



# City of Richmond

## Report to Committee

**To:** General Purposes Committee

**Date:** December 20, 2018

**From:** John Irving, P.Eng. MPA  
Director, Engineering

**File:** 12-8060-20-009921/Vol 01

**Re:** **City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 9947**

### Staff Recommendation

That the City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 9947 presented in the “City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 9947” report dated December 20, 2018, from Director, Engineering be introduced and given first, second, and third readings.

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

REPORT CONCURRENCE		
<b>ROUTED TO:</b>	<b>CONCURRENCE</b>	<b>CONCURRENCE OF GENERAL MANAGER</b>
Development Applications Law	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
<b>REVIEWED BY 1A/5B</b>	<b>INITIALS:</b> 	<b>APPROVED BY CAO</b> 

## Staff Report

### Origin

In October 2015, Council endorsed the issuance of a Request for Expression of Interest (RFEOI) to identify a suitable utility partner to conduct a feasibility analysis to design, build, finance and operate a district energy utility (DEU) in the City Centre North area of Richmond, on the basis of the following guiding principles:

1. The DEU will provide end users with energy costs that are competitive with conventional energy costs based on the same level of service; and
2. Council will retain the authority of setting customer rates, fees and charges for DEU services.

LIEC staff issued a Request for Proposals (RFP) in September 2016, with an expanded scope for City Centre to the three proponents shortlisted under the RFEOI. LIEC executed a Memorandum of Understanding with the lead proponent, Corix Utilities Inc. (Corix) in February 2018, as directed by LIEC Board and endorsed by Council.

As the City Centre DEU due diligence process has advanced, through rezoning applications and/or Official Community Plan (OCP) amendment application, six developments have committed to construct and transfer energy plants to the City or LIEC at no cost to the City or LIEC, so that LIEC can provide immediate service to these customers.

Council endorsed City Centre District Energy Utility Bylaw No. 9895 (CCDEU Bylaw) in September 2018, introducing a new district energy service area starting with five developments. In October 2018, Council amended the CCDEU Bylaw to include the Richmond Centre Mall development.

The purpose of this report is to recommend expansion of the service area to include the Polygon Fiorella development, located at 3551, 3571, 3591, 3611 and 3631 Sexsmith Road, associated with rezoning application RZ 17-778835.

This report supports Council's 2014-2018 Term Goal #4 Leadership in Sustainability:

*Continue advancement of the City's sustainability framework and initiatives to improve the short and long term livability of our City, and that maintain Richmond's position as a leader in sustainable programs, practices and innovations.*

*4.1. Continued implementation of the sustainability framework.*

*4.2. Innovative projects and initiatives to advance sustainability.*

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.*

6.2. *Infrastructure is reflective of and keeping pace with community need.*

## **Background**

### District Energy Utilities as Part of a Sustainable Community

Richmond's 2041 Official Community Plan (OCP) establishes a target to reduce community greenhouse gas (GHG) emissions 33 per cent below 2007 levels by 2020 and 80 per cent by 2050. The OCP also includes a target to reduce energy use 10 per cent below 2007 levels by 2020. Richmond's Community Energy & Emissions Plan (CEEP) identifies that buildings account for about 64 per cent of energy consumption in Richmond, and 43 per cent of GHG emissions; residential developments especially are prime energy consumers in the community. Richmond is growing, with today's population expected to increase by 35 per cent by 2041, and employment by 22 per cent. This growth will be accompanied by new building development, the majority of which will occur in Richmond's City Centre.

Shifting to more sustainable energy systems for buildings will support the City's climate and energy targets. Sustainable energy systems have the following characteristics:

- Use energy wisely – e.g. they are efficient, minimize consumption, minimize waste energy, and use low carbon sources of energy.
- Increase energy security by being reliant and resilient – e.g. they minimize price volatility, incorporate localized systems to avoid being completely dependent on external systems, and are adaptable to future technologies and energy sources.
- Have low-carbon intensity – e.g. they emit zero to low GHG emissions.
- Are cost-effective and do not result in unacceptable impacts (social, environmental or economic).

