcemain pressure monitoring, forcemain access installation, forcemain inspection and FOG remediation, be endorsed for submission in the 2012 to 2016 Capital Plan for consideration.*

This report supports Council's 2014-2018 Term Goal #6 Quality Infrastructure Networks:

> *Continue diligence towards the development of infrastructure networks that are safe, sustainable, and address the challenges associated with aging systems, population growth, and environmental impact.*
>
> *6.1. Safe and sustainable infrastructure.*

FOG, or Fat, Oil, and Grease, is better understood by the public and more commonly referred to as grease. This report provides an overview of the grease management initiatives implemented to date, initiatives currently being explored, as well as potential opportunities to further manage grease as the program continues to develop and expand.

Analysis

The impacts of grease on municipal sanitary sewer systems are a significant concern for the City and Metro Vancouver. Grease issues are primarily attributed to food establishments and residential properties that dispose of food waste into the sewer system either directly or as part of cleaning waste, such as dishwater.

The City's most significant grease issues occur in City Centre and various residential areas (see Attachment 1). In particular, the Lansdowne sanitary forcemain has had multiple failures mainly due to excessive pressures caused by grease build-up. The City spends approximately $380,000 annually on inspecting and cleaning sanitary sewers and pump stations identified as problematic. Metro Vancouver has also observed grease issues and is currently twinning the Gilbert Road Trunk Sewer to provide capacity for growth and facilitate future maintenance as a result of grease build-up. The cost to upgrade and twin the Gilbert Road Trunk Sewer is estimated at $100 million.

Grease Management Initiatives Implemented

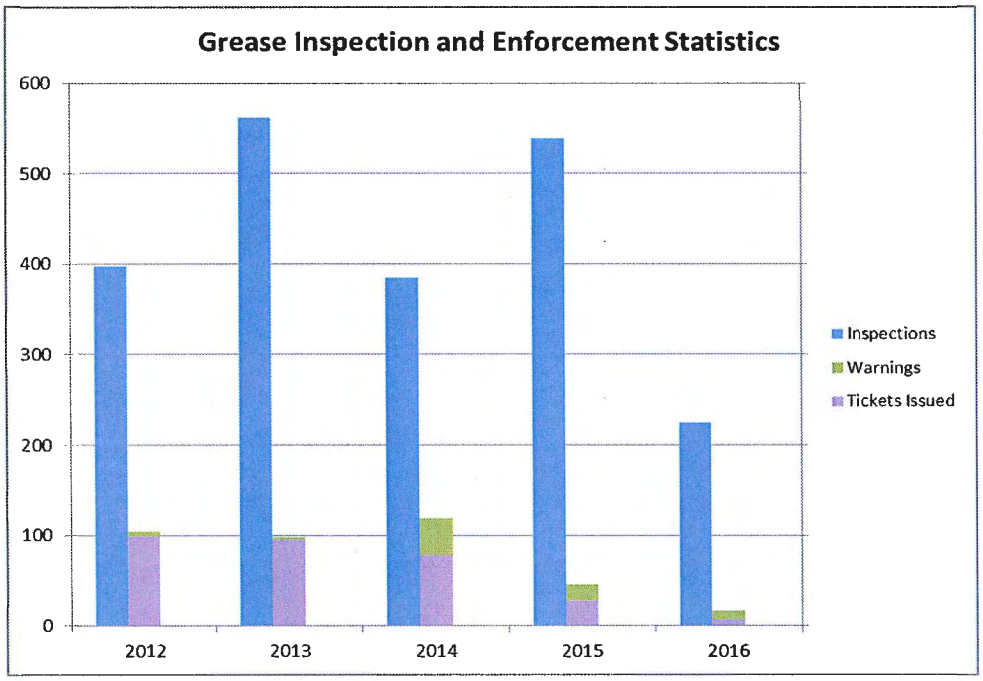
The City's Grease Management Program includes initiatives such as grease source control, public communication, sanitary sewer system monitoring and inspection, and on-going maintenance.

Grease Source Control

Controlling grease at the source is the most effective way to reduce grease build-up in the municipal sanitary sewer system. Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551, in conjunction with the Greater Vancouver Sewerage and Drainage District (GVS&DD) Food Sector Grease Interceptor Bylaw No. 268 requires food establishments to install and maintain grease traps.

Figure 1 illustrates the inspection and enforcement activities performed since enforcement started in 2011. While there is a high level of compliance with the bylaw, inspection and enforcement remains an important tool for grease management. Staff will continue to monitor compliance and report any significant changes should they be identified.

