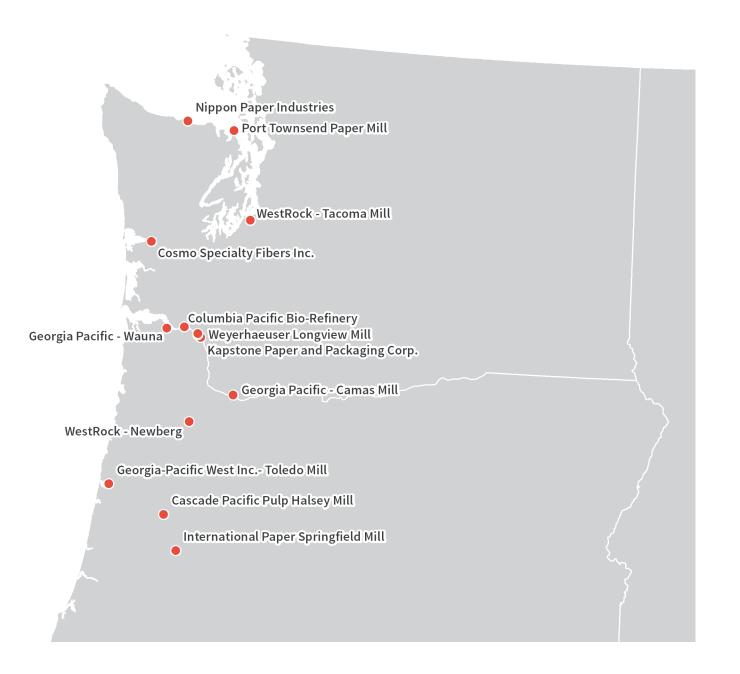
IDX FALL 2015 POTENTIAL PILOT-PLANT EVALUATION

ROAD MAP INTRO BY DANE IDX TEAM MEMBERS 12 SITES 5-6 MIN SITE OVERVIEW 4-5 MIN SITE Q&A WRAP-UP DISCUSSION



13 POTENTIAL PILOT-PLANT SITES



IDX STUDY

Dane Camenzind will introduce the 13 sites.

Each IDX Team Member was assigned 1-2 sites to present to you today.

As you can see, our 13 preliminary sites, from the work of Natalie Martinkus through discussions with Professor Olsen we identified as having potential to be co-developed into the new and emerging iso-butonol/biofuel industry.

All of the 12 sites provided to us are West of the Cascades,

CLATSKANIE, CLATSOP COUNTY, OR



STRENGTHS

- Greenfield adjacent to property (454.16 acres)
- Greyfield adjacent to the existing Georgia Pacific Facility (329.86 acres)
- On-site Wastewater treatment (33.8 MGD)
- Located on Columbia River with port access
- Existing rail lines on site

WEAKNESSES

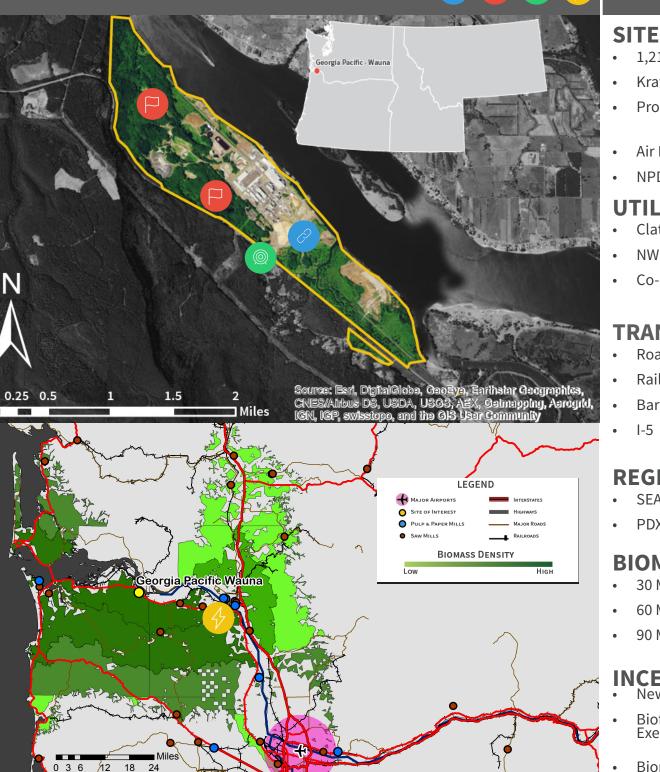
- Large elevation changes
- Greenfield owed by Georgia Pacific consist of :
- Designated Forestland (145.14 acres); and
- Highest and Best Use Forestland (309.02 acres)
- Northwest rail lines are washed out

OPPORTUNITIES

- I-5 is approximately 40 miles from facility
- US-30 is adjacent to facility
- Biomass Availability (700,000 BDT within 90 Minutes)

THREATS

- Available biomass may interfere with other competitors in the area
 - Kapstone (Longview, WA) Wood Boiler
 - Weyerhaeuser (Longview, WA) Wood Boiler
- Conversion of forestland into industrial land is costly



SITE DESCRIPTION

- 1,213 Acres
- Kraft Process
- Products: Toilet tissue, paper towels, napkins
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Clatskanie PUD: \$0.0425/KwH
- NW Natural Gas: \$16.60/Mcf
- Co-gen boilers on-site Y

TRANSPORTATION

•	Road	Y	<1 Miles
•	Rail	Y	On Site
•	Barge	Y	On Site
•	I-5		32 Miles

REGIONAL MARKET

•	SEATAC:	146 Miles
•	PDX:	73 Miles

BIOMASS QUANTITIES

- 30 Minutes: 90K BDT
- 60 Minutes: 350K BDT
- 90 Minutes: 700K BDT

- New Market Tax Incentive
- Biofuels Production Property Tax Exemption-OR
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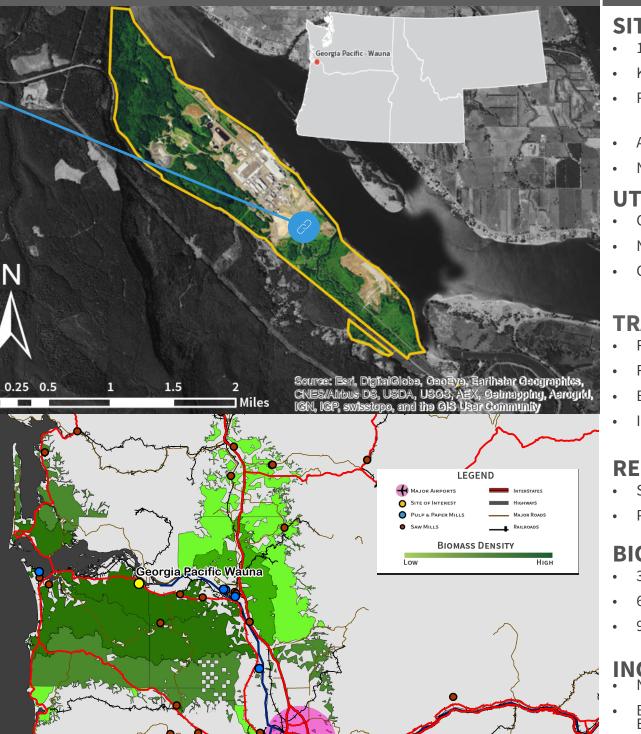
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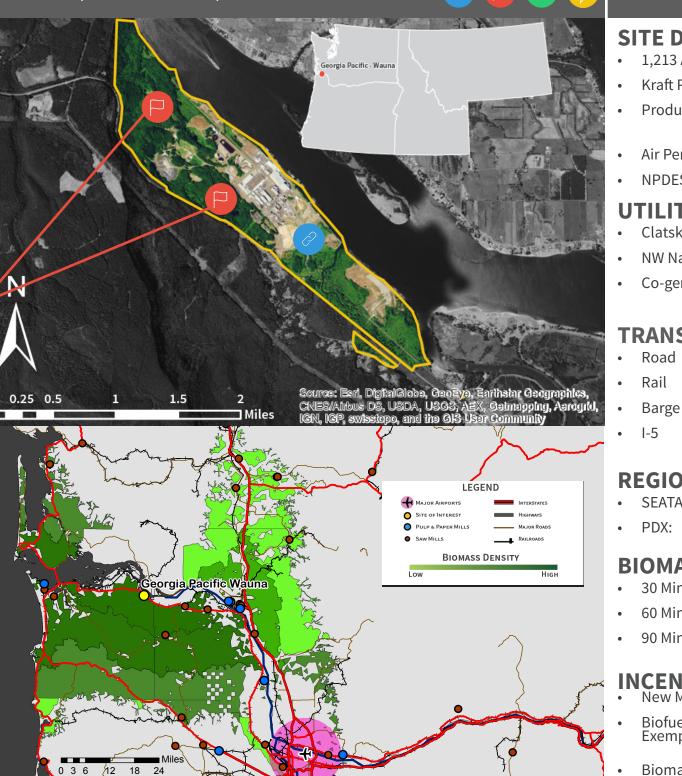
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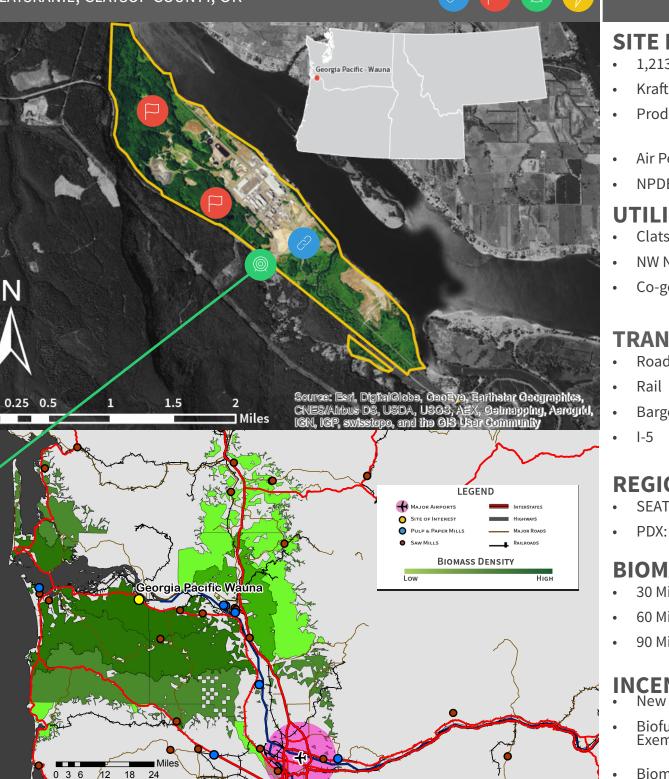
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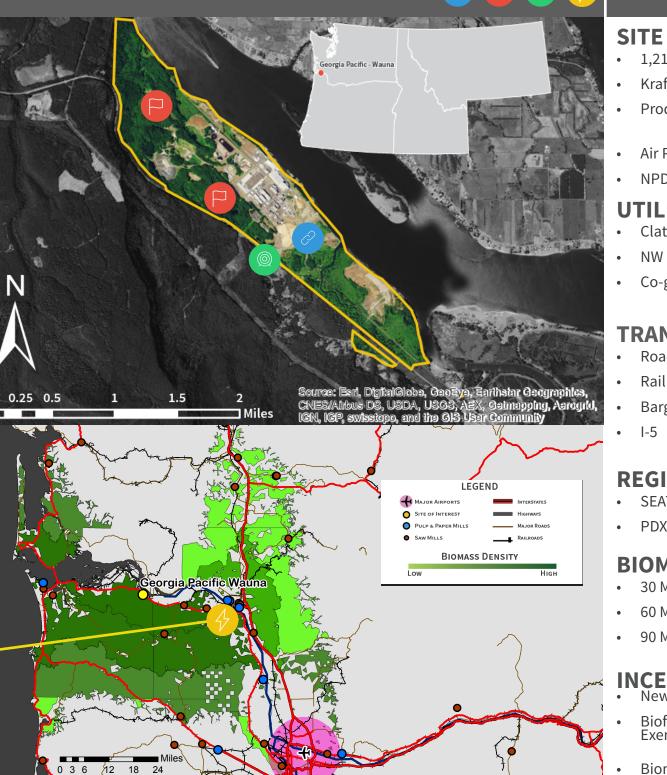
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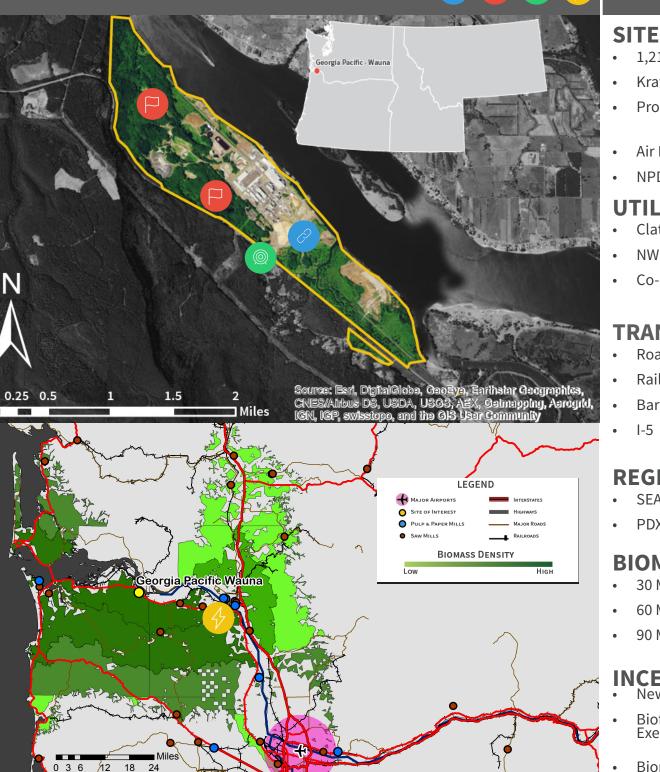
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STRENGTHS

- One of WestRock's two recently purchased mills on the West Coast.
- WestRock is a large company (Annual Revenue \$15b).

