



To: Public Works and Transportation Committee **Date:** April 29, 2019
From: Peter Russell, MCIP RPP **File:** 12-8060-20-009921/Vol 01
Senior Manager, Sustainability and District Energy
Re: **City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 10012**

Staff Recommendation

1. That the City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 10012 presented in the “City Centre District Energy Utility Bylaw No. 9895, Amendment Bylaw No. 10012” report dated April 29, 2019, from the Senior Manager, Sustainability and District Energy be introduced and given first, second, and third readings.

Peter Russell, MCIP RPP
Senior Manager, Sustainability and District Energy
(604-276-4130)

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

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 (MOU) 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 applications, seven 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. The CCDEU Bylaw has since been amended to expand the service area to include two additional developments.

The purpose of this report is to recommend expansion of the service area to include a hotel development located at 8871, 8891, 8911, 8931, 8951, and 8971 Douglas Street, associated with rezoning application RZ 15-704980.

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 GHG 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 carrying out the City's district energy initiatives. These district energy initiatives have been

recognized for excellence and leadership in innovation and sustainability through receipt of fourteen awards ranging from the provincial to international scale.

LIEC operates the Oval Village District Energy (OVDEU) and Alexandra District Energy (ADEU) Utilities while concurrently advancing new district energy opportunities. Attachment 1 indicates the current and planned future DEU areas throughout Richmond.

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 CO₂ as compared to business as usual¹. 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.

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 No. 3, in total connecting over 1,450 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 over 2,340 tonnes of GHG emissions in the community to-date.

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 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 GHG emissions reduction through the rezoning and/or OCP amendment application process. Seven development applicants have committed to construct and transfer energy plants to the City or LIEC through either of these

¹ 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.

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 and the Polygon Fiorella development in February 2019.

The development rezoning application (RZ 15-704980) was granted third reading at the Public Hearing held on February 19, 2018. The applicant is actively working to fulfill the rezoning considerations and prepare the associated Development Permit for the project for the City's Development Permit Panel's consideration.

Analysis

City Centre District Energy Utility Service Area Expansion

The six storey hotel building is estimated to consist of approximately 56,575ft² of hotel space.

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

- Immediate connectivity opportunity with the future low-carbon district energy system resulting in reduction of GHG emissions compared to business as usual;
- 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.

The rezoning considerations for this development include a requirement for a legal agreement that, if the City elects, would require the developer to transfer ownership of the development's centralized energy plant to the City or LIEC at no cost to the City or LIEC, so that LIEC can provide immediate service to the customer. City and LIEC staff have met with the developer's representative to obtain their commitment to transfer the energy plant in accordance with the legal agreement, and are continuing discussions to establish specific requirements associated with the plant. Rezoning considerations were applied to this development prior to establishment of requirements for a low-carbon energy plant and as such, the language did not require the centralized energy plant to be low-carbon. However, LIEC ownership of a conventional energy plant still carries significant benefits as LIEC can connect this building immediately to the future low-carbon district energy system or potentially implement on-site low-carbon technology at a later stage.

This development rezoning application also includes a single lot at 8960 Douglas Street which is proposed to consist of a single storey building with approximately 1,733 ft² of commercial space. Due to the small scale of this commercial building, a DEU requirement is not being sought for.

Due to the anticipated energy loads of the hotel development, LIEC staff have conducted a business case analysis for owning and operating this development's energy plant using the same rate structure that was applied for business case analysis of the other developments under the CCDEU Bylaw service area. Consistent with Council objectives, staff have used a rate that is competitive with the conventional energy costs for providing the same level of service. The rate structure and actual rate to customers will be refined once the costs have been confirmed through the design and engineering phase for the first developments within the CCDEU Bylaw service area.

The LIEC Board of Directors has reviewed this opportunity and recommends expanding the City Centre District Energy Utility service area to include the hotel development located at 8871, 8891, 8911, 8931, 8951, and 8971 Douglas Street.

Financial Impact

None.

The centralized 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 expansion of LIEC's customer base and in turn immediate connectivity opportunity to future low-carbon district energy systems in Richmond's City Centre area. 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.