Figure 1. Grease Inspection and Enforcement Statistics



The City's Green Cart Program also contributes to preventing grease from entering sanitary sewers by collecting food scraps for composting and discouraging the use of garburators. The Green Cart Program is available to both single-family and multi-family properties. In addition, residents can dispose of cooking oil and animal grease at the City's Recycling Depot.

Public Education and Communication

The GVS&DD bylaw and City bylaw do not directly address grease mitigation for residential properties; therefore, the City uses public education and communication to target the residential sector. Grease education and communication is delivered through utility bill inserts, information pamphlets in English and Chinese, social media, and public events such as the Public Works Open House.

Sanitary Sewer System Monitoring and Inspection

Pressure monitoring is conducted at every pump station in order to identify constrictions due to grease build-up in sanitary forcemains. Monitoring allows the City to be proactive and to prepare a planned response to grease issues while minimizing remediation cost and public disruption. In order to facilitate inspections of forcemains that are under abnormally high pressures, valves and inspection chambers are being installed on new forcemains in order to easily isolate sections of the system for inspection.

For gravity sanitary sewers, the City has a closed-circuit television (CCTV) inspection program. The City recently completed the CCTV inspection and condition assessment for the final section of sanitary sewers in the City, fulfilling its commitment to the Integrated Liquid Waste Resource Management Plan six years ahead of schedule. In addition, staff perform visual inspections for sections known to have grease issues, as part of the program to maintain gravity system capacity and prevent sanitary sewer overflows.

On-Going Maintenance

The City performs scheduled flushing of gravity sanitary sewers throughout the City with the primary focus on City Centre, which is on a 12-month cycle. Sanitary pump stations are also cleaned on a regular basis (approximately once every two weeks).

Grease Management Initiatives Currently Being Explored and Potential Future Opportunities

Staff are investigating additional initiatives to manage grease as well as potentially harvesting grease as a resource, and will report back to Council if there are any opportunities to be pursued further. These initiatives include biofuel conversion, district energy utility (DEU) integration, additional sanitary system monitoring, regulatory policy review, and a proposed grease management capital project.

Biofuel Production

The City is actively pursuing opportunities to partner with renewable energy companies to extract grease from the sanitary sewer system and produce sustainable biofuels. Most recently, the City collaborated with Earth Renu Energy Corp on a sewer grease collection and biodiesel production trial. Grease was collected from several pump stations, purified, analyzed, and used to produce biodiesel. Staff are currently working with Earth Renu to investigate options to improve the feasibility for grease extraction and processing, with the ideal outcome of developing a favourable business case to offset grease removal costs.

Additional Sanitary System Monitoring

Temperature is one of the variables that affect the solubility of grease. As temperature decreases, grease comes out of solution and solidifies. Staff will be conducting temperature monitoring and grease sampling at pump stations in order to determine the conditions in which grease is most prevalent as well as to identify catchments to target for maintenance and future initiatives.

DEU Integration

The DEU utilizes sustainable energy solutions, such as using thermal energy from the ground and waste heat to provide heating and cooling to residential and commercial buildings. Raw sewage has heat energy that can be extracted and used by the DEU. Extracting heat from sewage will decrease its temperature and potentially improve grease harvesting. Staff are currently investigating potential synergies with integrating the DEU with grease management/harvesting technologies and practices in City Centre.

Green Carts and Review of Regulatory Policies

Vegetables and other organic matter, which contain significant grease, enter the sanitary sewer system when garburators are used. However, the sanitary sewer system is not the best means to gather and dispose of food waste. The Green Cart Program is the most suitable option for disposal of food waste and has the potential to reduce the use of garburators and make them obsolete. To supplement the Green Cart Program, staff will investigate the possibility of providing residents with biodegradable grease containers that are acceptable in green carts.

In addition, staff will review regulatory policies with respect to garburators and grease traps. As the BC Plumbing Code does not prohibit garburators from being installed, staff will investigate the impact of garburators towards grease and review the effectiveness and feasibility of prohibiting garburators for new construction and major renovations. Furthermore, the BC Plumbing Code does not require grease traps for residential properties. Staff will investigate the feasibility and perform a cost-benefit analysis on a grease trap program for multi-family properties.

Staff will bring forward a grease management capital program to a future capital budget process for Council's consideration.

Financial Impact

None.

Conclusion

The City's Grease Management Program currently includes initiatives such as grease source control, public communication, sanitary sewer system monitoring and inspection, and on-going maintenance. Staff are investigating additional initiatives to manage grease as well as potentially harvesting grease as a resource, and will report back to Council if there are any opportunities to be pursued further. These initiatives include biofuel conversion, DEU integration, additional

sanitary system monitoring, regulatory policy review and a proposed grease management capital project.

