ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED
FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS)
Form 1600-1 Rev. 6-2010

Department of Natural Resources (DNR)

Region or Bureau
Northeast Region

Type List Designation
Type II per s. NR 150.03(8)(e)(6)(a), Wis. Adm. Code

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., August 15, 2011.

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Applicant: Oneida Seven Generations Corporation (OSGC)

Address: 1239 Flightway Drive, De Pere, WI 54115

Title of Proposal: Pyrolysis/Gasification Based Waste-to-Energy Facility

Location: County: Brown City/Town/Village: 1230 Hurlbut Street, City of Green Bay

Township Range Section(s): Bay Port Industrial Center No. 1 Replat, Lot 5, T.24N. – R.20E.

PROJECT SUMMARY

1. Brief overview of the proposal including the DNR action (include cost and funding source if public funds involved)

Oneida Seven Generations Corporation (OSGC) proposes to own, design, construct and operate a pyrolysis/gasification based waste-to-energy (WTE) facility in the City of Green Bay. The proposed facility would process municipal solid waste (MSW) into a synthetic gas (syngas) fuel that would be combusted to generate electricity. MSW received from local haulers would be initially processed by shredding and removing heavier inorganic materials that would be taken to a landfill for disposal. Recyclable materials would be separated by mechanical means and a manual sorting line using laborers. These recyclable materials would be diverted to reuse outlets. The remaining MSW would be further shredded and stored for use as feedstock to pyrolysis units. The MSW feedstock will be converted to syngas and char. The syngas would be used as fuel to heat the pyrolysis units and for gas-fired electrical generators that provide power to the existing utility distribution system.

The proposed facility would be located at 1230 Hurlbut Street (Parcel # 6-3043) within the boundaries of the City of Green Bay, Brown County, Wisconsin. The parcel is approximately 5.88 acres in an area of industrial facilities that have been developed on

historic fill. The proposed building would be 64,000 square feet with a 3,000 square foot mezzanine and would include an outdoor area for exterior cooling units, fencing, employee parking, a scale, and access roads off Hurlbut Street. See Attachments 1 through 7.

The pyrolytic system would be operated 24 hours per day, 7 days a week. Approximately 313 tons of municipal solid waste (MSW) would be received from solid waste haulers 5 days per week. This waste would be processed over a 7 day period resulting in approximately 223 tons of waste processed each day. Of the 223 tons of materials processed each day, approximately 22 tons would be inorganic debris such as dirt and non-recyclable glass, which would be sent to the Winnebago County Landfill in Oshkosh. Approximately 13 tons of recyclables such as aluminum, plastics and steel would be removed from the waste stream. Approximately 38 tons would be in moisture weight. The remaining, approximate 150 dry tons per day of solid waste and the constituent moisture weight would be processed through the pyrolytic process.

Pyrolysis is the thermal decomposition of organic matter in a pressure chamber at temperatures sufficient to volatilize or gasify organic material in the absence of added oxygen. Organic matter is loaded into a sealed reactor chamber that is lined with heat-resistant material (retort). The retort is heated with burners (retort oven) that use part of the gas produced by the chamber. Organic matter is heated by heat transfer through the retort walls and thermally decomposes (pyrolysis = heat + decomposition) into two major products, a combustible gas mixture (syngas) and a char by-product.

The char by-product, approximately 30 tons (or 20 percent of the amount processed), would be disposed of in an approved landfill or may be beneficially reused if it meets standards based on solid waste regulations and regulatory approvals. The syngas product would be used as operating fuel for the pyrolytic process burners as well as fuel for 3 internal combustion engine generators, rated at 2,174 horsepower each, used to produce electricity. The electricity generated by the facility would power the facility during operations and the excess energy generated would be sold to the utility company.

Wastewater would be generated by drainage of liquids from the MSW after dumping waste on a tipping floor and from water vapor in the syngas product, and would be collected and pretreated on-site to meet limits imposed by the Green Bay Metropolitan Sewerage District (GBMSD).