WestRock - Tacoma Mill Source: Earl, DigitalGlobe, GeoEye, Earl CNES/Airbus DS, USDA, USGS, AEX, G IGN, IGF, awlestopo, and the GIS User C LEGEND A MAJOR AIRPORTS INTERSTATES SITE OF INTEREST MAJOR ROADS PULP & PAPER MILLS

SAW MILLS

RAILROADS

SITE DESCRIPTION

- 162 Acres
- Kraft Process
- **Products: Paper and Cardboard**
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

Natural Gas

- Electric
- \$0.0471/KwH \$0.30627/therm
- Co-gen boilers onsite N

TRANSPORTATION

•	Road	Y	2 Miles
•	Rail	Y	On Site
•	Barge	Υ	On Site
•	I-5		2 Miles

REGIONAL MARKET

- SEATAC: 21 Miles PDX:
 - 145 Miles

BIOMASS QUANTITIES

- 30 Minutes: 14K BDT
- 135K BDT 60 Minutes:
- 90 Minutes: 370K BDT

INCENTIVES

- Close proximity to UW promotes visits by students and faculty.
- Refinery nearby

WEAKNESSES

- Location in large city, utilities are relatively expensive.
- Site is relatively small, space is limited for expansion
- Site has had several CWA and CAA violations in past.

OPPORTUNITIES

- Located on the Port of Tacoma with close access to barge, rail and truck.
- Professionals will be easier to recruit to urban facility.
- WestRock could be open to entrepreneurial ideas.

THREATS

Limited room for growth, offsite expansion would be expensive.

TACOMA, PIERCE COUNTY, WA

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STRENGTHS

- Approximately 350 acres of undeveloped Heavy Industrial zoned land
- Location in Portland/Vancouver Metro is a potential advantage for recruitment
- On-site solid waste landfill and wastewater treatment with a discharge of 20-35 MGD

WEAKNESSES

- Much of available Heavy Industrial zoned land is on difficult terrain or in high-visibility area
- Use of hog fuel boiler can compete with biofuel feedstock

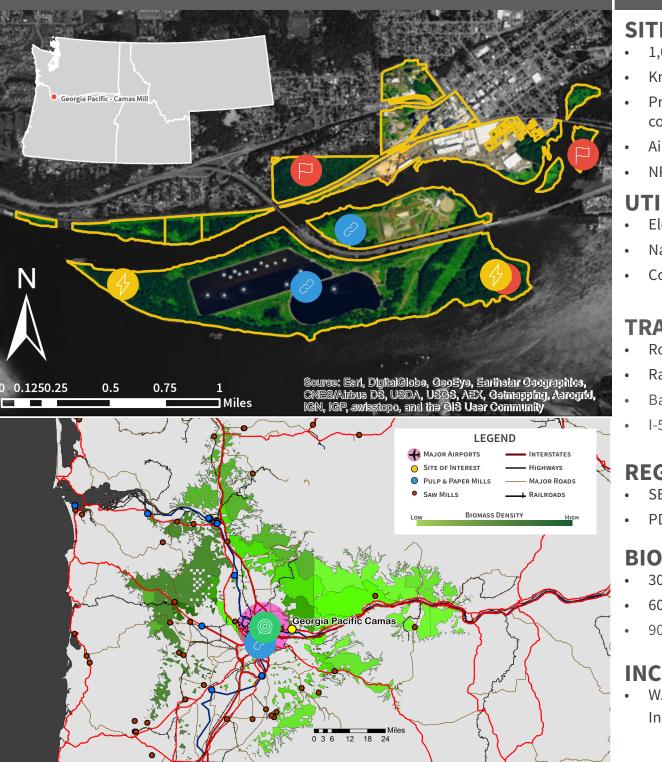
- 425,000 BDT of biomass available within 90 minutes of mill
- Close Proximity to Portland International Airport and Hillsboro Airport
- Highway, rail, and barge transportation
- On the Columbia River, 7 mi. to I-205, 14 mi. to I-5

THREATS

- Development on highly visible land could be resisted by community
- Changing regulatory climate (EPA regulations)

Camas, Clark County, WA





SITE DESCRIPTION

- 1,009 Acres
- Kraft Process
- Products: tissue, toweling, communication paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electricity: \$0.0642/KwH
- Natural Gas: \$0.50877/therm
- Co-gen boilers onsite Y

TRANSPORTATION

•	Road	Y	On-Site
•	Rail	Υ	On-Site
•	Barge	Υ	On-Site
•	I-5		14 Miles

REGIONAL MARKET

SEATAC: 167 Miles
 PDX: 12 Miles

BIOMASS QUANTITIES

- 30 Minutes: 15K BDT
- 60 Minutes: 100K BDT
- 90 Minutes: 425K BDT

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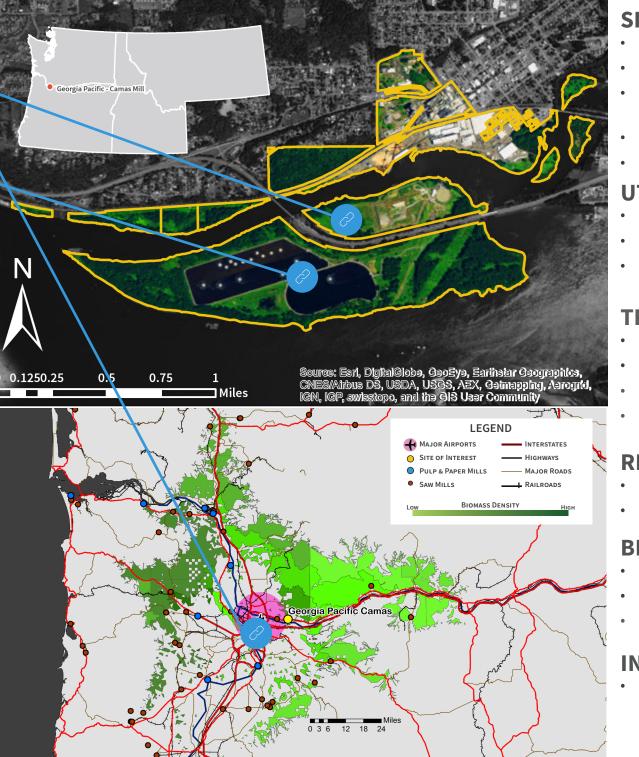
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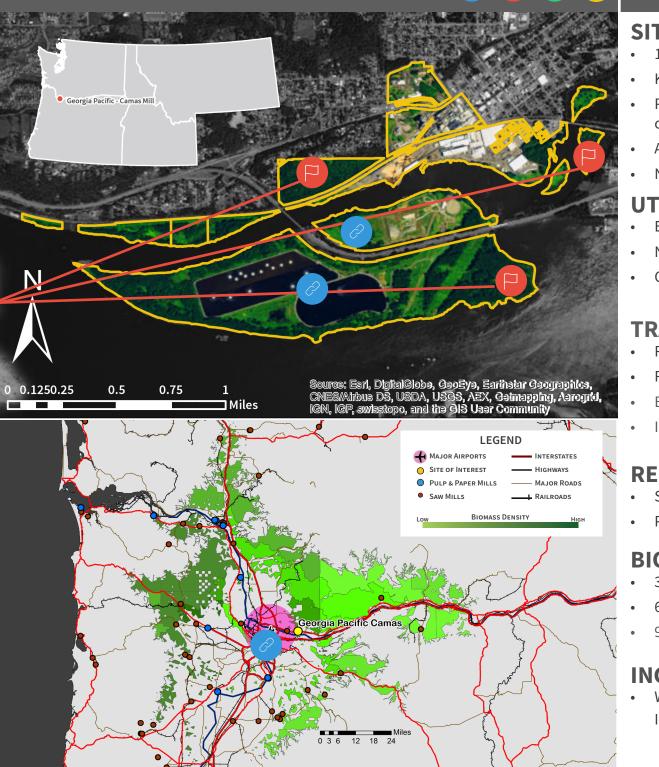
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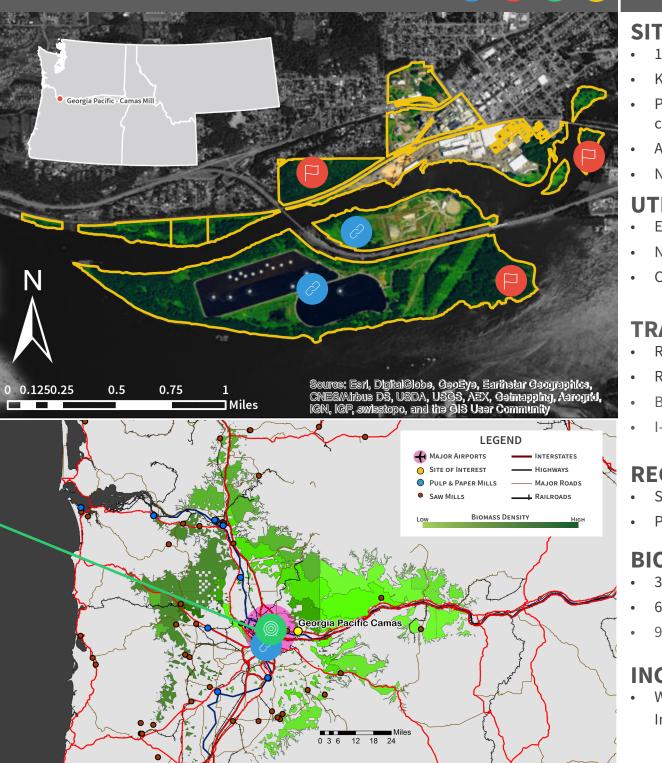
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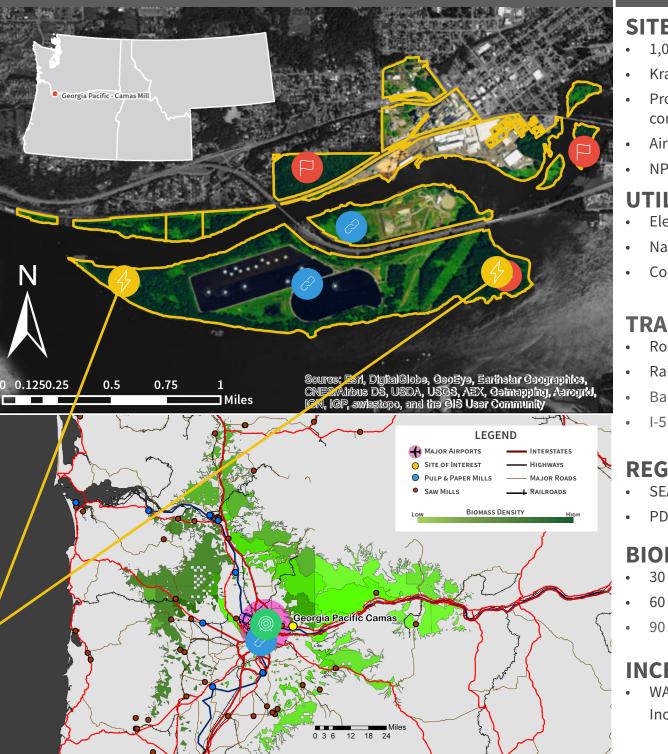
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TRANSPORTATION

•	Road	Y	On-Site
•	Rail	Υ	On-Site
•	Barge	Υ	On-Site
•	I-5		14 Miles

REGIONAL MARKET

SEATAC: 167 Miles
 PDX: 12 Miles

BIOMASS QUANTITIES

- 30 Minutes: 15K BDT
- 60 Minutes: 100K BDT
- 90 Minutes: 425K BDT

INCENTIVES

STRENGTHS

- Approximately 350 acres of undeveloped Heavy Industrial zoned land
- Location in Portland/Vancouver Metro is a potential advantage for recruitment
- On-site solid waste landfill and wastewater treatment with a discharge of 20-35 MGD

WEAKNESSES

- Much of available Heavy Industrial zoned land is on difficult terrain or in high-visibility area
- Use of hog fuel boiler can compete with biofuel feedstock

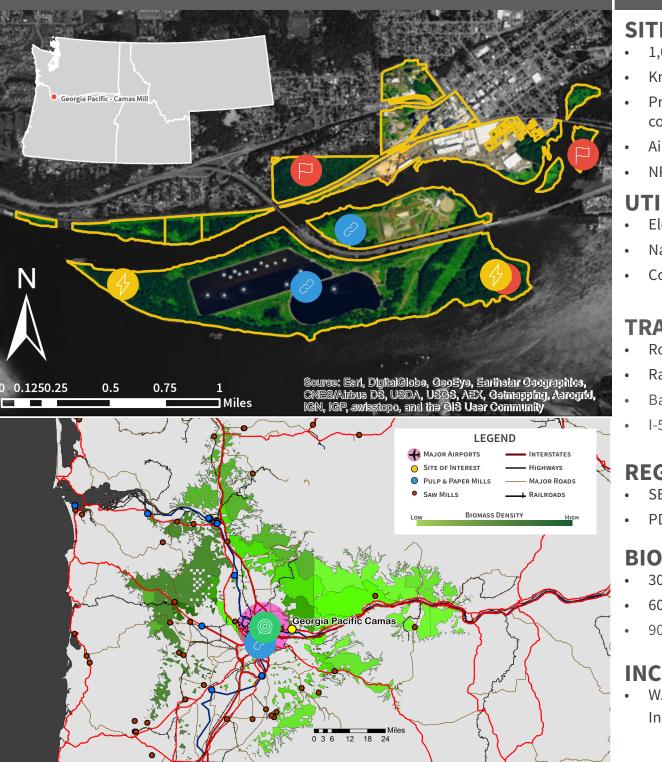
- 425,000 BDT of biomass available within 90 minutes of mill
- Close Proximity to Portland International Airport and Hillsboro Airport
- Highway, rail, and barge transportation
- On the Columbia River, 7 mi. to I-205, 14 mi. to I-5