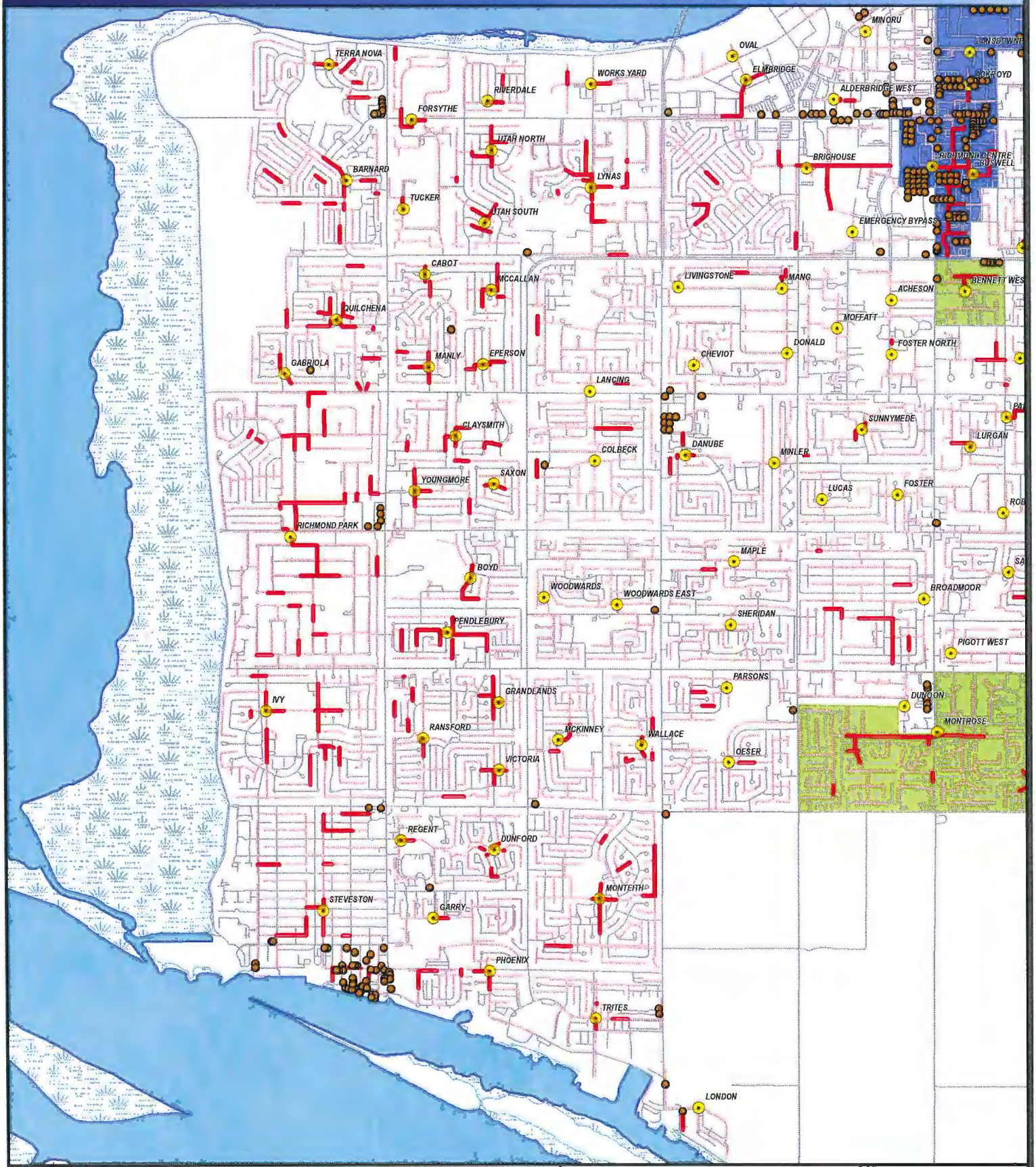
Lloyd Bie, P.Eng.
Manager, Engineering Planning
(4075)

Jason Ho, P.Eng.
Project Engineer
(1281)

LB:jh

Att. 1: Grease in City of Richmond Sanitary Sewers

Attachment 1 - Grease in City of Richmond Sanitary Sewers (1 of 3)



Legend

- Food Establishments
- Sewer Pumps
- Gravity Mains with Grease
- Gravity Mains

Catchments with Grease Problems

- Highest Level of Grease
- Second Highest Level of Grease

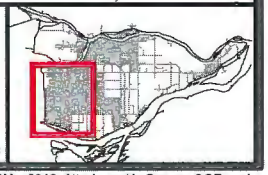
PWT - 14

Note:
The information shown on this map is compiled from various sources and the City makes no warranties, expressed or implied, as to the accuracy or completeness of the information. Users are reminded that lot sizes and legal description must be confirmed at the Land Title office in New Westminster. This IS NOT a legal document, and is published for information and convenience purposes only.