The generation of the pyrolytic gases is estimated to result in potential emissions of criteria pollutants (carbon monoxide, particulate matter, nitrogen oxides, etc.) from the combustion of the synthetic gas through the on-site burners, flare, and engines of less than 100 tons per year. The facility emissions are estimated to be below Prevention of Significant Deterioration (PSD) thresholds for each criteria pollutant (250 tons). The facility's air emissions control systems would ensure that the pyrolytic gasification and electricity generation process emissions meet Federal and State air quality standards.

Wisconsin Department of Natural Resources (DNR) Requirements

The facility would need to obtain the following permits and approvals from the DNR: an Air Construction and Operation Permit (NR 406 and 407), a Storm water Construction Permit (NR 216), Plan & Specification Approval for the Wastewater Pretreatment System (NR 108) and a Solid Waste Processing Plan of Operation Approval (NR 502.08).

Funding

The following is a list of the sources and amounts of public funds involved with this project:

- American Recovery Reinvestment Act – Low interest loan via the State of Wisconsin Dept of Commerce — $2 Million low Interest Loan
- State of Wisconsin Department of Commerce — $2 Million grant
- Bureau of Indian Affairs Loan Guarantee program — $19 Million loan guarantee
- Division of Energy and Mineral Development — $584,000 grant

Detailed Description of Facility Process Steps

MSW would be delivered into the building, tipped onto the concrete floor, and piled against the push walls. Any liquids would be allowed to drain into a lined trench drain that would run the length of the building. The trench drain would be connected to the leachate tank and wastewater pretreatment system.

MSW would be moved by a grapple bucket on the front of a wheeled loader into the primary shredder and broken down into pieces 8 inches and smaller. The material would then be moved by conveyor towards the ballistic separator. The ballistic separator would use vibration and momentum to divert undesirable materials from the shredded MSW, including:

- “3d” material (bottles, cans and anything that rolls).
- “waste material” (dirt, broken glass and small particles)

The goal is, to the extent practicable, to remove any materials with no heating value. In subsequent steps, recyclables would be

separated by machinery and by laborers on a manual sorting line.

- Aluminum would be separated with an eddy current magnet and gathered to be compacted, baled, and moved off-site as recycled product.
- #1 plastic would be handpicked and fall below the picking platform where it would be compacted, baled, and moved off-site as recycled product.
- #2 plastic would be handpicked and fall below the picking platform where it would be compacted, baled, and moved off-site as recycled product.
- Clean paper and cardboard would be collected, compacted, baled, and moved off-site as recycled product.
- Steel would be gathered with cross belt magnet, compacted, baled, and moved off-site as recycled product.

The residual MSW, consisting largely of usable organic pyrolytic materials, would be conveyed to the final shredder for size reduction to 2 inches minus. Shredded usable pyrolytic material (sup-mat) would be conveyed into storage silos using enclosed Hapman tube conveyors, which would minimize dust and odor.

The storage silos would hold the sup-mat until it was needed by the pyrolysis equipment. The Hapman enclosed tube conveyors would move the sup-mat to the pyrolysis equipment hoppers. The hoppers would feed sup-mat to the retort ovens through a series of air lock devices. The airlocks would minimize loss of heat and fuel gas and the entry of air, which is not needed for the pyrolytic process.

The sup-mat would undergo pyrolysis/gasification while it moved slowly through the retort oven. Waste/pyrolytic syngas would be produced. The retort oven would be kept at slightly negative pressure so that gases move through to the Venturi gas scrubber, de-mister and condenser tower.

The scrubbed gas would then be moved under vacuum to the intermediate storage tank prior to compression. Once the syngas is compressed, it would be ready for use in the electric generators and retort ovens. Water vapor and some organic vapors would be condensed and removed from the material and would be collected within the gas scrubbing system. The collected wastewater would be treated and filtered to a level acceptable for discharge to the GBMSD.

