

EAST NOSE CREEK

COMMUNITY AREA STRUCTURE PLAN
Justification Report

MAY 2023



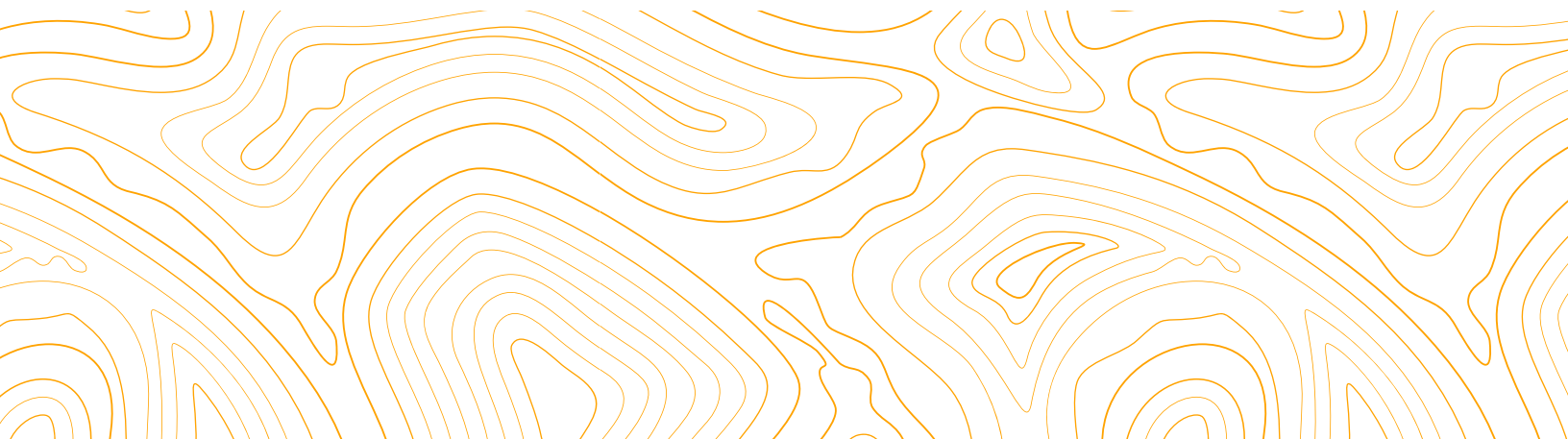


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EAST

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B&A Planning Group was retained by Highfield Land Management (Highfield) to prepare a Justification Report as required by Policy 2.9 of the *Airdrie City Plan*. This report supports the commencement of a Community Area Structure Plan (CASP) for the east Airdrie lands known as East Nose Creek. Planning and growth management analysis within this report justifies the commencement of this CASP by demonstrating a vision for a vibrant, sustainable community that addresses residential land need, supports growth for the City, and moves to achieve the goals outlined in existing City policy.



01

INTRODUCTION

THE AIRDRIE CITY PLAN STATES:

Where a development proponent is seeking to initiate a Community Area Structure Plan, Council shall require and review a planning and growth management justification report which addresses the relationship between the proposed CASP and the growth study elements contained in Policy 2.14. It is acknowledged that the initiation of a CASP in no way confers adoption.

BACKGROUND

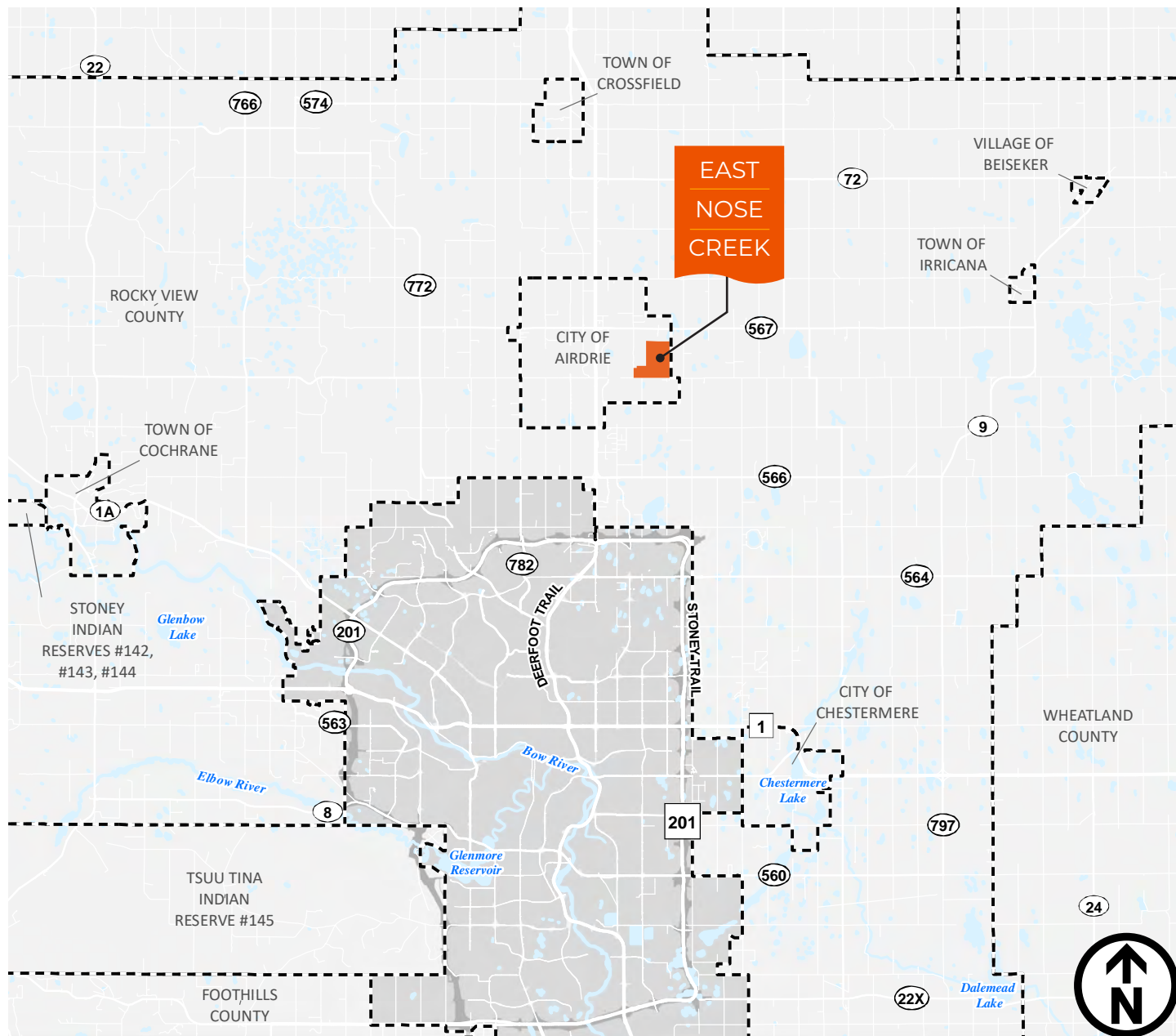
In 2012, the City of Airdrie annexed approximately 12,640 acres of land from Rocky View County to support the City's future population with a 50-year land supply that would offer a mix of residential, employment, and recreational land uses.

To establish a vision for the newly acquired lands, the City adopted a comprehensive growth management plan, known as the 12 Thousand Acres (12K) Plan, in 2018. The 12K Plan established numerous future CASP boundaries, including that of the East Nose Creek Community Area Structure Plan (ENC CASP). The ENC CASP includes approximately 1,110 acres (450 hectares) of land.

Since the time of adoption, numerous CASP justification reports and CASPs have been approved in preparation for the City's growing population. Notably, the Southeast Yankee Valley Boulevard CASP (SE YVB CASP) and the East Points Industrial CASP, which border the ENC CASP area to the south and the northwest, respectively. These CASPs include major employment opportunities including Airdrie Airpark and over 840 acres¹ of industrial lands which will benefit from the support of residential development in the ENC CASP area.

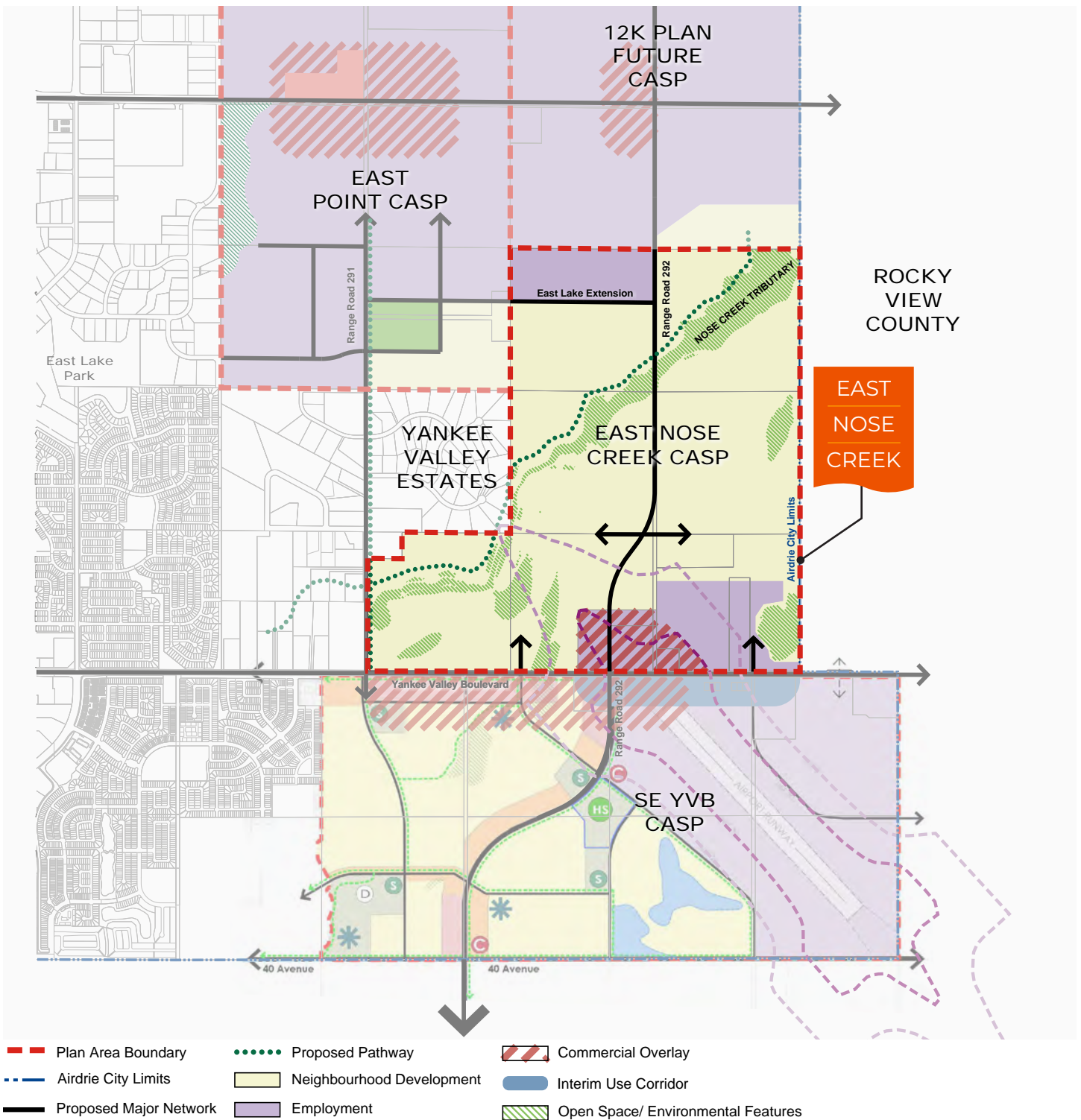
1. The East Points Industrial CASP estimates up to 340 hectares (840 acres) of industrial lands within the CASP area, as per Table 1 on page 3.8 of the East Points CASP.

FIGURE 1 - REGIONAL CONTEXT



- Municipality Boundary
- Subject Site
- Transportation and Utility Corridor

FIGURE 2 - LOCAL CONTEXT



VISION

The ENC CASP area benefits from unparalleled access to green infrastructure, namely the Nose Creek tributary, which presents opportunities for environmental sustainability, recreation, and community enhancement. Through a combination of environmental reserve (ER) and open space (MR) dedication along the tributary (delineation to be determined at the CASP stage upon completion of technical studies), the result is a linear green corridor which connects this community to other communities within Airdrie. This major community asset reinforces Airdrie's reputation as an amenity-rich municipality, supports existing City policy promoting stewardship of Nose Creek, and will contribute greatly to creating a sense of place for the future ENC CASP residents.

The proposed plan area will predominantly be allocated for residential use, supporting the significant employment lands in the adjacent East Points Industrial CASP and SE YVB CASP. The residential lands will offer a wide variety of built forms to accommodate a population with diverse needs and desires.

Aligning with the proposed land use allocation of the 12K Plan, non-residential development is proposed in the northwest corner and along the southern border of the plan area. Employment lands within the northwest corner are defined by the East Lake Hill extension, maintaining adjacency of like uses within the East Points Industrial CASP and proposed NSP lands (see Figure 2: Local Context). The proposed southern employment area is located within the 30m NEF contour, this is the area that may be effected by noise from the Airdrie Airpark and therefore is well suited for employment and/or commercial uses. The plan area is expected to accommodate industrial and commercial type uses that will support future East Nose Creek residents and Airdrie as a whole.

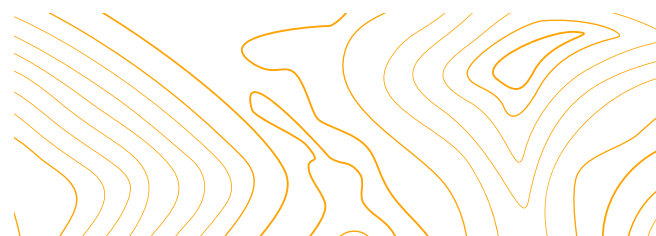
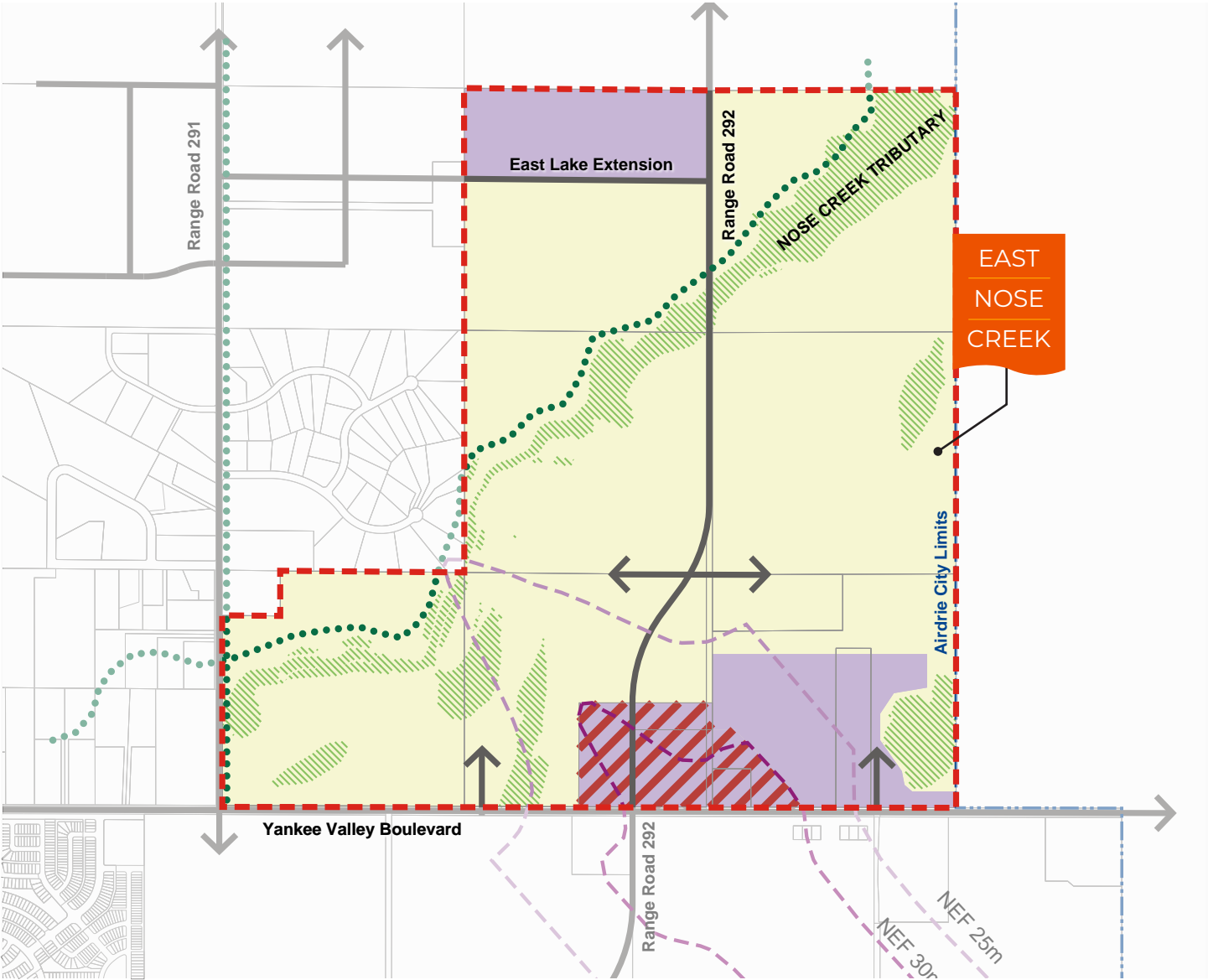


FIGURE 3 - DEVELOPMENT CONCEPT



- Plan Area Boundary

Proposed Pathway

Neighbourhood Development
- Airdrie City Limits

Airport NEF 25m Contour

Employment/ Industrial
- Proposed Major Network

Airport NEF 30m Contour



02 GROWTH & DEMAND ANALYSIS

CITY OF AIRDRIE POPULATION PROJECTIONS

The Calgary Metropolitan Growth Plan estimates Airdrie to have a population of 130,612 people by 2048 and 140,725 people by 2053. This is an increase of 10,113 people (~7%) in 5 years (as reported in the Population Projections, Rennie Intelligence, 2018). Airdrie is estimated to account for 4.7% (~23,500 people) of the Regional Employment Growth.

Based on the Growth Management Sequencing Strategy, outlined within the 12 Thousand Acres Plan (12K Plan), The ENC CASP lands are anticipated to be developed at the 160,000-210,000 population horizon. The 2022 Growth Report estimates reaching a population of 109,103 people by 2032, based on an annual population growth of 4% YOY. Assuming this growth rate continues in the following years, the City would hit the 160,000 horizon by 2042, and the 210,000 by 2049. The following timeline for ENC CASP approvals is estimated:



The above timeline is informed by past City of Airdrie planning experience such as that within the SW CASP. The ENC CASP lands are assumed to be developed in a phased manner, whereby each phase must undergo NSP application and approval, followed by Development Permit (DP) and subdivision application. Future developers of the ENC CASP lands have estimated approximately 30 acres, or 200-250 units (assuming an average of 7.5 upa) would be brought on annually, beginning in 2027 at the earliest. This would mean the full-build-out of residential lands would occur over approximately 25 years, reaching completion in the year 2052. This aligns with the sequencing of the shown in Figure 9: Growth Management Sequencing Strategy Map of the 12K Plan, as the City population is estimated to surpass the 210,000 horizon in 2049 (as shown on Table 1 - Population Projections on page 9 of this report).

TABLE 1 - Population Projections

Year	Pop. Growth YOY (%)	Population	Pop. Growth YOY (#)
2032	4%	109,103*	4,735
2033	4%	113,467	4,364
2034	4%	118,006	4,539
2035	4%	122,726	4,720
2036	4%	127,635	4,909
2037	4%	132,740	5,105
2038	4%	138,050	5,310
2039	4%	143,572	5,522
2040	4%	149,315	5,743
2041	4%	155,288	5,973
2042	4%	161,499	6,212
2043	4%	167,959	6,460
2044	4%	174,677	6,718
2045	4%	181,931	6,987
2046	4%	188,931	7,267
2047	4%	196,488	7,557
2048	4%	204,348	7,860
2049	4%	212,522	8,174

* Based on Page 10 of Airdrie's Growth Report: Tracking Development and Change (2022)

LAND SUPPLY

The annexation of lands has supported the municipality by providing a sufficient 50-year land supply. Progression of these annexed lands through the planning process is crucial so that land is available in a timely manner to meet growing demand. The 2018 Growth Strategy Update states the lands identified within the City Plan (2014) are projected to be exhausted between 2023 and 2026 across residential and non-residential land uses. As previously stated, to prepare the subject lands for future development in alignment with the 12K Plan sequencing strategy, planning of the ENC CASP should be initiated promptly. The ENC CASP lands will provide much needed residential opportunities for Airdrie's east side, providing a supportive employment base for future industrial and commercial development in the East Points Industrial CASP and SE YVB CASP areas. Planning of the ENC CASP lands along with adjacent CASP progression will support a more comprehensive vision for the east side, contribute capital to finance all kinds of infrastructure growth, and potentially increase Airdrie's residential market share in the region.

The proposed development concept for the ENC CASP offers a 83% residential, 17% non-residential assessment split. Alone the CASP area does not meet the City target of 75% residential, 25% non-residential assessment in new communities. However, when looking strictly at the allocation of land use, without assessment value, the plan area provides 72% residential, 16% non-residential split of the total area. Additionally, the concept aligns with the intent of the 12K Plan by orienting employment lands towards major transportation corridors and adjacent planned employment lands to the northwest and south. The northwest employment area allocation was determined by the proposed East Points Stage 1 Neighbourhood Structure Plan to ensure alignment with the East Lake Hill extension and to prevent adjacent conflicting uses. Additionally, the slight increase in residential land allocation of this CASP is counter-balanced by an over-allocation of non-residential lands in surrounding CASPs. The ENC CASP residential lands will provide a labour base for the developing employment lands. Integrating residential lands in this predominantly non-residential area would help to reduce traffic congestion by improving the balance of housing and jobs and eliminating the need for lengthy commuting. Residential uses also optimize infrastructure use and increase safety by activating the area at all hours. The ENC CASP lands are the missing piece to creating a complete community on Airdrie's east side.