The City has identified district energy utilities (DEUs) as a key component of sustainable energy systems that can be implemented in neighbourhoods undergoing redevelopment. Some of the key benefits of a DEU are as follows:

- Reduced building capital and operations costs – DEUs replace the need for individual buildings to have their own boilers or furnaces, chillers or air conditioners, resulting in capital cost and maintenance cost savings.
- Efficiency – DEUs can operate more efficiently than typical stand-alone building mechanical systems, thereby reducing emissions and costs.

- Reduced emissions through using renewable energy and waste energy sources – DEUs can use renewable sources such as sewer heat recovery, geothermal, biomass, combined heat and power generation, and other technologies with the potential for very low emissions. Moreover, DEUs can capture and use waste heat from industrial, commercial and institutional use (i.e. ice surfaces and wastewater treatment plants).
- Reliability – DEUs use proven technology; most DEU’s operate with a high reliability rate.
- Resiliency – District energy systems’ ability to make use of multiple different fuel sources allow DEUs to incorporate new energy source opportunities in the future, providing financial and environmental resiliency and mitigating the potential for volatility in thermal energy prices.

Many DEUs come to be identified by the energy source they are hooked up to, such as geothermal, biomass, or solar; however, the most critical elements of a DEU are the customer base and the distribution network, and when establishing the partnerships and legal framework of a DEU the primary focus should be on these elements. The specific system or technology that is used to generate the heat can be altered or switched out over the life of the DEU depending on the best available technology at the time.

### District Energy in Richmond

The City incorporated Lulu Island Energy Company Ltd. (LIEC) in 2013 for the purposes of managing district energy utilities on the City’s behalf. LIEC currently owns and operates the Oval Village District Energy (OVDEU) and Alexandra District Energy (ADEU) Utilities, as well as advances new district energy opportunities. Attachment 1 indicates the current and planned future DEU areas throughout Richmond. LIEC has been recognized for excellence, leadership, innovation and sustainability through receiving thirteen awards since the company’s inception, ranging from the provincial to international scale.

LIEC currently services eight buildings in the OVDEU service area, containing over 1,700 residential units. Energy is currently supplied from the two interim energy centres with natural gas boilers which combined provide 11 MW of heating capacity. When enough buildings are connected to the system, a permanent energy centre will be built which will produce low carbon energy. Currently the OVDEU is planned to harness energy from the Gilbert Trunk sanitary force main sewer through the implementation of the permanent energy centre in 2025. Over the next 30 years, the OVDEU system is anticipated to reduce GHG emissions by more than 52,000 tonnes of CO<sub>2</sub> as compared to business as usual<sup>1</sup>. OVDEU is developed under a concession agreement with Corix. During the concession period (30 years), Corix will design, build, finance and operate the OVDEU and will supply energy services to LIEC; LIEC owns the assets and Council sets customer rates.

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<sup>1</sup> Assumed that all energy was provided for heating. The business-as-usual (BAU) assumed that 40% of the building heating load would be provided from electricity and the remaining 60% would be from gas make-up air units.

LIEC provides heating and cooling services to six residential buildings in the ADEU service area, the large commercial development at “Central at Garden City”, the Richmond Jamatkhana temple and Fire Hall #3, in total connecting over 1450 residential units and over 1.6 million square feet of floor area. While some electricity is consumed for pumping and equipment operations, almost 100% of this energy is currently produced locally from the geo-exchange fields in the greenway corridor and West Cambie Park, and highly efficient air source heat pumps. The backup and peaking natural gas boilers and cooling towers in the energy centre have operated for only a few days throughout the system’s operation to date. LIEC staff estimate that this has eliminated 2,340 tonnes of GHG emissions in the community.

The City has continued to secure commitments that new developments in potential DEU service areas will be “District Energy Ready” through rezoning, development and building permit processes. This means that new developments in appropriate potential service areas are built with in-building mechanical systems that are compatible with district energy connection for space heating and domestic water heating.

LIEC is continuing to work with Corix on the City Centre DEU due diligence process as per the executed MOU. This work includes the development and analysis of long term DEU servicing strategies for the City Centre area. Staff are expecting to report to Council on the outcomes of this due diligence process in early 2019.