Detailed Description of the Sup-mat Process

Sup-mat would be delivered to the in-feed hopper at a pre-determined rate by the enclosed Hapman tube conveyor system. The Hapman tube conveying system would be controlled by the gasifier monitoring system. This would ensure direct communication preventing over filling of the retort oven in the event of a shutdown or mechanical failure. The sup-mat would be fed into the hopper by passing through a dual knife airlock system. The dual knife airlock system would be in place to prevent loss of heat and fuel gas and entry of additional air into the retort oven. The sup-mat placed into the feed hopper would be allowed to enter the first chamber by opening the top airlock knife. Once the determined amount of sup-mat enters the top chamber, the top airlock knife would close. At this point a light vacuum would be introduced into the chamber to ensure the maximum amount of air would be removed from the sup-mat. The bottom airlock knife would open allowing the sup-mat into the retort oven. Similarly, the discharge airlock knives would cycle immediately after the in-feed cycle is complete. The discharge airlock knives would also be used to discharge the char by-product, which would be then cooled and stored prior to disposal.

The retort under sub-stoichiometric condition (oxygen starved) would be heated to approximately 1200 to 1400 degrees Fahrenheit. Heat would be provided by external combustion units integral to the pyrolytic equipment. Retort residence time would be determined by the consistency of the sup-mat and the input moisture level. Residence time would be controlled by the speed of the retort auger. Typical residence time for sup-mat would be 60 minutes. This time would allow for the conversion of the sup-mat into condensable gases (syngas) including primarily hydrogen, carbon monoxide and hydrocarbons such as methane, ethane and propane, and the largely inorganic char.

Detailed Description of the Gas Process

The retort system would be kept at slightly negative pressure at all times. This pressure would be sensed by a transducer installed in the retort oven, which would monitor changes in pressure as gasses are being formed. As the pressure increases in the retort oven, the transducer would send a message to a blower system powered by a variable frequency drive to increase speed while maintaining a slight negative pressure. The same would be true in a reverse manner when the pressure would decrease in the retort oven. The system would be equipped with pressure blow-off valves to release retort pressure in the event of a blower failure until the process could be stopped. Operation of the system at slightly negative pressure would ensure safety of the system due to the fact that pressure would be not allowed to increase to an unsafe level. Once the sup-mat reaches the temperature of decomposition, the sup-mat becomes self-destructive and endothermic. The self-destructive reaction occurs when the sup-mat begins to convert into certain elements including hydrogen, carbon monoxide, and various hydrocarbons. It does this under an exothermic condition, releasing energy called the heat of formation. Heat of formation temperatures are typically 900 degrees-1100 degrees Fahrenheit. The heat of formation enhances the efficiency of the conversion system by reducing heat that would otherwise need to be provided by the external

combustion units.

The waste/pyrolytic syngas would be drawn from the retort oven through the gas wash system by a blower. A Venturi scrubber would be used to remove any carbon particles that may have traveled from the retort and to liquefy any heavier portions of the gas. The Venturi process cools the cleaned gas to an acceptable level prior to compression. The scrubber water temperature is controlled by a heat exchanger that would cool the water to approximately 170 degrees Fahrenheit. A demisting system would remove additional moisture from the cooled, cleaned gas and recycle it back into the scrubbing process. Excess liquids would be pumped into the wastewater treatment tank. Once the cooled, clean gas completes this process, it is transferred to an intermediate tank where it would await compression prior to storage.

A small fraction of the stored syngas would be used as fuel for the external combustion units of the pyrolytic equipment. The larger fraction would be routed to three four-stroke lean burn spark ignition reciprocating internal combustion engines to produce electricity.

Detailed Description of the Wastewater Process

Approximately 127 gallons of wastewater would be produced from the moisture contained in the MSW residual fed into each pyrolysis unit on an hourly basis. Water vapor would be produced when the sup-mat is heated in the retort oven. Water vapor would be collected as the gas moves through the Venturi scrubber and cooled. Condensed water vapor would be used by the scrubber to cool incoming gases. The scrubber would be a closed system so that the excess water would continually be removed and drained into the leachate tank where it would be pumped to the wastewater treatment tank for processing by the wastewater treatment system.

