

SITING PROCESS UPDATE SHORT LIST EVALUATION RESULTS

Southern Alberta Energy from Waste Association
Presentation to SAEWA Board – Feb. 19, 2020

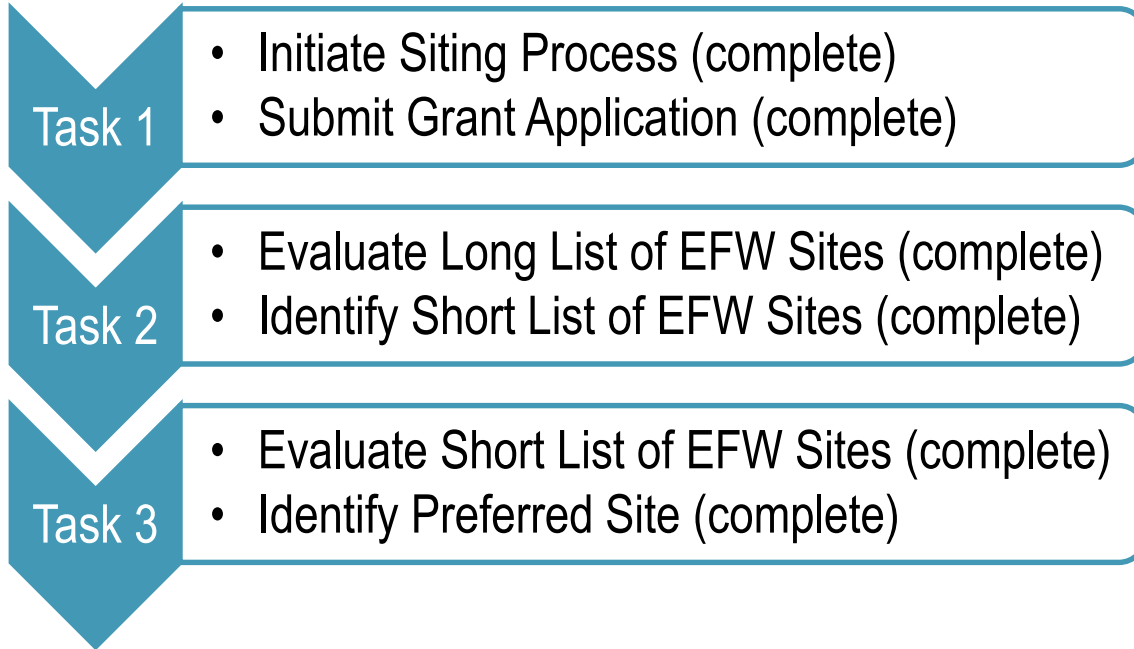


PRESENTATION OVERVIEW

- Introductions
- Siting Evaluation Update
 - Site Selection Process Tasks
 - Quick Refresher – Long List Evaluation
 - Short List Sites
 - Comparative Evaluation of Short List of Sites
- Next Steps

SITE SELECTION PROCESS TASKS

- Tasks to complete the selection of a preferred EFW site:

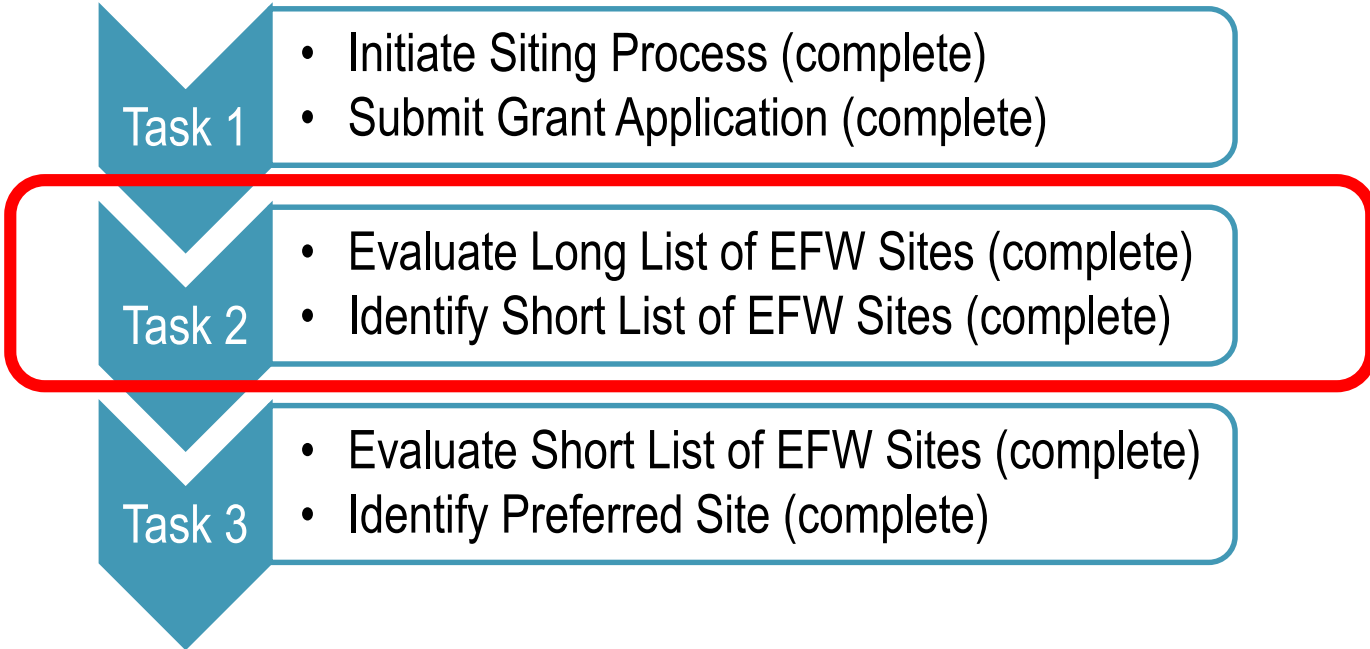


QUICKER REFRESHER

Long-List Evaluation

SITE SELECTION PROCESS TASKS

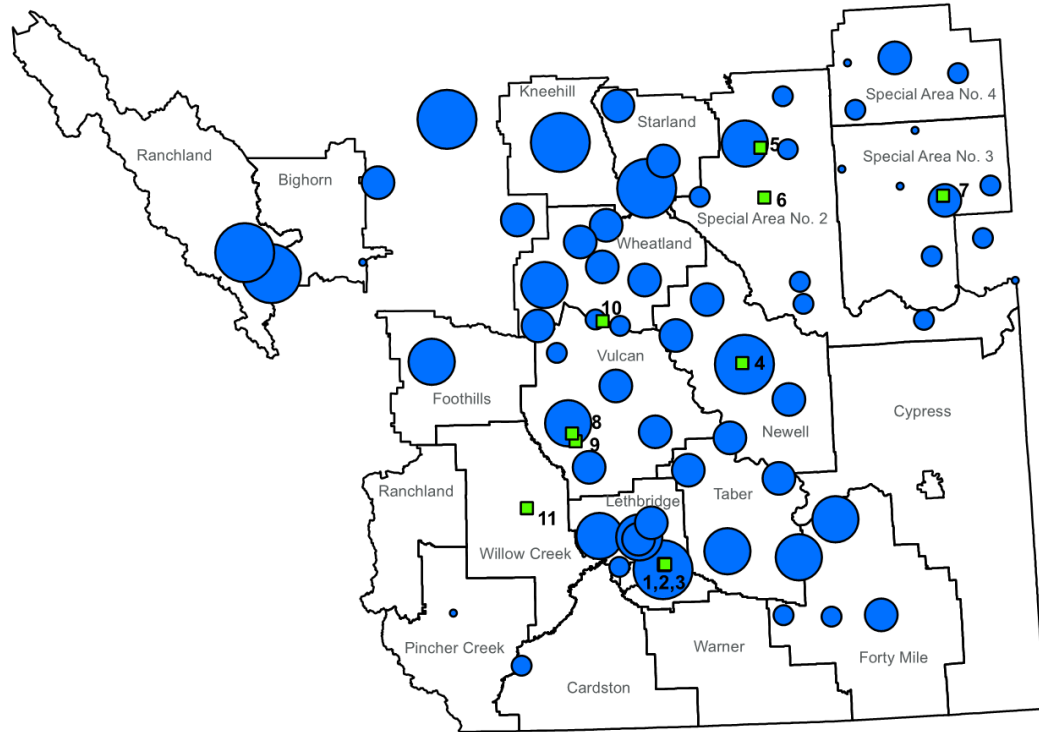
- Tasks to complete the selection of a preferred EFW site:



REQUEST FOR EXPRESSIONS OF INTEREST

- 11 sites submitted for analysis and comparative evaluation (Long List of EFW Sites):
 - Wheatland County (1 Site)
 - Vulcan County (2 Sites)
 - County of Newell (1 Site)
 - Town of Coaldale (3 Sites)
 - Special Areas Board (3 Sites)
 - Town of Claresholm (1 Site)

LOCATION OF LONG LIST OF EFW SITES



Legend

Potential EFW Site

1. Lethbridge County - Town of Coaldale - Site 1
2. Lethbridge County - Town of Coaldale - Site 2
3. Lethbridge County - Town of Coaldale - Site 3
4. Newell County
5. Special Area Number 2 - Cactus Corner
6. Special Area Number 2 - Hanna South
7. Special Area Number 3 - Oyen Rail
8. Vulcan County - Site 1
9. Vulcan County - Site 2
10. Wheatland County
11. Willow Creek No. 26 - Town of Claresholm

Transfer Stations and Landfills

MSW Annual Tonnage

- 31 - 292
- 292 - 836
- 836 - 1,993
- 1,993 - 3,633
- 3,633 - 19,616

□ Municipal Boundaries



COMPARATIVE EVALUATION OF LONG-LIST EFW SITES

Comparative Evaluation Results

Short-List

Criteria	Specification	Potential EFW Sites										
		Wheatland County	Vulcan County Site 1	Vulcan County Site 2	County of Newell	Town of Coaldale Site 1	Town of Coaldale Site 2	Town of Coaldale Site 3	Special Areas Board Hanna South	Special Areas Board Oyen Rail	Special Areas Board Cactus Corner	Town of Claresholm
Site Configuration												
Non-constrained site area ¹	Area (acres)	Green	Green	Green	Green	Red	Red	Red	Green	Green	Green	Red
Transportation												
Railways	Distance (m) from active railway lines	Green	Green	Green	Orange	Yellow	Yellow	Yellow	Red	Light Green	Red	Green
Incompatible Land Uses												
Rivers, lakes, and other water bodies	Area (acres) within 300 m of a waterbody	Green	Green	Green	Green	Orange	Red	Yellow	Green	Green	Green	Green
Residential areas ²	Percentage (%) within 1,000 m of residential areas	Green	Green	Green	Green	Orange	Red	Orange	Green	Green	Yellow	Orange
Airports and heliports	Distance (km) from a local airport/heliport (> 3 km)	Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Green	Red	Light Green	Red
First Nation Reserves, parks and recreational areas	Percentage (%) within 500 m of a First Nation Reserve, park or recreation area	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Waste Availability												
Waste Volume by Distance	Percentage (%) of SAEWA's waste within 300 km	Light Green	Light Green	Light Green	Light Green	Orange	Orange	Orange	Yellow	Red	Orange	Yellow
Waste Volume by Travel Time	Percentage (%) of SAEWA's waste within 210 minutes	Light Green	Light Green	Light Green	Light Green	Yellow	Yellow	Yellow	Green	Red	Light Green	Yellow
Tonne Kilometres ³	Total annual volume of waste (tonnes) transported by distance (km) (tkm)	Light Green	Light Green	Light Green	Light Green	Yellow	Yellow	Yellow	Yellow	Red	Orange	Yellow