TABLE 2 - Assessment Breakdown

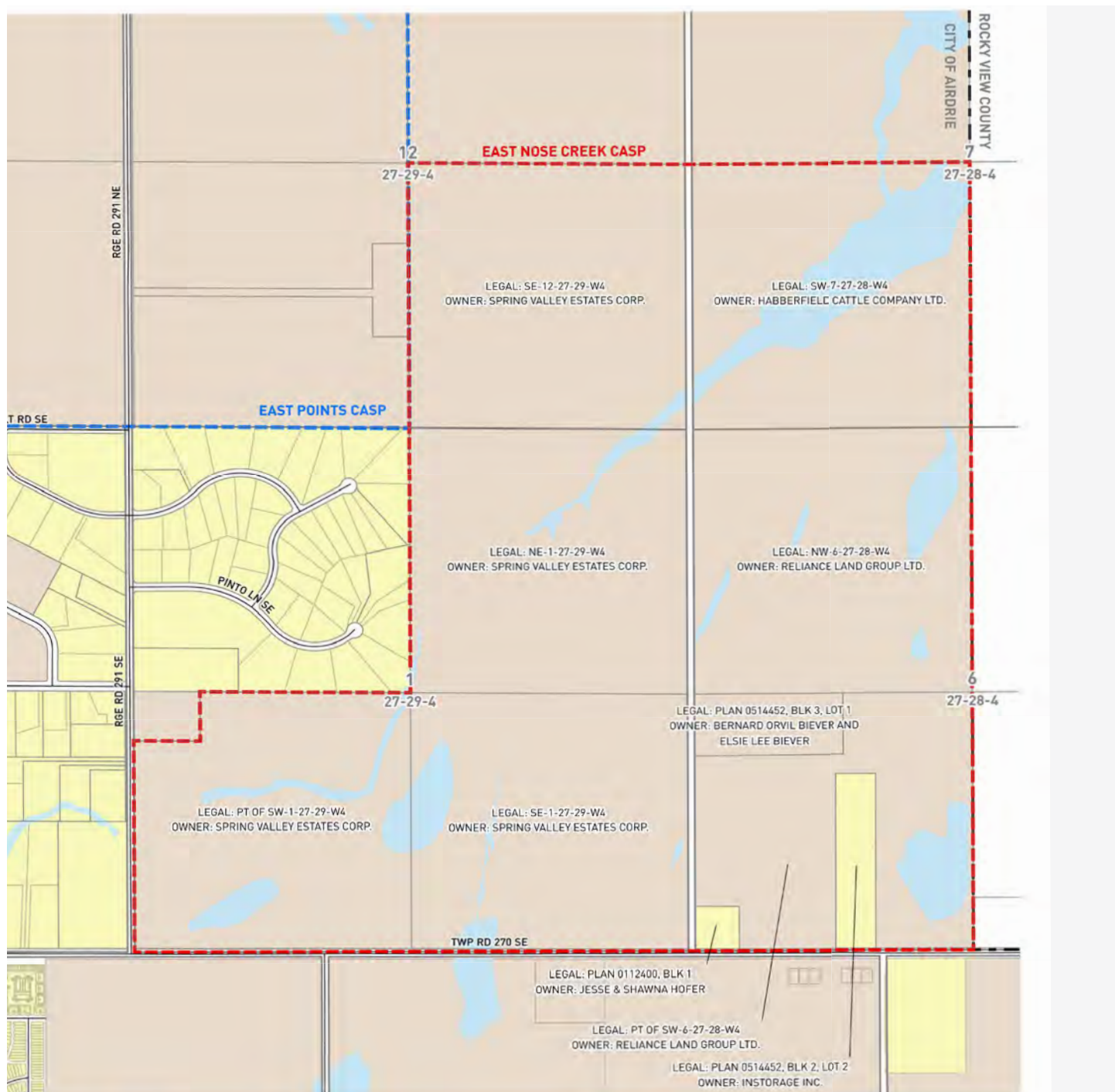
	ac	Assessment per ac	Assessment \$	%
Total Area	1111.51			
ER	140.53			
Industrial	129.39	\$2,080,000.00	\$411,819,200.00	10
Mixed Employment	50.51	\$3,820,000.00	\$192,948,200.00	7
Residential	791.08	\$2,990,000.00	\$2,437,178,500.00	83

TABLE 3 - Land Ownership & Current Use

OWNERSHIP			
	Legal Description	Ownership	Existing Use
1	SE-12-27-29-W4M	Spring Valley Estates Corp.	AG General Agriculture
2	SW-7-27-28-W4M	Habberfield Cattle Company Ltd.	AG General Agriculture
3	NE-01-27-29-W4M	Spring Valley Estates Corp.	AG General Agriculture
4	NW-06-27-28-W4M	Reliance Land Group Ltd.	AG General Agriculture
5	SW-01-27-29-W4M*	Spring Valley Estates Corp.	AG General Agriculture
6	SE-01-27-29-W4M	Spring Valley Estates Corp.	AG General Agriculture
7	SW-06-27-28-W4M	Reliance Land Group Ltd.	AG General Agriculture
8	Block 1 Plan 0112400	Jesse and Shawna Hofer	RR-4 Rural Residential 4 acre
9	Lot 1 Block 3 Plan 0514452	Bernard and Elsie Biever	AH Agriculture Holdings
10	Lot 2 Block 2 Plan 0514452	Instorage Inc.	RB-G Rural Business General

* Not including Lot 1 Plan 0012604

FIGURE 4 - LAND OWNERSHIP



EAST NOSE CREEK POPULATION & JOB PROJECTIONS

The ENC CASP development concept provides a general direction for the land use strategy within the CASP area. Based on that development form the tables below identify an estimated population and number of jobs generated by the CASP area.

TABLE 4 - ENC CASP Gross Developable Area

GROSS DEVELOPABLE AREA		
Use	Hectares	Acres
Residential	320.15	791.08
Industrial	52.36	129.39
Mixed Employment	20.44	50.51
Total:	392.95	970.98

TABLE 5 - ENC CASP Population Estimate

POPULATION		
Units/Ha	People per Household	Estimated Population
19.77	2.7	17,868

TABLE 6 - ENC CASP Employment Estimate

EMPLOYMENT		
Land Use	Jobs / Acre	Jobs
Industrial	11 jobs / acre ²	1,423
Mixed Use	21 jobs / acre ²	1,061
Schools	37 jobs / school*	259
Home-based	3.8 jobs / 100 people ³	679
Total:		3,422

* Assuming 7 schools

Home Based Jobs refers to those defined by the City of Calgary as "Home Occupation Class 1" whereby a resident uses a dwelling unit for business purposes, not requiring increased parking or accommodating other employees. This definition does not capture remote working as a result of the COVID-19 pandemic.

2. Airdrie's Growth Report: Tracking Development and Change (2022), page 24
3. City of Calgary Guide to the MDP and CTP (2011) pg 21

The background of the page is a photograph of a river with white water rapids, overlaid with a semi-transparent orange filter. In the bottom right corner, there are faint, stylized yellow topographic contour lines.

03 RISK ASSESSMENT & MITIGATION

RESIDENTIAL LAND DEMAND

The City of Airdrie residential real estate market is booming, and the City’s population is growing rapidly. According to CREB’s summary in the 2021 Airdrie Growth Report, July 2021 marked the City’s third quarter in a row with record-breaking residential sales. Gains are noted as being driven by strong detached home sales, a shift towards flexible work arrangements, and relative affordability to the City of Calgary. The Growth Report also notes persistent low inventory and vacancy rates for the City, with inventory levels dipping well below levels recorded over the last six (6) years. Low housing inventory could result in increased cost of housing for the City, losing their competitive edge in affordability compared to the City of Calgary. With communities across the province facing increased cost of living and fluctuating mortgage rates, it is important to maintain affordability by providing adequate and diverse housing supply. As previously noted, developers of the ENC CASP anticipate an approximate 25-year residential land supply to be entering the market as early as 2027. This timeline aligns with the 12K Plan sequencing strategy and population growth estimates. Increasing residential lands on the east side of Airdrie would provide a labour pool for developing employment lands, protect the City’s relative affordability, increase market diversity and maintain or potentially increase Airdrie’s residential market share in the region.

TABLE 7 - New Housing Construction CMHC

NEW HOUSING CONSTRUCTION (CMHC)			
Year	# of Units Absorbed	% Absorbed Units	New Housing Units Under Construction
2019	503	61.3%	618
2020	914	76.5%	302
2021	607	89.8%	585

INFRASTRUCTURE & FINANCIAL OBLIGATION TO THE CITY

Municipalities must understand their fiscal obligations when deciding to proceed with opening lands for growth. A review of the City's Utility Master Plan (UMP), Wastewater Lift Station Needs Assessment, the City's Master Stormwater Drainage Plan and the Transportation Master Plan (140K Plan) has been undertaken, along with reviews of adjacent CASPs and Justification Reports to determine development costs. A combination of capital infrastructure funded through regional levies, as well as developer funded infrastructure will be required to service the ENC CASP area. The developer commits to front-ending regional infrastructure as outlined by the City's Utility Master Plan (UMP) and Transportation Master Plan (TMP). It is acknowledged that the City is under no obligation to supplement (financially or otherwise) UMP or TMP upgrades if the required upgrades should not provide sufficient servicing capacity for all of the lands in the CASP.

The most significant infrastructure costs relate to downstream infrastructure that is needed to facilitate future growth plans in all areas of the City. These projects include the South Regional Lift Station, Forcemain to Calgary and Water Supply from Calgary. Growth on the east side is also dependent upon the extension of a gravity sanitary trunk sewer and construction of the SE Potable Water Reservoir and Booster Station. Regardless of approval of the ENC CASP, these capital projects are critical to continue growth within the City of Airdrie, and must be pursued.

Development within the ENC lands is dependent upon developer funded infrastructure. By planning for future development of the ENC CASP lands, the financial burden of developer funded infrastructure in Airdrie's annexed lands lessens, as it becomes shared amongst a larger group of developers investing in the area's growth. This could enable surrounding CASP lands to be brought on sooner than anticipated, by providing capital infrastructure to the benefit of all CASP areas in east Airdrie. Critical capital projects within the boundary of the ENC CASP include sanitary trunk sewer extension and arterial roadways which can be staged with development from a south to north growth pattern in alignment with the 12K Plan.

The City's levy structure is approved and is intended to finance the major capital projects needed for growth in the annexation lands. However, depending upon timing of the development, staging of infrastructure may need to be advanced by Developers by way of interim financing mechanisms until sufficient funds are collected through the City levy system. Growth in ENC will help to finance off-site infrastructure required for growth in other City approved CASP's.

ADDITIONAL ENC CASP BENEFITS

In addition to fulfilling residential land demand and supporting expansion of municipal infrastructure for east Airdrie CASP areas, the ENC CASP provides the following benefits:

- Supports comprehensive planning of shared infrastructure such as the East Lake Road extension and servicing infrastructure
- Increases the City tax base and provides contributing capital
- Provides residential opportunities adjacent to employment uses to limit commuting and congestion on major City roadways



04 SERVICING FEASIBILITY

WATER SERVICING

The ENC CASP is located entirely within the Northeast Pressure Zone as indicated in the City of Airdrie Utility Master Plan (UMP). For ultimate servicing, this area will be connected into the pressure zone from both the north and south through the water distribution network. According to the UMP, the water distribution system is proposed to consist of a pipe network up to 300mm in diameter which will be constructed as development occurs. Approximately 2 km of 500mm supply line is required north of the NE reservoir. No capital infrastructure such as reservoirs, feeder-main or booster stations are proposed within the ENC CASP.

Servicing extensions to East Nose Creek from the existing northeast reservoir would be through the East Points Industrial CASP. Policy within the East Points CASP denotes upgrades (storage and pumping) are necessary at the northeast reservoir to accommodate development within the CASP. From the north, watermain is existing within East Lake Road NE approximately 1 mile west of the northwest corner of the ENC CASP. Timing of the 500mm supply main relative to the development of ENC will be determined through modeling at the CASP stage. It may be possible the network extensions may be sufficient for the full growth of the ENC and therefore it was not included in Alternative Table 8A.

Since development within East Nose Creek is expected to be staged from south to north, water servicing will presumably be initiated from the south. This would require the construction of the Southeast Reservoir proposed for development of the SE YVB CASP. The Southeast Reservoir is planned to be located in the southwest corner of the SE YVB CASP within the Main Pressure Zone, using booster pumps for growth within the Northeast Pressure Zone.

Similar to servicing extensions from the north, according to the City's UMP and the SE YVB CASP, the water distribution network consisting of pipe sizes of up to 300mm in diameter, would be extended through the SE YVB CASP and into East Nose Creek.

A portion of land in the southwest corner of the ENC CASP is at similar elevations to the community of Ravenswood and therefore opportunity may exist to temporarily service early phases of development under the Main Pressure Zone prior to construction of the SE Reservoir. This alternative could be explored at the CASP stage, upgrades to the Main Pressure Zone may be triggered by this additional area and further study will be needed. Staged water servicing will be further defined in the future at the CASP and NSP stages and will ensure that the maximum demand flows are met to service both this CASP and to support the ultimate build out of the Northeast Pressure Zone. It is recognized that the City's ability to supply water and wastewater is subject to the Master Servicing Agreement with the City of Calgary.

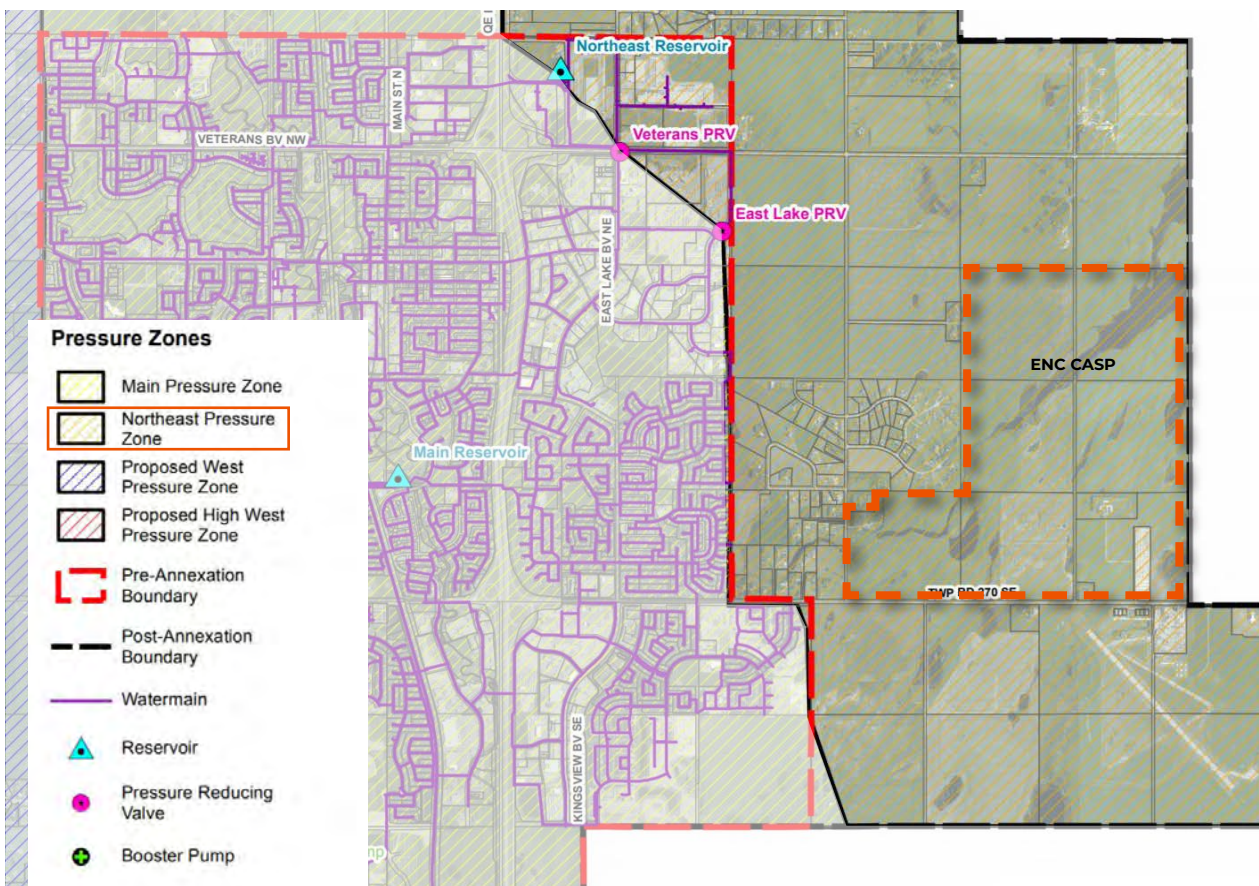
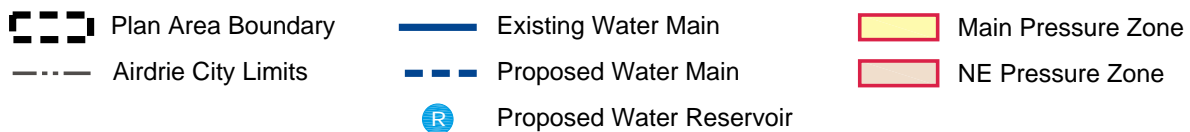
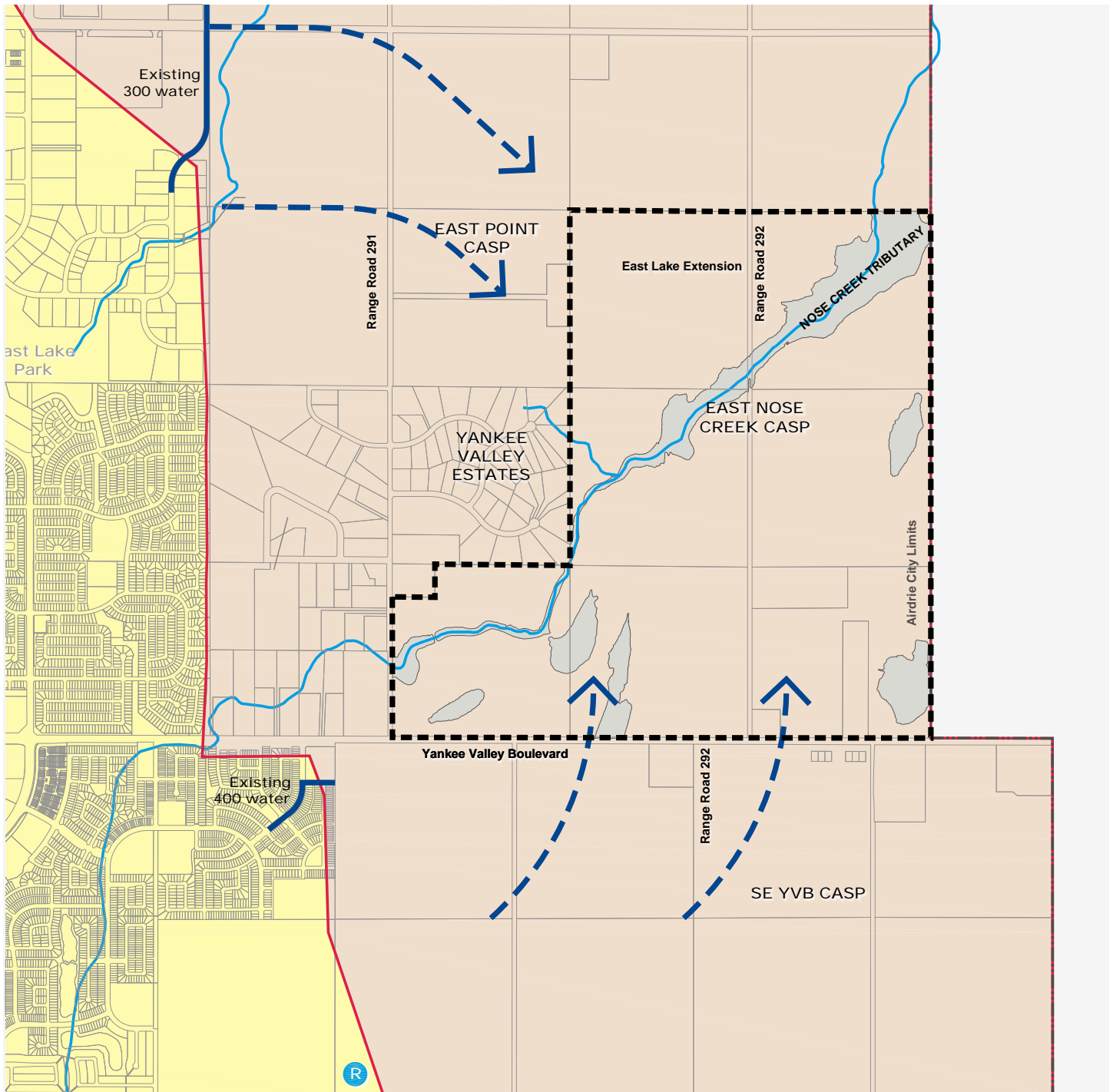


FIGURE 5 - EXISTING & PROPOSED WATER SERVICING



SANITARY SERVICING

Two possible servicing strategies have been considered for the East Nose Creek CASP area:

- a. Service using combination of Gravity Sewer Main, Lift Stations and Sanitary Force main in accordance with the City of Airdrie Utility Master Plan. (Primary option).
- b. Servicing using a Gravity Trunk Main that runs along a revised alignment to what was proposed in the Airdrie UMP. (Alternative option to be explored at the CASP stage).

Servicing in Accordance with the City of Airdrie UMP - Option A (Primary)

Sanitary servicing, as per the City of Airdrie UMP for the East Nose Creek CASP, would be conducted through a combination of gravity mains, trunk sewer, lift stations and forcemains. These will include both regional and local infrastructure. Two regional wastewater lift stations are proposed (Lift Station #6 and #7) as identified in the City of Airdrie's Utility Master Plan (UMP) and City of Airdrie's Wastewater Lift Station Needs Assessment. Lift Station #6 and twin 500mm diameter forcemains will convey flows South to Yankee Valley Boulevard where 900mm and 1200mm gravity trunks will carry flow to Lift Station #7 proposed to be located near the southeast corner of the community of Meadowbrook.

From Lift Station #7 sanitary flow would be conveyed by twin 750mm diameter force mains connected to a proposed 1200mm diameter gravity trunk within the SE YVB CASP. This sanitary trunk continues south and then west along 40th Ave which, upon its completion, will convey flows to the proposed Lift Station #8 prior to being pumped to Calgary. The sanitary trunk along 40th Ave is partially constructed and budgeted for extension to service the SE YVB CASP area.



According to the City's UMP, both Lift Stations #6 and #7 would be required for the full development of the ENC CASP and they also benefit other development lands. The service catchment area for Lift Station #7 is 33 quarter sections or 5,280 acres (2,137 Ha) which includes all the annexation lands on the east side of Airdrie from Yankee Valley Boulevard to QEII, as well as a single quarter section within the east portion of the SE YVB CASP.

The City of Airdrie Wastewater Lift Station Needs Assessment (July 2020) estimated the combined total costs of these lift stations and forcemains to be \$27.4 million. Adding in the cost of the land for the lift station and the need for a trunk sewer in Yankee Valley Boulevard to take the flow from LS6 to LS7, the combined total cost of the lift station strategy becomes \$32.4 million. Although some staging opportunities are available to reduce initial costs, a significant capital investment would be needed to advance development in the ENC CASP.

Alternate Gravity Trunk Main Approach - Option B (Secondary to be explored at CASP)

To reduce the capital costs and long-term operation and maintenance costs associated with sanitary lift stations, an alternative servicing strategy based on gravity trunk sewer may be contemplated, to be affirmed through further investigation at the CASP stage. It is acknowledged that this option was previously considered however was constrained by excessive depth of manholes. Further investigation is required to consider this option.