Water will drain from waste being dumped on the tipping floor and may also be generated during the primary or final shredding process. Wastewater from the tipping floor would drain to a lined trench drain located in the tipping floor. Any wastewater resulting from material being shredded would be collected by a catch basin. Wastewater collected by the trench drains and catch basins would be directed into the leachate tank and pumped to the wastewater treatment system.

The wastewater treatment system would consist of three components: a membrane filtration system to remove floating particulate and oily residue; a dissolved air filtration (DAF) system to remove any free oil and sludge from the water; and an ozone treatment system that would destroy any light sensitive hydrocarbons. The wastewater would be treated to an acceptable level for discharge into the GBMSD sewer system. Discharged wastewater would meet all standards and Industrial Wastewater Discharge Permit limits set by the GBMSD. Wastewater would not be discharged directly to waters of the state, either to surface water (via ditch or stormwater) or to groundwater. The DNR would review and approve wastewater pretreatment plans.

2. Purpose and Need (include history and background as appropriate)

OSGC's purpose is to generate and sell electricity from municipal solid waste (MSW). The proposed facility would also promote and enhance business and economic development in Brown County by creating up to 20 full time jobs, reduce the volume of MSW being landfilled, and reduce greenhouse gas emissions caused by landfilled waste.

Municipal solid waste would be processed through a pyrolysis system creating a syngas. The syngas would provide fuel for the pyrolytic process and power three internal combustion engine generators. The generators would produce electricity that would be sold to Wisconsin Public Service Corporation (WPSC) as established in negotiated power purchase agreements.

The fully enclosed facility would receive 313 tons of MSW five days a week, thus reducing the volume of MSW going to regional landfills. This would extend the life of area landfills and potentially postpone the need to develop new landfills on Greenfield land. The proposed facility would use existing MSW collection and hauling systems and would reduce time, fuel, labor, and equipment investment needed for hauling collected waste to the Winnebago County Landfill. The by-product, char, would account for approximately 20 percent of the original volume of waste. The char would be landfilled initially, and, if demonstrated to be acceptable, would be re-used as a beneficial product subject to DNR approval. The char may be suitable for beneficial use as concrete additives, flowable fill material, and aggregate for sub-base of roads and stabilization for landfill cover if it meets certain waste characteristics.

Recyclables would be separated from the MSW, such as #1 and #2 plastics, aluminum and non-processable materials. These recyclables would be bailed and local contractors would competitively bid for each recyclable product. The separated items are recyclables that have already been discarded by households into the main solid waste stream. By collecting and bailing these items as part of the Oneida facility operations, this facility would be decreasing the amount of recycles normally going to the landfill and improving the current recycling rates.

The proposed facility may reduce greenhouse gas emissions by: avoiding hauling MSW to distant landfills; reducing the amount of

waste going to the landfills; reducing resulting fugitive landfill gas emissions; and reducing the use of fossil fuels, such as coal, to produce electricity.

Pyrolysis is an established process for thermal degradation of waste materials and for manufacturing purposes. This innovative project proposes a commercial scale electrical generation facility fueled by municipal solid waste.

3. Authorities and Approvals (list local, state and federal permits or approvals required)

- DNR Air Construction and Operation Permit (NR 406 and 407),
- DNR Storm water Construction Permit (NR 216),
- DNR Plan & Specification Approval for the Wastewater Pretreatment System (NR 108),
- DNR Solid Waste Processing Plan of Operation Approval (NR 502.08), and
- DNR Environmental Analysis and Review Procedures for Department Actions (NR 150).
- Federal and local approvals, including a Green Bay Metropolitan Sewerage District Industrial Wastewater Discharge Permit, may also be required.

PROPOSED PHYSICAL CHANGES (more fully describe the proposal)

4. Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yard, etc.)