THREATS

- Development on highly visible land could be resisted by community
- Changing regulatory climate (EPA regulations)

Camas, Clark County, WA





SITE DESCRIPTION

- 1,009 Acres
- Kraft Process
- Products: tissue, toweling, communication paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electricity: \$0.0642/KwH
- Natural Gas: \$0.50877/therm
- Co-gen boilers onsite Y

TRANSPORTATION

•	Road	Y	On-Site
•	Rail	Υ	On-Site
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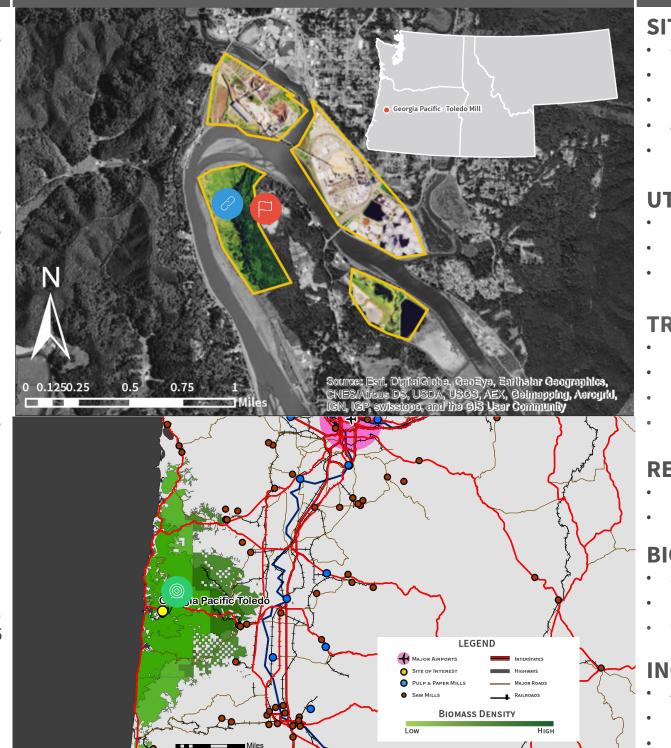
INCENTIVES

STRENGTHS

- Multiple green fields on site (larger targeted one having 94.3 acres)
- Kraft and mild sulfate mill
- Located on the Port of Toledo
- Land is zoned for Heavy Industry

WEAKNESSES

- Access to larger greenfield is difficult, as there is a operating mill adjacent to the lot.
- Site is not close to major markets of Sea-Tac or PDX.



12 18 24

Toledo, Lincoln County, OR

SITE DESCRIPTION

- 458 Acres
- Kraft & NSSC
- Products: Pulp & Paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric Name & \$0.0523/KwH
- Natural Gas Name & \$0.5087/unit
- Boiler Natural gas/ 66 MW

TRANSPORTATION

•	Road	Y	1 Mile
•	Rail	Y	On Site
•	Barge	Y	On Site
•	I-5		58 Mile

REGIONAL MARKET

- SEATAC:
 - PDX: 144 Miles

BIOMASS QUANTITIES

292 Miles

- 30 Minutes: 37K BDT
- 60 Minutes: 175K BDT
- 90 Minutes: 340K BDT

INCENTIVES

- Alternative Fuel Loans
- **Biofuel Production Tax Exemption**
- Biomass Eligibility for tax credits

OPPORTUNITIES \bigcirc

- Located adjacent to the Port of Toledo and also existing rail line access on site
- Only 5 miles away highway 20
- Biofuel property tax exemptions (OR)
- Biofuel tax incentives (OR)
- Biomass availability of 340,00 BDT within 90 minutes of mill

THREATS

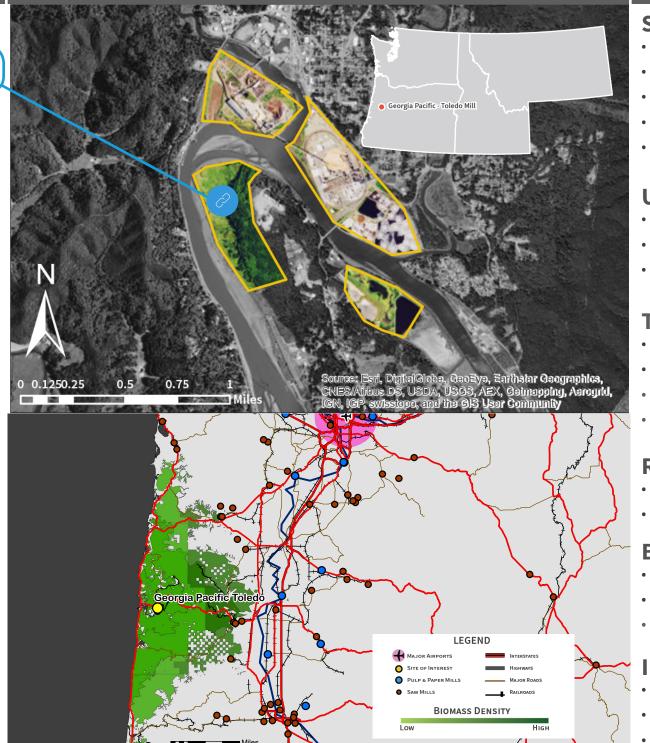
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292 Miles

90 Minutes: 34

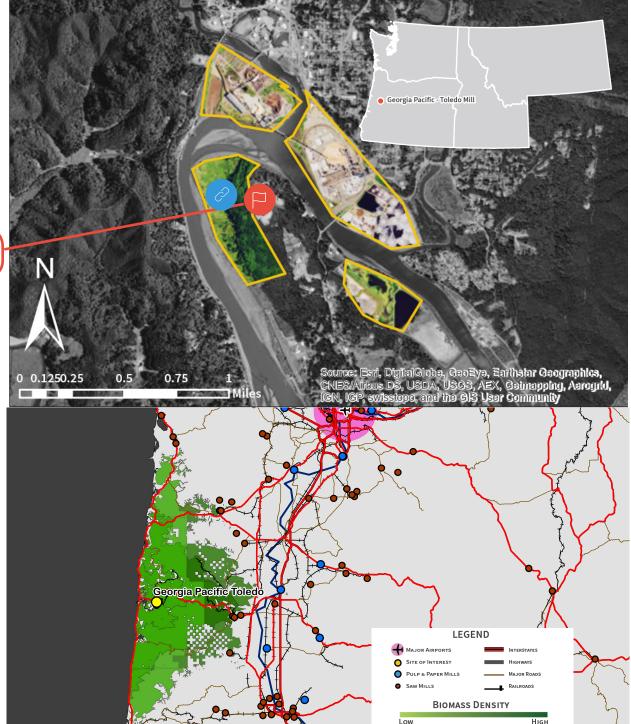
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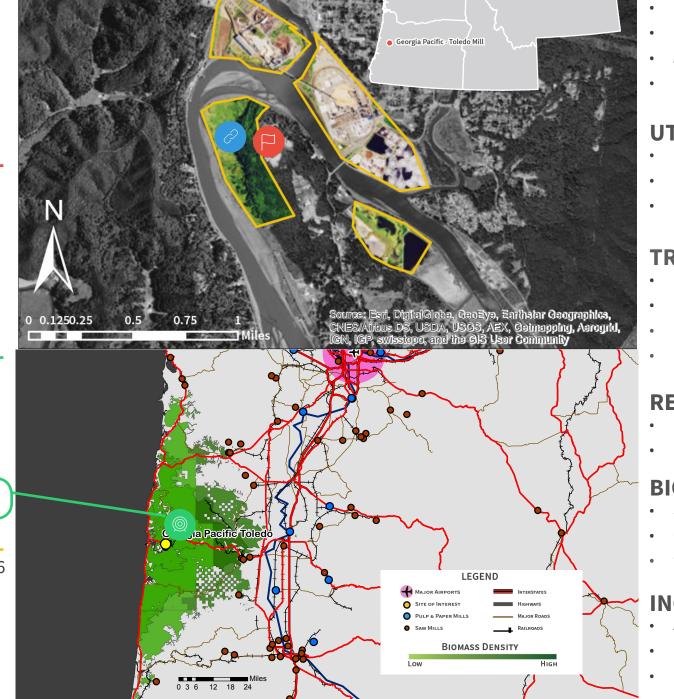
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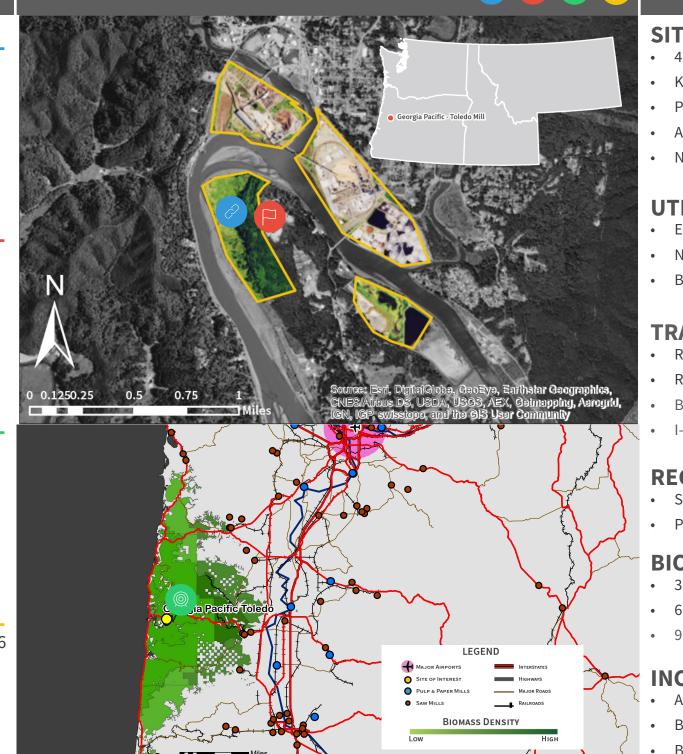
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- Existing equipment uses Sulphites, could potentially be compatible with Calcium **Bisulphite**
- 420 acres available for expansion
- Has shown a interest in investigating entrepreneurial ideas.

WEAKNESSES

- Does not have access to Port of Grays Harbor
- Currently does not process more than one species of tree (hemlock)
- Majority of property, including the existing facility, is in the FEMA Floodplain

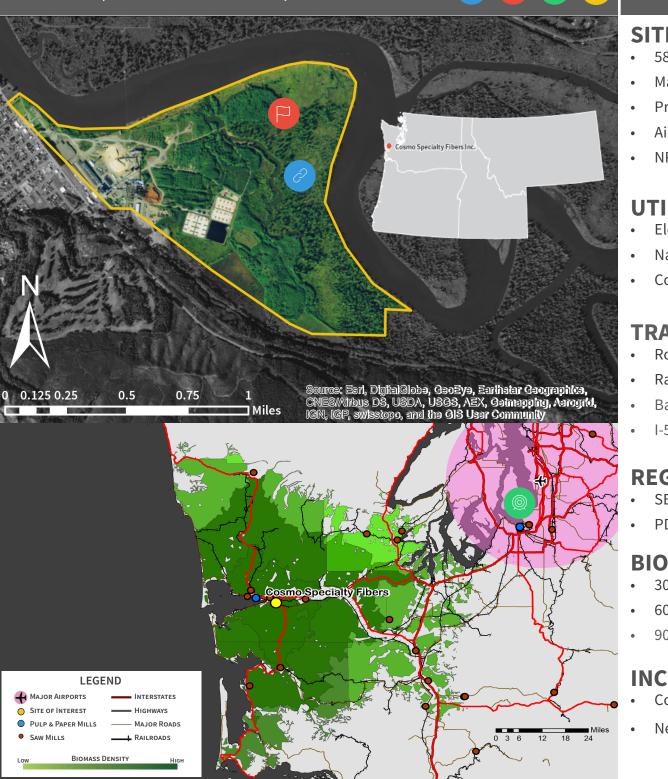
OPPORTUNITIES 0

- Weyerhaeuser owns a nearby log yard, with port access
- 578,000 BDT of biomass available with 90 minutes
- Nearest potential competition is WestRock Tacoma (79 miles)

THREATS

- New Industry has repeatedly faced resistance from local organizations
- It may be challenging to recruit qualified professionals to rural location

COSMOPOLIS, GRAYS HARBOR COUNTY, WA



SITE DESCRIPTION

- 587 Acres
- Magnesium Sulfite
- **Products:** Paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
 - Natural Gas N/A