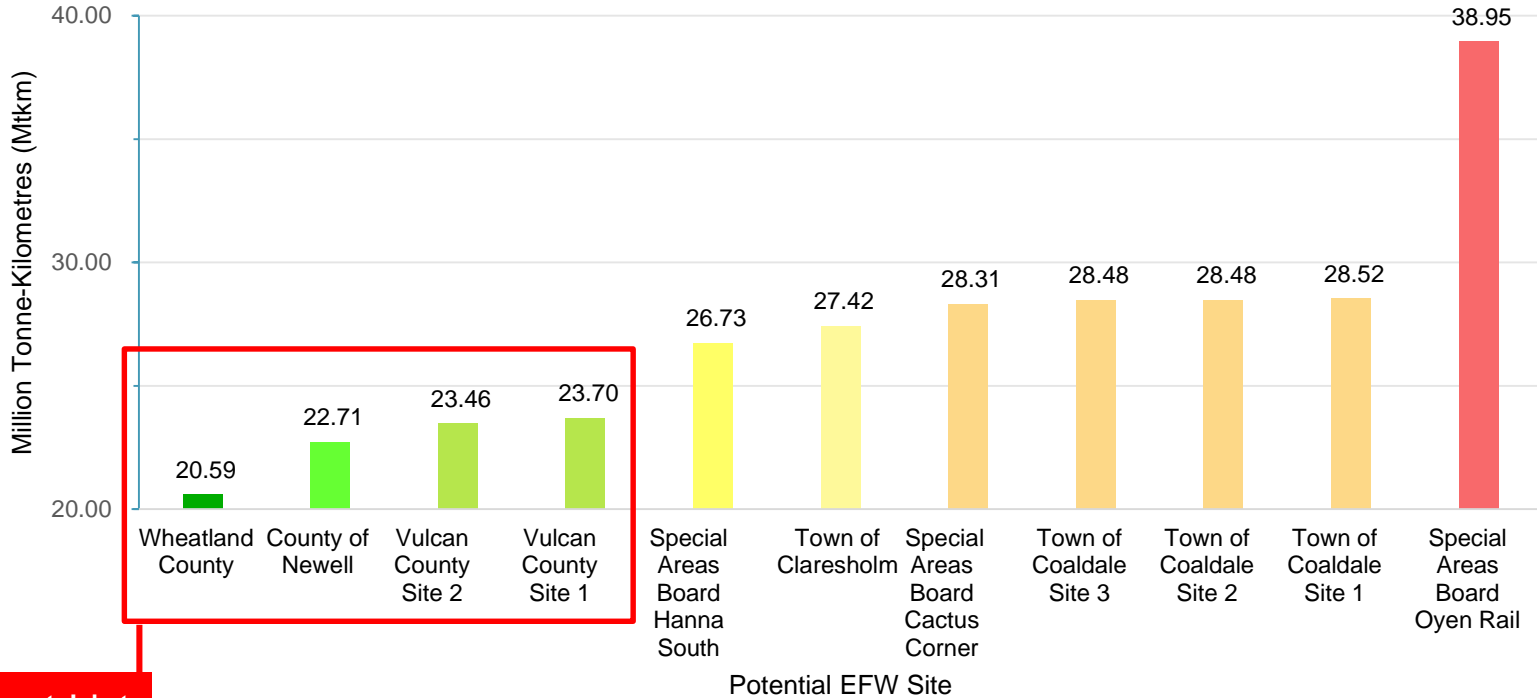
Notes:

1. Area of the site that is not constrained by any of the criteria specifications.
2. Residential areas include cities, towns, villages, hamlets, and named settlements.
3. This is the annual waste volume for each waste source (tonnes) multiplied by the driving distance from each waste source to the proposed EFW site (km) and then added up for each site.

Legend	Most preferred / least constrained	Light Green	Light Green	Yellow	Yellow	Orange	Red	Least preferred / most constrained
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COMPARATIVE EVALUATION OF LONG-LIST EFW SITES

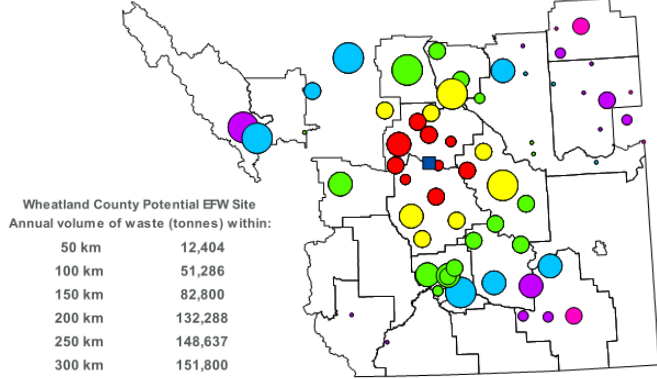
Tonne-Kilometres by Potential EFW Site



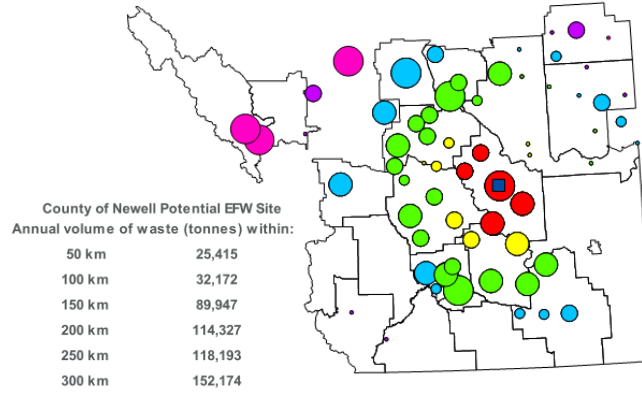
Short-List

COMPARATIVE EVALUATION OF LONG-LIST EFW SITES

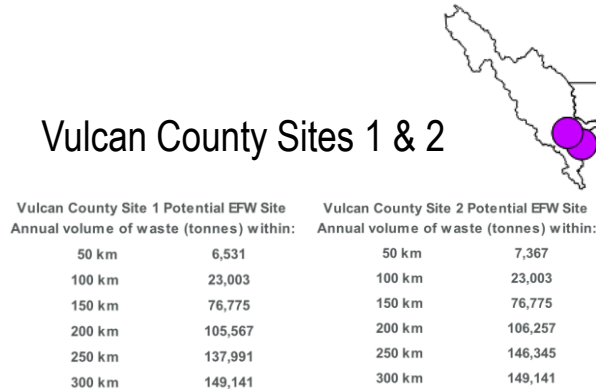
Waste Volume by Distance



Wheatland County Site



County of Newell Site



Vulcan County Sites 1 & 2

Legend

- Municipal Boundaries
- Potential EFW Sites

Transfer Stations and Landfills Within:

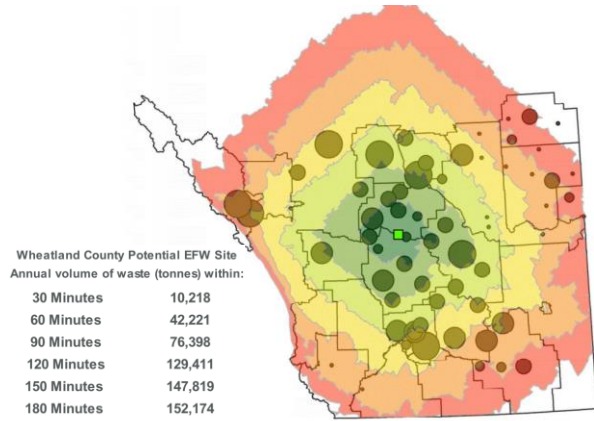
- 50KM
- 100KM
- 150KM
- 200KM
- 250KM
- 300KM