A full gravity servicing design concept would see sanitary trunk sewer being extended to the northeast corner of the East Nose Creek CASP area. All lands within the CASP would drain by gravity, to the trunk which flows southwest, through the SE YVB CASP, connecting to the 1200mm Sanitary Trunk on 40th Avenue. This would remove the need for Lift Stations #6 and #7, creating cost savings and addressing staging obligations in the future (i.e. installation of a second twin forcemain in the future).

In the City's UMP, a gravity trunk option was previously considered for the east side as option B-2 however the proposed alignment followed quarter sections and the current concept would be more feasible by following the natural drainage path of the land. The alignment of the trunk would need to be optimized through the development of the lands within both the SE YVB and ENC CASP's. Ideally, the corridor would utilize a road network that followed the natural topography of the low-lying lands to minimize depth of the trunk sewer where possible.

Assuming the trunk is connected to the proposed 1200mm main as shown in the Wastewater Lift Station Needs Assessment within the SE YVB CASP and extended to the location that was proposed for Lift Station #6, a total of 3000 metres of trunk main is required. Depths are expected to range from 4 to 10 metres and sizes from 1050 mm to 1200 mm diameter. The total cost is estimated to be significantly less than the lift station option.

Option B would not minimize the need for regional infrastructure, but rather facilitate ENC development at a reduced cost for the developer. The estimated capital costs for infrastructure within the CASP, as per Option B outlined in the Appendix, are \$32.40 M compared to \$48.36 M under Option A, as described by Table 8.

Further details of costs can be found in the Appendix. These servicing strategies are shown in Figure 7: Alternate Sanitary Servicing.

To limit the depth of the trunk sewer, a small area of lower lying land within the existing acreage lots immediately to the east of Meadowbrook, close to where Lift Station #7 was proposed, may be better served to connect to the existing sanitary sewer within nearby communities. If these acreage lands were to develop and depending upon the storm pond location and grading plan, this may or not be required.

FIGURE 6 - SERVICING IN ACCORDANCE WITH THE UMP

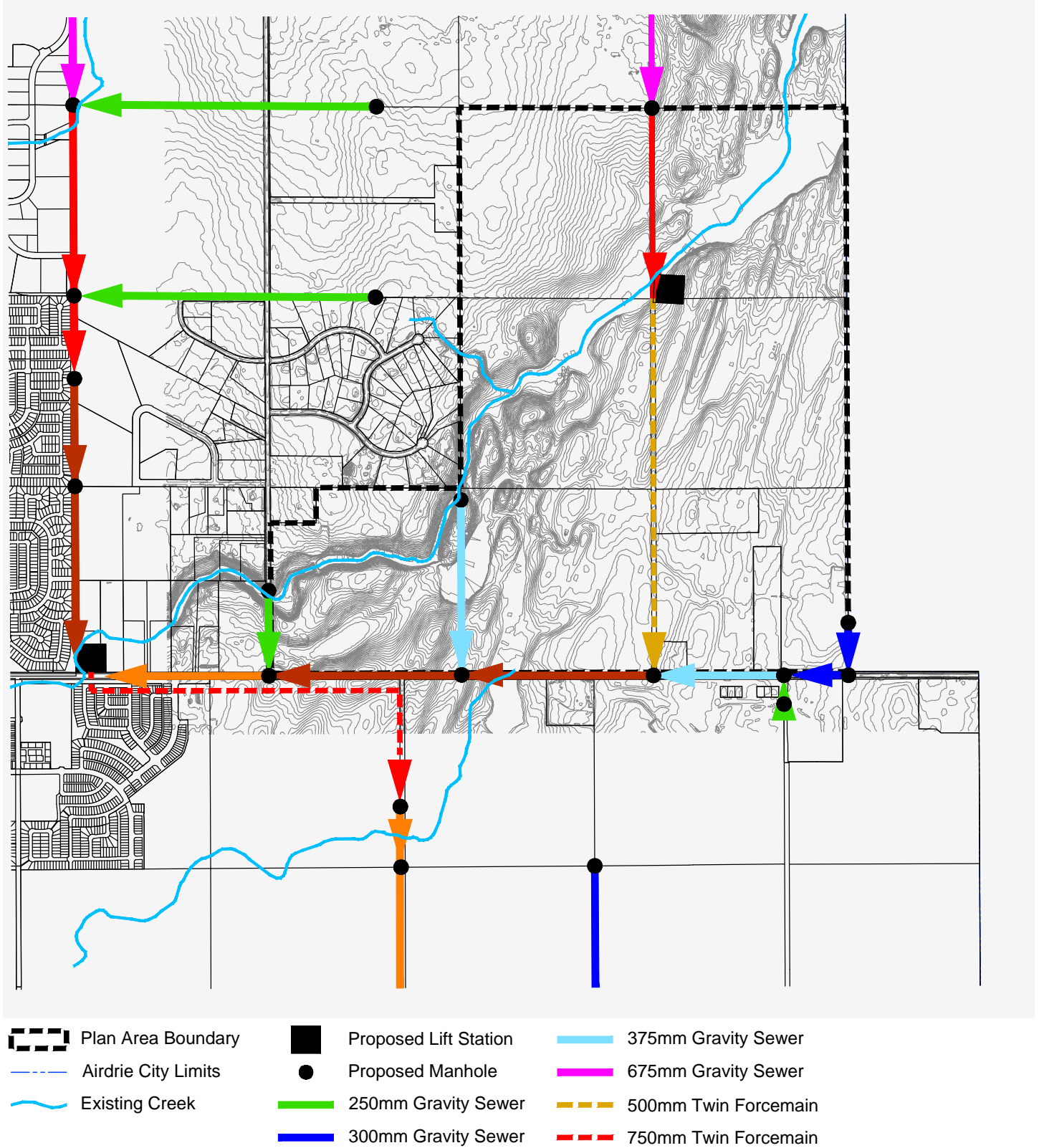
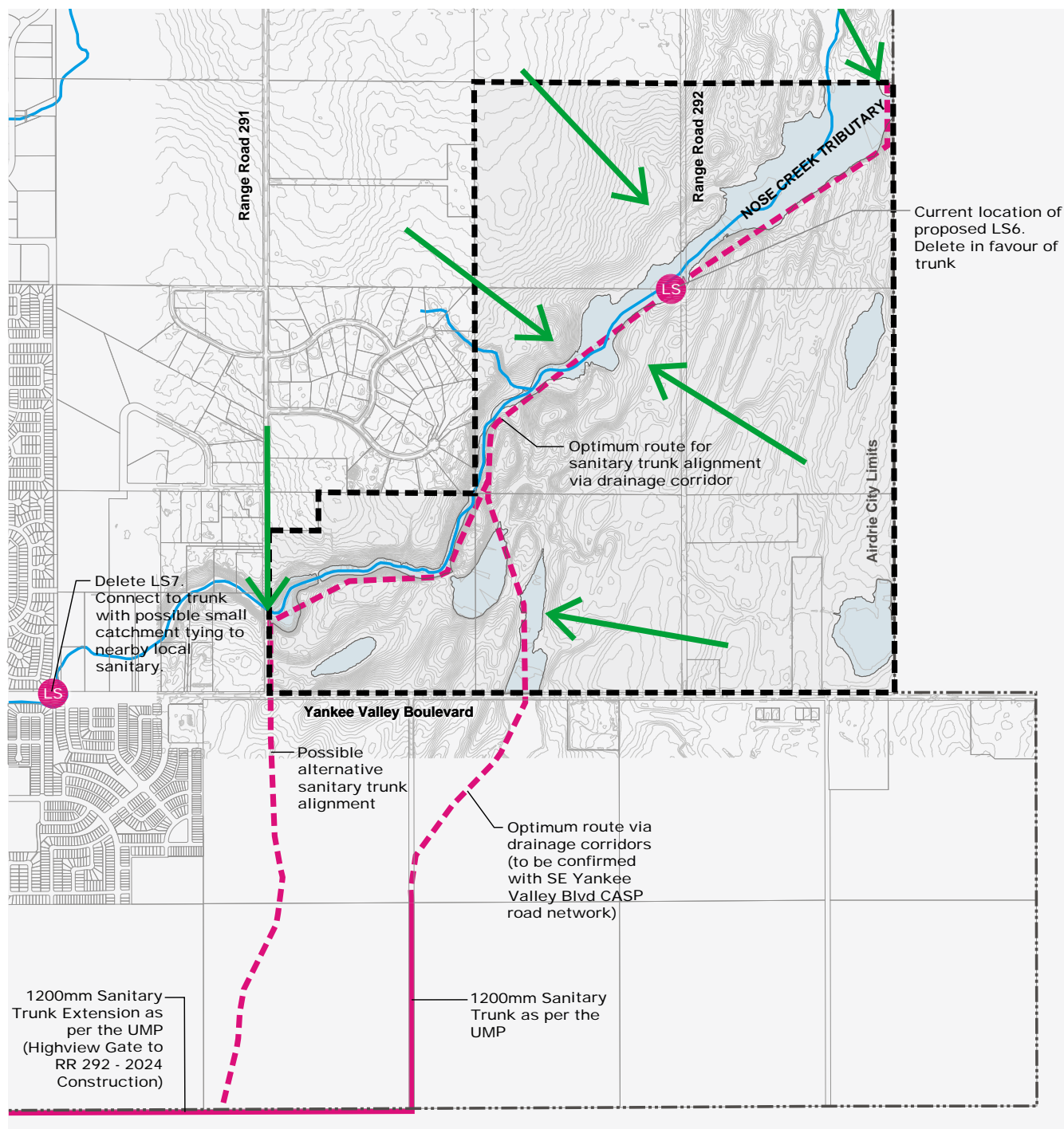


FIGURE 7 - PRELIMINARY ALTERNATE SANITARY SERVICING



--- Plan Area Boundary

--- Airdrie City Limits

— Watercourse

LS Lift Station

--- Sanitary Trunk Sewer

Environmental Significant Area/
Historical or Existing Wetlands

STORMWATER SERVICING

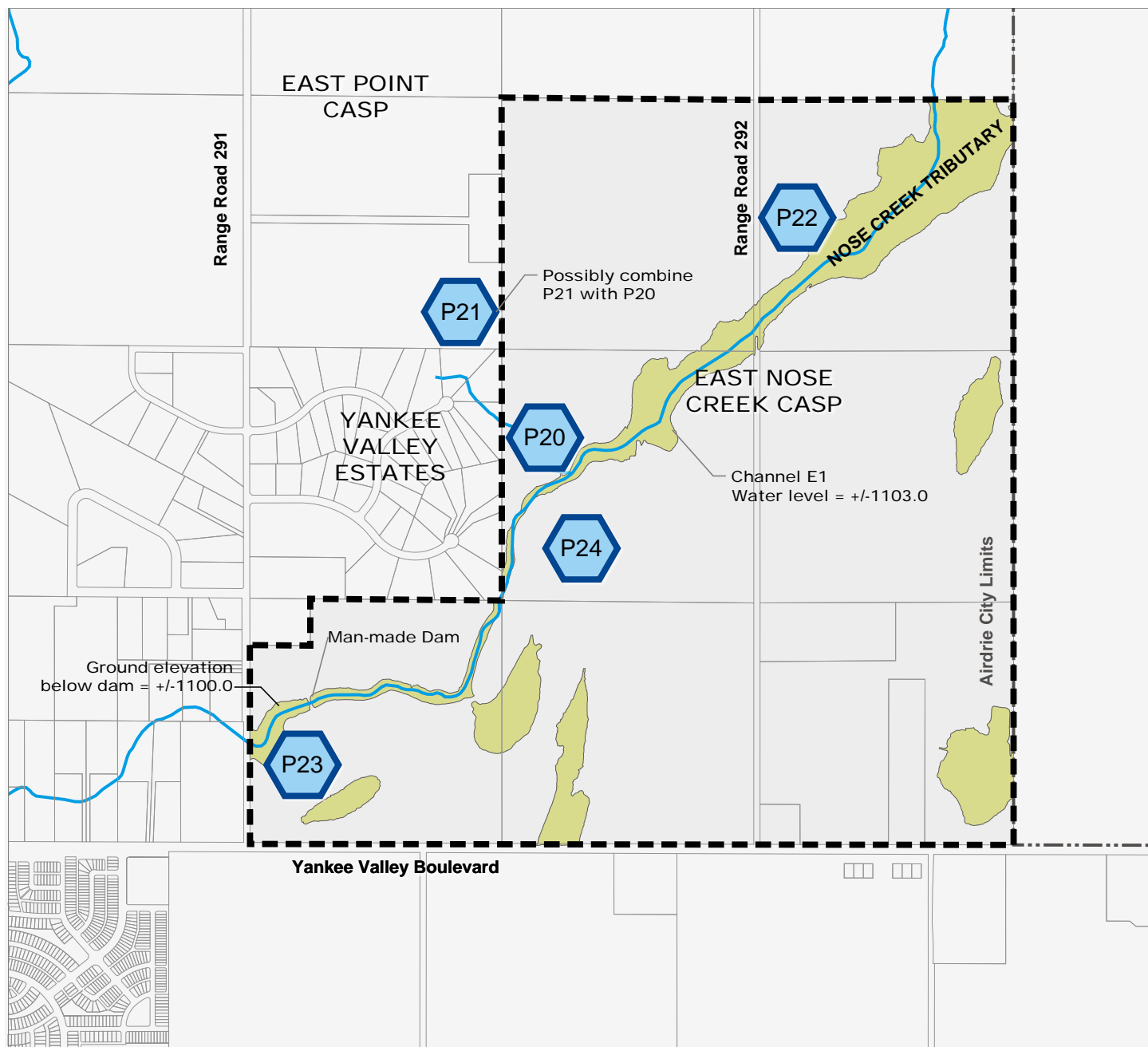
As described in the City of Airdrie Master Stormwater Drainage Plan (Revised March 2015), a natural channel (labeled as E1 on Figure 3-1 of the MSDP) and a series of natural wetlands convey runoff southwesterly towards Nose Creek within the east portion of the study area. This channel conveys runoff into the developed areas within east Airdrie. The MSDP identifies a pre-development catchment area of 2645 ha and peak flow of 1,971 L/s for drainage channel E1.



As shown on Figure 8, this drainage channel extends through East Nose Creek CASP at a relatively constant water level of 1103m. With natural topography in this tributary being quite flat, a man-made dam was constructed to store the water presumably for agricultural purposes. The location of the dam is near the southwest corner of the ENC CASP and ground elevation downstream of the dam is approximately 1100m. Stormwater for the East Nose Creek CASP will be serviced using gravity sewer pipe and stormwater management and storage facilities to collect and improve the quality and quantity of storm water flows before being released into downstream infrastructure and ultimately into the tributary. According to the City's MSDP, four stormwater management facilities (P20, P22, P23 and P24) are proposed to be located within the ENC CASP.

Stormwater management facilities will have their final locations determined through the CASP and NSP stages taking into consideration topography, existing wetlands and development concepts. Combining facilities that are in close proximity may provide more efficiency in functionality and land use. For example, stormwater facility P21 that is proposed to be located in the southeast corner of the East Points CASP may be more suited to be combined with facility P20. Future storm water management facilities will be designed and built to the City of Airdrie Standards with release rates and volume control rates that meet the requirements given in the Nose Creek Watershed Water Management Plan (NCWWMP). The NCWWMP is currently undergoing a joint municipal review which may impact volume control targets for the Nose Creek drainage basin.




FIGURE 8 - STORMWATER SERVICING



 Plan Area Boundary
 Airdrie City Limits

 Wet Pond Stormwater Facility

 Environmental Significant Area/
Historical or Existing Wetlands

 Watercourse

CAPITAL INFRASTRUCTURE COSTS

Capital infrastructure cost is assumed to consist of infrastructure which will be considered for funding under City Off-site Levies. Since some of the future infrastructure costs have already been identified in other CASP justifications, we have summarized capital infrastructure in the following three categories. All regional infrastructure noted within this report is necessary for the growth and Development of the City, the following categorization is intended to break down the different benefiting areas, further highlighting the scale of various infrastructure upgrades, and not intended to minimize the need for regional infrastructure.

1. Within and more specific to the East Nose Creek CASP
2. Identified as part of the SE Yankee Valley Boulevard CASP
3. Beneficial to all growth areas of the City

All the above categories involve infrastructure that will be a benefit to East Nose Creek in varying amounts.

Water

According to the City's UMP, the maximum size pipe within the ENC CASP will be 300mm diameter which is the responsibility of the developer to install. Therefore, no capital water infrastructure applies directly to the ENC CASP. The ENC CASP will benefit from the SE Reservoir, booster pump and 400mm reservoir fill line projects as proposed in the YVB CASP and therefore are included in the capital costs. The water supply line to Calgary is required for overall growth of new development which will have a proportional benefit to East Nose Creek.

Sanitary / Wastewater

Based on the UMP, capital infrastructure costs are required to facilitate sanitary servicing for the ENC area, the developing SE YVB CASP area, and the City overall. Key pieces of capital infrastructure directly within the ENC CASP include Lift Stations 6 and 7, as well as the associated forcemain. This infrastructure has not been included in the 3-year Capital Budget (2020-2022), or the 5-year Capital Plan (2022-2029). The southeast wastewater trunk within the SE YVB CASP area, as well as the south regional lift station and wastewater forcemain to Calgary (beneficial to all growth areas) have been included in the 10-year capital plan and are considered capital infrastructure costs relating to the ENC CASP.

It would be preferable to share upfront capital costs for infrastructure with other landowners/ developers who benefit from upgrades. However, the ENC Landownership Group is also committed to working with the City on a front-ending agreement to advance the necessary infrastructure for development to occur.

Storm

No levy-funded stormwater infrastructure is required within ENC CASP and therefore all stormwater infrastructure will be provided by the Developer. No off-site stormwater infrastructure is deemed to be required for development within the ENC CASP at this time, however this will be confirmed throughout the CASP process, and it is noted that off-site stormwater infrastructure may include a 1200mm storm trunk through SE YVB CASP and 40th Avenue. This storm trunk was not contemplated by the City Master Drainage Plan (2015) or the East Points Master Drainage Plan.

Transportation

Arterial road widening and new construction are levied infrastructure and therefore included in the capital costs. The levy will support necessary improvements throughout the City road network to support the additional population from this CASP area. Arterial roads associated with ENC CASP are summarized as follows:

- Yankee Valley Boulevard – Widening from 2 to 4 lanes
- South Portion of Range Road 291 – Widening from 2 to 4 lanes
- Range Road 292 – New 4 lanes

The costs for Yankee Valley Boulevard were evenly split to both the ENC CASP and SE YVB CASP. Approximately 650 metres of Range Road 291 will be widened from 2 to 4 lanes with 50% of the costs being applied to ENC CASP. Approximately 2.5 Km of Range Road 292 is assumed to be constructed through the CASP based on a 4 lane divided arterial.

There are no arterial roads within the CASP in the east to west direction according to the City's Master Transportation Plan. Instead, these main connecting roads are assumed to be either primary collector or collector standard and therefore not included in the capital costs.

The capital costs for the information described above are provided in the Table 8 - ENC CASP Expected Capital Costs. The ENC CASP will benefit directly from the projects described in Table 8, and development of the CASP area will bring levy payments of over \$150 million to benefit transportation network access across the City. CASP and NSP TIA's will identify transportation infrastructure needed for the CASP area.

Cost

Based on the estimates in Table 8, the cost for capital infrastructure within ENC is relatively low when compared to infrastructure that is required off-site. Capital infrastructure costs within the SE YVB CASP will provide a benefit to growth in East Airdrie while costs reported in the column for all Airdrie, are a benefit to the entire annexation lands. Therefore, these costs will be required to support existing approved CASP areas in the annexation lands of the City. Levy payments based on the current 2019 rates will amount to over \$150 million.

References for Table 8 - ENC CASP Expected Capital Costs can be found within Appendix B, on page 67.

TABLE 8 - ENC CASP Expected Capital Costs - as per preferred Option A

ENC CASP Expected Capital Costs								
Item #	Regional Infrastructure Item	In 10-year Capital Plan (2020 - 2029)	In 3-year Capital Budget (2020 - 2022)	Est. Capital Infrastructure Cost within East Nose Creek CASP	Est. Capital Infrastructure Cost within SE YVB CASP	Est. Capital Infrastructure Cost for all Airdrie Growth	Estimated Operations Cost	Expected Levies for Contributing CASP area (+/- 462 ha)
1	Transportation							\$104.75 M
1.1	RR292 (YVB to North Boundary - 4 lanes divided	No	No	\$12.25 M				
1.2	RR291 (650m North of YVB) - 4 lanes divided - 50%	No	No	\$1.63 M				
1.3	YVB Update East Part 2	Yes	No	\$9.78 M	\$9.78 M			
2	Wastewater							\$30.99 M
2.1 a	Lift Station #6 and Forcemain	No	No	\$8.5 M			\$0.26 M/yr	
2.1 b	Lift Station #7 and Forcemain	No	No	\$14.1 M			\$0.42 M/yr	
2.2	South Regional Lift Station	Yes	No			\$25.34 M	\$0.76 M/yr	
2.3	Wastewater Forcemain to Calgary	Yes	No			\$24.22 M		
2.5	Southeast Wastewater Trunk	Yes	No		\$8.24 M		\$0.01 M/yr	
3	Potable Water							\$33.22 M
3.1	Water Supply Line to Calgary	Yes	No			\$19.95 M		
3.2	New South East Reservoir	No	No		\$5.60 M		\$0.11 M/yr	
3.3	Reservoir Pump Station	Yes	No		\$7.03 M		\$0.28 M/yr	
34	500mm NE Water Supply Line	No	No	\$2.11 M				
4	Storm Water							\$0.52 M
4.1	Developer-funded Storm Infrastructure Only							
5	Acreage Assessment							\$2.11 M
6	Recreational Levy							\$10.96 M
	TOTALS			\$48.37 M	\$33.04 M	\$69.51 M	\$1.84 M/yr	\$182.55 M

STAGED INFRASTRUCTURE - ALTERNATE SCENARIO

The intention of the ENC CASP is to follow the UMP to provide servicing for the CASP area. The development group however does not want to lose sight of possible cost savings or creative solutions to be explored at the CASP stage. Any alternative solution would require thorough review by the City and developers. There is no study to date from the city that identifies these lands as eligible for latent capacity, however this section is intended to flag this area for potential work and investigation at the CASP stage.

Sanitary servicing may be staged with phased construction of the required lift stations and twin forcemains in accordance with the City's UMP and Lift Stations Needs Assessment. With the Alternate servicing strategy, sanitary trunk sewer will need to be extended from 40 Avenue to YVB for ultimate development within East Nose Creek. However, trunk sewer is only required to be extended through the CASP area as development occurs from south to north. Comparing this to the wastewater lift stations and forcemain scenario, the staging of trunk sewer can be better managed to reduce initial upfront costs. Prior to extension of the trunk sewer, connections to local gravity mains within Lanark may be possible pending further investigation at the CASP stage.