NORTH

0 100 200 400
Meters

Map By: Jhannan
Map Date: May, 2016



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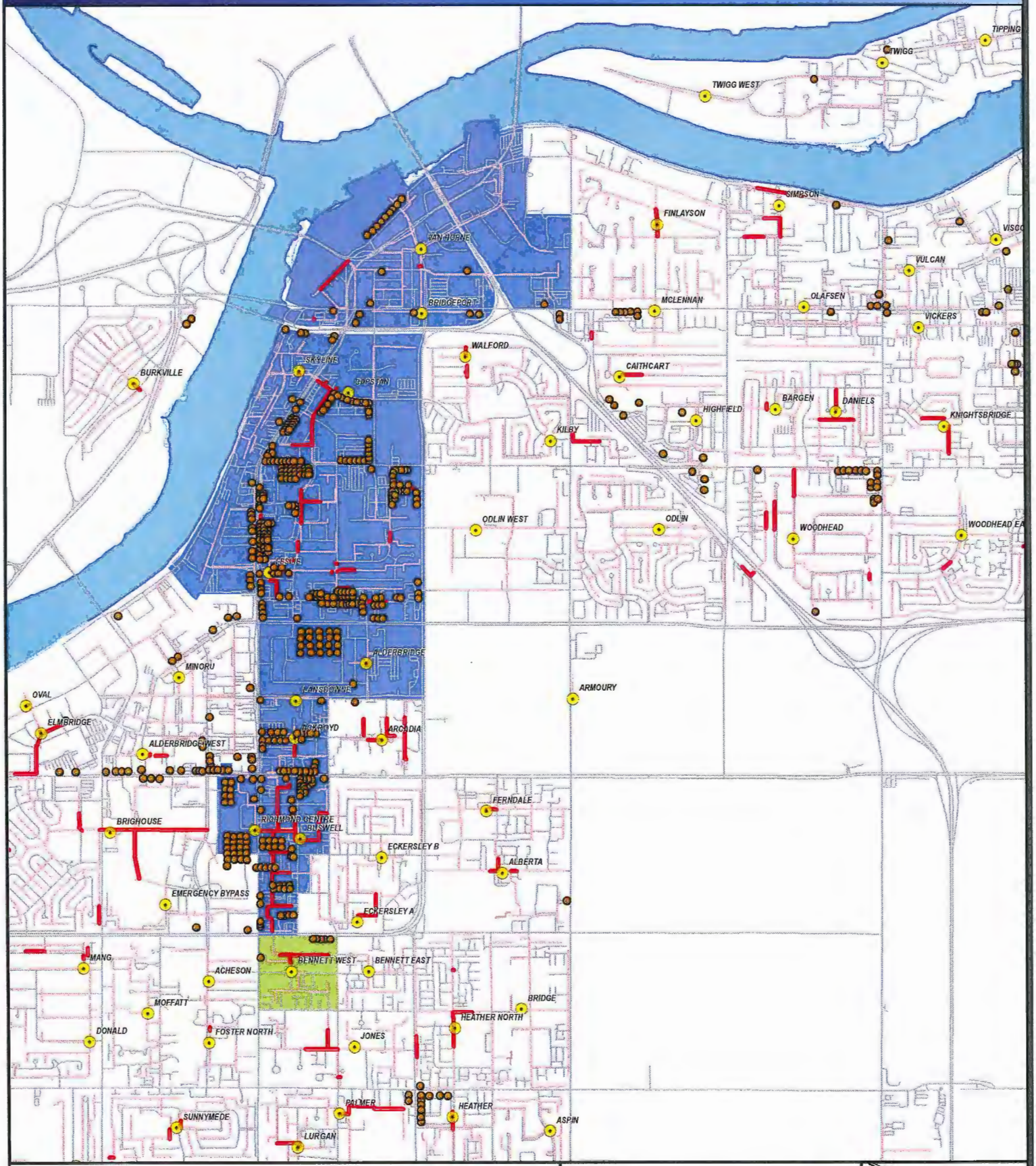
Attachment 1 - Grease in City of Richmond Sanitary Sewers (2 of 3)



Legend

- Food Establishments
- Sewer Pumps
- Gravity Mains with Grease
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Catchments with Grease Problems