According to the City of Green Bay's website, the proposed site is located in its bay front (Bayport Industrial Tract), which is a large area west of the Fox River that has been filled with dredged material, utility ash, and other wastes over a period of many years. The proposed site is located in an area that was once wetland and floodplain, but is now mildly contaminated because of it being filled. The area is highly disturbed, covered with large rock and gravel from previous filling, and dominated by invasive vegetation such as *Phragmites australis*.

The site would be graded, utilities would be installed, and the buildings, roads, and structures described in paragraph six would be constructed.

5. Manipulation of Aquatic Resources (include relevant quantities - cfs, acre feet, MGD, etc.)

The proposed site is located in an area that was once wetland and floodplain, an essential part of the Bay's ecology and once home to many species of birds, mammals, reptiles and insects. However, because of it being filled and used as an area for construction debris landfills, fly ash and dredged material disposal operations; it is now considered mildly contaminated. The majority of the proposed site itself is covered with large rocks and gravel from previous filling activities occurring over a period of many years.

According to the Brown County land information map, the proposed building site has been filled to rise above designated Federal Emergency Management Agency flood mapping. Because of the historic filling, there are no wetlands or waterways associated with the project site. The project location is not within a floodplain, nor 250 feet of any private water supply, nor within 1200 feet of any public water supply.

During construction, groundwater and surface water would be protected by a series of Construction Best Management Practices (BMPs). Storm water control steps would be taken for temporary construction entrance, silt fencing, dust control, and a storm water collection pond with inlets and outlets.

The storm water collection pond would be located in the southeast portion of the site. A vegetated ditch on the west side of the site would empty into the storm water collection pond. A storm sewer with six catch basins would collect storm water from north and east side of the site and discharge into the storm water collection pond. See attachment 7.

This facility would use water from Green Bay Water Utility for typical business uses such as drinking and bathroom facilities. According to the applicant all water used in relation to operation of the waste processing facility would come from pyrolysis process itself.

6. Buildings, Treatment Units, Roads and Other Structures (include size of facilities, road miles, etc.)

The parcel is approximately 5.88 acres. The proposed building would be 64,000 square feet with a 3,000 square foot mezzanine and would include an outdoor area for exterior cooling units, fencing, employee parking, a scale, and access roads. See Attachments 6 and 7.

The interior storage area is designed for 7,800 square feet of MSW storage on the tipping floor. The amount of material coming in on a daily basis would cover approximately 1,235 square feet of area on the tipping floor, leaving approximately 6,565 square feet of area open.

The proposed site design and grading plan provides for a one-way traffic route on the site. Vehicles would enter the site at the south entrance and exit the site at the north entrance. The entrances are far enough from the curve in the road (Hurlbut) so as to not interfere with visual clearance.

The site would be completely enclosed by six foot chain link fencing. The only area not fenced would be the office parking area at the front (west) side of the facility and the storm water management area on the west side of the facility.

The facility would need to construct electrical transmission lines to conduct power to the WPSC or nearest substation.

7. Emissions and Discharges (include relevant characteristics and quantities)

During construction

Groundwater and surface water would be protected by a series of BMPs. Control features would be installed for the temporary construction entrance, including silt fencing, dust control, and a storm water collection pond with inlets and outlets. A Storm Water Construction Permit, issued under ch. NR 216, Wis. Adm. Code, has been obtained from the DNR.

During facility operation

Wastewater

The concrete slab would have a one percent slope toward the tipping floor room. The tipping floor room would have a floor drain that would be piped to a holding tank. The interior processing area would have various floor drains to collect excess water. The interior floor drains would be piped to the holding tank. All interior wastewater would be collected in holding tanks and tested and treated to applicable GBMSD standards and limits prior to being released to the sanitary sewer system (see water mass balance description below). No liquids from the interior of the building would be released to surface water. An Industrial Wastewater Discharge Permit would be obtained from the GBMSD.