\$0.0471/KwH

Co-gen boilers onsite - Y

TRANSPORTATION

Road 1 Miles Rail Ν Barge Ν I-5 50 Miles

REGIONAL MARKET

- SEATAC: 97 Miles
 - PDX: 143 Miles

BIOMASS QUANTITIES

- 30 Minutes: 80K BDT
- 60 Minutes: 338K BDT
- 90 Minutes: 578K BDT

- Cosmo is a NARA Project Partner
- New Market Tax Incentive

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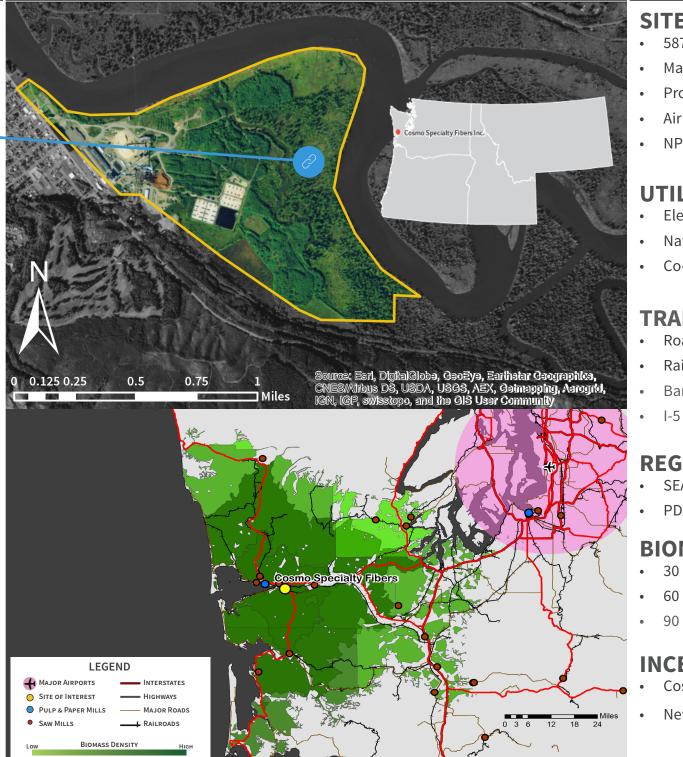
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TRANSPORTATION

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578K BDT

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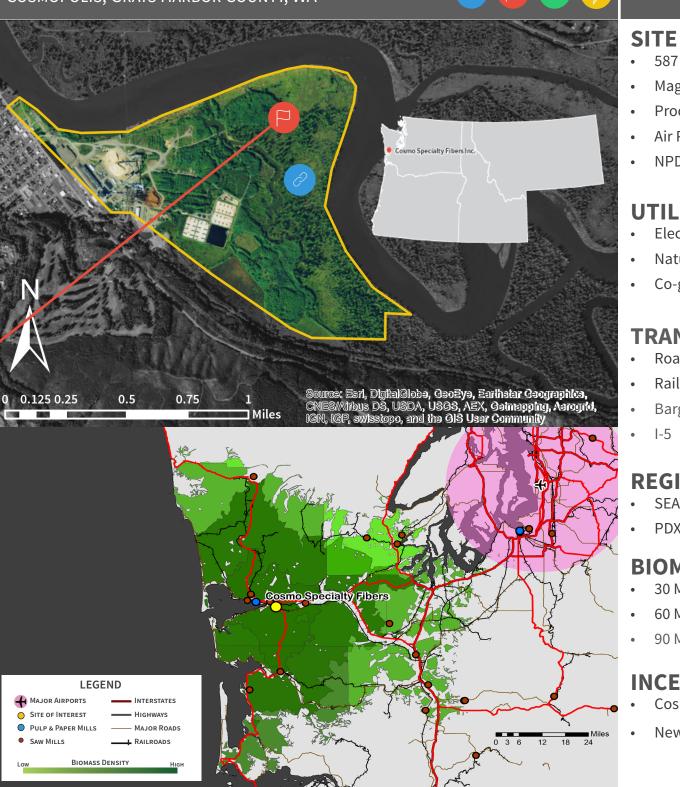
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\$0.0471/KwH

Co-gen boilers onsite - Y

TRANSPORTATION

•	Road	Y	1 Miles
•	Rail	Ν	
•	Barge	Ν	
•	I-5		50 Miles

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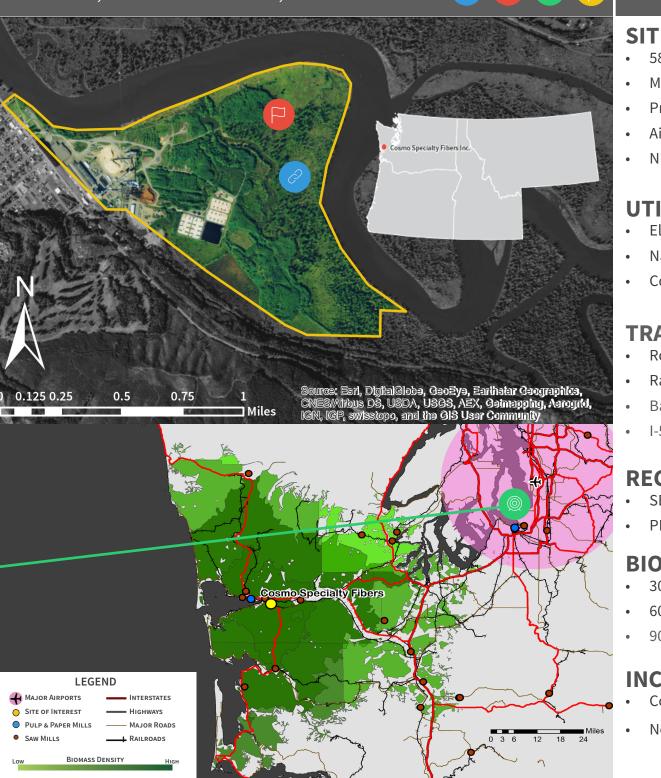
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Cosmopolis, Grays Harbor County, WA



SITE DESCRIPTION

- 587 Acres
- Magnesium Sulfite
- Products: Paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
 - Natural Gas N/A
- Co-gen boilers onsite Y

TRANSPORTATION

- Road Y 1 Miles
 Rail N
 Barge N
 I-5 50 Miles
 - SU MILLES

\$0.0471/KwH

REGIONAL MARKET

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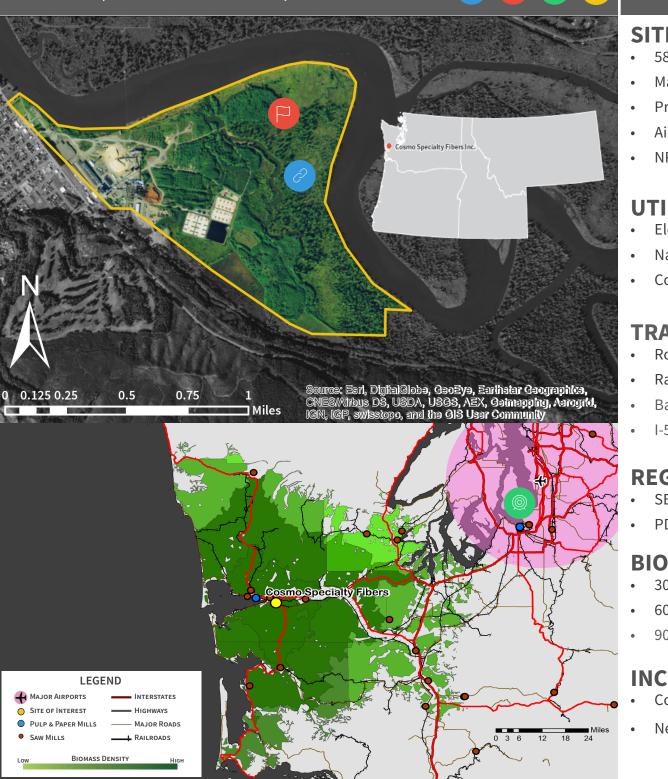
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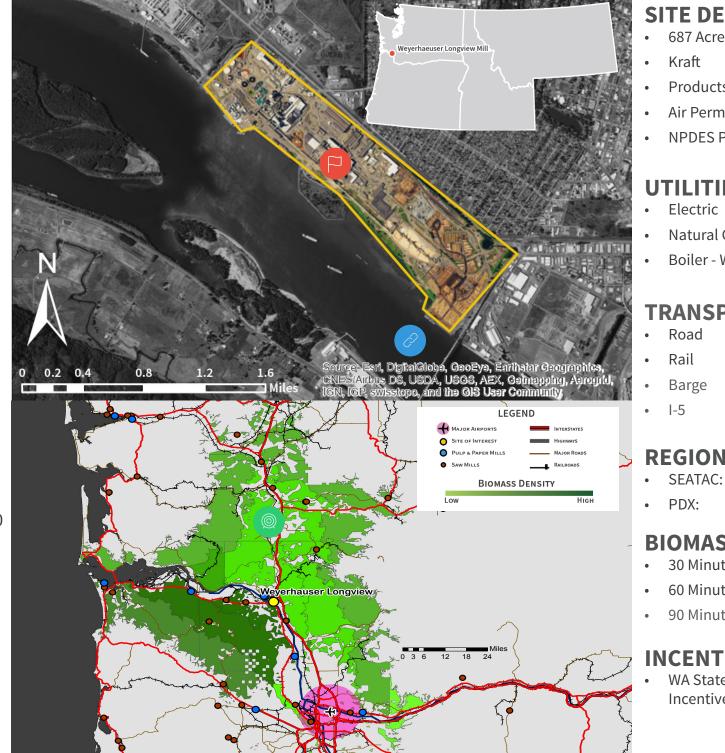
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STRENGTHS

- Small portion of greyfield that can be re-purposed for pilot facility (26 acres)
- Located on the Columbia river
- Only 6 miles to 15 and has existing rail lines on site

WEAKNESSES

- Crowded site with very little room for full plant expansion
- No greenfields within direct proximity to site to develop that are owned by Weyerhaeuser



LONGVIEW, COWLITZ COUNTY, WA

OPPORTUNITIES \bigcirc

- Located adjacent to the Columbia River and also existing rail line access on site
- Only 5 miles away I5
- Only 54 mile to PDX
- Biomass availability of 740,000 BDT within 90 minutes of mill

THREATS

- Competition for space and power with Norpac venture neighboring proposed grey field site.
- Competition for Biomass with neighboring mills in the area. (Kapstone and GP Camas)

SITE DESCRIPTION

- 687 Acres
- **Products:** Paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric Name & \$0.0382/KwH
- Natural Gas Name & \$0.45782/unit
- Boiler Wood/44 MW

TRANSPORTATION

•	Road	Y	6 Miles
•	Rail	Y	On Site
•	Barge	Y	On Site
•	I-5		6 miles

REGIONAL MARKET

116 Miles 54 Miles

BIOMASS QUANTITIES

- 30 Minutes: 60K BDT
- 60 Minutes: 340K BDT
- 90 Minutes: **760K BDT**

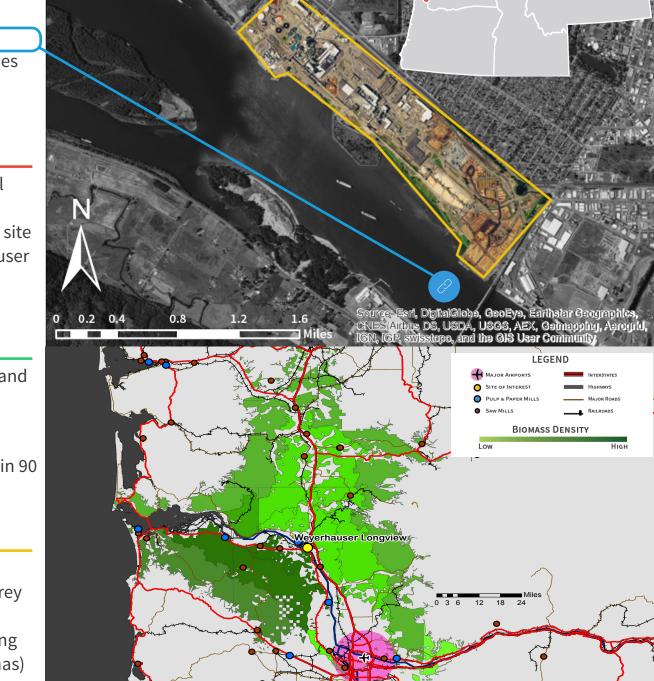
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Weverhaeuser Longview Mi

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LONGVIEW, COWLITZ COUNTY, WA



Weverhaeuser Longview Mi B B B B DinitalGlobe, GeoEye, Earthstar Geograp 0.2 s DS. USDA, USGS, AEX, Geir IEGEND BIOMASS DENSITY Low auser Longviev

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SEATAC: 116 Miles 54 Miles PDX:

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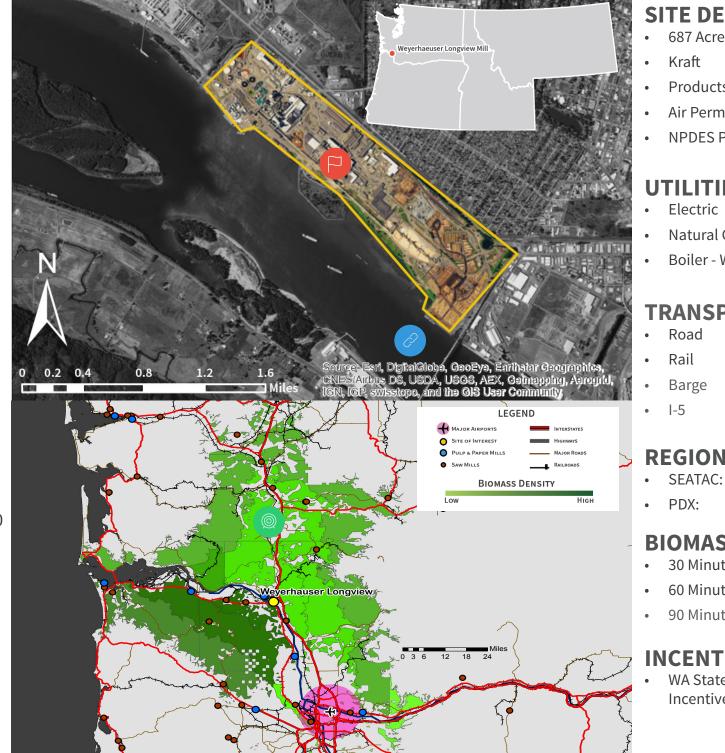
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INCENTIVES