- Highest Level of Grease
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PWT - 15

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NORTH

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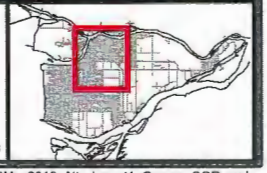
Meters

Map By: Jhannan
Map Date: May, 2016



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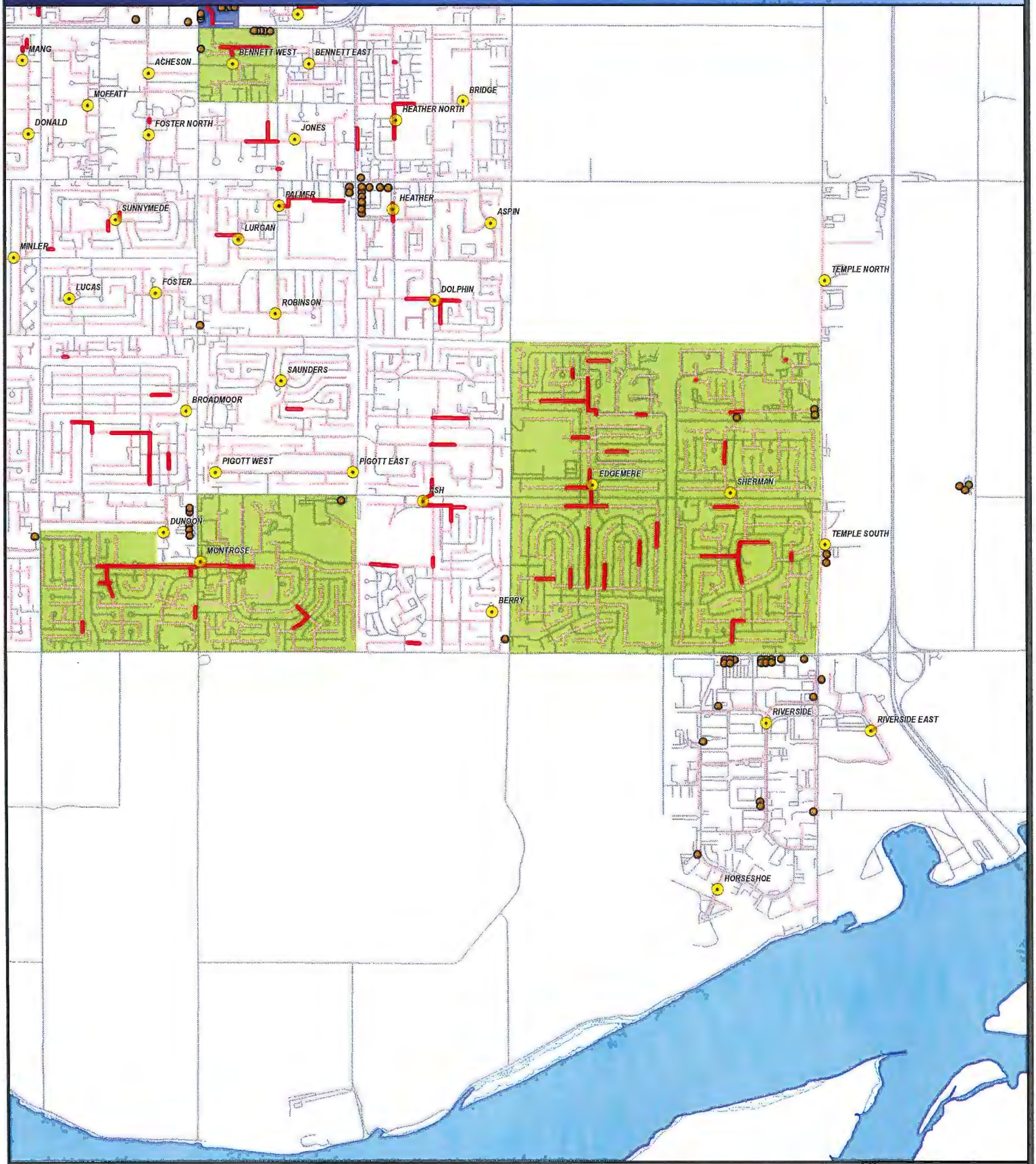
Attachment 1 - Grease in City of Richmond Sanitary Sewers (3 of 3)



Legend

- Food Establishments
- Sewer Pumps
- Gravity Mains with Grease
- Gravity Mains

Catchments with Grease Problems

- Highest Level of Grease
- Second Highest Level of Grease

PWT - 16

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NORTH
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