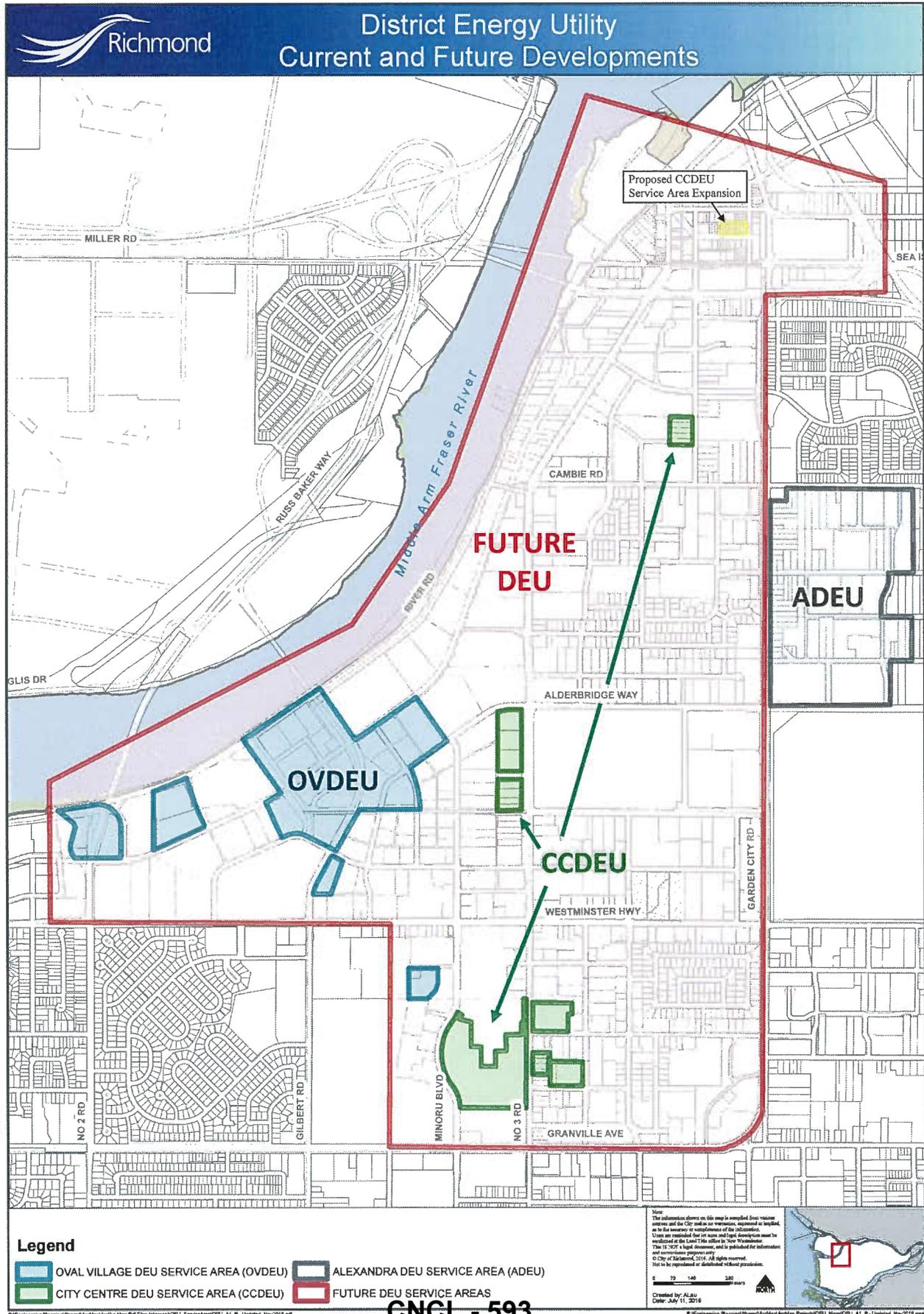


Peter Russell, MCIP RPP
Senior Manager, Sustainability and District Energy
(604-276-4130)

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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. 10012**

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. 10012**”.

FIRST READING

SECOND READING

THIRD READING

ADOPTED

CITY OF RICHMOND
APPROVED for content by originating dept.