Transfer Stations and Landfills MSW Annual Total

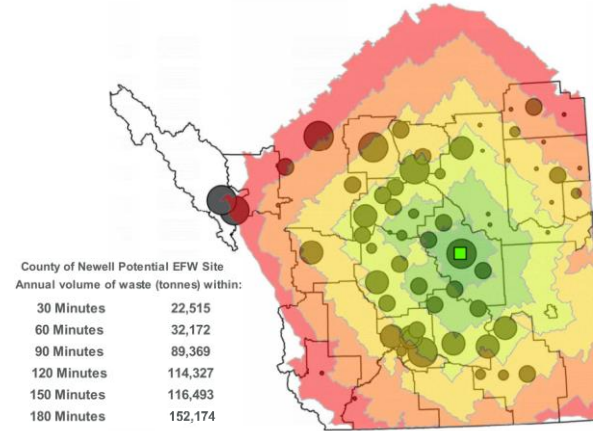
- 32 - 415
- 416 - 952
- 953 - 1494
- 1495 - 3634
- 3635 - 19617

COMPARATIVE EVALUATION OF LONG-LIST EFW SITES

Service Area Analysis



Wheatland County Site



County of Newell Site

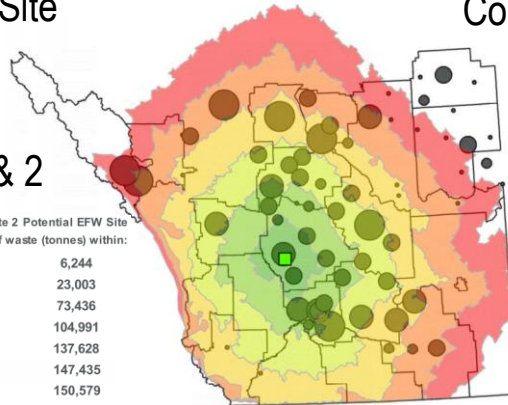
Vulcan County Sites 1 & 2

Vulcan County Site 1 Potential EFW Site
Annual volume of waste (tonnes) within:

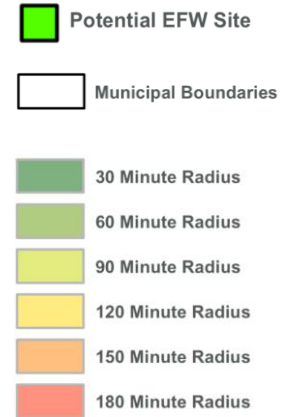
30 Minutes	4,393
60 Minutes	23,003
90 Minutes	73,772
120 Minutes	105,567
150 Minutes	137,628
180 Minutes	147,435
210 Minutes	150,579

Vulcan County Site 2 Potential EFW Site
Annual volume of waste (tonnes) within:

30 Minutes	6,244
60 Minutes	23,003
90 Minutes	73,436
120 Minutes	104,991
150 Minutes	137,628
180 Minutes	147,435
210 Minutes	150,579