As the City Centre DEU due diligence process has advanced, staff saw the opportunity to secure a customer base for the immediate implementation of greenhouse gas emissions reduction through the rezoning and/or OCP amendment application process. Six development applicants have committed to construct and transfer energy plants to the City or LIEC through either of these processes, so that LIEC can provide immediate service to these customers. The commitment for these developments to construct and transfer energy plants to the City or LIEC was subject to adoption of a DEU service area bylaw pertaining to these sites. LIEC and City staff subsequently developed the CCDEU Bylaw to secure commitments from the first five developments, which Council adopted in September 2018. Council amended the CCDEU Bylaw to include the Richmond Centre Mall development in October 2018.

The Polygon Fiorella rezoning application (RZ 17-778835) was granted third reading at the Public Hearing held on May 22, 2018. The applicant is actively working to fulfill the rezoning considerations and advance the associated Development Permit for the project to the City’s Development Permit Panel for consideration.

### **Analysis**

The Polygon Fiorella development is estimated to consist of approximately 175,000ft<sup>2</sup> of residential space.

Expanding the City Centre District Energy Utility service area to include a development of this type results in the following direct benefits:

- Immediate reduction of greenhouse gas (GHG) emissions compared to business as usual;
- Immediate connectivity opportunity with the future low carbon district energy system;
- Expansion of LIEC's customer base under a positive stand-alone business case while the City Centre strategy develops;
- Increasing community's energy resiliency; and
- Providing financial and environmental stability to customers, mitigating potential volatility in energy costs.

City and LIEC staff met with the developer's representatives and, through the rezoning application, obtained their commitment to design and construct a low carbon energy plant, and transfer its ownership to the City or LIEC at no cost to the City or LIEC so that LIEC can provide immediate service to the customer and start immediate implementation of GHG emission reduction.

The LIEC Board of Directors has reviewed this opportunity and recommends expanding the City Centre District Energy Utility service area to include the development located at 3551, 3571, 3591, 3611 and 3631 Sexsmith Road.

In order to address this and other business development opportunities already approved by Council and LIEC Board in the City Centre DEU service area, ongoing growth and expansion of ADEU and OVDEU, and management of LIEC assets, the need for additional staff member has been identified. LIEC staff have recommended to the Board that one regular full time Assistant Project Manager be hired with the primary responsibility to support district energy approvals process coordination, grant funding applications coordination, implementation and management of information and communication technology. This position will also allow existing staff to focus further on the operational improvements of the existing customers and infrastructure and further business expansion as directed by Council and LIEC Board. 2019 LIEC operating budget approved by the Board and presented to Council at January 9, 2019 Finance Committee had accounted for the cost of this new position. As a part of the mandate given by Council to LIEC Board to manage the business and affairs of the LIEC, LIEC Board will consider creation of this new staff position.

### **Financial Impact**

None. The low carbon energy system will be designed and constructed by developers at their cost. Costs incurred by LIEC for engineering support and operations and maintenance will be funded from the existing and future LIEC capital and operating budgets. All LIEC costs will be recovered from customers' fees.

**Conclusion**

Expanding the service area for the City Centre District Energy Utility Bylaw No. 9895 as proposed will allow for immediate provision of low carbon energy and in turn immediate avoidance of GHG emissions from a large development in Richmond's City Centre area. It would also provide the new Polygon Fiorella development an immediate connectivity opportunity with the future district energy system which is currently in development. The project will increase the community's energy resiliency by taking advantage of the district energy system's ability to utilize different fuel sources and future fuel switching capability of the technology.