Kapstone Paper Mill

STRENGTHS

- Potential greenfield onsite (49.84 acres)
- Rail onsite and possible access to port
- Wastewater treatment plant onsite (57 MGD)
- Onsite steam and power generation (25MW)
- Friendly climate with local professionals

WEAKNESSES

- Port dredging may be necessary to utilize **Cowlitz River**
- Labor force may be an issue just ended a 5 month strike this September



OPPORTUNITIES

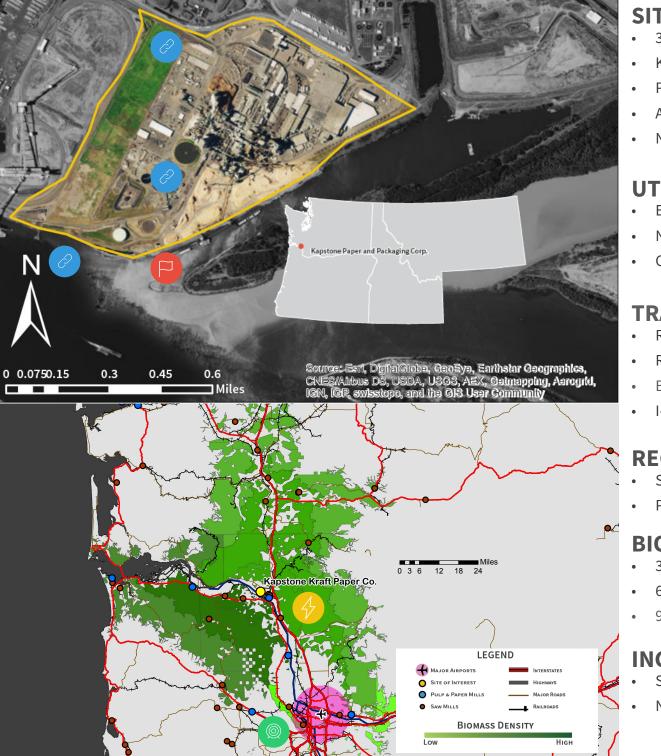
- Close Proximity to PDX (39 miles) and Hillsboro (39 miles) Airports
- Large biomass availability (760,000 BDT within 90 minutes)

THREATS

- Competition for materials by nearby mills (Weyerhaeuser Longview)
- Changing labor law climates

LONGVIEW, COWLITZ COUNTY, WA





SITE DESCRIPTION

- 350 Acres
- Kraft Process
- Products: Paper, Box
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric Name & \$0.0382/KwH
- Natural Gas Name & \$0.45782/unit
- Co-gen boilers onsite N

TRANSPORTATION

	•	Road	Υ	<5 Miles	
	٠	Rail	Υ	Onsite	
	•	Barge	Υ	Onsite	
	٠	I-5:		<5 Miles	
	R	EGION		ARKET	
-	٠	SEATAC:		122 Miles	
	•	PDX:		39 Miles	
C	-				
	В	IOMAS	S QI	UANTITIES	
	٠	30 Minut	es:	60K BDT	
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٨					
	I	ICENT	IVES		
-	٠	State Bio	ofuel Ta	ax Exemption Possibl	е
2	•	New Mai	rket Ta	x Incentive	

Kapstone Paper Mill

STRENGTHS

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- Potential greenfield onsite (49.84 acres)
- Rail onsite and possible access to port
- Wastewater treatment plant onsite (57 MGD)
- Onsite steam and power generation (25MW)
- Friendly climate with local professionals

WEAKNESSES

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Kapstone Paper and Packaging Corp N obe, Geollye, Earthstar Geographics, 0 0.0750.15 0.3 0.45 0.6 S/Airbus DŠ, USDA, USGS, AEX, Geimapping, Aerogild, IGP, swisstopo, and the GIS User Community Miles stone Kraft Paper Co **LEGEN BIOMASS DENSITY** Low

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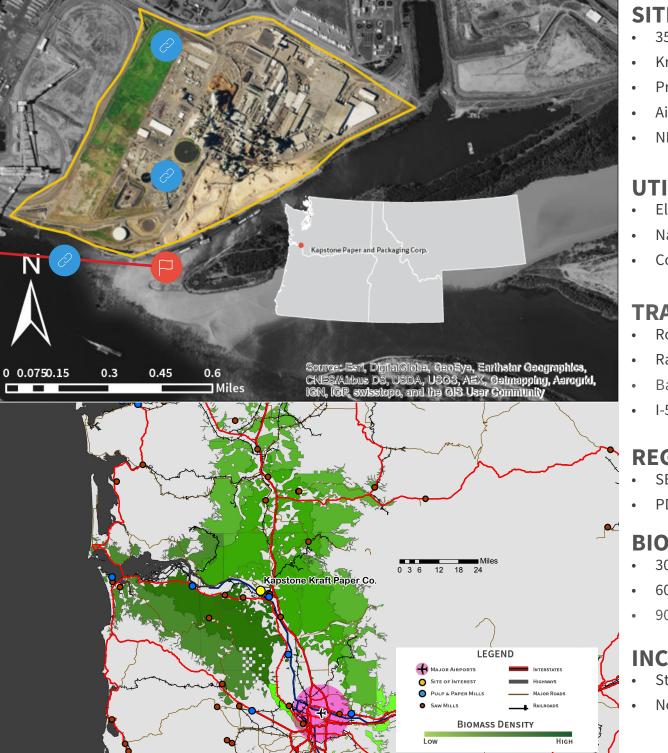
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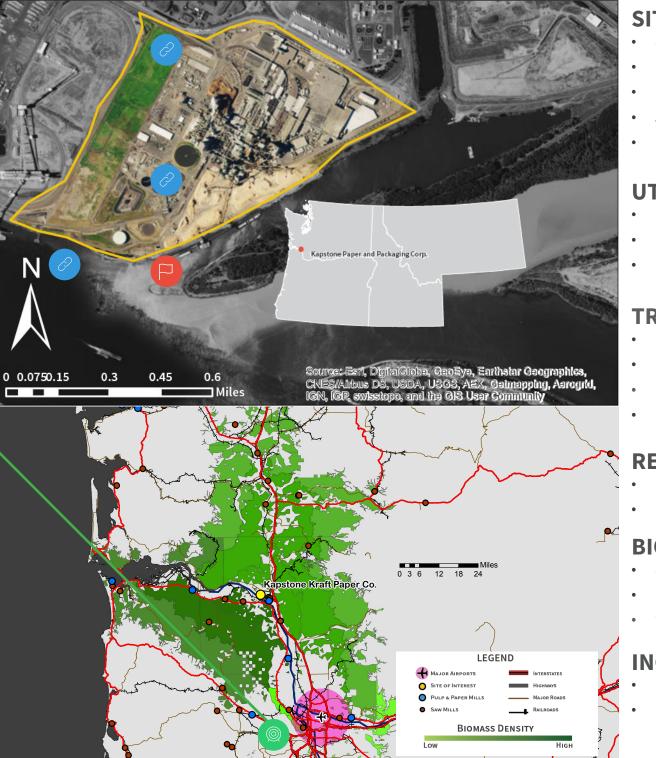
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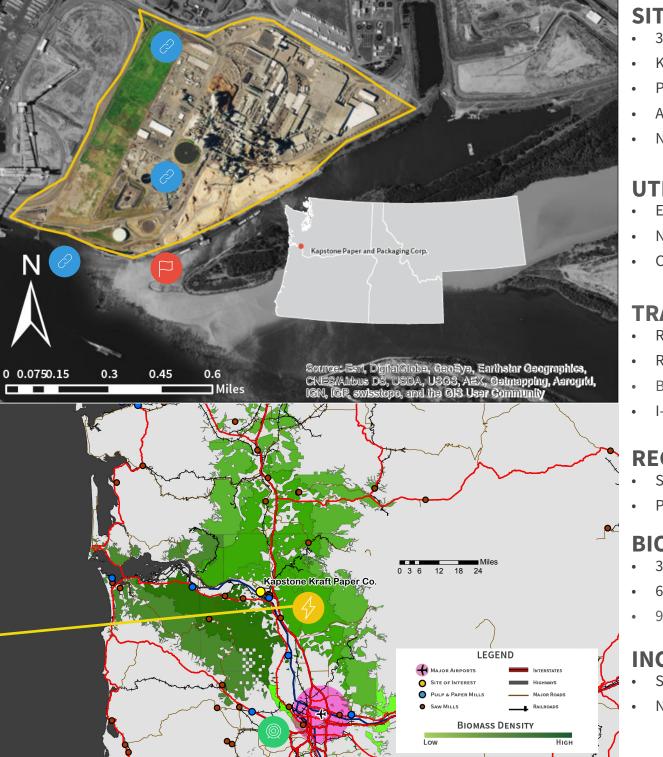
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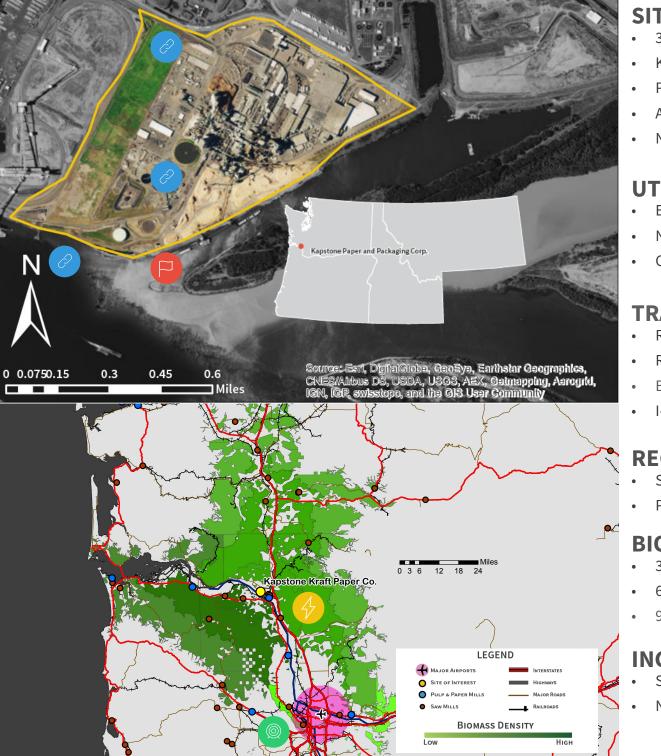
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OPPORTUNITIES

- Located 48 miles from PDX (immediate access to Highway 99 running into I-5)
- 510,000 BDT of residuals available within 90 minutes.

THREATS

- Farming industry is booming and surrounds site.
- Biomass is limited to 75,000 BDT per year within 60 minute drive-time.

NEWBERG, YAMHILL COUNTY, OR



WestRock - Newberg Natural Gas 0 0.05 0.1 0.3 0.4 0.2 : Esri, DigitalGlobə, Gəozyə, Zarihətar Gəographikə, Alrbus DS, USDA, USGS, AZX, Gəimapping, Aərogrid, ⊐ Miles 1-5 0 3 6 12 18 24 PDX: LEGEND **BIOMASS DENSITY**

SITE DESCRIPTION

- 146 Acres
- Thermo-mechanical process
- Products: Newsprint and Packaging
- Air Permit: Y
- NPDES Permit: N

UTILITIES

- Electric
- ~\$0.46/therm

~\$0.0483/KwH

Boilers On-Site - 2 Hogfuel, 4 Natural Gas

TRANSPORTATION

•	Road	Y	<1 Mile
•	Rail	Y	On Site
•	Barge	Ν	NA
•	I-5		13 Miles

REGIONAL MARKET

- SEATAC: 190 Miles
 - 48 Miles

BIOMASS QUANTITIES

- 30 Minutes: 7K BDT
- 60 Minutes: 75K BDT
- 90 Minutes: **510K BDT**

- **Enterprise Zone Tax Exemption**
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STRENGTHS

- On site green space: approximately 33 acres
- On site waster water treatment ponds
- Receiving \$100M upgrade to mill
- Tax break provided by Springfield while they upgrade their facility - Community Support

WEAKNESSES

- Low biomass availability 300,000 BDT within 90 minutes
- Struggling Plant considering 20% layoffs
- Recently received tax break on upgrades so site could stay open.

OPPORTUNITIES 0

- Proximity to Interstate-5 (I-5)
- Direct Rail connection to site
- Open to entrepreneurial ideas
- 8 lumber mills within 5 miles & 10+ Lumber mills within 25 miles

THREATS

- Located in City limited space for site
- Far from potential markets (130 miles to PDX)
- Biomass competition competing with International Paper for biomass in the region

Springfield, Lane County, OR



International Paper - Springfield Mi LEGEND MAJOR AIRPORTS NTERSTATES SITE OF INTEREST Ρυμρ & Paper Mills A IOR ROADS RAILROADS SAW MILLS **BIOMASS DENSITY** International Paper Springfield 18 24 12

SITE DESCRIPTION

- 316 Acres
- Kraft Process
- Products: Pulp & Paper, Packaging
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
- \$0.0483/KwH \$0.0005/therm
- Natural Gas
- **Boiler** onsite 60 MW

TRANSPORTATION

•	I-5:		6 Miles
•	Barge	Ν	
•	Rail	Υ	On Site
•	Road	Y	6 Miles

REGIONAL MARKET

- SEATAC: 270 Miles PDX:
 - Eugene: 16 Miles

BIOMASS QUANTITIES

- 30 Minutes: 16K BDT
- 60 Minutes: 140K BDT
- 90 Minutes:

INCENTIVES

- Alternative Fuel Loans
- **Biofuel Production Tax Exemption**

300K BDT

Biomass Eligibility for tax credits

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LEGEND

BIOMASS DENSITY

NTERSTATES

—— Major Roads ——

MAJOR AIRPORTS

Ρυμρ & Paper Mills

SITE OF INTEREST

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International Paper - Springfield Mi

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- Kraft Process
- Products: Pulp & Paper, Packaging
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
- \$0.0483/KwH \$0.0005/therm
- Natural Gas \$0.000
- Boiler onsite
 60 MW

TRANSPORTATION

D	ECION		ANDRE.
•	I-5:		6 Miles
•	Barge	Ν	
•	Rail	Υ	On Site
•	Road	Y	6 Miles

REGIONAL MARKET

- SEATAC: 270 Miles
 PDX: 130 Miles
 - Eugene: 16 Miles
 - 16 Miles

BIOMASS QUANTITIES

- 30 Minutes: 16K BDT
- 60 Minutes: 140K BDT
- 90 Minutes: **300K BDT**

INCENTIVES

18 24

12

- Alternative Fuel Loans
- **Biofuel Production Tax Exemption**
- Biomass Eligibility for tax credits

STRENGTHS

- On site green space: approximately 33 acres
- On site waster water treatment ponds
- Receiving \$100M upgrade to mill
- Tax break provided by Springfield while they upgrade their facility - Community Support

WEAKNESSES

- Low biomass availability 300,000 BDT within 90 minutes
- Struggling Plant considering 20% layoffs
- Recently received tax break on upgrades so site could stay open.