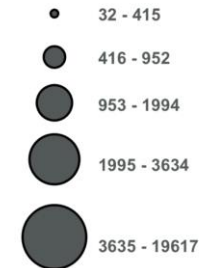


LEGEND



Transfer Stations and Landfills

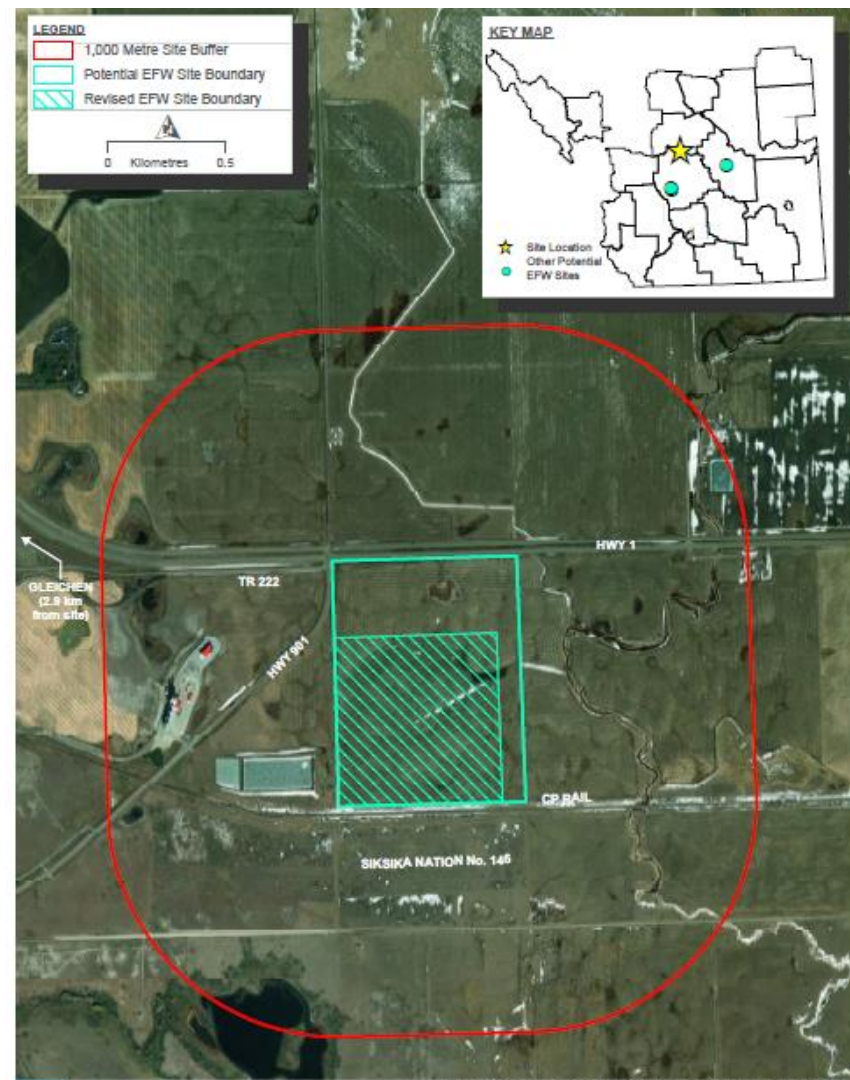
MSW Annual Tonnage



SHORT LIST SITES

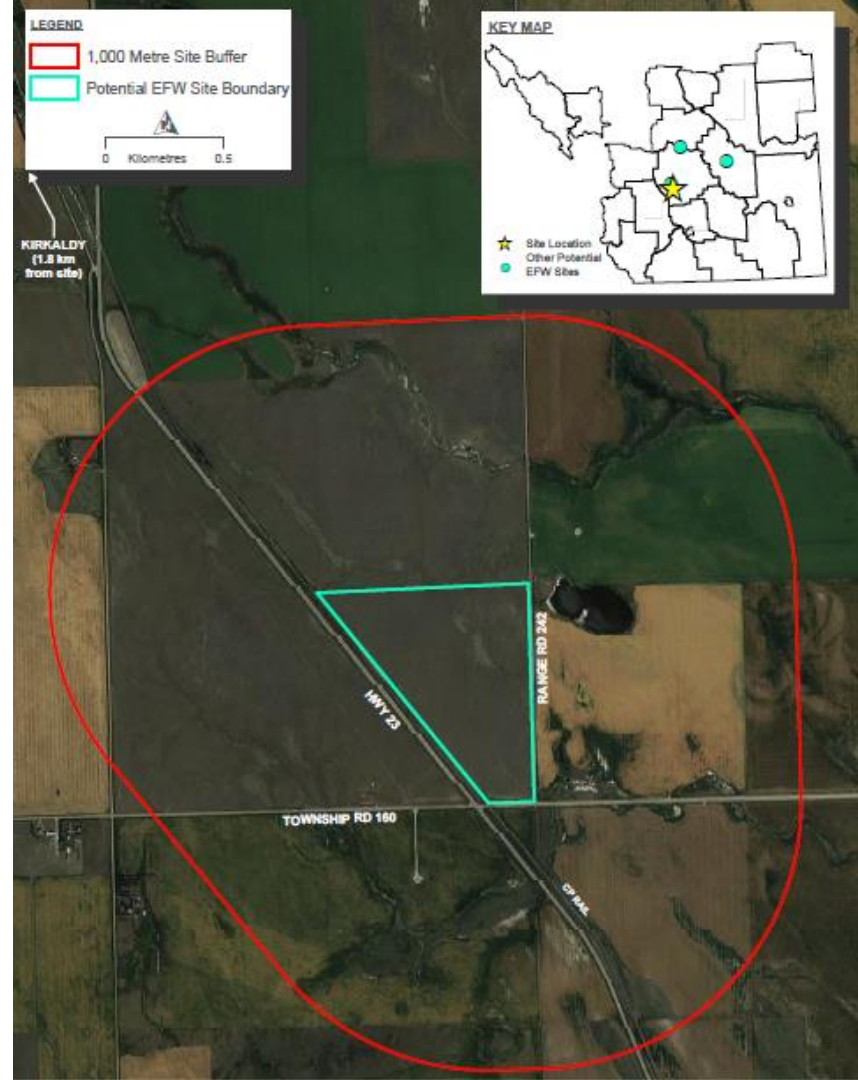
WHEATLAND COUNTY SITE

- The Wheatland County site is located approximately 2.9 km east of the hamlet of Gleichen, east of Hwy 901 and south of Hwy 1. The site comprises one 128.74 acre parcel of land within NW-9-22-22-W4M.



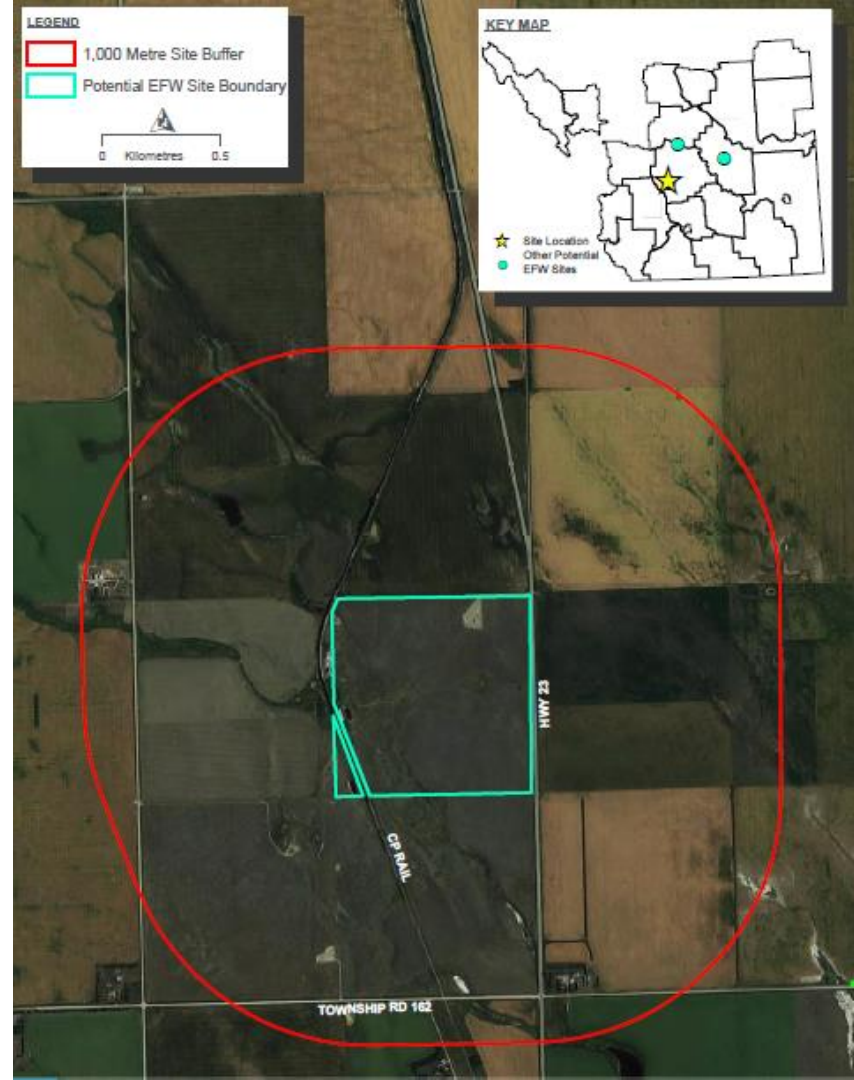
VULCAN COUNTY SITE #1

- Vulcan County Site 1 is located approximately 1.8 km southeast of the hamlet of Kirkcaldy, east of Hwy 23. The site comprises one 94.15 acre parcel of land with the legal description SE-3-16-24-W4M.