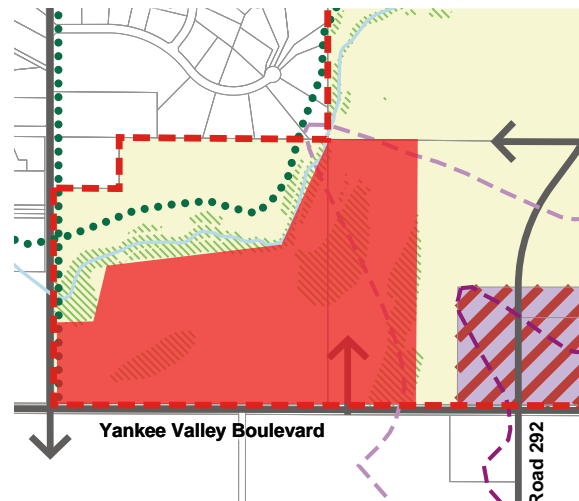


FIGURE 9 - INITIAL DEVELOPMENT AREA

As mentioned previously, water extensions from Lanark will be investigated for the potential servicing of early development stages in the southwest corner of the CASP. Based on the UMP and subject to detailed modeling, it appears suitable water pressures are available (275 kPa to 350 kPa during Peak Hour Demand) for finished grade elevations of up to about 1110 metres based on servicing from the Main Pressure Zone. Therefore, an area as shown on Figure 9 is approximated as potentially serviceable from existing infrastructure until Capital Infrastructure is available for East Nose Creek. Upon construction of the SE Reservoir and booster station in the SE YVB CASP, the lands can be converted into the NE Pressure Zone.

FUNDING & FINANCE

It is understood that capital infrastructure is required to service the lands within the CASP boundary and that the servicing capacity does not currently exist. The East Nose Creek land ownership group commit to enter into a funding agreement with the City and/or the proponents of other CASP areas, as applicable, to front end the following pieces of required regional infrastructure, in accordance with City of Airdrie master servicing plans or approved alternatives, prior to initiating Neighbourhood Structure Plan (NSP) and Land Use Amendment processes:

- Wastewater: Forcemain to Calgary, South Regional Lift Station, Lift Stations within the ENC CASP, and / or SE Trunk Sewer Extensions
- Water: Water Supply Line to Calgary, SE Reservoir and Booster Station

The front ending reimbursement methodology will adhere to the Funding and Financing Model currently being negotiated between the development industry and the City. The East Nose Creek CASP landowners acknowledge and understand that with this financial commitment, the City requires time to initiate, plan, design and construct the supporting regional infrastructure. The time for this activity may impact the NSP and Land Use Amendment processes. It is mutually recognized by the landownership group and the City that the estimated costs and the benefiting areas will be further refined during the CASP development and review process. Prior to first reading of any NSP within the benefiting lands, a front-ending obligation shall be submitted to the satisfaction of the City. This agreement shall reflect cost determinations based on statutory land use approvals as granted by Council through the approved CASP. Further, it is mutually recognized by the landowner group and the City that where critical pieces of new infrastructure are front-ended by the Development Industry and provide a benefit beyond the CASP boundary, the City will commit to negotiate a cost-recovery process as part of the funding and financing agreement that requires proportional repayment from future benefiting CASP areas, and which may allow for cost recovery. Such agreements will be entered into with the understanding that this does not provide an exemption to the social, economic and servicing infrastructure required to be paid for by levies under the Modernized Municipal Government Act.

05 TRANSPORTATION

The background of the page is a photograph of a residential street, heavily tinted with an orange-red color. The street is lined with mature trees, and a stop sign is visible on the right side. The stop sign is octagonal and has the word "STOP" on it. Below the stop sign is a rectangular sign that says "ALL WAY". Further down the pole are two smaller signs: a diamond-shaped "BUMP" sign and a rectangular "15 MPH" speed limit sign. In the bottom right corner, there are yellow contour lines overlaid on the image, suggesting a topographical map or a design element.

The ENC CASP shall provide opportunity to address infrastructure deficiencies necessary to support sustained economic development and population growth, including the broader regional context level infrastructure needs such as major transportation and transit infrastructure. The 2020 Airdrie Transportation Master Plan, entitled the 140K Plan, has been adopted to guide development in the City as they approach the 140,000 population horizon over the next 20 years. The Plan is modeled with two horizon years in mind, 2028 and 2039. The following chart outlines the anticipated improvements which may impact the ENC CASP area.

TABLE 9 - 140K Plan Anticipated Improvements

140K Plan Anticipated Improvements		
Roadway	Section	Upgrades
RR 291	Yankee Valley Boulevard to North of Veterans Boulevard	Widen 2 lanes to 4 lanes
Re-aligned RR 292	40 Avenue to Veterans Boulevard	New construction – 2 lanes from 40 Ave to Veterans Blvd; upgrade to ultimate 4 lanes along corridor as development progresses
Veterans Blvd.	East Lake Road to realigned RR 292	Widen 2 lanes to 4 lanes
Yankee Valley Blvd.	Kings Heights Gate to re-aligned RR 292	Widen 2 lanes to 4 lanes

Majority of the upgrades in the previous chart are anticipated for the 2039 horizon.

Development of the transportation network in the ENC CASP area is necessary for City growth, and includes vital connections within the City's skeletal network. Realignment of RR292 as shown on Figure 10: Transportation, is one of these crucial pieces as it provides the main north-south connection for the transportation network on the east side of Airdrie. This connection is expected to take place as development in the area occurs. Commencement of the ENC CASP would act as a catalyst for this development, benefiting surrounding CASP areas and existing development such as the East Lake Industrial Park, helping enhance the non-residential tax base within Airdrie. Estimated capital infrastructure cost for construction of RR292 as 4 lanes divided road, from Yankee Valley Boulevard to the north boundary of the ENC CASP is \$12.25 M.

The 140K Plan indicates that RR291 will be classified as a 4-lane arterial road. RR291 forms part of the western boundary of the ENC CASP area for approximately 650 metres north of Yankee Valley Boulevard. Since this is a boundary road, half Capital Construction Costs equating to \$1.63 M have been applied to ENC CASP.

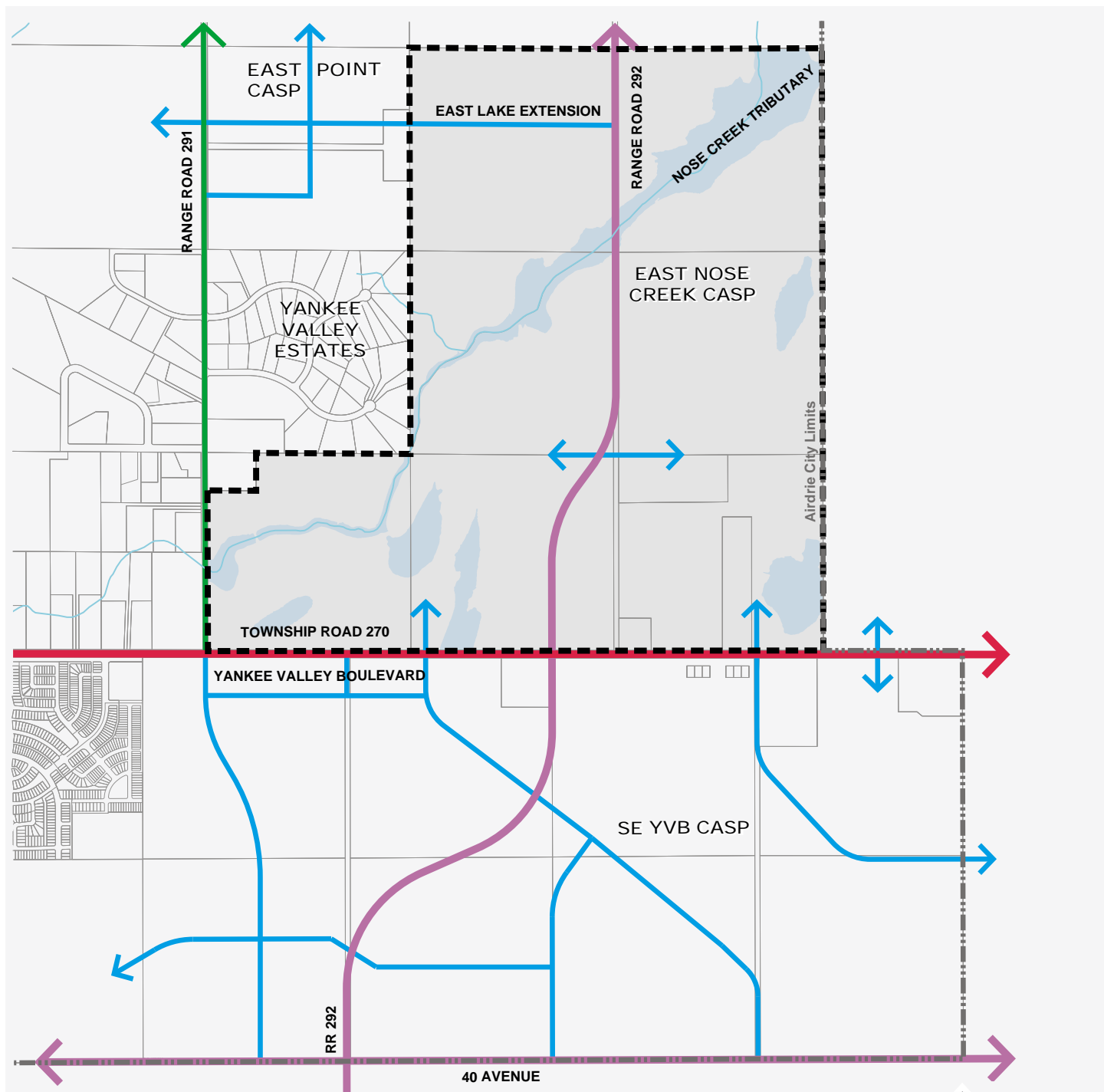
Yankee Valley Boulevard (YVB) comprises the southern boundary of the ENC CASP area. Development of the ENC CASP internal road network will avoid increased congestion at the YVB and Queen Elizabeth II Highway interchange by increasing lanes and offering additional north-south connections via RR292 and RR291. This will support the anticipated industrial traffic of East Points Industrial CASP and East Lake Industrial Park. The update costs are noted as being shared between the ENC CASP and SE YVB CASP based on an estimated \$9.78 M per CASP.

TRANSIT & ACTIVE TRANSPORTATION

The ENC CASP shall develop with an efficient road network system that accommodates the existing natural features of the land while allowing opportunities for convenient and proximal opportunities to utilize transit and active transportation modes. The road network will be designed to support local and regional transit opportunities as well as providing safe and enjoyable pedestrian environments to promote ridership and alternative transportation modes. Re-alignment of RR292 will provide opportunities for efficient access to the City of Calgary, and possible intermunicipal transit. All opportunities to enhance transit and active transportation will be explored at the CASP stage based on guidance of the existing Transit Master Plan, and Great Places Plan.



FIGURE 10 - TRANSPORTATION



- Plan Area Boundary
- Airdrie City Limits
- Existing Major Network
- Future Major Network
- Existing Local Network
- Future Local Network

The background of the page is a landscape photograph of rolling hills and a field, tinted in a solid orange color. In the foreground, there is a field of tall, dry grass and a wire fence with wooden posts. The hills in the background are rounded and stretch across the horizon. The sky is filled with soft, white clouds.

06 LAND SUITABILITY

MDP Policy 2.14 d) Proximity of the proposed development to sour gas operations and facilities, rail ways, confined feeding operations, floodways, unstable slopes, airport vicinity contours and other identified hazards;

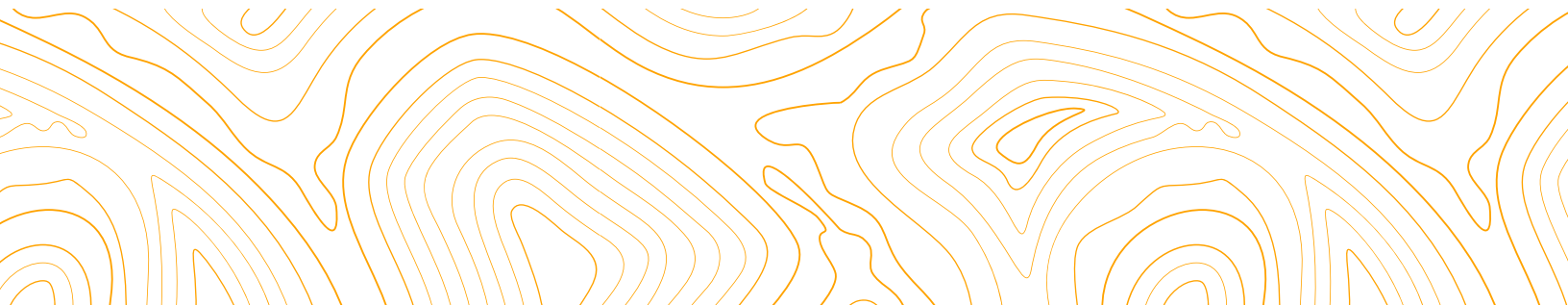
STEEP SLOPES

As seen on Figure 11: Opportunities and Constraints, the ENC CASP area contains some slopes exceeding 15% along the southwest portion of the Nose Creek Tributary. City Plan Policy 3.9 states that slopes of 15% or greater will be considered unsuitable for development and shall be identified as Environmental Reserve, this will be confirmed at the CASP stage.

OIL & GAS INFRASTRUCTURE

Within the subject lands, an abandoned well site is located in the northwest corner of SW-06-27-28-W4M and a natural gas pipeline operated by ATCO Gas and Pipelines Ltd. runs northwest from the southeast corner towards Yankee Valley Estates. Subsequent planning stages will ensure the appropriate measures are taken to mitigate any risks presented by the proximity of this oil and gas infrastructure. Mineral rights are listed on title for all seven (7) quarter-sections of the proposed ENC CASP boundary. Mineral rights owners will be engaged during CASP preparation.

The ENC CASP area does not contain any sour gas operations or facilities, rail ways or confined feeding operations, and is not impacted by the floodways.



AIRPORT VICINITY & NOISE EXPOSURE FORECAST CONTOURS

The Airdrie Airpark is located just south of Yankee Valley Boulevard, south of the ENC CASP boundary. The Airpark is a privately-owned Registered Aerodrome facility which is expected to continue accommodating aviation business related development, presenting opportunities as a major employment area for future East Nose Creek residents. The ENC CASP lands fall within the Airport Vicinity Protection Area (AVPA) as outlined on *Map 4 of the Airdrie Land Use Bylaw* and will therefore adhere to the maximum building height restrictions illustrated on Map 4 (ranging 27-45 metres). At the subsequent Development Permit application stage, the developer shall refer to Section 7.8 of the *Airdrie Land Use Bylaw* to ensure compliance to the administrative requirements. Subsequent planning stages will also consider aspects of the *Land Use in the Vicinity of Aerodromes* (TP 1247) publication including bird hazards, telecommunications and electronic systems, and restrictions to visibility.

As seen on Figure 11: Opportunities & Constraints, the ENC CASP area also falls within two Noise Exposure Forecast (NEF) contours. Transport Canada recommends that where the NEF exceeds 30, new residential development should not proceed. All lands within the NEF 30 contour are proposed as employment/commercial lands and are not expected to include any residential development in accordance with *Land Use in the Vicinity of Aerodromes* (TP 1247).

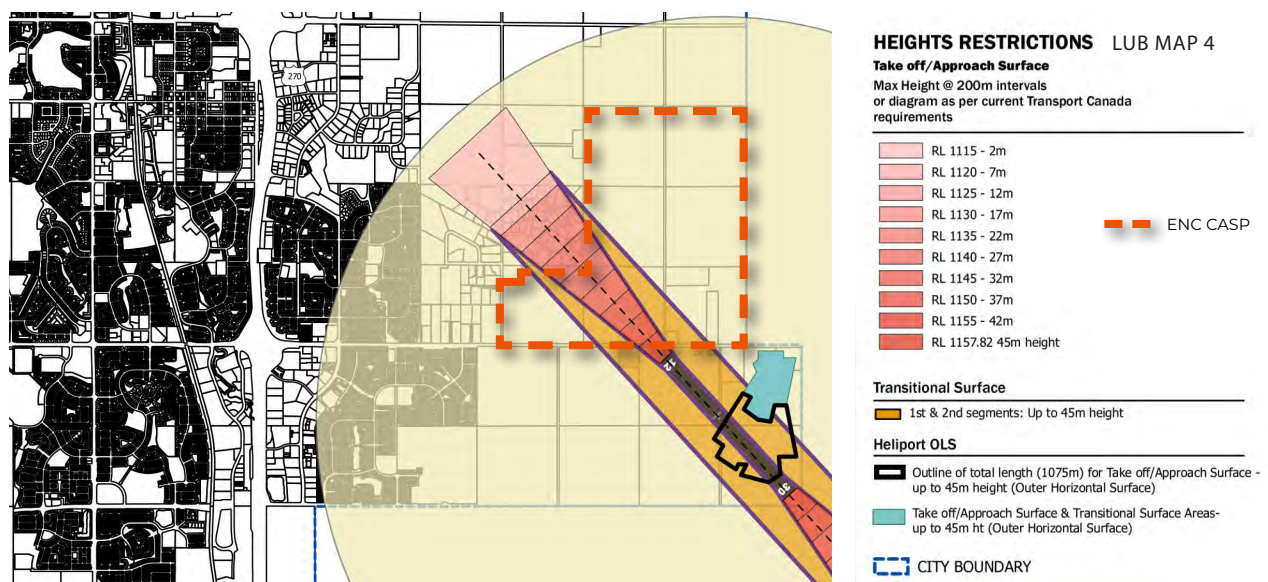
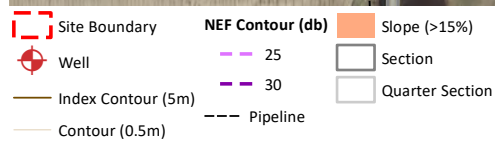
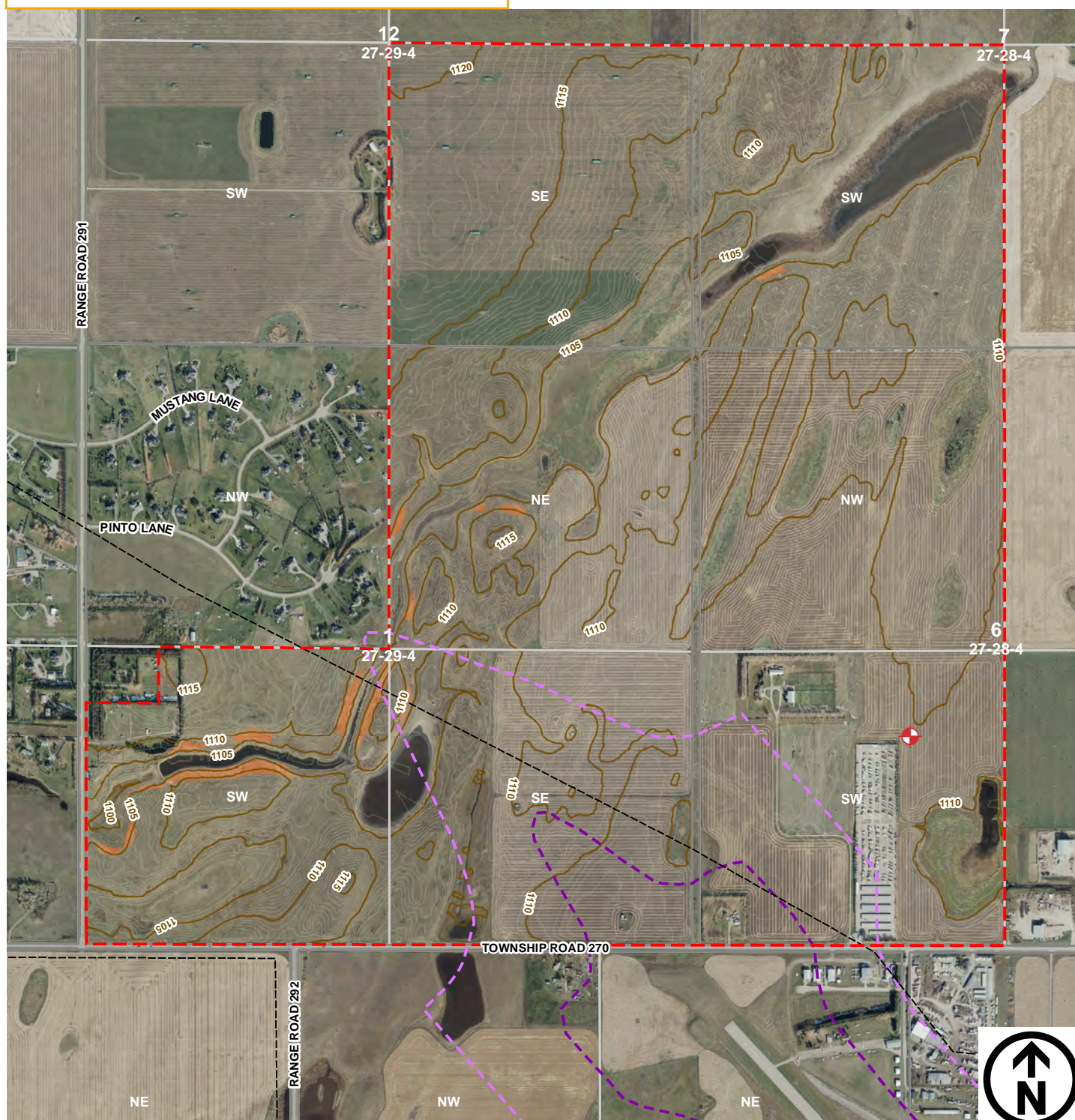


FIGURE 11 - OPPORTUNITIES & CONSTRAINTS



07

COMMUNITY SERVICE IMPACTS

EMERGENCY SERVICES

The development of new CASPs within Airdrie may increase the need for additional facilities for emergency response coverage. The scale and location of required facilities is to be determined through CASP processes. The provision of all other community services that will be necessary to enable and support the influx of residents and jobs into the CASP area will be determined through the CASP Process.