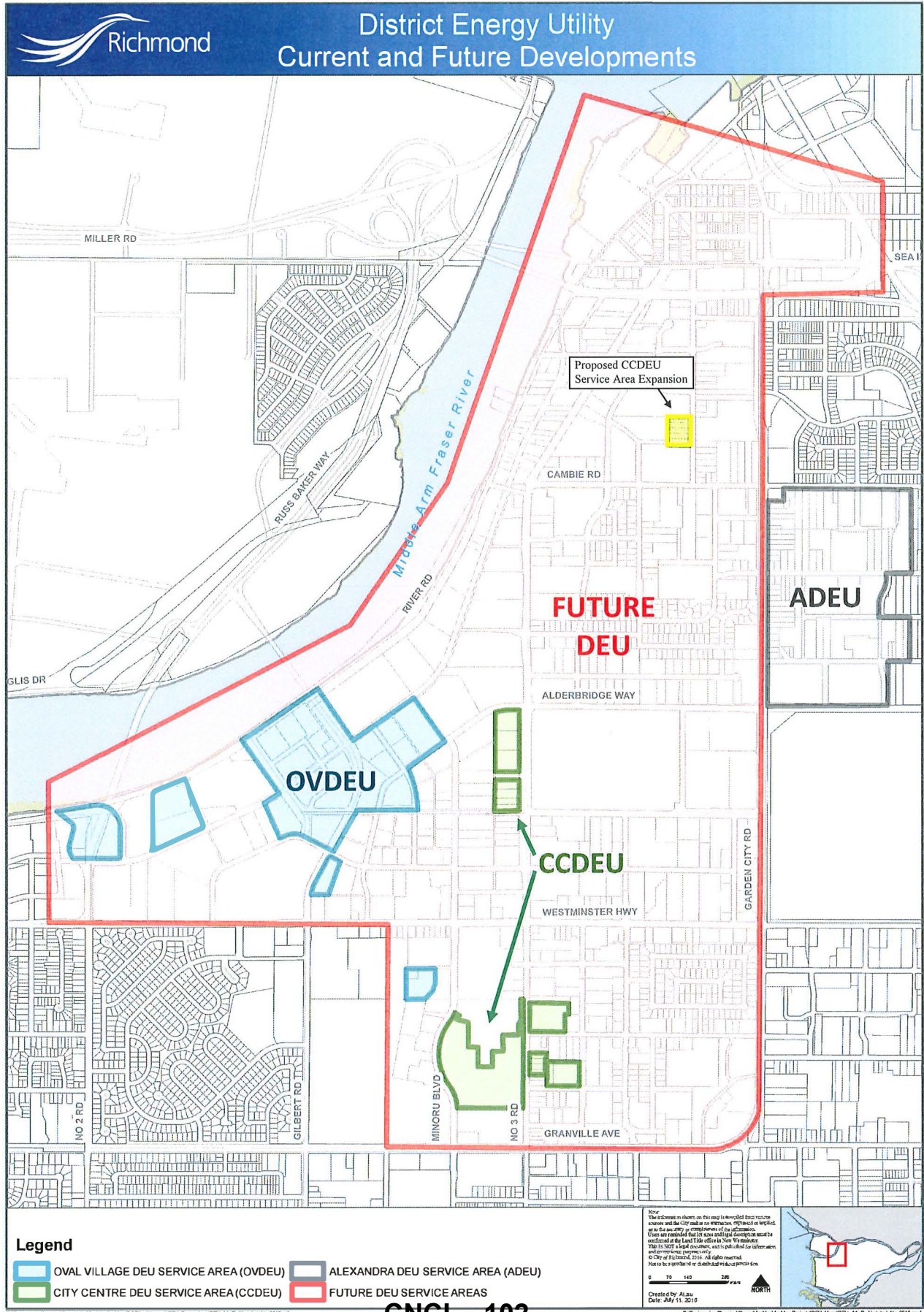
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Senior Manager, Sustainability and District Energy  
(604-276-4130)

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Att. 1: Map of Current and Future District Energy Utility Areas in Richmond

# Attachment 1 – Map of Current and Future District Energy Utility Areas in Richmond







City Centre District Energy Utility Bylaw No. 9895  
Amendment Bylaw No. 9947

The Council of the City of Richmond enacts as follows:

1. The **City Centre District Energy Utility Bylaw No. 9895** is further amended:
  - (a) by deleting Schedule A (Boundaries of Service Area) in its entirety and replacing with a new Schedule A attached as Schedule A to this Amendment Bylaw; and
  - (b) by deleting Schedule E (Energy Generation Plant Designated Properties) in its entirety and replacing with a new Schedule E attached as Schedule B to this Amendment Bylaw.
2. This Bylaw is cited as “**City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 9947**”.