Storm Water

The storm water collection pond would be located in the southeast portion of the site. A vegetated ditch on the west side of the site would empty into the storm water collection pond. A storm sewer with six catch basins would collect storm water from north and east side of the site and discharge into the storm water collection pond.

MSW Mass Balance

Approximately 313 tons of MSW would be received 5 days a week resulting in approximately 223 ton per day processed 7 days a week. Of the 223 tons of materials processed each day, approximately 22 tons would be inorganic debris such as dirt and glass that would be sent to the Winnebago County Landfill in Oshkosh. Approximately 13 tons of recyclable material, such as aluminum, plastics and steel, would be removed for recycling. Approximately 38 tons would be in moisture weight. The remaining approximate 150 dry tons per day and the constituent moisture weight would be processed through the pyrolytic process. At the end of the process, approximately 30 tons (or 20 percent of the amount processed) of char would remain and would be disposed of in an approved landfill or may be beneficially reused based on regulatory approval.

Water Mass Balance

Approximately 127 gallons of water would be produced from the moisture contained in the MSW by each pyrolysis unit on an hourly basis. Water would be produced when the sup-mat is heated in the retort oven. Water would be collected as the gas moved through the Venturi scrubber where the gas would be scrubbed and cooled. As the scrubber condensed the water vapor back to water it would be used by the scrubber to cool the incoming gases. The scrubber would be a closed system so the excess water that was created would be removed continually and drained into the leachate tank where it would be pumped to the wastewater treatment tank then processed by the wastewater treatment system.

Contact water from the waste on the tipping floor would drain directly from the load. Wastewater drainage may also occur while the material is being shredded either in the primary or final shredder. The direct drainage water on the tipping floor would drain to a concrete trench drain located in the tipping floor. Any water that would drain from the material while the material is being shredded would be collected by the catch basin. The water that is collected by the trench drains and catch basins would drain into the leachate tank and then be pumped to the wastewater treatment unit.

The wastewater treatment system would consist of three components: a membrane filtration system to remove floating particulate and oily residue; a dissolved air filtration (DAF) system to remove any free oil and sludge from the water; and an ozone treatment system that would destroy any light sensitive hydrocarbons. All wastewater would be treated to an acceptable level before being discharged into the GBMSD collection system. All discharge water would meet the standards and limits set by GBMSD.

Air Emissions

The calculated uncontrolled potential air emissions from the facility, based upon the air construction permit application, indicated the facility would be a minor source under ch. NR 405, Wis. Adm. Code (PSD). Thus, the facility is subject to air construction permitting under ch. NR 406, Wis. Adm. Code. The Department believes the facility is subject to the New Source Performance Standard (NSPS) for Small Municipal Waste Combustors under s. NR 440.76, Wis. Adm. Code. Therefore, the facility would be classified as a Part 70 major source under ch. NR 407, Wis. Adm. Code, for operation permit purposes. Under s. NR 407.02(6)(b)3., Wis. Adm. Code, any source subject to this NSPS is required to have a Part 70 operation permit.

The facility would be a minor source of federal hazardous air pollutants as the calculated aggregate emissions of individual pollutants are expected to be less than 10 tons per year and the cumulative federal hazardous air pollutant emissions are calculated to be less than 25 tons per year.

The facility-wide potential emissions for criteria and hazardous air pollutants after control are listed in the following table:

Table 1 - Criteria Pollutants Emissions.

	Potential to Emit (PTE)*	
Pollutant	Pounds per hour	Tons per year
PM_{10} / $PM_{2.5}$	1.21 / 1.20	5.26 / 5.23
Sulfur Dioxides	4.94	19.4
Nitrogen Oxides	23.2	99.4
Volatile Organic Compounds	10.3	40.6
Carbon Monoxide	23.1	88.8

Table 2 - Hazardous Air Pollutant Emissions.