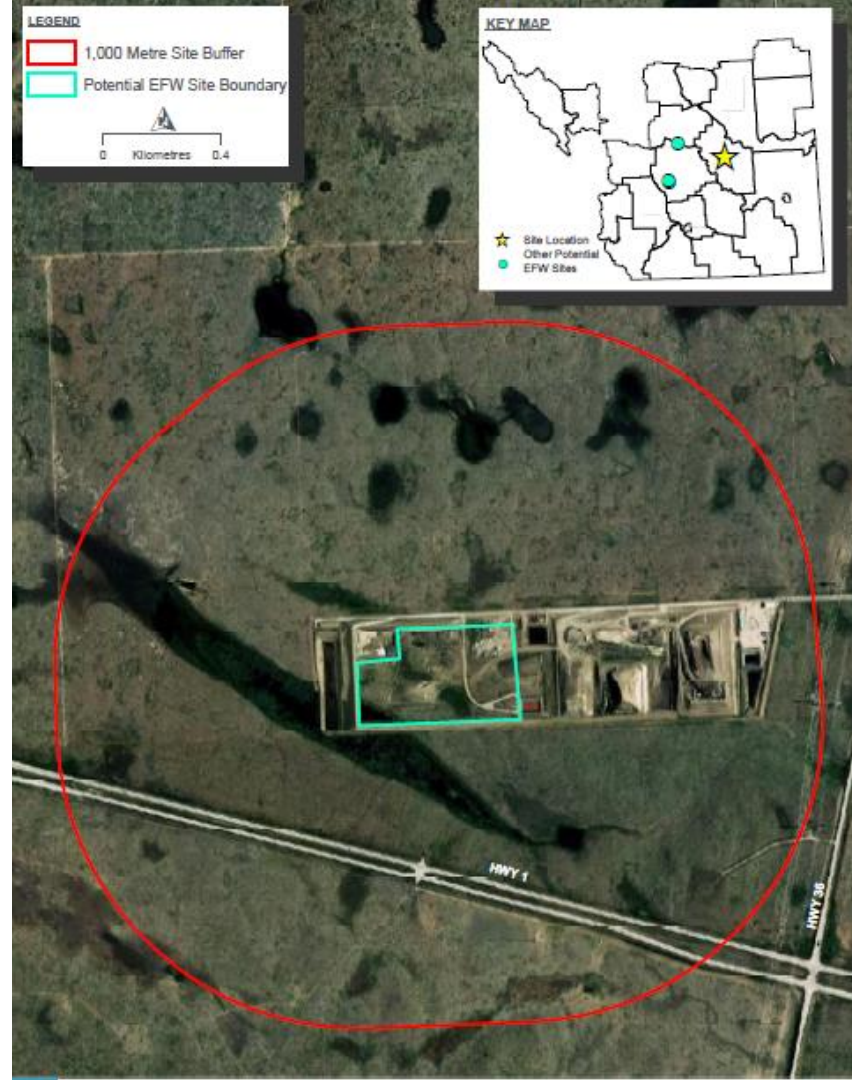
VULCAN COUNTY SITE #2

- Vulcan County Site 2 is located approximately 1.1 km north of the hamlet of Kirkcaldy, west of Hwy 23. The site comprises one 151.42 acre parcel of land with the legal description NE-16-16-24-W4M.



COUNTY OF NEWELL SITE

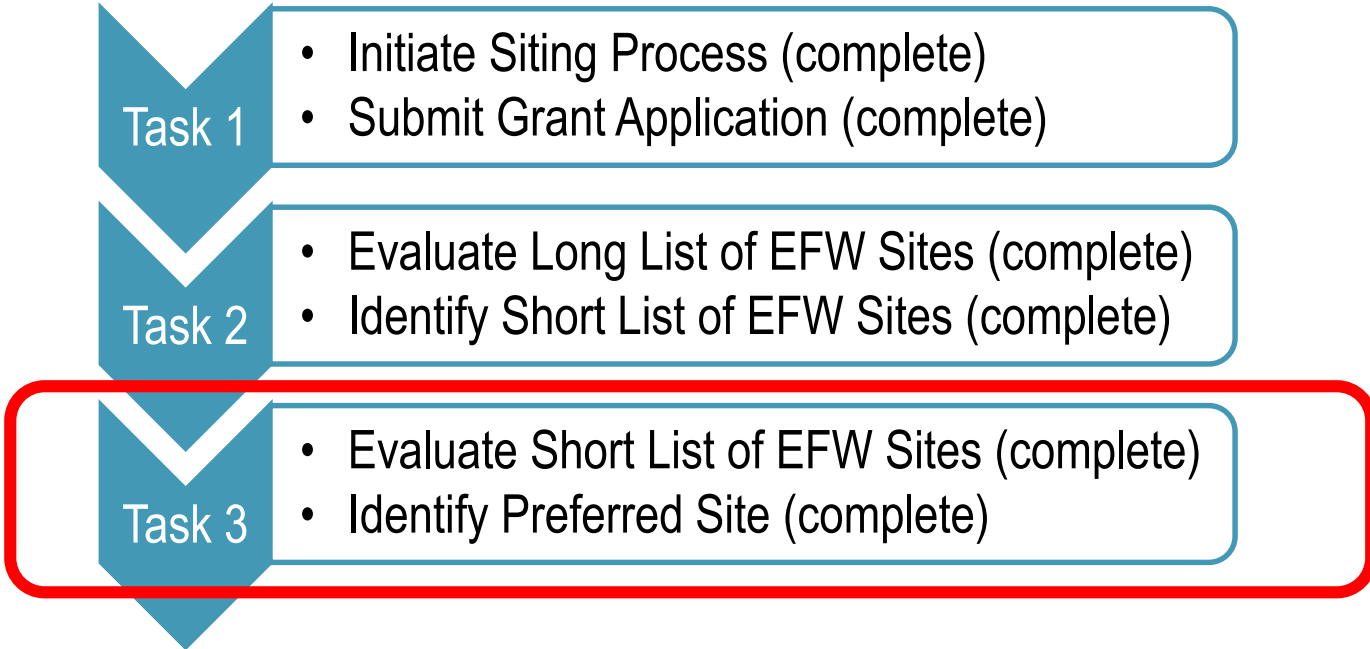
- The County of Newell site is approximately 37 acres located on the Newell Regional Landfill site, north of Hwy 1. The site comprises a partial parcel of land with the legal description S1/2-34-19-15-W4M.