OPPORTUNITIES 0

- Proximity to Interstate-5 (I-5)
- Direct Rail connection to site
- Open to entrepreneurial ideas
- 8 lumber mills within 5 miles & 10+ Lumber mills within 25 miles

THREATS

- Located in City limited space for site
- Far from potential markets (130 miles to PDX)
- Biomass competition competing with International Paper for biomass in the region

Springfield, Lane County, OR



International Paper - Springfield Mi LEGEND MAJOR AIRPORTS NTERSTATES SITE OF INTEREST Ρυμρ & Paper Mills AJOR ROADS RAILROADS SAW MILLS **BIOMASS DENSITY** International Paper Springfield 18 24 12

SITE DESCRIPTION

- 316 Acres
- Kraft Process
- Products: Pulp & Paper, Packaging
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
- \$0.0483/KwH \$0.0005/therm
- Natural Gas
- **Boiler onsite** 60 MW

TRANSPORTATION

•	Road	Y	6 Miles
•	Rail	Υ	On Site
•	Barge	Ν	
•	I-5:		6 Miles

REGIONAL MARKET

- SEATAC: 270 Miles PDX:
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International Paper - Springfield Mil LEGEND MAJOR AIRPORTS NTERSTATES SITE OF INTERES PULP & PAPER MILLS A IOR ROADS SAW MILLS L RAILROADS BIOMASS DENSITY International Paper Springfield 18 24 12

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- NPDES Permit: Y

UTILITIES

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- \$0.0483/KwH
- Natural Gas \$0.0005/therm
- **Boiler onsite** 60 MW

TRANSPORTATION

•	Road	Y	6 Miles
•	Rail	Y	On Site
•	Barge	Ν	
•	I-5:		6 Miles

REGIONAL MARKET

- SEATAC: 270 Miles PDX:
 - Eugene: 16 Miles

BIOMASS QUANTITIES

- 30 Minutes: 16K BDT
- 60 Minutes: 140K BDT
- 90 Minutes:

INCENTIVES

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International Paper - Springfield Mi LEGEND MAJOR AIRPORTS NTERSTATES SITE OF INTEREST Ρυμρ & Paper Mills A IOR ROADS RAILROADS SAW MILLS **BIOMASS DENSITY** International Paper Springfield 18 24 12

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300K BDT

Biomass Eligibility for tax credits

STRENGTHS

- Approximately 350 acres of greenfield that is currently farmland
- 2 large water treatment ponds Each 113,000 gallons 10 day process
- Invested \$1.3M in small water treatment facility that discharges water into river

WEAKNESSES

- This site shares facility with GP Existing tension between parties (past lawsuits)
- Boiler wood consumption competition over biomass availability

- 5 miles from I-5
- Qualify as renewable energy development zone tax exempt for 5 years
- 2014 ownership change Hong Kong; International Grand Investment Corporation

THREATS

- Located over 100 miles from nearest market
- Low biomass availability 230,000 BDT within 90 minutes
- Linn County Unemployment Rate: 6.4% (1.3% above national average)

Halsey, Linn County, OR

125 0.25

0.75

□ Miles

Pacific Halsev

0 3 6 12 18 24

INTERSTATES

Source: Esri, Digital@lobə, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

BIOMASS DENSITY

👍 Major Airports

SITE OF INTEREST

PULP & PAPER MILLS
 Saw MILLS

Lat

Cascade Pacific Pulp - Halsey Mill

SITE DESCRIPTION

- 635 Acres
- Kraft Process
- Products: Pulp & Paper
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
- Natural Gas
- Boilers onsite Y 200BDT/yr

\$0.0759/KwH

TRANSPORTATION

- Road Y 5 Miles
 Rail Y On Site
 Barge N
 - I-5 5 Miles

REGIONAL MARKET

- SEATAC: 252 Miles
 - PDX: 103 Mil

BIOMASS QUANTITIES

- 30 Minutes: 25K BDT
- 60 Minutes: 90K BDT
- 90 Minutes: 230K BDT

- Alternative Fuel Loans
- Biofuel Production Tax Exemption
- Biomass Eligibility for tax credits

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HALSEY, LINN COUNTY, OR

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Cascade Pacific Pulp - Halsey Mill Lat Source: Esri, Digital@lobə, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community 0.75 □ Miles LEGEND 👍 Major Airports INTERSTATES SITE OF INTEREST PULP & PAPER MILLS SAW MILLS **BIOMASS DENSITY** Pacific Halsey

0 3 6 12 18 24

- **Biofuel Production Tax Exemption**
- Biomass Eligibility for tax credits

SITE DESCRIPTION

- 635 Acres
- Kraft Process
- Products: Pulp & Paper
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- Natural Gas
- Boilers onsite Y 200BDT/yr

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TRANSPORTATION

- 5 Miles Road On Site Rail Υ Barge Ν
 - I-5 5 Miles

REGIONAL MARKET

- SEATAC: 252 Miles
- PDX:

BIOMASS QUANTITIES

- 30 Minutes: 25K BDT
- 60 Minutes: 90K BDT
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Halsey, Linn County, OR

125 0.25

Cascade Pacific Pulp - Halsey Mill 1 mm Source: Esri, Digital@lobə, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community 0.75 □ Miles LEGEND A MAJOR AIRPORTS INTERSTATES SITE OF INTEREST PULP & PAPER MILLS SAW MILLS **BIOMASS DENSITY** Pacific Halsey 0 3 6 12 18 24

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UTILITIES

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TRANSPORTATION

- Road Y 5 Miles
 Rail Y On Site
 Barge N
 - I-5 5 Miles

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LEGEND

BIOMASS DENSITY

👍 Major Airports

SITE OF INTERES

PULP & PAPER MILLS
 Saw MILLS

Lat

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 Rail Y On Site
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 - I-5 5 Miles

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TRANSPORTATION

- Road Y 5 Miles
 Rail Y On Site
 Barge N
 - I-5 5 Miles

REGIONAL MARKET

- SEATAC: 252 Miles
 - PDX: 103 Mil

BIOMASS QUANTITIES

- 30 Minutes: 25K BDT
- 60 Minutes: 90K BDT
- 90 Minutes: 230K BDT

- Alternative Fuel Loans
- Biofuel Production Tax Exemption
- Biomass Eligibility for tax credits

PORT TOWNSEND, JEFFERSON COUNTY, WA



\$0.064/KwH

\$0.555/therm

10 Miles

On-site

75 Miles

100 Miles

205 Miles

6K BDT

30K BDT

60K BDT

γ

STRENGTHS

- Mill owns 150 acres of HI zoned greenfield adjacent to existing infrastructure
- Large (33 acre) industrial wastewater treatment plant on site
- Able to receive feedstock via barge

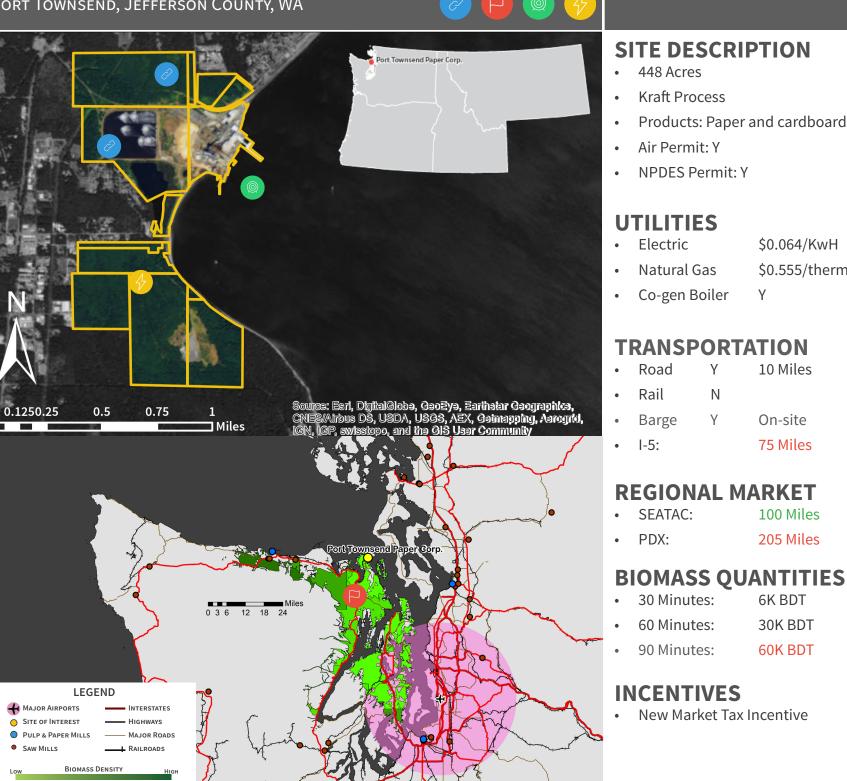
WEAKNESSES

- Low quantities of biomass available in region due to far NE location on the Olympic Peninsula
- Water supply source unstable, mill was at serious threat of shutting down this past summer due to supply concerns

OPPORTUNITIES \bigcirc

- Mill could ship biofuel via barge
- Mill is assessing feasibility of utilizing biochar, a by-product of pyrolysis, to filter stormwater on site and manufacture cleansing units
- New ownership more capable of capital investment

- 220 of 448 acres zoned Rural Residential or **Designated Forest Land**
- Mill in non-compliance with aspects of Clean Water Act and Clean Air Act
- Mill has faced resistance from community including successful efforts to block an expansion to the co-gen plant in 2014



PORT TOWNSEND, JEFFERSON COUNTY, WA



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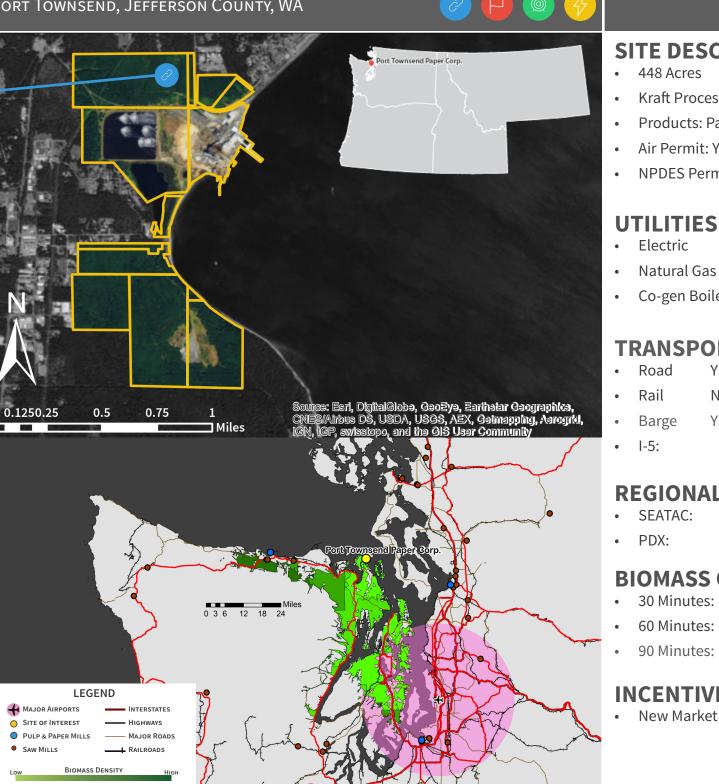
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SITE DESCRIPTION

- 448 Acres
- Kraft Process
- Products: Paper and cardboard
- Air Permit: Y
- NPDES Permit: Y

UTILITIES

- Electric
- \$0.064/KwH \$0.555/therm
- Co-gen Boiler γ

TRANSPORTATION

- 10 Miles Ν Barge γ On-site 75 Miles

REGIONAL MARKET

- SEATAC: 100 Miles
 - 205 Miles

BIOMASS QUANTITIES

- 30 Minutes: 6K BDT
- 60 Minutes: 30K BDT
- 90 Minutes: 60K BDT

INCENTIVES

New Market Tax Incentive

STRENGTHS

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PORT TOWNSEND, JEFFERSON COUNTY, WA SITE DESCRIPTION Port Townsend Paper Corp 448 Acres Kraft Process Products: Paper and cardboard Air Permit: Y NPDES Permit: Y UTILITIES Electric Natural Gas Co-gen Boiler . TRANSPORTATION Road Rail . Source: Esrl, DigitalGlobə, Gəozyə, Earlihətar Gəographikə, QNES/Alıbus DS, USDA, USGS, AZX, Gəimapping, Aərogıtdı, 0.1250.25 0.5 0.75 Barge ⊐ Miles stopo, and the GIS User Communit I-5: **REGIONAL MARKET** SEATAC: PDX: **BIOMASS QUANTITIES** 30 Minutes: 12 60 Minutes: 90 Minutes: **INCENTIVES** LEGEND A MAJOR AIRPORTS INTERSTATES New Market Tax Incentive SITE OF INTEREST PULP & PAPER MILLS MAJOR ROADS SAW MILLS RAILROADS BIOMASS DENSITY