FUTURE SCHOOL SITES

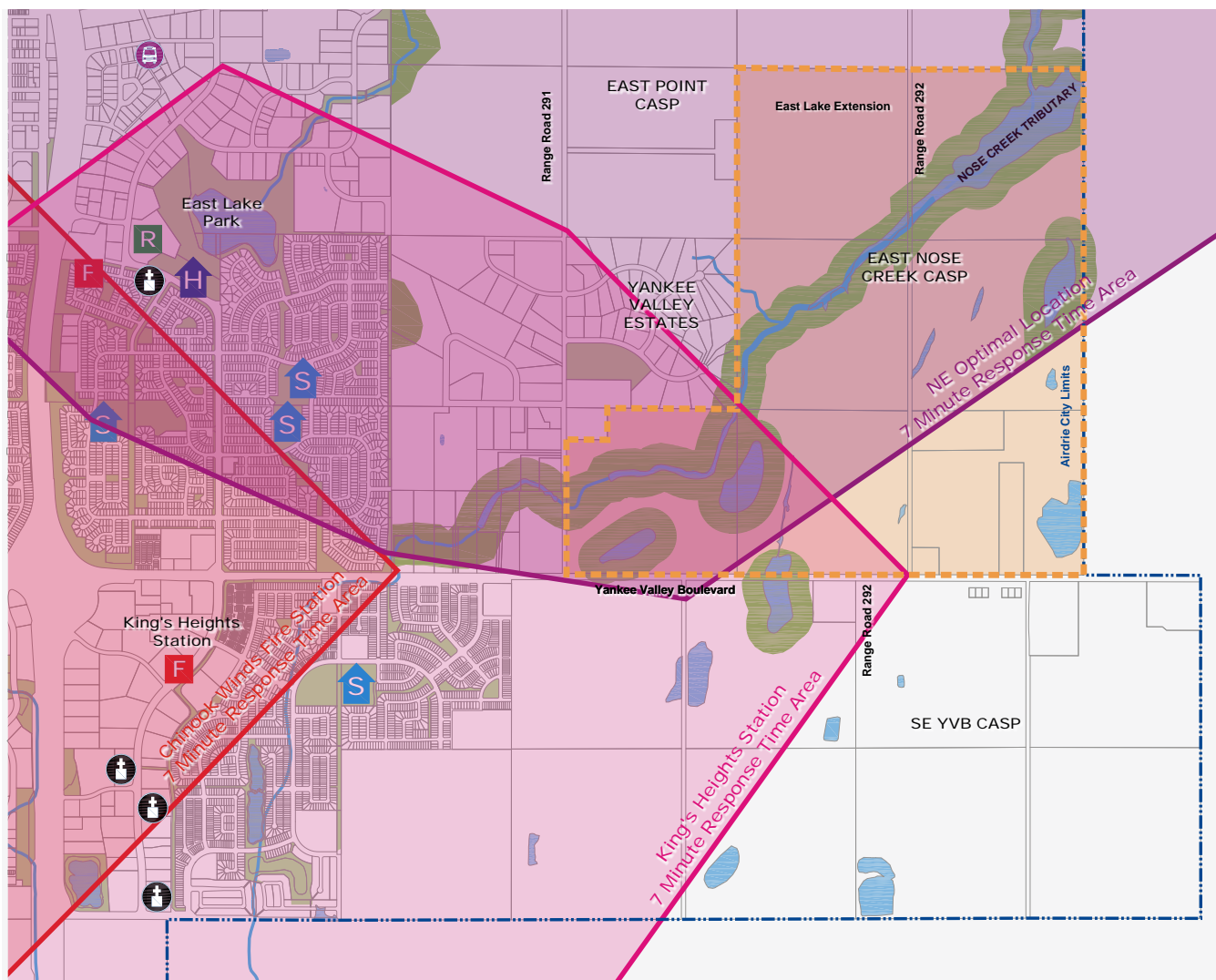
Residential development within the CASP area will require the provision of new schools sites. The project team will work with the Calgary Catholic School District, FrancoSud School Board, and Rocky View School Division to determine the number of school sites required, as well as the location and design of the school sites. The ENC CASP envisions schools as an integral part of the community for green space opportunities, social sustainability and education.

Generally it is assumed that 1 school site is needed per quarter section, and 1 high school site for every 7,000 dwellings. Based on the estimates of this report that would be approximately 7 school sites and 1 high school. Allocation of lands for school sites will be confirmed in subsequent CASP and NSP stages.

At the CASP stage the ENC CASP area will explore the inclusion of open space nodes such as Type E: Outdoor Sports and Recreational Facilities as defined by the Great Places Plan.



FIGURE 12 - COMMUNITY SERVICES



- | | | | | | |
|--|---------------------|--|-----------------------------|--|------------|
| | Plan Area Boundary | | School (Elementary/ Middle) | | Open Space |
| | Airdrie City Limits | | High School | | |
| | Fire Station | | Church | | |
| | Recreation Facility | | Transit Terminal | | |



08

OPEN SPACE

ENVIRONMENTAL CONSTRAINTS & OPPORTUNITIES

Natural features within the proposed CASP area were mapped out in the 2013 *Ecological Inventory Expansion and Environmental Best Practices Report* as East Site 'Site C'. The lands contain a large wetland complex and drainage system which drains from northeast to southwest through the site, eventually connecting with Nose Creek. While fieldwork was not completed on the entirety of the lands as part of the 2013 study by O2 Planning + Design, GIS-derived data identified the presence of natural/semi-natural grassland, riparian corridor, isolated stepping stone, wetland complex, open water wetland, marsh wetland, trees and shrubs, and steep slopes.

A Biophysical Impact (BI) will be required as part of the CASP process, in accordance with the City's BI/BIA Framework, to accurately identify and map environmentally significant areas within the site. Delineation of Environmental Reserve and open space will occur based on the results of this technical review. Opportunities for recreation will be explored with the City at the time of CASP review.



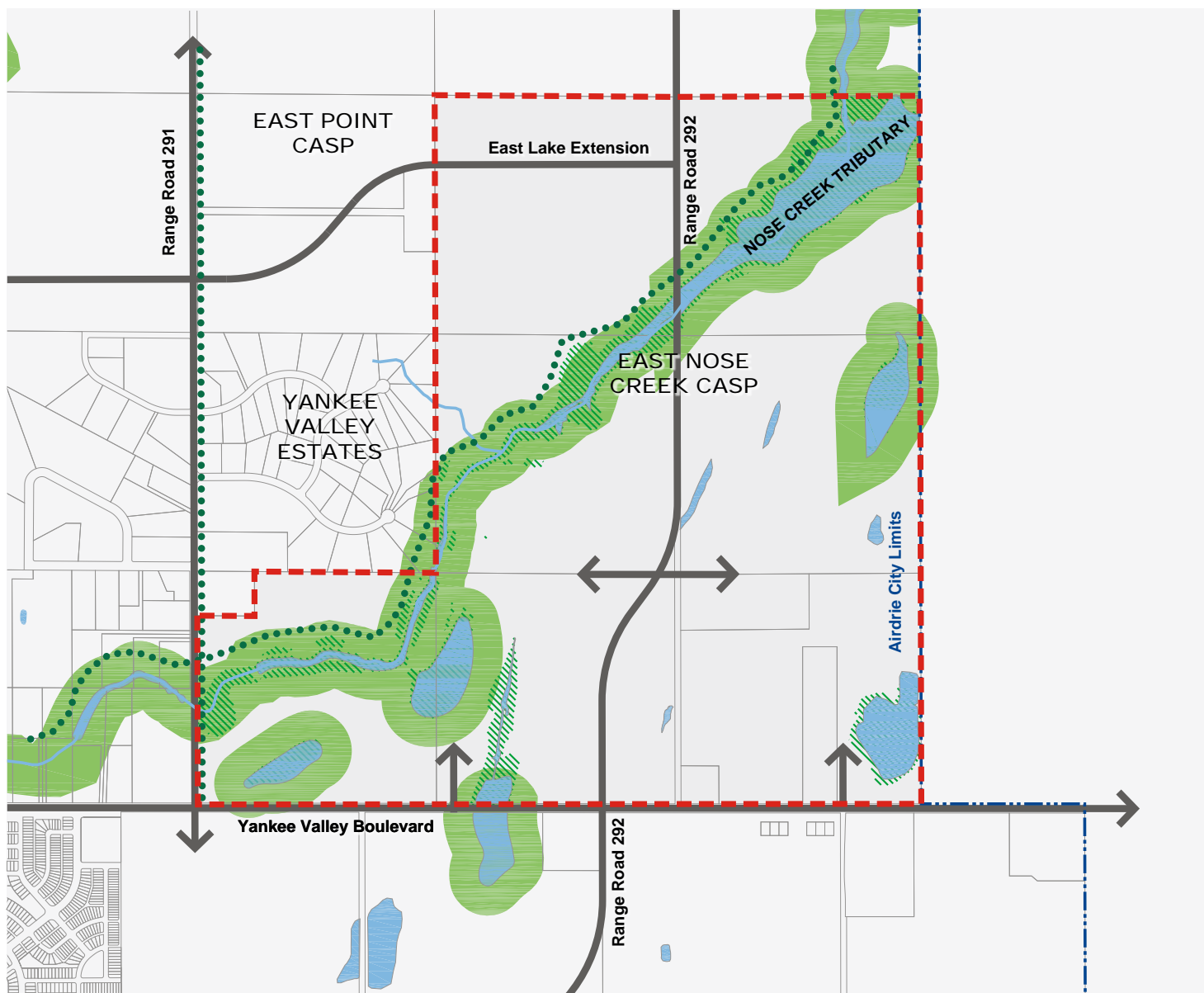
Integration and preservation of the East Nose Creek corridor shall occur as outlined by City ER Policy and City Plan Policy 3.8 which states “Lands dedicated as environmental reserve are intended to remain in their natural state and/or be used as part of a passive park and pathway system. Major municipal infrastructure may cross environmental reserve lands in the least intrusive manner possible by minimizing the impact of the crossing and taking into consideration sensitive environmental features in the vicinity of the crossing.”

The Nose Creek Tributary presents the opportunity to preserve a regionally significant ecological resource that could provide a sense of place and provide social, recreational and educational opportunities for the future residents of the East Nose Creek CASP area.

As seen in Figure 13: Open Space Network, the East Nose Creek green corridor runs from the northeast to the southwest of the plan area and a pathway is proposed to run adjacent to the corridor connecting to a proposed pathway along RR291, as identified in the *Great Places Plan*. This open space network is envisioned to be a community-defining asset, providing immense social, recreational, and environmental value.