SHORT LIST EVALUATION

SITE SELECTION PROCESS TASKS

- Tasks to complete the selection of a preferred EFW site:



SHORT-LIST EVALUATION PROCESS

- A comparative evaluation process, using a set of evaluation criteria, was utilized to compare the sites against one another, and narrow the list down even further.
- Comparative evaluation comprised a detailed constraints-based analysis, including:
 - desktop studies;
 - field reconnaissance & investigations;
 - GIS data and analysis (including GIS model developed by the University of Alberta for SAEWA); and,
 - Consultation with Utility Companies, Regulators/Agencies, Potential Energy-Users, Railways, etc.
 - Consultation with Host Municipalities (including a Request for Clarification and Individual Meetings)

SNAP SHOT OF CRITERIA TABLE

Criteria	Indicator	Rationale	Data Source
<i>Cost & Constructability</i>			
Required infrastructure	<ul style="list-style-type: none"> Infrastructure required but not currently available on site (e.g., water supply) 	<ul style="list-style-type: none"> New infrastructure increases capital cost 	<ul style="list-style-type: none"> REOI submissions Field reconnaissance Satellite mapping Utility mapping¹ Municipal input Utility company input
Upgrades to existing infrastructure	<ul style="list-style-type: none"> Infrastructure present on site that requires upgrades. This includes transportation infrastructure both on and off site that requires upgrades to enable site access (e.g., road resurfacing, off/on ramps) 	<ul style="list-style-type: none"> Infrastructure upgrades increase capital cost 	<ul style="list-style-type: none"> REOI submissions Field reconnaissance Satellite maps Utility mapping¹ Municipal input Utility company input Input from Alberta Transportation Clarification requests
Property ownership	<ul style="list-style-type: none"> Area of site located on privately-owned property (acres) Percentage (%) of site located on privately-owned property Area of site located on municipal property (acres) Percentage (%) of site located on municipal property 	<ul style="list-style-type: none"> Requirement for property acquisition increases capital cost Increased risk to cost and schedule resulting from potential acquisition of privately-owned property 	<ul style="list-style-type: none"> REOI submissions Wheatland County's 2017 Land Map² Clarification requests
Required permits, approvals, and agreements	<ul style="list-style-type: none"> Nature and complexity of required site-specific permits, approvals, and agreements 	<ul style="list-style-type: none"> Increased complexity of permits, approvals, and agreements can increase capital cost and create schedule delays 	<ul style="list-style-type: none"> Specified timelines where applicable and professional judgement
Potential end users	<ul style="list-style-type: none"> Proximity (km) to future proposed or existing nearby potential energy user(s) 	<ul style="list-style-type: none"> Economic benefit to having nearby potential existing energy users or plans for the establishment of compatible neighbouring businesses that could take advantage of either electricity or steam 	<ul style="list-style-type: none"> REOI submissions Satellite maps Field reconnaissance Clarification requests

SHORT-LIST EVALUATION PROCESS

- For each evaluation criteria category, technical memorandums with supporting appendices have been prepared to document analysis and findings.
- Evaluation criteria categories included:

<p>Cost and Constructability Required infrastructure Upgrades to existing infrastructure Property ownership Required permits, approvals, and agreements Potential end users Waste haulage</p> <p>Environmental Air Quality Water bodies Wetlands Environmentally Sensitive Areas (ESAs) Species at Risk</p>	<p>Social and Cultural First Nation reserves Parks and recreational areas Rural residential and urban residential areas Historic resources Sensitive receptors</p> <p>Land Use Zoning Land Uses Airports and heliports</p>	<p>Technical Design flexibility Land surface gradient (topography) Power plants and substations Transmission lines Natural gas pipelines Water supply Roads Railways Traffic</p>
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EXAMPLE OF EVALUATION TABLE

Criteria	Specification	Short List of Potential EFW Sites			
		Wheatland County Site	Vulcan County Site 1	Vulcan County Site 2	County of Newell Site
Potential end users	Proximity (km) to future proposed or existing nearby potential energy user(s)	Lowest number of potential end users of energy in relative proximity to the site. Siksika Nation No. 146, directly south of the site Paterson Grain Long Plain Terminal on Hwy 901, 450 m west of the site Community of Gielchen, 2.6 km west of the site	Moderate number of potential end users of energy in relative proximity to the site. Hamlet of Kirkcaldy, 2 km north of the site Vulcan County/Nelson Industrial Park, 8.3 km from the site, currently in design phase (construction to start in Q3 2020) Village of Champion, 8.7 km south of the site Town of Vulcan, 9 km north of the site	High number of potential end users of energy in relative proximity to the site. Hamlet of Kirkcaldy, 1.1 km south of the site Vulcan County/Nelson Industrial Park, 4.5 km from the site, currently in design phase (construction to start in Q3 2020) Town of Vulcan, 5.7 km north of the site Village of Champion, 12.6 km south of the site	Highest number of potential end users of energy in relative proximity to the site. Various businesses located approximately 5.5 km southeast of the site including JBS Canada, MCL Feeders, and IEH Services Canada City of Brooks, 10.9 km southeast of the site Village of Duchess, 11.4 km northeast of the site Village of Rosemary, 13.5 km northwest of the site Initial discussions with JBS have revealed JBS' interest in using steam and electricity, and in providing a water supply and potential fuel for the EFW facility.
	RANK	4	3	2	1
Waste haulage	Annual volume of waste (tonnes) within 50 km	12,404	6,531	7,367	25,415
	Annual volume of waste (tonnes) within 100 km	51,286	23,003	23,003	32,172
	Annual volume of waste (tonnes) within 150 km	82,800	76,775	76,775	89,947
	Annual volume of waste (tonnes) within 200 km	132,288	105,567	106,257	114,327
	Annual volume of waste (tonnes) within 250 km	148,637	137,991	146,345	118,193
	Annual volume of waste (tonnes) within 300 km	151,800	149,141	149,141	152,174
	Percentage (%) of SAEWA's waste within 300 km	99.8	98.0	98.0	100
	Total annual volume of waste (tonnes) transported by distance (km) (tonne kilometres ¹)	20,591,591	23,700,952	23,461,314	22,706,501
	Estimated annual cost (\$) to transport waste to the site	\$948,461	\$1,091,680	\$1,080,642	\$1,045,875
		RANK	1	4	3
	OVERALL CATEGORY RANK	14	15	12	3
Environmental					
Air Quality	Current air quality in the surrounding area	The concentration of measured contaminants in air for 2019 were below Alberta's AAQO at the monitoring station nearest the site.	The concentration of measured contaminants in air for 2019 were below Alberta's AAQO at the monitoring station nearest the site.	The concentration of measured contaminants in air for 2019 were below Alberta's AAQO at the monitoring station nearest the site.	The concentration of measured contaminants in air for 2019 were below Alberta's AAQO at the monitoring station nearest the site.
	Number of and distance from nearby sources of air emissions	Traffic on Hwy 1 and Hwy 901 Locomotives on the CP Rail line Emissions associated with the Paterson Grain Long Plain Terminal approximately 450 m west of the site	Traffic on Hwy 23 Locomotives on the CP Rail line	Traffic on Hwy 23 Locomotives on the CP Rail line	Operations at the Newell Regional Landfill immediately adjacent to the site Traffic on Hwy 1 and Hwy 36
	Estimated GHG contribution from transportation of waste to site (based on distance of waste travel) (tonnes CO ₂ /year)	Transportation of waste to the Wheatland County site would generate approximately 563 tonnes of CO ₂ per year	Transportation of waste to Vulcan County Site 1 would generate approximately 647 tonnes of CO ₂ per year	Transportation of waste to Vulcan County Site 2 would generate approximately 641 tonnes of CO ₂ per year	Transportation of waste to the County of Newell site would generate approximately 620 tonnes of CO ₂ per year.
	RANK	1	4	3	2