\$0.064/KwH

\$0.555/therm

10 Miles

On-site

75 Miles

100 Miles

205 Miles

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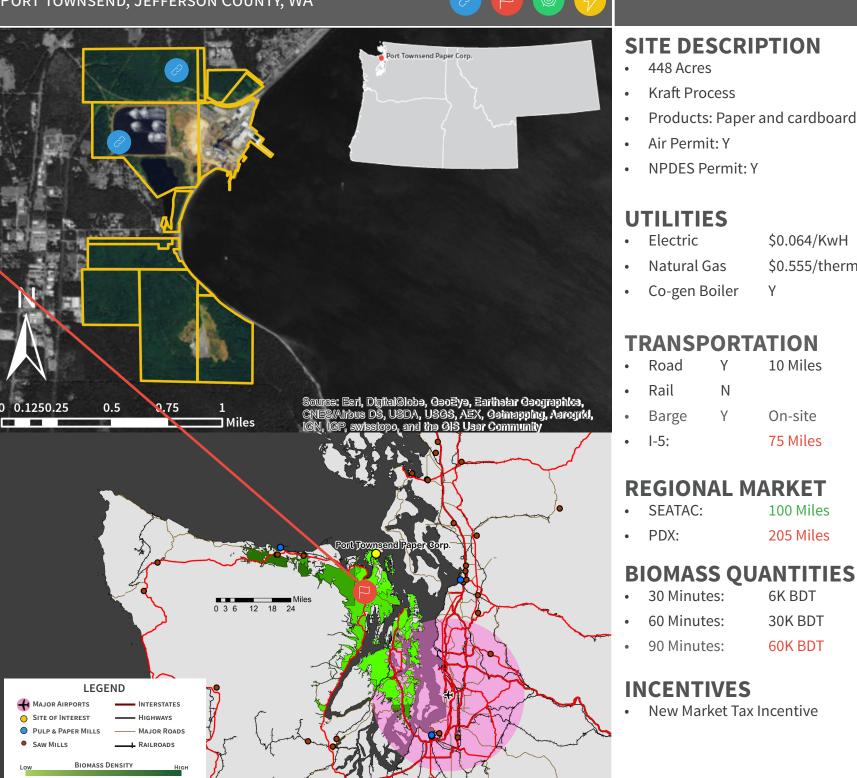
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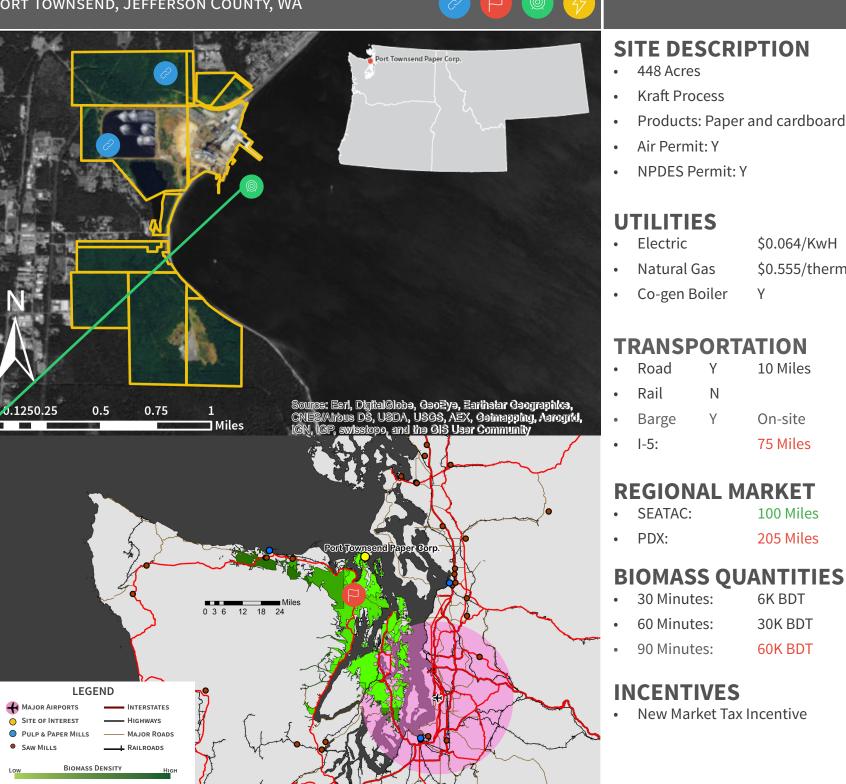
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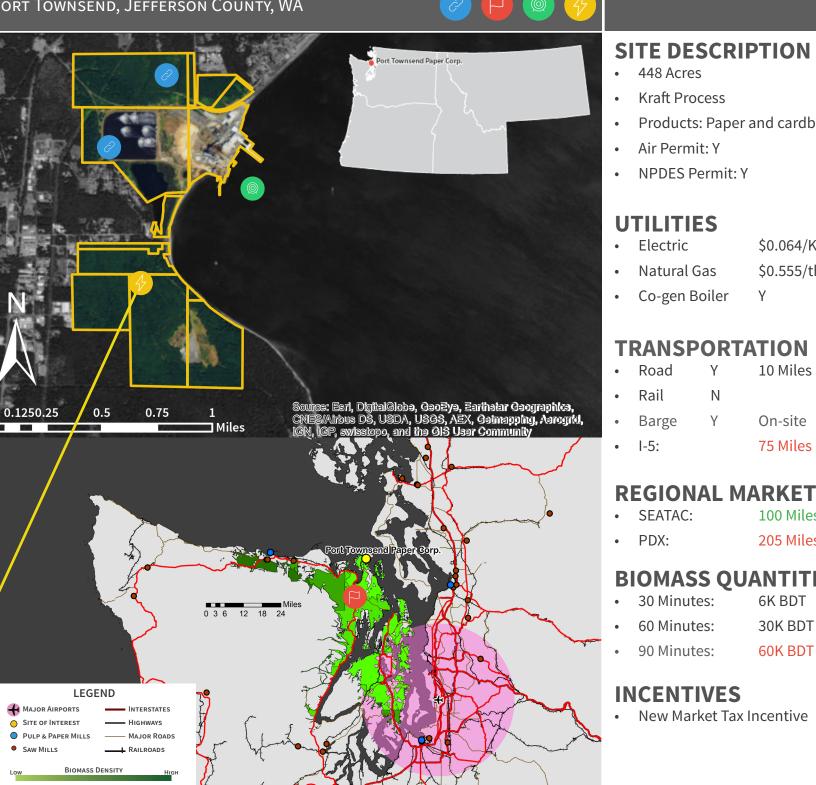
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SITE DESCRIPTION

- Kraft Process
- Products: Paper and cardboard
- NPDES Permit: Y
- \$0.064/KwH \$0.555/therm
- Co-gen Boiler γ

TRANSPORTATION

٠	Road	Υ	10 Miles
•	Rail	Ν	
•	Barge	Υ	On-site
•	I-5:		75 Miles

- 100 Miles
 - 205 Miles

BIOMASS QUANTITIES

- 6K BDT
- 30K BDT
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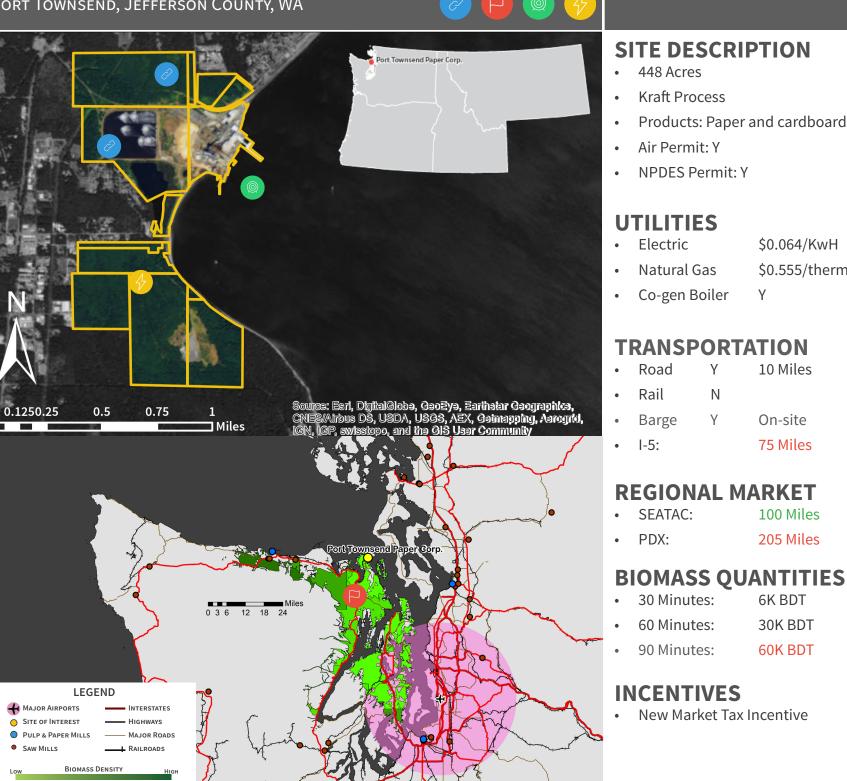
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Port Angeles, Clallam Country, WA



STRENGTHS

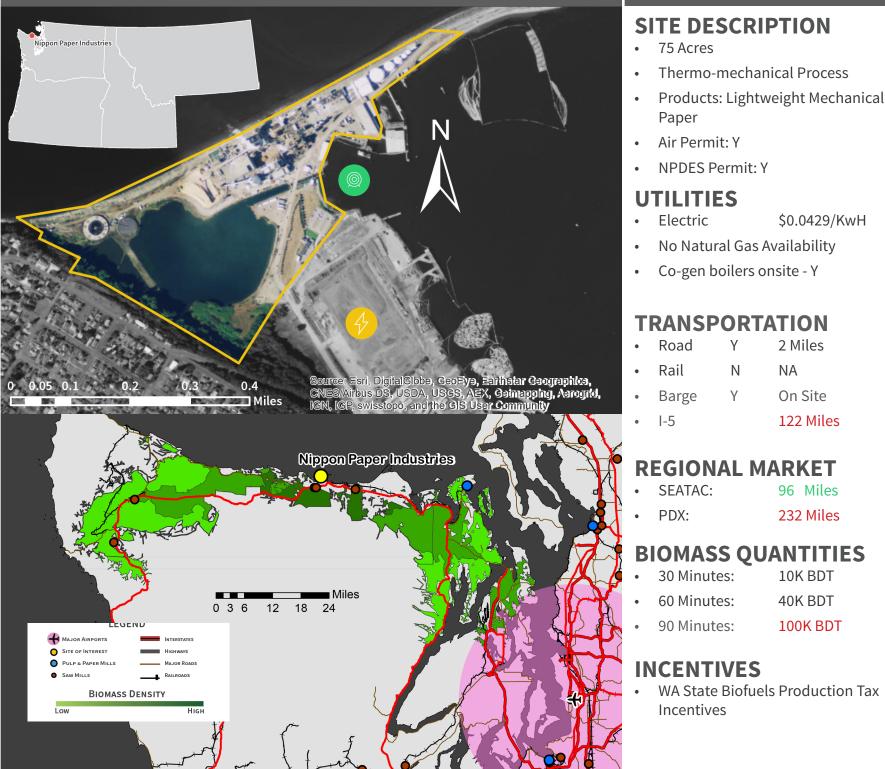
- Company has invested over \$300 million in this plant since 1988.
- New co-gen facility outputs ~15 MW of electricity with eventual output of 20 MW.
- Existing relationships with forest residual shipping companies.

WEAKNESSES

- New \$81 million co-gen facility requires 180,000 BDT of biomass per year.
- Ongoing multi-million dollar lawsuits with co-gen contractor.
- Site confines (75 acres) too small for pilot plant addition.

- Located adjacent to the Port of Port Angeles with existing relationships with shipping companies.
- 3-mile proximity to Fairchild International Airport with capacity for 737 aircraft.

- Only 100,000 BDT per year available within 90 min.
- Only greenfield nearby is owned and protected by the Lower Elwha Klallam Tribe.