FIGURE 13 - OPEN SPACE NETWORK



- - - - Plan Area Boundary
- - - - Airdrie City Limits
- Proposed Major Network
- Proposed Pathway
- ▨▨▨▨ Open Space/ Environmental Features
- ~~~~~ Small Permanent Watercourse



09 POLICY ALIGNMENT

CALGARY METROPOLITAN REGION GROWTH PLAN

The Calgary Metropolitan Region Board (CMRB) was established in 2018 with the intent to provide direction for future development within the Calgary Metropolitan Region and to ensure collaboration between member municipalities. The board is comprised of elected officials representing numerous municipalities, including the City of Airdrie, Rocky View County, and the City of Calgary. The Regional Growth Plan was approved by the Minister of Municipal Affairs and has been in effect since August 15th 2022.

The Growth Plan is regulated by the Municipal Government Act (MGA) and the Calgary Metropolitan Region Board Regulation (Alberta Regulation 190/2017 of the Municipal Government Act).

The intent of previously approved statutory plans such as the Airdrie City Plan, the 12K Plan, and the AirdrieOne Sustainability Plan will be upheld. Assuming support of the ENC CASP by the City Council, the Plan would go before the CMRB for evaluation based on the Regional Evaluation Framework (REF), and be circulated to member municipalities for comment. The proposed ENC CASP aligns with Regional Growth Plan policies by:

- Orienting growth to a Preferred Growth Area
- Providing development in the form of a Preferred Placetype (Masterplan Community)
- The ENC CASP area shall meet the minimum average residential density for Masterplan Communities within Urban Municipalities (20 dwelling units/hectare or 8 units per acre)
- Preserving the function of regionally significant natural systems such as the East Nose Creek tributary
- Providing diverse housing and employment opportunities

CITY OF AIRDRIE/M.D. OF ROCKY VIEW INTERMUNICIPAL DEVELOPMENT PLAN (IDP)

The City of Airdrie/M.D. of Rocky View IDP was adopted in 2001 to plan for the future development of lands for which the City and the County had mutual interest. The southwestern portion of the subject lands fall within the IDP boundary as part of the notification zone, the remainder of the lands were not included in the IDP. At the time of IDP adoption, the City of Airdrie boundary did not include the subject lands as they were a part of the 12,640-acre annexation in 2012. The IDP has not been amended to reflect this change, however the proposed ENC CASP will demonstrate compliance with the IDP by collaborating with the County to ensure land use compatibility and coordination of efficient servicing and transportation. The eastern edge of the subject lands directly border Rocky View County, and special attention will be paid to ensure boundary conditions are treated respectfully, and reflect a thoughtful transition.



AIRDRIE CITY PLAN (MDP) BYLAW NO. B-17/2014

The Airdrie City Plan is a Municipal Development Plan (MDP) adopted by the City in 2014, and most recently amended in 2018. The City Plan was developed in alignment with the AirdrieOne Sustainability Plan to encourage a sustainable future for the City. Policies within the City Plan guide future statutory and non-statutory planning documents including Community Area Structure Plans (CASPs). The City Plan does not designate land use for the subject lands as it is considered beyond the 90,000 population planning horizon. The MDP notes a long term population projection of 110,000 people by as early as 2040, assuming no other constraints and using aggressive growth trends. Section 2.9 of the City Plan requires approval of a planning and growth management Justification Report prior to the initiation of a CASP. The City Plan refers to Sections 2.13 and 2.14 which outline criteria by which a justification report is assessed. Policy 2.13 states:

2.13 The City will assess the need to convert rural and agricultural land to urban development based on growth rates, growth trends and residential and employment land analysis requirements. The decision to bring specific lands into urban development areas and expand the growth boundaries will be based on an analysis of development demand, City and landowner objectives, as well as constraints and opportunities which will consider, but not be limited to:

- a. Population projections*
- b. Growth trends*
- c. Land availability and development absorption rates*
- d. Expectations for completing approved community plan areas and neighbourhoods*
- e. Vacant land analysis*

Section 2.14 of the Airdrie City Plan states:

2.14 The City will manage the location and sequencing of urban development by applying the following growth criteria to the assessment of proposals to bring additional lands into urban development. This assessment is conducted in addition to the land supply analysis indicated above. Each criteria has been addressed within this report.

- a. Ability of the proposed development to enhance the proportion of non-residential development;*
- b. Fiscal implications of the development and assessment of short and long term costs/risks to the City;*
- c. Adjacency of proposed growth area to existing development and services;*
- d. Proximity of the proposed development to sour gas operations and facilities, railways,*
- e. Confined feeding operations, floodways, unstable slopes, airport vicinity contours and other identified hazards;*
- f. Infrastructure capacity, including road and piped infrastructure;*
- g. Servicing requirements and expansion feasibility;*
- h. The funding/financing strategy outlined by the proponent to address costs for the required servicing and infrastructure, including front-ending requirements;*
- i. Environmental constraints and opportunities (e.g. consideration of wetlands, natural vegetation and natural drainage systems);*
- j. Community infrastructure capacity implications (e.g. emergency and protective services, schools, parks and recreation);*
- k. Ability of the proposed development to broaden and improve the amenities, use mix and housing choice within residential communities; and*
- l. Ability to effectively align the development with AirdrieOne sustainability objectives.*



The City Plan also notes the Airport Vicinity Protection Area (AVPA) and presence of Noise Exposure Forecast (NEF) contour lines, both of which enter the southern quarter-sections of the subject lands. Development within these areas is subject to height restrictions, and other land use, development and building regulations.

Nose Creek is acknowledged as “Airdrie’s most significant natural asset” and its preservation is a priority for the City. As per section 3.1, through the CASP process the City shall require the natural drainage course and wetlands on site be identified as environmental reserve.

3.13. The minimum riparian setback width shall be 15 m from top of bank, or 25m from centre of creek or the 1:100 year high water mark (whichever is greater) or as recommended by a biologist report that considers floodway and rate of erosion amongst other factors acceptable to the City as per the Nose Creek Watershed Management Plan.

Wetlands shall be identified at the CASP stage and ecological significance shall be identified. Based upon the *Ecological Inventory Expansion & Best Practices Report*, it is assumed a significant amount of the wetlands and drainage course on site shall be preserved.



AIRDRIEONE SUSTAINABILITY PLAN

The AirdrieOne Sustainability Plan was adopted in 2012 to encourage community stakeholders to invest in Airdrie's future. The plan identifies a series of goals, actions, objectives and measures to promote intersectional sustainability for the City.

The ENC CASP aligns with the goals of the AirdrieOne Sustainability Plan and moves towards achieving those goals by providing an opportunity for both residential and non-residential use that is economically, socially, and fiscally sustainable. The proposed plan facilitates a fiscally responsible amount of non-residential use that addresses the City's desire to balance the ratio of residential and non-residential uses. The development pattern will strive to maximize accessibility with minimal infrastructure and promote a broad range of housing opportunities for the City.

The East Nose Creek green corridor will contribute to the environmental and social sustainability of the community by creating opportunities for activity and interaction, promoting community pride and improving environmental protection. The corridor creates opportunities for education about watershed health and conservation, and enhances cultural sustainability by highlighting the elements that make Airdrie unique. Successful maintenance and riparian protection of the tributary will also help accomplish fiscal sustainability by minimizing costly engineering solutions.



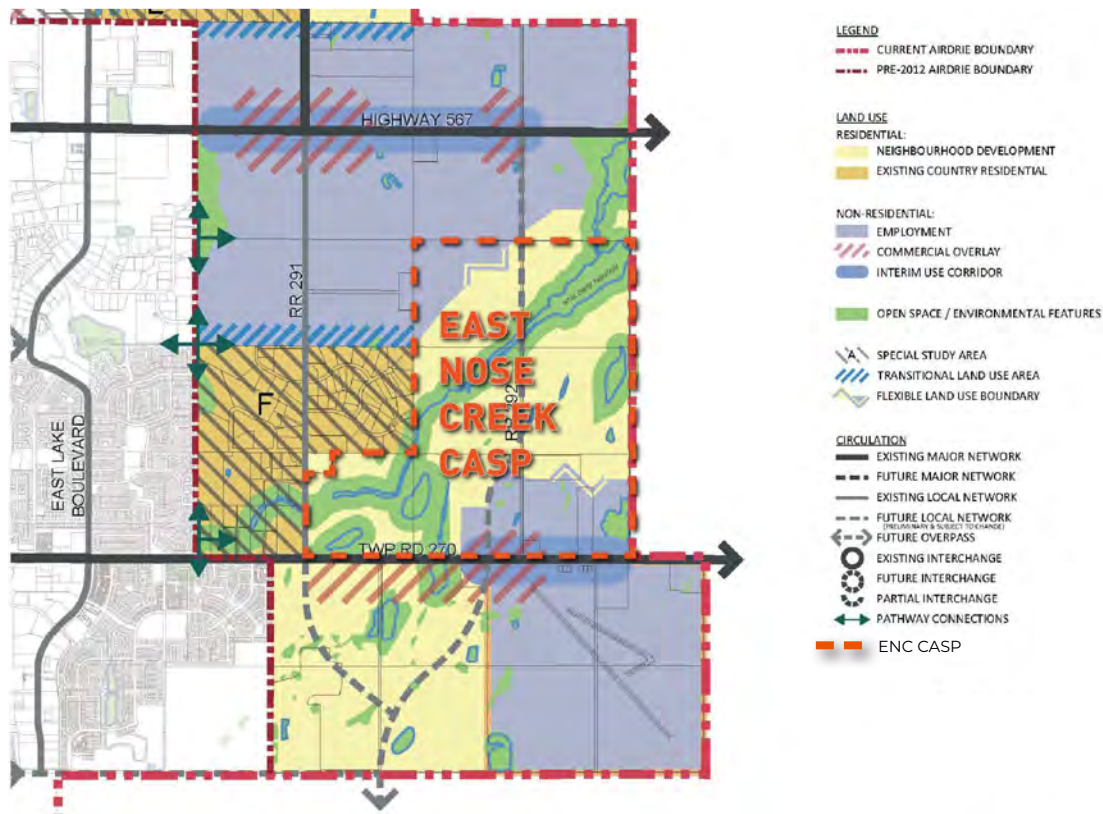
12 THOUSAND ACRES PLAN

The 12 Thousand Acres Plan (12K Plan) is a Growth Sequencing Strategy put together by the City to guide Council's decision making on future development of the ~12,640 acres (5, 115 hectares) which were annexed by the City from Rocky View County in 2012. These lands were annexed to provide a 50-year land supply for growth, now nearly 10 years later it is the logical next step to continue detailed planning for the future of these lands.

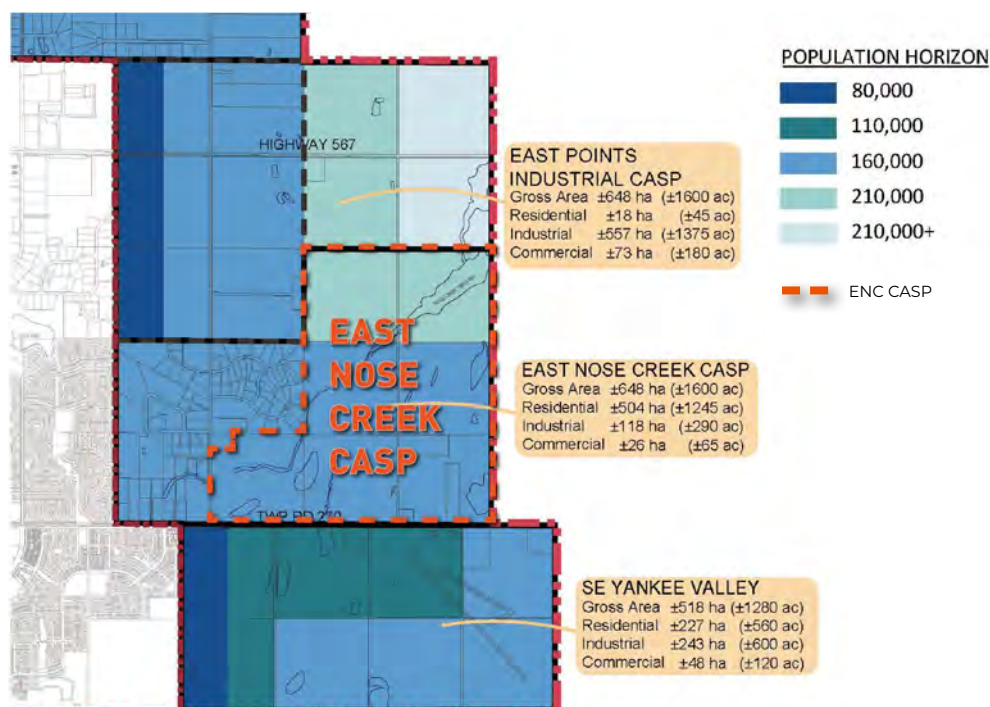
The boundary of the proposed ENC CASP within this report aligns with that of the 12K Plan. Figure 7: Land Use Concept, of the 12K Plan identifies the subject lands as predominantly community development, with significant open space surrounding the Nose Creek tributary and associated wetlands. Boundaries between proposed non-residential uses in the northwest and southeast corners are identified as flexible, and a future local network road is proposed to connect Yankee Valley Boulevard, south of the site, with Highway 567 in the north. A non-residential interim use corridor is proposed along Yankee Valley Boulevard in the south of the subject lands, as well as a commercial overlay. The 12K Plan envisions the ENC CASP area to be developed sequentially within two population thresholds. Majority of the subject lands are proposed to align with the population threshold of 160,000 while the two northern quarter sections are anticipated at the 210,000 population threshold. As noted in the 12K Plan, development of the ENC CASP area is proposed to occur sequentially, contingent on planning rationale determined at the CASP stage. The 12K Plan states that any proposed phasing or sequencing strategy that does not align with that of the Plan will not directly impact the approval of CASPs however a proposed strategy should be justified and proven during the review and approval of the CASP.

The proposed ENC CASP aligns with the 12K Plan vision, by preserving significant land for open space, providing residential land use for community growth, and designating lands in the northwest and south for industrial and commercial development. The proposed road network will follow that of the 12K Plan, and be further refined throughout the subsequent CASP and Neighbourhood Structure Plan (NSP) processes. As outlined in Section 2 Growth and Demand Analysis, initiation of planning the ENC CASP lands now will ensure their alignment with proposed sequencing within the 12K Plan.

Land Use Concept - 12 Thousand Acre Plan - City of Airdrie



Growth Management Sequencing Strategy - 12 Thousand Acre Plan - City of Airdrie



AIRDRIE'S ECONOMIC STRATEGY 2018-2028

Airdrie's Economic Strategy takes a place-based approach, aiming to attract economic investment through establishing a sense of place, building upon the City's strengths and creating a place where people want to be. Community engagement highlighted three key strengths, Airdrie's small-town feel, geographic location, and entrepreneurial leadership. In reference to the City's entrepreneurial spirit, the strategy notes that 60% of all Airdrie businesses operate from home. The proposed ENC CASP reflects this fact by providing a range of housing options recognizing the prevalence of alternative work environments throughout the COVID-19 pandemic. The ENC CASP will provide access to amenities within a family-friendly community that aligns with the City's small-town feel, all of which are noted as qualities that make Airdrie a popular destination for residents and businesses. The ENC CASP lands also provide the City with much needed shovel-ready non-residential lands and improve transportation networks providing key linkages between business hubs such as the East Lake Industrial area.

THE GREAT PLACES PLAN

The Great Places Plan is rooted in extensive public engagement taking place in 2006 and most recently, in 2015. The Plan establishes a vision for developing Airdrie's open space system, and guiding principles for achieving that vision. Looking towards the year 2026, the Plan envisions Airdrie's Open Space System to be a "model of environmental stewardship and a highly valued community asset." The Nose Creek tributary is noted as a Green Corridor with opportunities for a proposed adjacent pathway.

The ENC CASP concept aligns with the intentions of the Great Places Plan by preserving the ecological integrity of the Nose Creek corridor and surrounding areas as an amenity resource. Highly connected pathway systems and preservation of the natural landscape will encourage recreation and create new opportunities for residents to connect with their environment.

AIRDRIE UTILITY MASTER PLAN

Future water servicing within the post-annexation boundary requires an expansion of the existing Northeast Pressure Zone, and either expansion of the northeast reservoir or a new southeast reservoir.

The Master Plan contemplates two variations to the proposed servicing concept for the 110,000 growth horizon.

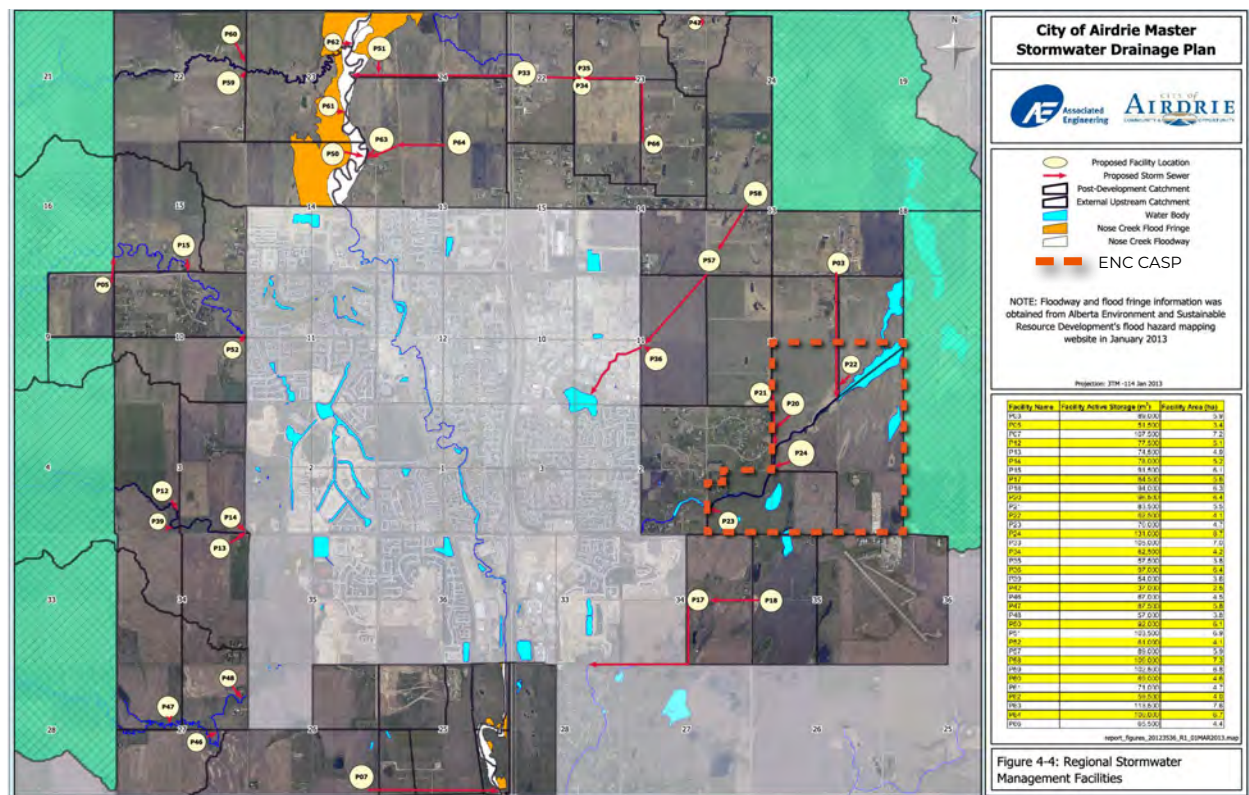
- a. *Reconfigure the existing booster station to distribute potable water from the new supply main to the Southeast and Southwest Reservoirs.*
- b. *Move the Southeast and Southwest Reservoirs into the Main Pressure Zone to eliminate the need for a booster pump.*



AIRDRIE MASTER STORMWATER DRAINAGE PLAN

Stormwater management in the Nose Creek Watershed is extremely important, and the Airdrie Master Stormwater Drainage Plan outlines numerous strategies to promote appropriate riparian management and ensure the preservation of this regionally significant environmental resource. The Plan notes multiple permanent waterbodies, and environmentally significant areas within the ENC CASP boundary, as well as a pipeline running from the northwest to the southeast in the southern portion of the plan area. The subject lands are not within the Nose Creek floodway and the plan contemplates four proposed facility locations within the plan area.

The ENC CASP supports this plan by integrating natural areas into open space systems and the urban fabric, preserving natural drainage courses and incorporating regional stormwater management facilities. In subsequent planning stages the ENC area will ensure appropriate development setbacks, refer to stormwater Best Management Practices, and encourage the use of Low Impact Development (LID) practices.



EAST POINTS TARGET SECTOR ANALYSIS & EAST POINTS MARKETING STRATEGY

The East Points Target Sector Analysis and East Points Marketing Strategy notes Airdrie's top five industries as retail trade, construction, health care and social assistance, transportation and warehousing, and professional or technical services. Population growth in Airdrie has consistently surpassed that of Alberta by nearly five times in the 2011 and 2016 census. At the time of study, Airdrie had a surplus of workers with over 20,000 more workers than jobs, making Airdrie a net exporter of labour. Target sectors for the city include energy production and management, and transportation, wholesale and warehousing. Knowledge based industries were identified as emerging and construction and manufacturing remain industries of interest. The majority of the Airdrie workforce had been commuting to Calgary in 2016 and most of those who were working in Airdrie also lived there. The strategy notes a number of vacant land parcels in Airdrie that are designated for employment uses in existing industrial and business parks such as Kingsview Industrial Park and East Lake Industrial Park. The ENC CASP lands will provide contiguous and shovel-ready non-residential lands and enable the progression of adjacent planned employment hubs such as the East Points Industrial CASP area, and the SE YVB CASP area.



AIRDRIE RETAIL GAP ANALYSIS

The Retail Gap Analysis was carried out in 2018 and 2019 and was most recently updated in 2020. The report acknowledges the lasting impacts of the COVID-19 pandemic, especially on the retail sector. It was found that the majority of retail sectors suffered 15-20% declines as a result of temporary or permanent closures throughout the pandemic. The report notes the strength in Airdrie's young family demographic, which is supported by strong household income. The ENC CASP area will offer a range of housing options to support this demographic.

An aerial photograph of a suburban area, showing a mix of residential streets with houses and larger commercial or industrial buildings. A large, semi-transparent orange rectangle is overlaid on the entire image, serving as a background for the text.

APPENDIX A

MDP

COMPLIANCE

TABLE

MDP Policy 2.14 Compliance	
2.14 The City will manage the location and sequencing of urban development by applying the following growth criteria to the assessment of proposals to bring additional lands into urban development.	
Criteria	Compliance
a) Ability of the proposed development to enhance the proportion of non-residential development;	The ENC CASP area as proposed does not align with the target assessment breakdown of 75% residential, 25% non-residential. However, this report has justified this discrepancy as the CASP area will provide a labour force within the residential lands to support surrounding CASP areas, meets the intent of proposed flexible land use boundaries within the 12K Plan, and aligns with the vision for the greater east Airdrie community as well as surrounding approved planned lands.
b) Fiscal implications of the development and assessment of short and long term costs/risks to the City;	A combination of capitol infrastructure funded through regional levies, as well as developer funded infrastructure will be required to serve the ENC CASP area. Detailed development costs would be determined during CASP and NSP preparation. See Section 3: Risk Assessment & Mitigation for more detail.
c) Adjacency of proposed growth area to existing development and services;	The ENC CASP area borders two existing CASPs, the East Points Industrial CASP and the SE YVB CASP. The East Points CASP was recently approved for significant industrial development, and the SE YVB CASP includes the existing Airdrie Airpark which presents an employment opportunity. The existing residential development known as Yankee Valley Estates borders the ENC CASP to the west.
d) Proximity of the proposed development to sour gas operations and facilities, railways, confined feeding operations, floodways, unstable slopes, airport vicinity contours and other identified hazards;	The proposed ENC CASP area does not contain any sour gas operations and facilities, railways, or confined feeding operations, and is not impacted by the floodway. Slopes exceeding 15% are identified on Figure 11: Opportunities and Constraints and are not proposed for development. Airport Vicinity Contours are also identified on Figure 11 and subsequent planning stages will fulfill the requirements for those areas. Non-residential development is located within the highest NEF contour to limit negative impacts on residential development. See Section 6: Land Suitability for more detail.