SHORT-LIST EVALUATION RESULTS

- The results of the comparative evaluation indicate that the most preferred site is the County of Newell site followed by Vulcan County Site 2.

Criteria	Potential EFW Sites			
	Wheatland County Site	Vulcan County Site 1	Vulcan County Site 2	County of Newell Site
Cost and Constructability	14	15	12	9
Environmental	9	12	13	8
Social and Cultural	14	8	11	5
Land Use	5	4	4	3
Technical	16	16	11	19
Overall Comparative Ranking	58	55	51	44

Legend	Least Preferred			Most Preferred
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PREFERRED SITE – WHY COUNTY OF NEWELL

- **Highest Ranking for Cost and Constructability**

- Limited/No Upgrades required to existing roadway infrastructure
- Publicly Owned
- Permitting/Approvals likely easier given it is a brownfield site and already an existing waste management facility
- High potential for potential energy users which could have a significant effect on overall business case for facility

- **Highest Ranking for Environmental**

- Furthest from nearest waterbody
- Fewest number of wetlands in proximity
- 0 at-risk species were identified within a 1 km radius
- Already an existing waste management facility

PREFERRED SITE – WHY COUNTY OF NEWELL (CONT'D)

- **Highest Ranking for Social and Cultural**

- Furthest from nearest Park
- Furthest from Residential Areas
- Furthest from Historic Resources
- Furthest from Sensitive Receptors

- **Highest Ranking for Land Use**

- Compatible with existing zoning; "Public Service" already approved for waste management.
- Part of the Newell Regional Landfill, the site area is used for storing concrete, asphalt, and shredded tires

- **3rd Highest Ranking for Technical**

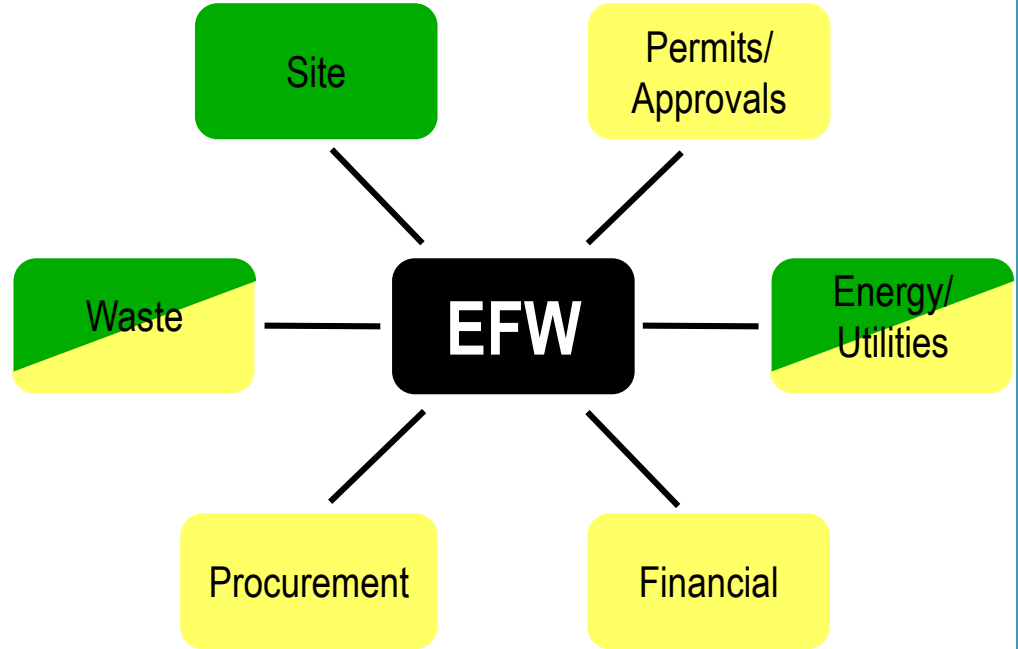
- Good design flexibility, although the site is smaller than others (note adjacent property is available is required.)
- Scores lower on utility connections, but could be offset by potential agreements with neighbouring industrial facility(s)
- Distance from rail is greater than other sites

WHAT ABOUT VULCAN 2?

- Carrying two (2) sites forward as the EFW facility development process progresses, has a number of significant advantages, including the ability to build in redundancy to manage risks, including (but not limited to):
 - Risk that overtime, one site may no longer be available;
 - Potential unforeseen risks (e.g. permitting issues);
 - Risk related to SAEWA reaching an agreement with the municipality and/or landowner to secure the site; and,
 - Risk related to SAEWA reaching an agreement related to utilities, energy users, rail access, etc.
- An opportunity to further explore potential energy end-users (and in the case of Newell, potential water supply alternatives) and build these opportunities into the business case analysis.

NEXT STEPS

- The next steps for the development process overall include:
 - confirmation of potential energy users;
 - development of a more detailed business case;
 - economic analysis and review of financing options;
 - securing waste supply;
 - consideration of rail access options; and,
 - initiation of the facility/technology procurement process.



HDR