Port Angeles, Clallam Country, WA



STRENGTHS

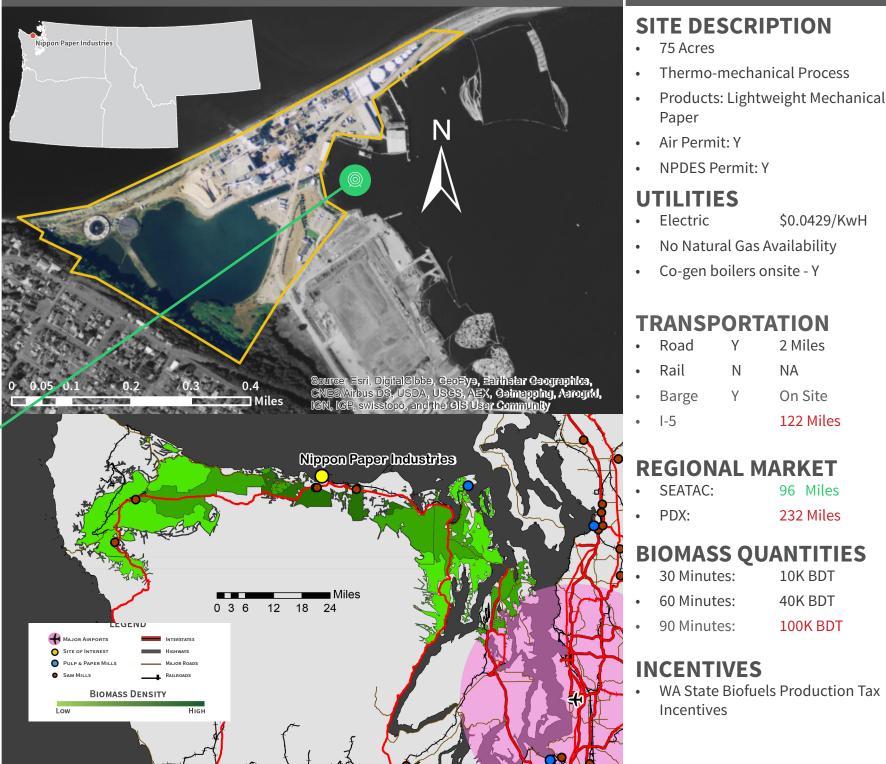
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Port Angeles, Clallam Country, WA



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- New \$81 million co-gen facility requires 180,000 BDT of biomass per year.
- Ongoing multi-million dollar lawsuits with co-gen contractor.
- Site confines (75 acres) too small for pilot plant addition.

- Located adjacent to the Port of Port Angeles with existing relationships with shipping companies.
- 3-mile proximity to Fairchild International Airport with capacity for 737 aircraft.

- Only 100,000 BDT per year available within 90 min.
- Only greenfield nearby is owned and protected by the Lower Elwha Klallam Tribe.



Port Angeles, Clallam Country, WA



STRENGTHS

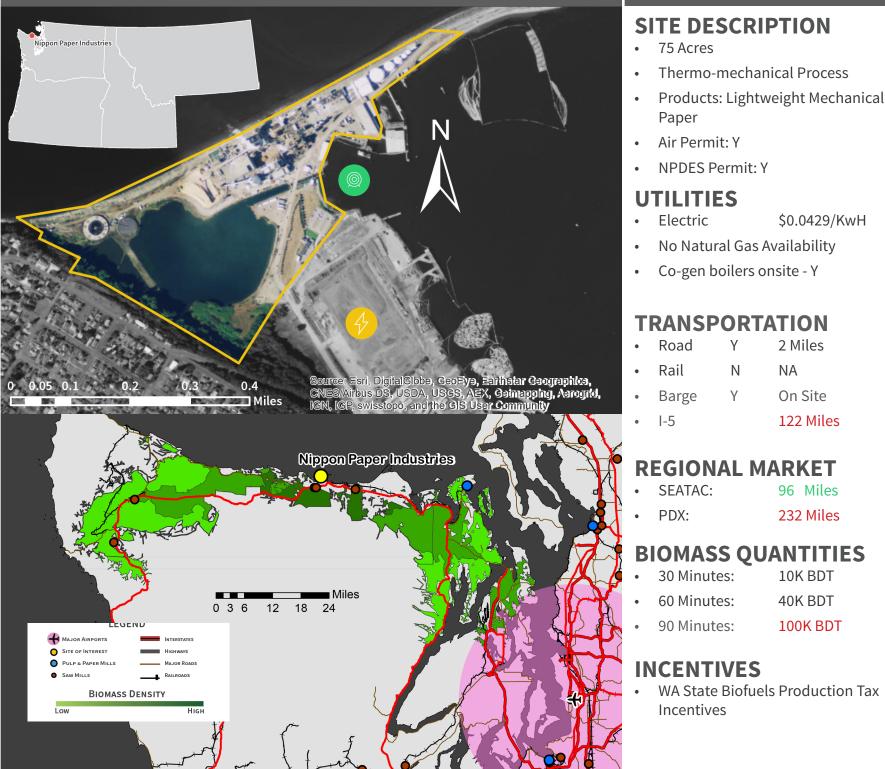
- Company has invested over \$300 million in this plant since 1988.
- New co-gen facility outputs ~15 MW of electricity with eventual output of 20 MW.
- Existing relationships with forest residual shipping companies.

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STRENGTHS

- One of Global Partners, LP recent West Coast investments in crude oil and ethanol facility
- Existing wastewater treatment plant
- 200,000 Barrel storage capacity
- Deep water marine terminal; Columbia River
- On Site rail access

WEAKNESSES

- Land is leased from Port of St. Helens' Westward Industrial Park; long-term lease transfer agreement issues
- Ownership transition to Global Partners, LP
- Currently used for crude oil terminal only
- Limited room for expansion on site (15 acres)

OPPORTUNITIES \bigcirc

- Industrial park owns 800 available acres; none zoned industrial
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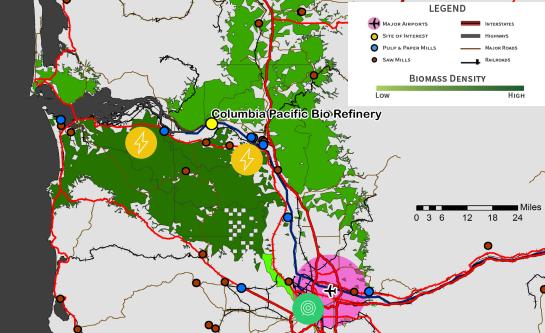
THREATS

- Strong environmental NGOs contested air permit
- Potential biomass competition from three operating paper mills within 20 miles

CLATSKANIE, COLUMBIA COUNTY, OR







SITE DESCRIPTION

- 44 Acres
- Crude Export & Ethanol Biorefinery
- Products: Crude Oil (former Ethanol)
- Air Permit: Y
- NPDES Permit: Y (Through Port)

UTILITIES

- Electric
- ~\$0.0483/KwH ~\$0.46/therm
- Boilers On-Site -

TRANSPORTATION

•	Road	Y	<1 Mile
•	Rail	Υ	BNSF On Site
•	Barge	Υ	1,200' dock
,	I-5		20 Miles

REGIONAL MARKET

•	SEATAC:	138 Miles
•	PDX:	64 Miles

BIOMASS QUANTITIES

- 30 Minutes: 30K BDT
- 60 Minutes: 230K BDT
- 90 Minutes: **600K BDT**

- **Enterprise Zone Tax Exemption**
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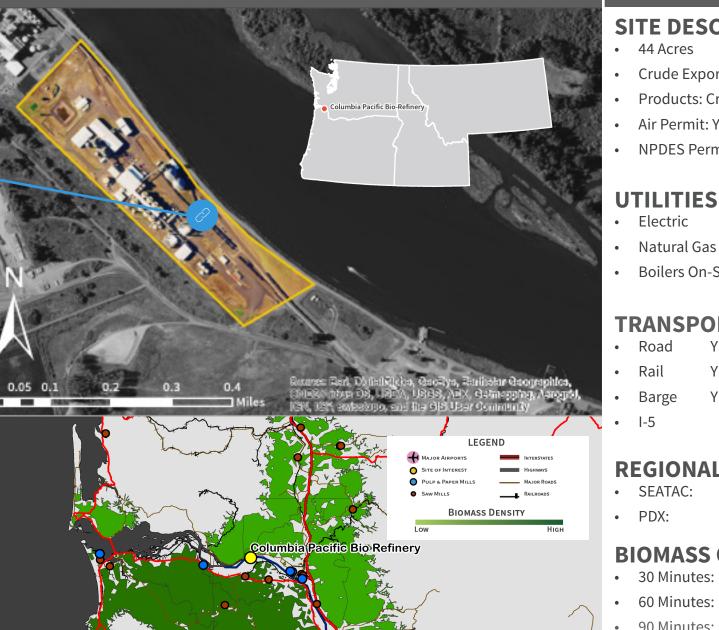
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036

12 18 24



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CLATSKANIE, COLUMBIA COUNTY, OR



036

12 18 24



Electric Natural Gas

44 Acres

Air Permit: Y

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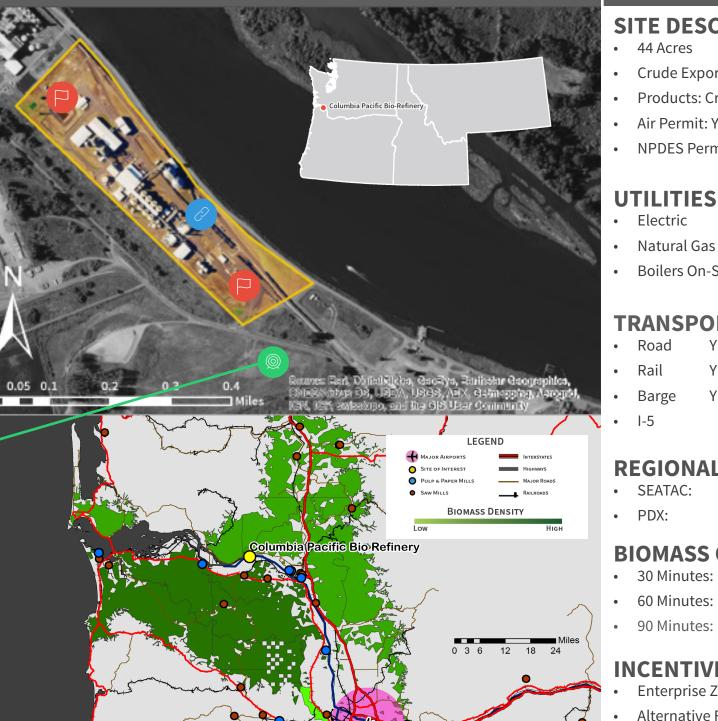
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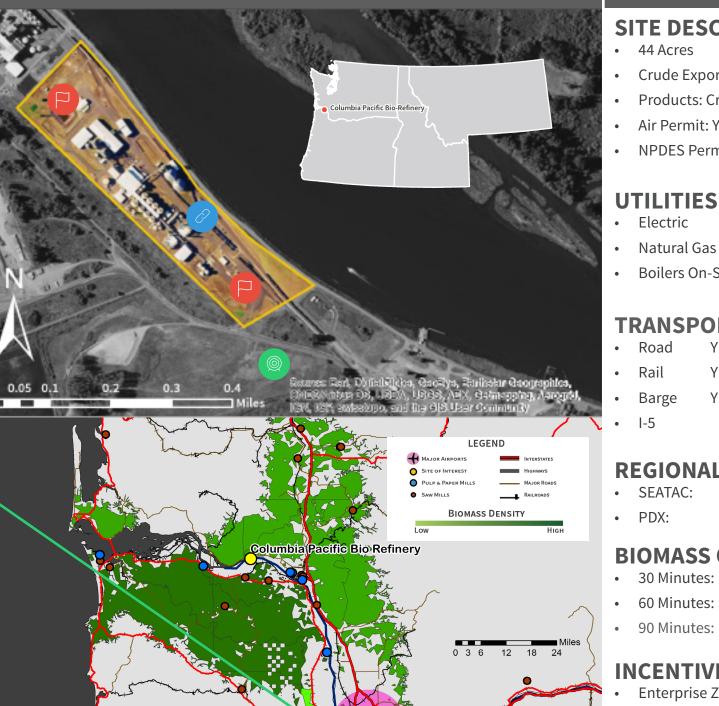
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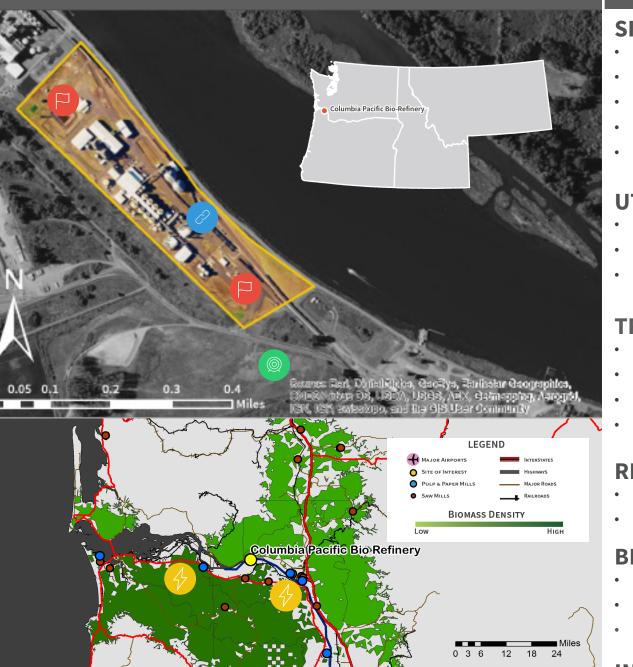
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PILOT PLANT COMPARISON CHART

		Developable	and	0 1	
	Biomassiphi	Developable	bistance to	Distance to Distance to	CIniles Distance to
	Biomwith	Devel acte	Distannile	JISTO SEAL	Distannile
GP Wauna	700,000	455	73	146	32
WestRock Tacoma	370,000	0	145	21	2
GP Camas	425,000	350	12	167	14
GP Toledo	340,000	94	144	292	58
Cosmo Specialty	578,000	420	143	97	50
Weyerhaeuser LV	760,000	26	54	116	6
Kapstone	760,000	50	39	122	5
WestRock Newburg	510,000	0	48	190	13
International	300,000	33	130	270	6
CP Halsey	230,000	350	103	252	5
Port Townsend	60,000	150	205	100	75
Nippon	100,000	0	232	96	122
Columbia Pacific	600,000	15	64	138	20

NOTES:

The Site Comparison Chart does not display all of the information needed to adequately select a site.

The chart is a resource that can help compare data easily represented in a numerical form.