MDP Policy 2.14 Compliance	
e) Infrastructure capacity, including road and piped infrastructure;	Development of new infrastructure, and upgrades to existing infrastructure will be funded via a combination of developer funding and regional levies. Development of this infrastructure is required to facilitate growth in east Airdrie and will benefit the City beyond the boundaries of the ENC CASP area. For further detail see Section 3: Risk Assessment & Mitigation, Section 4: Servicing Feasibility, and Section 5: Transportation.
f) Servicing requirements and expansion feasibility;	Water servicing is feasible via existing and planned infrastructure. Sanitary servicing is explored with two possible options and the approach aligning with the UMP is recommended. Stormwater will be serviced using gravity sewer pipe and stormwater management and storage facilities. Stormwater management facilities will have their final locations determined through the CASP and NSP stages. See Section 4: Servicing Feasibility for analysis, detailed servicing plans will be addressed at the CASP/NSP stage.
g) The funding/financing strategy outlined by the proponent to address costs for the required servicing and infrastructure, including front-ending requirements;	A combination of capitol infrastructure funded through regional levies, as well as developer funded infrastructure will be required to serve the ENC CASP area.
h) Environmental constraints and opportunities (e.g. consideration of wetlands, natural vegetation and natural drainage systems);	The Nose Creek Tributary and surrounding area, as well as numerous existing wetlands will be preserved as a combination of Environmental Reserve and dedicated open space, woven within the urban fabric the green corridor will bring a sense of place to the community. Subsequent planning stages will explore strategies to minimize impacts to this natural resource during development.
i) Community infrastructure capacity implications (e.g. emergency and protective services, schools, parks and recreation);	The development of new CASPs within Airdrie may increase the need for additional facilities for emergency response coverage. The scale and location of required facilities is to be determined through CASP processes. The ENC CASP envisions schools as an integral part of the community for green space opportunities, social sustainability and education. Specific school requirements will be identified in subsequent planning stages. The East Nose Creek Green Corridor will provide ample opportunity for recreation and flexible open space.

APPENDIX B **EAST NOSE CREEK CASP EXPECTED CAPITAL COSTS**

APPENDIX A (also TABLE 8) - ENC CASP Expected Capital Costs - As per Option A

ENC CASP Expected Capital Costs								
Item #	Regional Infrastructure Item	In 10-year Capital Plan (2020 - 2029)	In 3-year Capital Budget (2020 - 2022)	Est. Capital Infrastructure Cost within East Nose Creek CASP	Est. Capital Infrastructure Cost within SE YVB CASP	Est. Capital Infrastructure Cost for all Airdrie Growth	Estimated Operations Cost	Expected Levies for Contributing CASP area (+/- 462 ha)
1	Transportation							\$104.75 M
1.1	RR292 (YVB to North Boundary - 4 lanes divided	No	No	\$12.25 M				
1.2	RR291 (650m North of YVB) - 4 lanes divided - 50%	No	No	\$1.63 M				
1.3	YVB Update East Part 2	Yes	No	\$9.78 M	\$9.78 M			
2	Wastewater							\$30.99 M
2.1 a	Lift Station #6 and Forcemain	No	No	\$8.5 M			\$0.26 M/yr	
2.1 b	Lift Station #7 and Forcemain	No	No	\$14.1 M			\$0.42 M/yr	
2.2	South Regional Lift Station	Yes	No			\$25.34 M	\$0.76 M/yr	
2.3	Wastewater Forcemain to Calgary	Yes	No			\$24.22 M		
2.5	Southeast Wastewater Trunk	Yes	No		\$8.24 M		\$0.01 M/yr	
3	Potable Water							\$33.22 M
3.1	Water Supply Line to Calgary	Yes	No			\$19.95 M		
3.2	New South East Reservoir	No	No		\$5.60 M		\$0.11 M/yr	
3.3	Reservoir Pump Station	Yes	No		\$7.03 M		\$0.28 M/yr	
34	500mm NE Water Supply Line	No	No	\$2.11 M				
4	Storm Water							\$0.52 M
4.1	Developer-funded Storm Infrastructure Only							
5	Acreage Assessment							\$2.11 M
6	Recreational Levy							\$10.96 M
	TOTALS			\$48.37 M	\$33.04 M	\$69.51 M	\$1.84 M/yr	\$182.55 M

REFERENCES FOR TABLE 8 ENC CASP Expected Capital Costs

References for the ENC CASP Expected Capital Costs		
Item	Comments	Reference #
1	Levies include Transportation, landscaping, pathway, and land acquisition costs as included in 2019 Off-site Levies and Acreage Assessments Rate Table	Reference I
1.1	Value of \$5,000 /m for Arterial Roads applied over 2450 m	
1.2	Value of \$5,000 /m for Arterial Roads applied over 650 m	
1.3	Value of \$19.6M was presented in the SE YVB CASP as an assumed 80% of the road upgrades from Kings Heights Gate to City Limits as presented as item 900011 in the 2018-2027 CBC recommended Capital Budget and Plan, this value is split between the East Nose Creek CASP and the SE YVB CASP	Reference V
2	Levies include wastewater fees and PUL acquisition costs per acre for V-3 Recovery Rea as included in the 2019 Off-site Levies and Acreage Assessments	Reference I
2	Operating Costs determined per pg 35 of the UMP: 3% of Capital Cost for Lift Stations	Reference IV
2	Operating Costs for Deep Sewer presented to be in alignment with the SE YVB CASP which assumed a cost of \$10,000	Reference V
2.1 a	Values from Wastewater Lift Station Needs Assessment (2020), for Stage 1 works (pages 2-17), includes land acquisition per Appendix K page 3, and excludes pipe oversize.	
2.1 b	Values from Wastewater Lift Station Needs Assessment (2020), for Stage 1 works (pages 2-17), includes land acquisition per Appendix K page 3, and excludes pipe oversize.	
2.2	Value from 2021 City of Airdrie Budget, pg 56	Reference III
2.3	Value from 2021 City of Airdrie Budget, pg 56	Reference III
2.5	Value from 2021 City of Airdrie Budget, pg 56	Reference III
3	Water Levies calculated as \$11,769 per Acre as per the 2019 Offsite Levies and Acreage Assessments	Reference I
3	Operating Costs determined per UMP: 2% of Capital Cost for reservoirs and 4% for water pump stations	Reference IV
3.1	Value from 2021 City of Airdrie Budget, pg 55 & 56 (\$1.5M +18.45M)	Reference III
3.2	SE Reservoir Projected Cost from UMP Appendix G cost estimate	Reference II
3.3	SE Reservoir Pump Station Value as per Pg 55 & 56 of the 2021 City of Airdrie Budget (\$0.6903M + \$6.3353M)	Reference III
3.4	400 mm Reservoir Fill line value used from SE YVB CASP which references the UMP final report	Reference V
3.5	500 mm NE Water Supply Line value from UMP	Reference II
4	Storm water Costs have not been included in this Capital Costs assessment as Stormwater Management Facility Costs are the Developer Responsibility	
4.1	Developer-funded Storm Infrastructure Only	Reference I
5	Acreage Assessments include Levy Report and Engineering Review fee for \$1,850 per acre as per the 2019 Off-site Levies and Acreage Assessments	Reference I
6	Recreation Levy assumes 8 dwellings per Hectare at a rate of \$1,200 per dwelling as per the 2019 Off-site Levies and Acreage Assessments	Reference I

ENC CASP Expected Capital Costs - As per Alternative Option B

ENC CASP Expected Capital Costs								
Item #	Regional Infrastructure Item	In 10-year Capital Plan (2020 - 2029)	In 3-year Capital Budget (2020 - 2022)	Est. Capital Infrastructure Cost within East Nose Creek CASP	Est. Capital Infrastructure Cost within SE YVB CASP	Est. Capital Infrastructure Cost for all Airdrie Growth	Estimated Operations Cost	Expected Levies for Contributing CASP area (+/- 462 ha)
1	Transportation							\$104.75 M
1.1	RR292 (YVB to North Boundary - 4 lanes divided	No	No	\$12.25 M				
1.2	RR291 (650m North of YVB) - 4 lanes divided - 50%	No	No	\$1.63 M				
1.3	YVB Update East Part 2	Yes	No	\$9.78 M	\$9.78 M			
2	Wastewater							\$30.99 M
2.1	Wastewater Trunk Extension (YVB to NE corner of ENC CASP)	No	No	\$8.75 M			\$0.01 M/yr	
2.2	South Regional Lift Station	Yes	No			\$25.34 M	\$0.76 M/yr	
2.3	Wastewater Forcemain to Calgary	Yes	No			\$24.22 M		
2.4	Wastewater Trunk Extension to YVB	No	No		\$3.89 M		\$0.01 M/yr	
2.5	Southeast Wastewater Trunk	Yes	No		\$8.24 M		\$0.01 M/yr	
3	Potable Water							\$33.22 M
3.1	Water Supply Line to Calgary	Yes	No			\$19.95 M		
3.2	New South East Reservoir	No	No		\$5.60 M		\$0.11 M/yr	
3.3	Reservoir Pump Station	Yes	No		\$7.03 M		\$0.28 M/yr	
3.4	400 mm Reservoir Fill Line	No	No		\$2.40 M			
4	Storm Water							\$0.52 M
4.1	Developer-funded Storm Infrastructure Only							
5	Acreage Assessment							\$2.11 M
6	Recreational Levy							\$10.96 M
	TOTALS			\$32.40 M	\$36.93 M	\$69.51 M	\$1.18 M/yr	\$182.55 M

REFERENCES FOR ENC CASP Expected Capital Costs - Alternative Option B

References for the ENC CASP Expected Capital Costs		
Item	Comments	Reference #
1.1	Value of \$5,000 /m for Arterial Roads applied over 2450 m	
1.1	Levies include Transportation, landscaping, pathway, and land acquisition costs as included in 2019 Off-site Levies and Acreage Assessments Rate Table	Reference I
1.2	Value of \$5,000 /m for Arterial Roads applied over 650 m	
1.3	Value of \$19.6M was presented in the SE YVB CASP as an assumed 80% of the road upgrades from Kings Heights Gate to City Limits as presented as item 900011 in the 2018-2027 CBC recommended Capital Budget and Plan, this value is split between the East Nose Creek CASP and the SE YVB CASP	Reference V
2	Operating Costs determined per pg 35 of the UMP: 3% of Capital Cost for Lift Stations	Reference IV
2	Operating Costs for Deep Sewer presented to be in alignment with the SE YVB CASP which assumed a cost of \$10,000	Reference V
2.1	Value determined from alignment and sizing of Sanitary Trunk Sewer servicing CASP area from YVB to NE corner of site	Reference VI
2.1	Levies include wastewater fees and PUL acquisition costs per acre for V-3 Recovery Rea as included in the 2019 Off-site Levies and Acreage Assessments	Reference I
2.2	Value from 2021 City of Airdrie Budget, pg 56	Reference III
2.3	Value from 2021 City of Airdrie Budget, pg 56	Reference III
2.4	Value determined from alignment and sizing of Sanitary Trunk Sewer servicing CASP area from Sanitary Trunk main on RR 292 to YVB	Reference VI
2.5	Value from 2021 City of Airdrie Budget, pg 56	Reference III
3	Operating Costs determined per UMP: 2% of Capital Cost for reservoirs and 4% for water pump stations	Reference IV
3.1	Value from 2021 City of Airdrie Budget, pg 55 & 56 (\$1.5M +18.45M)	Reference III
3.1	Water Levies calculated as \$11,769 per Acre as per the 2019 Off-site Levies and Acreage Assessments	Reference I
3.2	SE Reservoir Projected Cost from UMP Appendix G cost estimate	Reference II
3.3	SE Reservoir Pump Station Value as per Pg 55 & 56 of the 2021 City of Airdrie Budget (\$0.6903M + \$6.3353M)	Reference III
3.4	400 mm Reservoir Fill line value used from SE YVB CASP which references the UMP final report	Reference V
4	Storm water Costs have not been included in this Capital Costs assessment as Stormwater Management Facility Costs are the Developer Responsibility	
4.1	Developer-funded Storm Infrastructure Only	Reference I
5	Acreage Assessments include Levy Report and Engineering Review fee for \$1,850 per acre as per the 2019 Off-site Levies and Acreage Assessments	Reference I
6	Recreation Levy assumes 8 dwellings per Hectare at a rate of \$1,200 per dwelling as per the 2019 Off-site Levies and Acreage Assessments	Reference I

REFERENCE I - City of Airdrie 2019 Off-site Levies and Acreage Assessments

City of Airdrie Off-site Levies and Acreage Assessments (POST-ANNEXATION)

Benefiting Area Zone	Water Infrastructure		Wastewater Infrastructure		Stormwater Infrastructure		Transportation Infrastructure		TOTAL	
	\$/ha	\$/ac	\$/ha	\$/ac	\$/ha	\$/ac	\$/ha	\$/ac	\$/ha	\$/ac
1	\$71,914	\$29,102	\$67,085	\$27,148			\$226,732	\$91,755	\$365,730	\$148,006
2	\$71,914	\$29,102	\$67,085	\$27,148	\$2,652	\$1,073	\$226,732	\$91,755	\$368,382	\$149,079
3	\$71,914	\$29,102	\$67,085	\$27,148	\$786	\$318	\$226,732	\$91,755	\$366,516	\$148,324
4	\$71,914	\$29,102	\$67,085	\$27,148	\$582	\$235	\$226,732	\$91,755	\$366,312	\$148,241
5	\$71,914	\$29,102	\$67,085	\$27,148	\$4,439	\$1,797	\$226,732	\$91,755	\$370,170	\$149,803
6	\$71,914	\$29,102	\$67,139	\$27,107			\$226,732	\$91,755	\$365,784	\$148,028
7	\$71,914	\$29,102	\$67,139	\$27,107	\$786	\$318	\$226,732	\$91,755	\$366,571	\$148,346
8	\$71,914	\$29,102	\$62,747	\$25,393			\$226,732	\$91,755	\$361,392	\$146,250
9	\$71,914	\$29,102	\$62,747	\$25,393	\$786	\$318	\$226,732	\$91,755	\$362,178	\$146,569
10	\$71,914	\$29,102	\$62,747	\$25,393	\$2,412	\$976	\$226,732	\$91,755	\$363,804	\$147,227
Weighted Average	\$71,914	\$29,102	\$65,463	\$26,479	\$2,445	\$989	\$226,732	\$91,755	\$366,554	\$148,325

City of Airdrie 2019 Offsite Levies and Acreage Assessments (Continued)

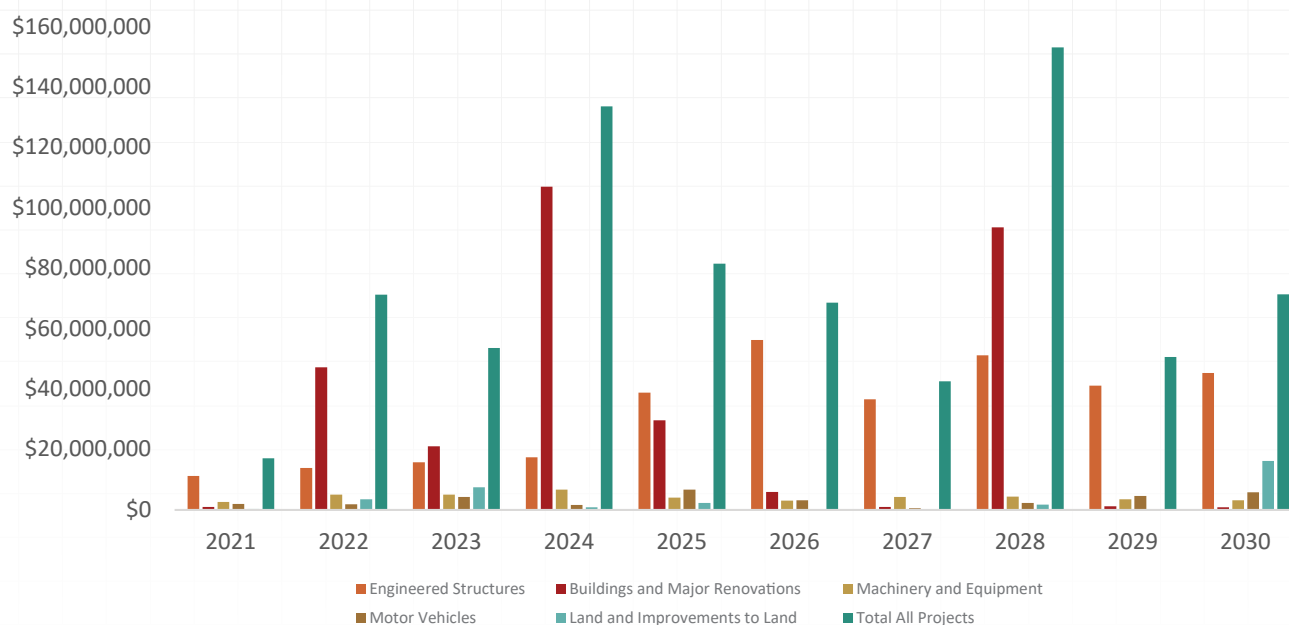
		Acreage Assessments				
Prime Recovery Area	Sub Recovery Area	Levy Report Per Acre	Engineering Review Fee Per Acre	TOTAL ACREAGE ASSESSMENTS PER ACRE	TOTAL CHARGE PER ACRE	RECREATION LEVY PER RESIDENTIAL DWELLING
I	I	\$450	\$1,400	\$1,850	\$93,071	\$1,200
II	II	\$450	\$1,400	\$1,850	\$93,071	\$1,200
III	III-1	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	III-2	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	III-3	\$450	\$1,400	\$1,850	\$93,071	\$1,200
IV	IV	\$450	\$1,400	\$1,850	\$93,071	\$1,200
V	V-1	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	V-2	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	V-3	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	V-4A	\$450	\$1,400	\$1,850	\$100,299	\$1,200
	V-4B	\$450	\$1,400	\$1,850	\$102,995	\$1,200
VI	VI-1	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	VI-2	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	VI-3	\$450	\$1,400	\$1,850	\$93,071	\$1,200
	VI-4	\$450	\$1,400	\$1,850	\$103,288	\$1,200

REFERENCE II - City of Airdrie Utility Master Plan

	Item	Quantity	Units	Unit Cost	Sub-Total	Contingency	Engineering	Total Cost
						30%	15%	
Main Pressure Zone	300mm Distribution Main	42,249	Metres	\$ 424.00	\$17,913,576	\$5,374,073	\$2,687,036	\$25,974,685
	400mm Distribution Main	0	Metres	\$ 528.00	\$0	\$0	\$0	\$0
	500mm Distribution Main	0	Metres	\$ 640.00	\$0	\$0	\$0	\$0
	600mm Distribution Main	377	Metres	\$ 736.00	\$277,472	\$83,242	\$41,621	\$402,334
	400mm Reservoir Fill Line	0	Metres	\$ 528.00	\$0	\$0	\$0	\$0
	Pavement Rehabilitation	816	Metres	\$ 750.00	\$611,793	\$183,538	\$91,769	\$887,099
	Reservoir Storage	1,300	Cubic Metres	\$ 1,325.00	\$1,722,500	\$516,750	\$258,375	\$2,497,625
	Reservoir Pump Station	0	Items	\$ 1,103,448.00	\$0	\$0	\$0	\$0
	Pressure Reducing Valves	0	Items	\$ 50,000.00	\$0	\$0	\$0	\$0
Total 1:					\$20,525,341	\$6,157,602	\$3,078,801	\$29,761,744
Northeast Pressure Zone	Item	Quantity	Units	Unit Cost	Sub-Total	Contingency	Engineering	Total Cost
						30%	15%	
	300mm Distribution Main	63,870	Metres	\$ 424.00	\$27,080,880	\$8,124,264	\$4,062,132	\$39,267,276
	400mm Distribution Main	85	Metres	\$ 528.00	\$44,880	\$13,464	\$6,732	\$65,076
	500mm Distribution Main	2,276	Metres	\$ 640.00	\$1,456,640	\$436,992	\$218,496	\$2,112,128
	600mm Distribution Main	0	Metres	\$ 736.00	\$0	\$0	\$0	\$0
	400mm Reservoir Fill Line	5,784	Metres	\$ 528.00	\$3,053,952	\$916,186	\$458,093	\$4,428,230
	Pavement Rehabilitation	6,253	Metres	\$ 750.00	\$4,689,384	\$1,406,815	\$703,408	\$6,799,606
	Reservoir Storage	2,922	Cubic Metres	\$ 1,325.00	\$3,871,650	\$1,161,495	\$580,748	\$5,613,893
Reservoir Pump Station	1	Items	\$ 2,272,414.00	\$2,272,414	\$681,724	\$340,862	\$3,295,000	
Pressure Reducing Valves	6	Items	\$ 50,000.00	\$300,000	\$90,000	\$45,000	\$435,000	
Total 2:					\$42,769,800	\$12,830,940	\$6,415,470	\$62,016,209
West Pressure Zone	Item	Quantity	Units	Unit Cost	Sub-Total	Contingency	Engineering	Total Cost
						30%	15%	
	300mm Distribution Main	27,207	Metres	\$ 424.00	\$11,535,768	\$3,460,730	\$1,730,365	\$16,726,864
	400mm Distribution Main	0	Metres	\$ 528.00	\$0	\$0	\$0	\$0
	500mm Distribution Main	0	Metres	\$ 640.00	\$0	\$0	\$0	\$0
	600mm Distribution Main	0	Metres	\$ 736.00	\$0	\$0	\$0	\$0
	400mm Reservoir Fill Line	1,784	Metres	\$ 528.00	\$941,952	\$282,586	\$141,293	\$1,365,830
	Pavement Rehabilitation	8,959	Metres	\$ 750.00	\$6,719,523	\$2,015,857	\$1,007,928	\$9,743,309
	Reservoir Storage	10,000	Cubic Metres	\$ 1,325.00	\$13,250,000	\$3,975,000	\$1,987,500	\$19,212,500
Reservoir Pump Station	1	Items	\$ 3,386,207.00	\$3,386,207	\$1,015,862	\$507,931	\$4,910,000	
Pressure Reducing Valves	13	Items	\$ 50,000.00	\$650,000	\$195,000	\$97,500	\$942,500	
Total 3:					\$36,483,450	\$10,945,035	\$5,472,518	\$52,901,003
High West Pressure Zone	Item	Quantity	Units	Unit Cost	Sub-Total	Contingency	Engineering	Total Cost
						30%	15%	
	300mm Distribution Main	12,209	Metres	\$ 424.00	\$5,176,616	\$1,552,985	\$776,492	\$7,506,093
	400mm Distribution Main	1,666	Metres	\$ 528.00	\$879,648	\$263,894	\$131,947	\$1,275,490
	500mm Distribution Main	0	Metres	\$ 640.00	\$0	\$0	\$0	\$0
	600mm Distribution Main	0	Metres	\$ 736.00	\$0	\$0	\$0	\$0
	400mm Reservoir Fill Line	1,094	Metres	\$ 528.00	\$577,632	\$173,290	\$86,645	\$837,566
	Pavement Rehabilitation	1,853	Metres	\$ 750.00	\$1,389,511	\$416,853	\$208,427	\$2,014,791
	Reservoir Storage	3,800	Cubic Metres	\$ 1,325.00	\$5,035,000	\$1,510,500	\$755,250	\$7,300,750
Reservoir Pump Station	1	Items	\$ 2,942,069.00	\$2,942,069	\$882,621	\$441,310	\$4,266,000	
Pressure Reducing Valves	9	Items	\$ 50,000.00	\$450,000	\$135,000	\$67,500	\$652,500	
Total 4:					\$16,450,476	\$4,935,143	\$2,467,571	\$23,853,190
From Calgary	Item	Quantity	Units	Unit Cost	Sub-Total	Contingency	Engineering	Total Cost
						30%	15%	
	600mm Supply Main	11,000	Metres	\$ 1,575.00	\$17,325,000	\$5,197,500	\$2,598,750	\$25,121,250
Total 5:					\$17,325,000	\$5,197,500	\$2,598,750	\$25,121,250
				Grand Total:	\$133,554,066	\$40,066,220	\$20,033,110	\$193,653,396

REFERENCE III - City of Airdrie Capital Plan Budget

2021 – 2030 Capital Plan



The results indicate that the plan meets the debt limit requirements. The following three factors are specifically tested in determining whether the plan is fiscally sound:

- Reserves balances over the ten-year period remain in a positive balance
- Provincial and self-imposed debt limits have been met throughout the ten years
- Grant sources have not been committed forward and each of the year-end balances of grant streams are within acceptable levels

The ten-year plan has a few unfunded projects listed below:

Unfunded Projects

2022 Plan

Wastewater Force Main to Bayview Gate	\$2,100,000
Wastewater Lift Station Davy Lands	1,500,000
Wastewater Lift Station Minto Lands	1,500,000
Water Supply Line to Calgary	1,500,000

2023 - 2027 Plan

Reservoir Pumphouse – West Airdrie	\$6,563,500
Water Supply to South Windsong Reservoir	5,783,000
24 th Street – Reunion to 800m North	2,450,000
Reservoir Pumphouse – Southeast Airdrie	690,300

2028 Plan	
Regional Recreation Centre	\$89,859,900
Wastewater Force Main Construction to Calgary	24,222,000
Wastewater Gravity Trunk – Southwest Airdrie	9,307,000
Wastewater Lift Station Davy Lands	1,431,800
Wastewater Lift Station Minto Lands	1,431,800
2029 Plan	
Water Supply Line to Calgary	\$18,450,300
Wastewater Gravity Trunk – Southeast Airdrie	8,241,100
2030 Plan	
South Regional Lift Station	\$25,341,200
Reservoir Pumphouse – Southeast Airdrie	6,335,300

These projects are related to development of post-annexed lands and need to be funded from new offsite levies as existing levies are only for the City's pre-annexed lands. The unfunded projects include the design and construction of the wastewater force main and lift station, water supply line to Calgary, as well as the second phase of the proposed Regional Recreation Centre planned for 2028. There will be work done on new levies for recreation in the near future.