APPROVED for legality by Solicitor

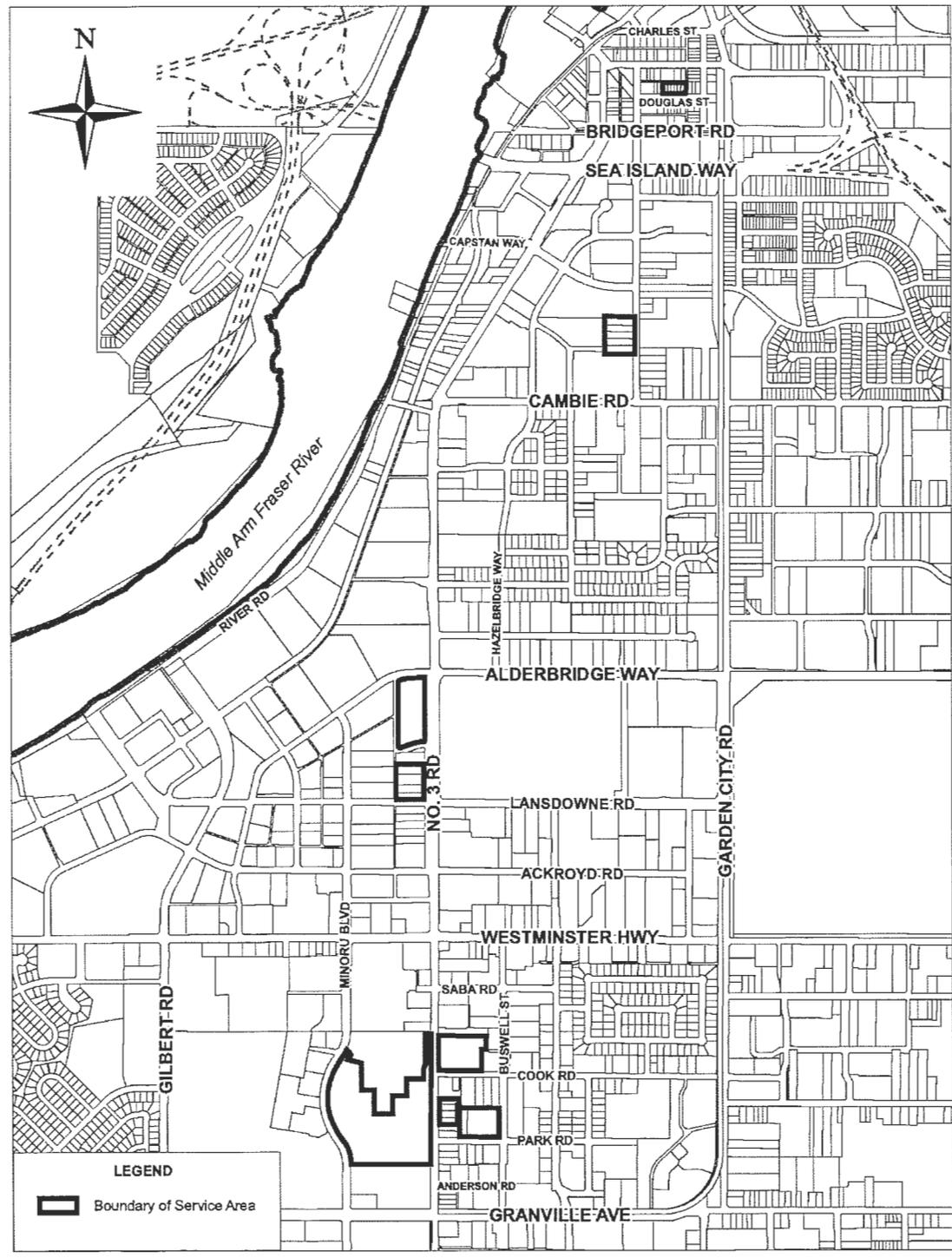

MAYOR

CORPORATE OFFICER

Schedule A to Amendment Bylaw No. 10012

SCHEDULE A to BYLAW NO. 9895

Boundaries of Service Area



Schedule B to Amendment Bylaw No. 10012

SCHEDULE E to BYLAW NO. 9895

Energy Generation Plant Designated Properties