FIRST READING

SECOND READING

THIRD READING

ADOPTED

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CITY OF RICHMOND
APPROVED for content by originating dept.
APPROVED for legality by Solicitor
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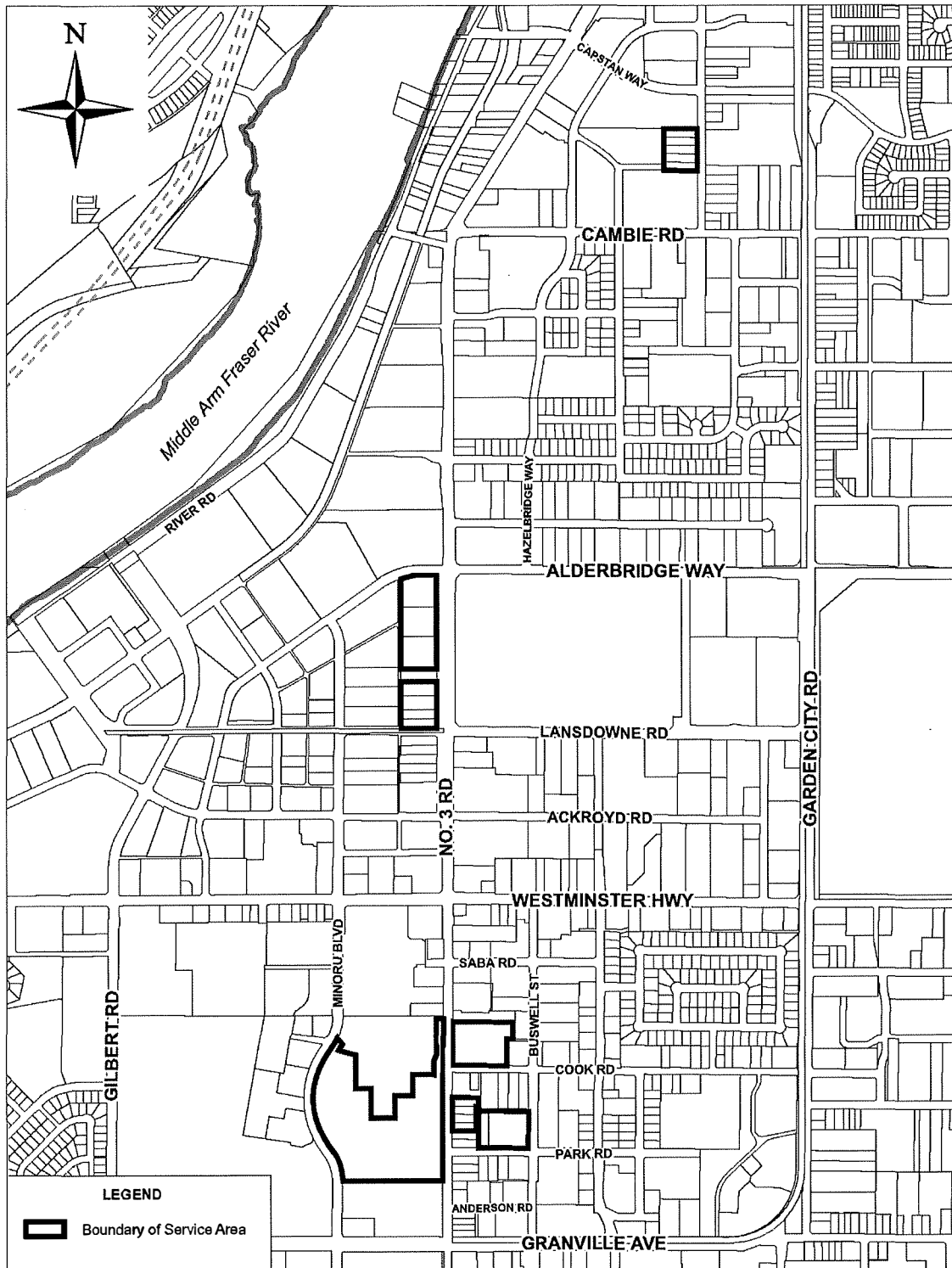
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MAYOR

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CORPORATE OFFICER

**Schedule A to Amendment Bylaw No.9947**

**SCHEDULE A to BYLAW NO. 9895**

**Boundaries of Service Area**



**Schedule B to Amendment Bylaw No. 9947**

**SCHEDULE E to BYLAW NO. 9895**

**Energy Generation Plant Designated Properties**