Administration would like to base annual transfers to the capital reserves on the amortization value of capital assets of the prior year. The tangible capital assets net book value at December 31, 2020 was \$808 million. The 2021 planned transfer to Capital reserves is \$15.4 million. Specific reserves exist to meet the capital needs for areas such as technology, fleet, parks and buildings. The plan results are indicating that most of these designated funds are sufficient to provide for the specific capital needs over the next ten years.

The purpose of the General Operating reserve is to provide ongoing funding to ensure that a practical level of available financial resources is maintained to protect against fluctuating revenues and expenditures. The intended application was to cover emergency expenditures when needed. The reserve policy targets a minimum balance in this fund at three months or 25 per cent of the approved annual general operating fund. The 2021 general operating budget (excluding utilities, draws from reserves, and internal recoveries) is projected to be \$98.2 million; 25 per cent of this amount is \$24.5 million. The ten-year plan sees this reserve balance remaining close to the target.

Capital Plan – Environment, Influences and Defined Assumptions

The current environmental conditions are considered in developing assumptions incorporated into the ten-year plan. Council's strategic priorities guide the development of the ten-year plan. Capital needs for the City are planned out over the short and long term. Fiscal health is measured and debt limits are tested.

City of Airdrie Growth

For 2021, the population growth is estimated to be 1.6 per cent or 72,960. The influx of people into the community puts added pressure on City service providers, infrastructure needs and community facilities. Community demographics will put pressure on specific service areas more so than others will.

Development Forecast

Airdrie's low taxes, no business tax and reasonable offsite levy environment, fuel developer interest. Growth numbers translate into potential increased housing sales. Assumptions made regarding development activity determine projected levy revenue. Development activity is projected to be 52 acres in 2021, 80 acres in 2022 and 97 acres in 2023. Levy revenue is collected over a three-year period.

REFERENCE IV - City of Airdrie Utility Master Plan

Cost

For each of these alternatives the capital and operational expenditures (CAPEX and OPEX) have been evaluated as indicated in the table below.

A full breakdown of the costs is indicated in Appendix F.

Table 3.16: Capital and Operational Expenditures

Water Concept	CAPEX (\$'000s)	OPEX (\$'000s/year)
Wat A-1	\$78,700	\$1,300
Wat A-2	\$75,600	\$1,400
Wat B-1	\$74,100	\$1,100
Wat B-2	\$80,900	\$1,000
Wat C-1	\$73,300	\$1,300
Wat C-2	\$75,900	\$1,400

Operational Costs Assumptions:

- Facility allowance for operating costs is 2% of capital value for reservoirs and 4% of capital value for water pump stations. These estimates have been derived from assessments of operating expenditures associated with the existing infrastructure.
- No other operational cost allowances have been included – i.e. flushing etc though it is recognized that there will be an operational cost for network activities however, they are low in comparison with other operational cost elements and would be broadly similar for each of the different servicing concepts.

Other Considerations

The social, environmental or economic impacts indicated in Table 3.14 above associated with both construction impact and the residual risk associated with the water system network were considered. Assumptions have been made as to the extent, duration and likelihood of each of the potential 'risk events'. From this information the impact matrices have been used to quantify the likely impact in dollar terms to create an additional delivery risk cost and an annual economic risk for residual risks.

Construction Impact

Traffic Disruption

For almost all alternatives the impact on traffic will be minimal as the development of the new infrastructure is largely in undeveloped land. However, Concept A-1 requires network reinforcements from Main Reservoir to Northeast Reservoir over a period of approximately 40 days and impacting up to 15,000 vehicles per day. There is therefore a significant social impact through the disruption of traffic estimated at \$5 per vehicle per day. This is a value derived from estimates for traffic impact in the City of Calgary and is considered as appropriate for application in Airdrie.

Table 3.17: Water System Delivery Impact

Key Risk	Delivery Impact (\$'000s)					
	A-1	A-2	B-1	B-2	C-1	C-2
Traffic Impacts	106	-	-	-	-	-

REFERENCE V - SE Yankee Valley Boulevard CASP Justification Report

TABLE 6.0 PROJECTED INFRASTRUCTURE COSTS

Required Infrastructure	In 10-Year Capital Plan (2018-2027)	In 3-Year Capital Budget (2018-2021)	Estimated Capital Cost	Estimated Annual Operating Costs	Anticipated Levies Contributing from SE YVB CASP Area (± 518 ha)
			(millions)	(millions)	(millions)
Transportation¹					
RR292 Extension	No	No	\$13.9 ⁽²⁾		\$87.7 ⁽¹³⁾
RR291 to RR292 Connection	No	No	\$7.8 ⁽³⁾		
YVB Update East Part 2	Yes	No	\$19.6 ⁽⁴⁾		
40 Avenue SE Extension, Highview Gate to 800 m East (#866)	Yes	Yes	\$10.9 ⁽⁵⁾		
40 Avenue SE Extension, 800 m East to RR292 (#867)	Yes	No	\$11.2 ⁽⁵⁾		
40 Avenue SE Extension, RR292 to City Limits	No	No	\$25.0 ⁽⁶⁾		
Utility Servicing					
Potable Water:					\$16.3 ⁽¹⁴⁾
• Water Supply Line to Calgary (#93)	Yes	No	\$17.0 ⁽⁷⁾		
• New Southeast Reservoir	No	No	\$5.6 ⁽⁸⁾	\$0.11 ⁽¹⁷⁾	
• Reservoir Pump Station	No	No	\$3.3 ⁽⁸⁾	\$0.13 ⁽¹⁷⁾	
• 400 mm Reservoir Fill Line	No	No	\$2.4 ⁽⁸⁾		
Wastewater:					\$7.2 ⁽¹⁵⁾
• South Regional Lift Station	Yes	No	\$13.5 ⁽⁹⁾	\$0.41 ⁽¹⁷⁾	
• Twin 900 mm Forcemains to Calgary	No	No	\$23.3 ⁽⁸⁾		
• 1200 mm Sanitary Sewer Extensions	No	No	\$4.6 ⁽⁸⁾	\$0.01 ⁽¹⁷⁾	
• 1050 mm Sanitary Sewer Extensions	No	No	\$1.4 ⁽⁸⁾	\$0.01 ⁽¹⁷⁾	
• 375 mm Sanitary Sewer Extensions	No	No	\$0.5 ⁽⁸⁾		
• 250 mm Sanitary Sewer Extensions	No	No	\$1.2 ⁽⁸⁾		
• Twin 525 mm Forcemains	No	No	\$1.8 ⁽¹⁰⁾		
Stormwater:					
• Storm Pond at QEII/40 Avenue Interchange	No	No	\$0.8 ⁽¹¹⁾	0.04 ⁽¹⁸⁾	
• 1200 mm Outlet Pipe/Outfall from Storm Pond	No	No	\$2.2 ⁽¹²⁾	0.11 ⁽¹⁸⁾	
Acreage Assessment					\$2.3 ⁽¹⁶⁾
Total			\$166.0	\$0.82	\$113.5

Notes:

- Costs are based upon costs found in the City of Airdrie 2018-2027 Capital Budget: Budget Summary, as well as the Connecting Airdrie TMP TIIP List.
- Range Road 292 extension - Capital cost assumes approximately 1/2 of full project is part of SE YVB ASP. \$18.5 estimated cost in TMP TIIP was for full length @ 4 lanes. Road is 6 lanes, so assumed another 50% increase in cost. Therefore, final number was 1/2 of \$18.5, X 1.5.
- Range Road 291 Connection - Cost is based on 2 Lane urban cross section with peds & bikes. Assumed to be a levied road.
- Costs are from City of Airdrie 2018-2027 Capital Fund Budget Summary, Item 900011. SE YVB CASP portion is 80% of total amount, therefore 80% of total cost within the Capital Budget is assigned to the SE YVB CASP.
- Costs are from City of Airdrie 2018-2027 Capital Fund Budget Summary, Items 866 and 867.
- Costs are based upon City of Airdrie 2018-2027 Capital Fund Budget Summary, project 867. It is assumed that the 800 m cost of 40th Avenue will be tripled to provide the 2.4 km distance of the new 40th Avenue extension, however overall costs will be lower due to smaller utility requirements within this portion of the roadway, compared to portions west.

7. Costs from 2018-2027 Proposed Capital Budget and Plan. The Airdrie Utility Master Plan (UMP) Final Report noted this cost at \$25,121,250 including engineering and contingency.
8. Costs from Airdrie UMP Final Report and includes engineering and contingency.
9. Costs from 2018-2027 Proposed Capital Budget and Plan. It is assumed that this is what is referred to as L.S. #8 in the Airdrie UMP Final Report which notes the cost at \$25,375,000 for the Post 110,000 Growth Horizon including engineering and contingency.
10. Costs from Airdrie UMP Final Report and includes engineering and contingency. These forcemains are not required for servicing of the CASP area and are noted only given their proposed alignment is through the CASP area.
11. Costs are high level estimate by Pasquini & Associates only as part of this justification report. The storm pond is not required for servicing of the CASP area and is only included to complete the project list. The storm pond will only serve as a flow- through for storm drainage from the CASP area to the outlet pipe and outfall.
12. Costs are high level estimate by Pasquini & Associates only as part of this justification report.
13. Transportation Levy based on \$169,259 per ha as per the Offsite Development Levies, Acreage Assessments and Recreational Contribution Effective – January 18, 2016.
14. Potable Water Levy based on \$31,438 per ha as per the Offsite Development Levies, Acreage Assessments and Recreational Contribution Effective – January 18, 2016.
15. Wastewater Levy based on \$13,907 per ha as per the Offsite Development Levies, Acreage Assessments and Recreational Contribution Effective – January 18, 2016. Public Utility Lots Land Acquisition rate of \$781 per hectare included with this Levy.
16. Acreage Assessments based on \$4,384 per ha as per the Offsite Development Levies, Acreage Assessments and Recreational Contribution Effective – January 18, 2016.
17. Facility allowance for operating costs as per the Airdrie UMP Final Report is 2% of capital value for reservoirs and 4% of capital value for water pump stations. Operating costs is 3% of capital value for lift stations. Allowance made for deep sewer lines have used \$10,000 for each concept with deep sewers to take account of enhanced monitoring requirements for deep sewers. Operational costs are expressed as average annual cost.
18. Operating and maintenance for stormwater management facilities were assumed at 5% of the construction costs as per the City of Airdrie Master Stormwater Drainage Plan (AE, September 2013).

6.5 Staged Capital Infrastructure Costs

It is important to highlight that the total estimated capital cost of **\$166.0 million** noted in **Table 6.0** is capital expenditure required progressively, over time, and for ultimately servicing of not only the SE YVB CASP area, but other future development outside the pre-annexation boundary. Initial servicing of the SE YVB CASP area will require a significantly less amount of capital expenditure as shown in **Table 7.0**.

TABLE 7.0 PROJECTED INFRASTRUCTURE STAGING COSTS

Required Regional Infrastructure (Initial Development)	Estimated Capital Cost
	(millions)
Transportation	
40 Avenue SE Extension:	
• Highview Gate to 800 m East (#866)	\$10.9
• 800 m East 70 RR 292	\$11.2
Utility Servicing	
Potable Water:	
• New Southeast Reservoir	\$5.6
• Reservoir Pump Station	\$3.3
Total	\$31.0

REFERENCE VI - East Nose Creek Sanitary Costs

East Nose Creek - Sanitary Gravity Main Sizing and Cost Analysis

Catchment		Area	Area	Cumulative	Residential Pop	Cumulative Residential Pop	Non-Residential Pop	Cumulative Non-Residential Pop	Population	Residential Flows / capita	Non Residential flows/capita	Unpeaked Residential flows	Cumulative Unpeaked Residential flows	Unpeaked Non-Residential flows	Cumulative Unpeaked Non-Residential flows	Residential Peak Factor	Non Residential Peak Factor	Peaked Residential Flow	Peaked Non-Residential Flow	Total Peaked Flow	I&I flows	Cumulative Total Flow
Area Label	Zoning	m2	ha	ha					Persons	L/day/capita	L/day/capita	L/s	L/s	L/s	L/s			L/s	L/s	L/s		
D	Residential	2,050,750	205	205	3,800	3,800	1,000	1,000	8,600	255	155	11	11	2	2	3.353	5.000	37.61	8.97	46.58	57.42	104.00
A	Residential	16,751,950	1,675	1,880	12,463	12,463	9,175	10,175	34,101	255	155	37	48	16	18	2.859	4.088	137.24	74.62	211.85	526.48	738.33
B	Residential	2,798,382	280	2,160	1,607	14,070	1,000	11,175	16,678	255	155	5	53	2	20	2.806	4.024	148.01	80.67	228.68	604.83	833.51
C	Residential	2,660,102	266	2,426	4,513	18,583	1,007	12,182	24,103	255	155	13	66	2	22	2.685	3.966	177.35	86.68	264.02	679.31	943.34
E	Residential	135,554	14	NA	88	NA	0	Na	88	255	155	0	1			4.259	0.000	4.26		4.26	3.80	8.05

Mannings Calculations										
Catchment Serviced	EX TOTAL Q (L/s)	SLOPE (%)	CALC PIPE DIAMETER	NOMINAL PIPE DIAMETER	ACTUAL PIPE DIAMETER	PIPE MATERIAL	MANNING'S N	FULL VELOCITY (m/s)	PIPE CAPACITY (L/s)	EX PERCENT FULL CAPACITY (%)
D-A	104.0	0.100%	600	600	609.6	PVC	0.013	0.69	202.5	51%
A-B	738.3	0.100%	1050	1050	1066.8	PVC	0.013	1.01	900.4	82%
B-C	833.5097588	0.100%	1200	1200	1219.2	PVC	0.013	1.10	1285.6	65%
C-tie-in	943.3370831	0.100%	1200	1200	1219.2	PVC	0.013	1.10	1285.6	73%

*600mm pipe used to minimize slope

* a 1050 pipe results in 91% capacity

Pipe Costs											
*Using Calgary 2021 DA rates											
Catchment Serviced	Pipe Dia mm	Length of Pipe	InV @ Start	InV @ End	Avg slope	Depth @ Start	Depth @ End	Avg Depth (m)	Material Cost /m \$	Placement Cost /m \$	Total Cost \$
D-A	600	1280	100.54	99.00	0.1200%	4.00	8.00	6.00	\$290.00	\$520.00	\$1,036,800.00
A-B	1050	1250	99.00	96.58	0.1932%	4.00	10.42	7.21	\$811.00	\$1,326.00	\$2,671,250.00
B-C	1200	820	96.58	95.00	0.1932%	10.42	10.00	10.21	\$815.00	\$2,443.97	\$2,672,358.75
C-tie-in	1200	970	95.00	86.00	0.9278%	10.00	6.00	8.00	\$815.00	\$1,891.23	\$2,625,043.10
SubTotal Cost										\$9,005,451.85	

Notes
Each increase in 5m increment creates a placing cost increase of 1.08, except for 6.0-6.5 and 6.5-7.0 which increase by 1.1. Therefore the pipes that are too deep will increase by 1.1 over each 0.5m increment

*assumed class 3 conc pipe - type 1 installation (some sections to require class IV when depths exceed 8m)

Manhole Costs											
*Using Calgary 2021 DA rates											
Catchment Serviced	Pipe Dia mm	Length of Pipe	Minimum MH Needed	InV @ Start	InV @ End	Avg slope	Depth @ Start	Depth @ End	Avg Depth (m)	Placement &mat Cost /MH \$	Total Cost \$
D-A	600	1280	7	100.54	99.00	0.1200%	4.00	8.00	6.00	\$9,101.00	\$63,707.00
A-B	1050	1200	7	99.00	96.66	0.1951%	4.00	10.34	7.17	\$17,685.00	\$123,795.00
B-C	1200	850	5	96.66	95.00	0.1951%	10.34	10.00	10.17	\$32,366.46	\$161,832.32
C-tie-in	1200	3060	17	95.00	86.00	0.2941%	10.00	6.00	8.00	\$21,398.85	\$363,780.45
SubTotal Cost										\$713,114.77	

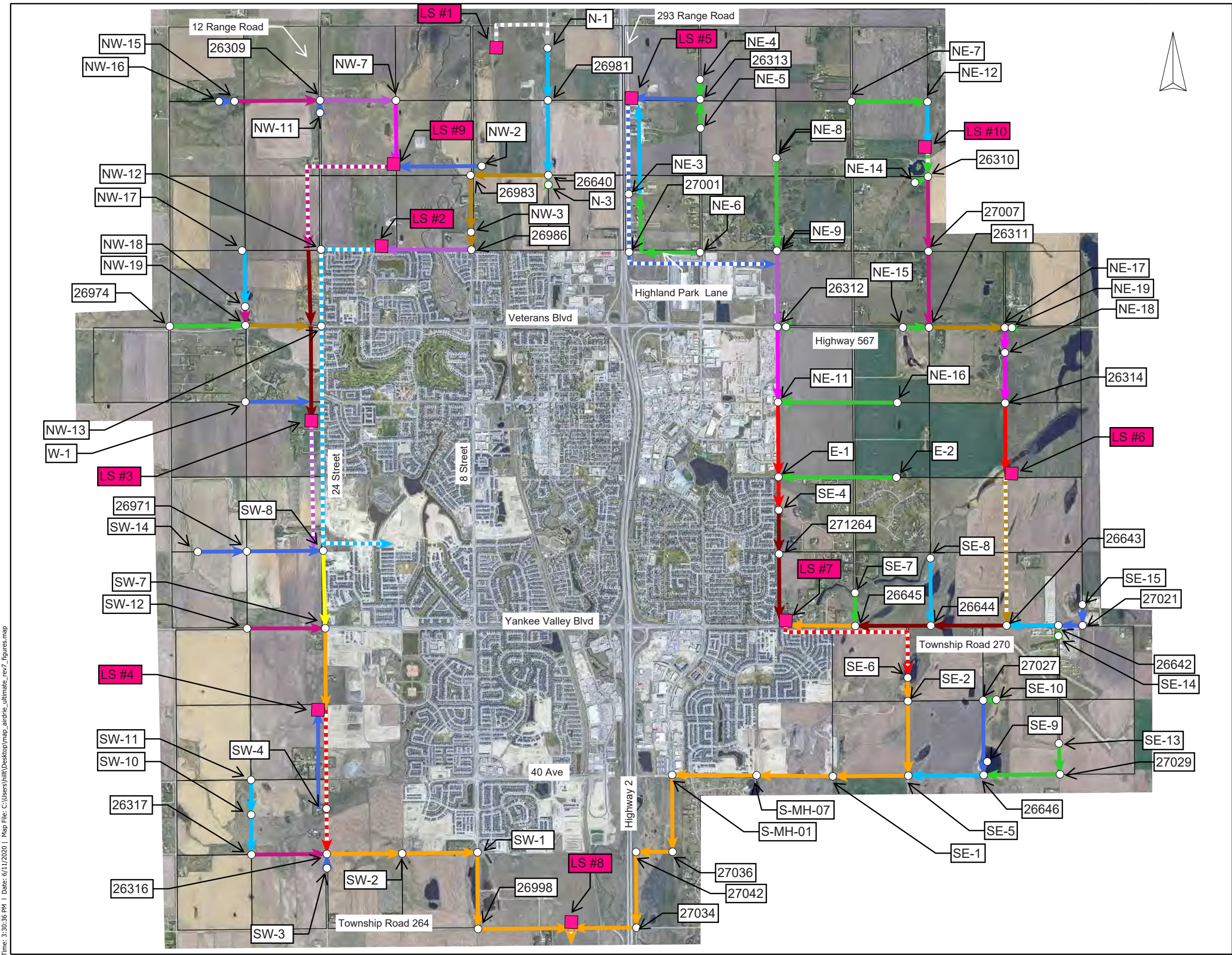
**assume 1S MHs for all w/ 1800 dia barrels - 600mm pipe using 5A

Notes
Each increase in 5m increment creates a placing cost increase of 1.08, except for 6.0-6.5 and 6.5-7.0 which increase by 1.1. Therefore the pipes that are too deep will increase by 1.1 over each 0.5m increment

Captial costs for lift station option		Captial costs for Gravity Sewer Option	
Regional Infrastructure Item	Estimated Capital Infrastructure Cost (\$Millions)	Regional Infrastructure Item	Estimated Capital Infrastructure Cost (\$Millions)
Wastewater		Wastewater	
LS #6 Land	0.11	Wastewater Trunk	
LS #6 Phase 1 per LSNA	6.7	Extension (YVB to NE	8.75
LS #6 Phase 2 per LSNA	0.8	Wastewater Trunk	
Twin 500mm FM	2.72	Extension to YVB	\$3.89
LS #7 land	0.3		
LS #7 Phase 1 per LSNA	12.3		
LS #7 Phase 2 per LSNA	1.2		
Twin 750mm FM	4.25		
900mm gravity upststream of LS7	3.013		
1200mm gravity upststream of LS7	1.124		
Total Cost	32.407	Total Cost	12.63

Cost Break Down	Costs for Trunk from YVB to NE corner of CASP	
	(includes D-A, A-B,B-C)	
	Pipe Cost	\$6,380,408.75
	Manhole Cost	\$349,334.32
	SubTotal:	\$6,729,743.07
	30% E&C	\$2,018,922.92
	Total	\$8,748,665.99
	Costs for Trunk 1200 tie in to YVB	
	(includes C-tie-in)	
	Pipe Cost	\$2,625,043.10
	Manhole Cost	\$363,780.45
	SubTotal:	\$2,988,823.55
	30% E&C	\$896,647.07
	Total	\$3,885,470.62

Subtotal	\$9,718,566.62
30% E&C	\$2,915,569.99
Total	\$12,634,136.61



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<div><div><div></div></div><div>Proposed Lift Station</div></div> <div><div><div></div></div><div>Proposed Manhole</div></div> <div><div><div></div></div><div>250 mm Gravity Sewer</div></div> <div><div><div></div></div><div>300 mm Gravity Sewer</div></div> <div><div><div></div></div><div>375 mm Gravity Sewer</div></div> <div><div><div></div></div><div>450 mm Gravity Sewer</div></div> <div><div><div></div></div><div>525 mm Gravity Sewer</div></div> <div><div><div></div></div><div>600 mm Gravity Sewer</div></div> <div><div><div></div></div><div>675 mm Gravity Sewer</div></div> <div><div><div></div></div><div>750 mm Gravity Sewer</div></div> <div><div><div></div></div><div>900 mm Gravity Sewer</div></div> <div><div><div></div></div><div>1050 mm Gravity Sewer</div></div> <div><div><div></div></div><div>1200 mm Gravity Sewer</div></div> <div><div><div></div></div><div>200 mm Single Forcemain</div></div> <div><div><div></div></div><div>250 mm Twin Forcemain</div></div> <div><div><div></div></div><div>300 mm Twin Forcemain</div></div> <div><div><div></div></div><div>350 mm Twin Forcemain</div></div> <div><div><div></div></div><div>450 mm Twin Forcemain</div></div> <div><div><div></div></div><div>500 mm Twin Forcemain</div></div> <div><div><div></div></div><div>600 mm Twin Forcemain</div></div> <div><div><div></div></div><div>750 mm Twin Forcemain</div></div> <div><div><div></div></div><div>1200 mm Twin Forcemain</div></div>			
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CHECKED		CA	JUN 20
APPROVED		CA	JUN 20



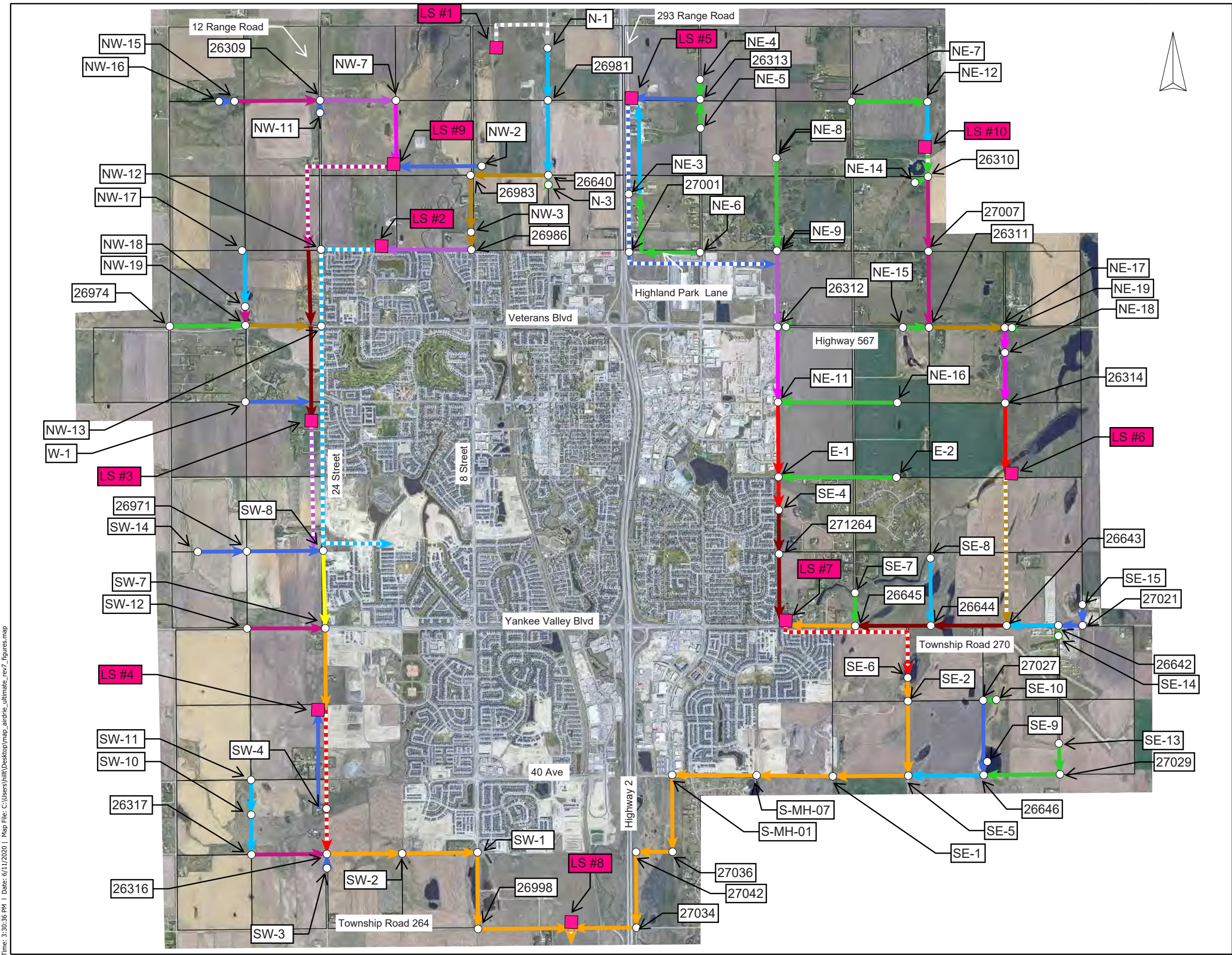
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WASTEWATER LIFT STATION
NEEDS ASSESSMENT

FUTURE SANITARY SERVICING CONCEPT
MANHOLE OVERVIEW

DRAWING NUMBER	REV. NO.	SHEET
Appendix G Figure	B	



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<div><div><div></div></div><div>Proposed Lift Station</div></div> <div><div><div></div></div><div>Proposed Manhole</div></div> <div><div><div></div></div><div>250 mm Gravity Sewer</div></div> <div><div><div></div></div><div>300 mm Gravity Sewer</div></div> <div><div><div></div></div><div>375 mm Gravity Sewer</div></div> <div><div><div></div></div><div>450 mm Gravity Sewer</div></div> <div><div><div></div></div><div>525 mm Gravity Sewer</div></div> <div><div><div></div></div><div>600 mm Gravity Sewer</div></div> <div><div><div></div></div><div>675 mm Gravity Sewer</div></div> <div><div><div></div></div><div>750 mm Gravity Sewer</div></div> <div><div><div></div></div><div>900 mm Gravity Sewer</div></div> <div><div><div></div></div><div>1050 mm Gravity Sewer</div></div> <div><div><div></div></div><div>1200 mm Gravity Sewer</div></div> <div><div><div></div></div><div>200 mm Single Forcemain</div></div> <div><div><div></div></div><div>250 mm Twin Forcemain</div></div> <div><div><div></div></div><div>300 mm Twin Forcemain</div></div> <div><div><div></div></div><div>350 mm Twin Forcemain</div></div> <div><div><div></div></div><div>450 mm Twin Forcemain</div></div> <div><div><div></div></div><div>500 mm Twin Forcemain</div></div> <div><div><div></div></div><div>600 mm Twin Forcemain</div></div> <div><div><div></div></div><div>750 mm Twin Forcemain</div></div> <div><div><div></div></div><div>1200 mm Twin Forcemain</div></div>			
PROJECT NO.	2019-3577	INITIAL	DATE
DRAWN		TH	JUN 20
DESIGNED		TH	JUN 20
CHECKED		CA	JUN 20
APPROVED		CA	JUN 20



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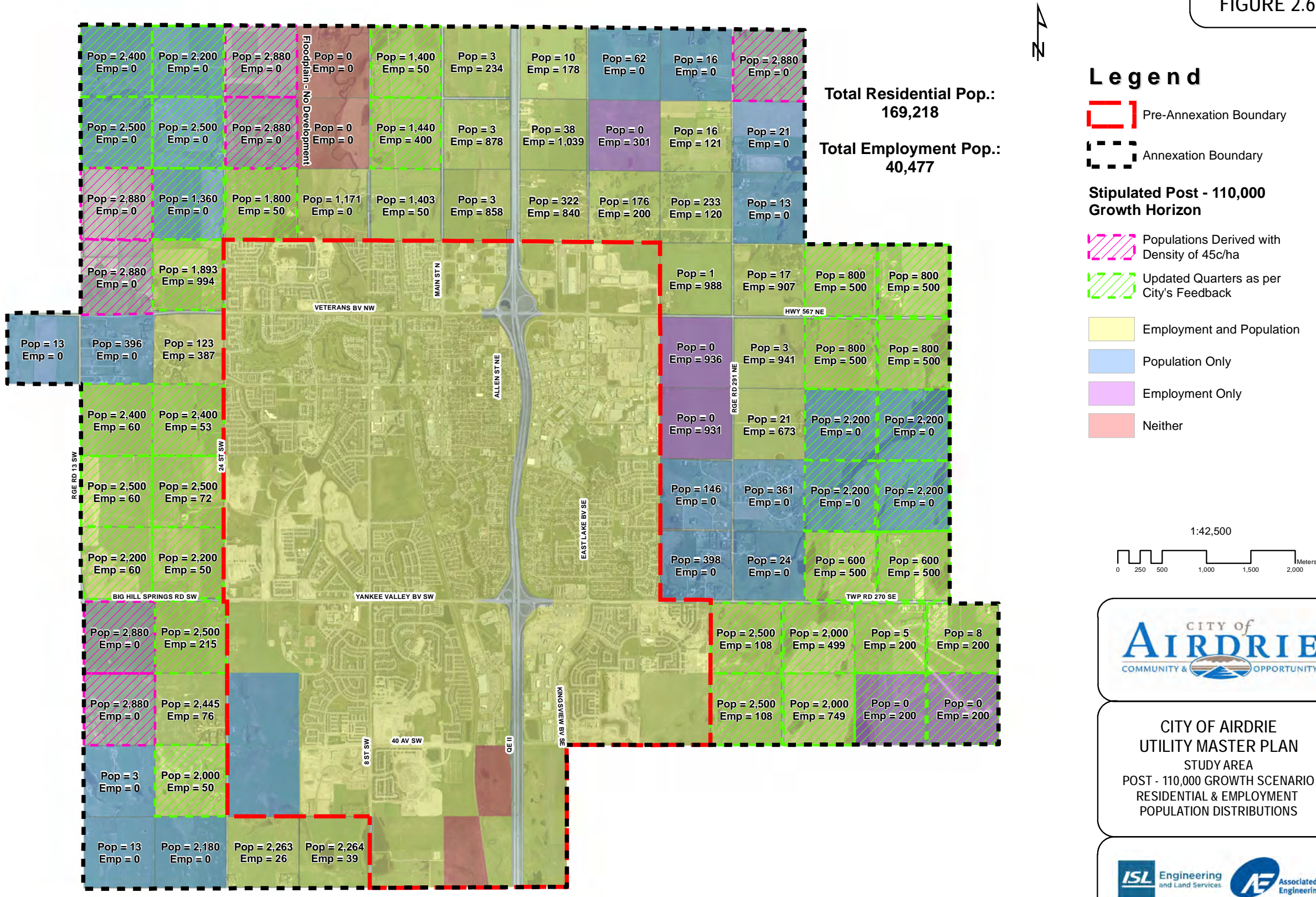


WASTEWATER LIFT STATION
NEEDS ASSESSMENT

FUTURE SANITARY SERVICING CONCEPT
MANHOLE OVERVIEW

DRAWING NUMBER	REV. NO.	SHEET
Appendix G Figure	B	

FIGURE 2.6



Date: 4/5/2016 Document: M:\26300026347_Airdrie_Utility_Master_Plan\02_CADD\20_Drafting\201_GIS Figures\Report Figures\2.0 Study Area\Figure 2.6 - Post 110K Population Distributions.mxd