	Potential to Emit (PTE)*		
Pollutant	Pounds per hour	Pounds per year	Tons per year
Chromium III (7440-47-3) sf	1.6E-03	14.0	7.0E-03
Mercury (7439-97-6) sf	1.8E-04	1.53	7.7E-04
Nickel (7440-02-0) sf	1.7E-04	1.52	7.6E-04
Dioxin/Furans as TEQ (--) sf	9.2E-09	8.1E-05	4.0E-08
Copper (7440-50-8) s	1.9E-03	16.6	--
Iron Oxide (1309-37-1) s	1.7E-03	14.9	--
Tin (7440-31-5) s	3.6E-03	31.5	--
Selenium (7782-49-2) sf	2.4E-03	21.0	1.1E-02
Antimony (7440-36-0) sf	3.7E-03	32.4	1.6E-02
Hydrogen Sulfide (7783-06-4) s	0.21	1,840	--
Formaldehyde (50-00-0) sf	1.73	15,155	7.58
Acetaldehyde (75-07-0) sf	2.1E-02	184	9.2E-02
Phosphoric Acid (7664-38-2) s	5.9E-02	517	--
Potassium Hydroxide (1310-58-3) s	8.5E-03	74.5	--
Sodium Hydroxide (1310-73-2) s	6.1E-03	53.4	--
Hydrogen Chloride (7647-01-0) sf	2.2E-02	193	9.6E-02
Hydrogen Fluoride (7664-39-3) sf	6.3E-04	5.52	2.7E-03
Total s. 112(b) Federal Hazardous Air Pollutants (individual / combined) =			<10 / <25

s = state hazardous air pollutant; f = Federal hazardous air pollutant

The significant air emission units at the facility include:

Process P01, Stack(s) S01 – Retort Oven #1.
Process P02, Stack(s) S02 – Retort Oven #2.
Process P03, Stack(s) S03 – Retort Oven #3.
Process P11, Stack S11, Control C11 – SI RICE #1.
Process P12, Stack S12, Control C12 – SI RICE #2.
Process P13, Stack S13, Control C13 – SI RICE #3.
Process P21, Stack S21, Control C21 – Cooling Tower #1.
Process P22, Stack S22, Control C22 – Cooling Tower #2.
Process P23, Stack S23, Control C23 – Cooling Tower #3.
Process P31, Stack S31 – Flare #1.

An air dispersion modeling of the proposed facility demonstrated compliance with the National Ambient Air Quality Standards and increment consumption for all criteria pollutants.

Table 3 - Modeling Analysis Results
(All Concentrations in $\mu g/m^3$)

	PM_{10} – 24 hour	PM_{10} – Annual	$PM_{2.5}$ – 24 hour	$PM_{2.5}$ – Annual
New/Mod. Source Impact	6.2	1.1	-	-
PSD Increment	30.0	17.0	n/a	n/a
% Increment Consumed	20.7	6.5	n/a	n/a
Facility Impact	6.2	-	6.1	1.1
Background Concentration	47.0	n/a	28.9	10.2
Total Concentration	53.2	n/a	35.0	11.3
NAAQS	150.0	n/a	35.0	15.0
% NAAQS	35.5	n/a	100.0	75.3

Table 4 - Modeling Analysis Results
(All Concentrations in $\mu g/m^3$)

	NO_2 – Annual	CO – 1 hour	CO – 8 hour
New/Mod. Source Impact	24.5	-	-
PSD Increment	25.0	n/a	n/a
% Increment Consumed	98.0	n/a	n/a
Facility Impact	24.5	358.3	219.8
Background Concentration	24.1	1,362.7	1,191.2
Total Concentration	48.6	1,721.0	1,411.0
NAAQS	100.0	40,000	10,000
% NAAQS	48.6	4.3	14.1

Table 5 - Modeling Analysis Results
(All Concentrations in $\mu g/m^3$)

	SO_2 – 3 hour	SO_2 – 24 hour	SO_2 – Annual
New/Mod. Source Impact	82.4	48.5	10.7
PSD Increment	512.0	91.0	20.0
% Increment Consumed	16.1	53.3	53.5
Facility Impact	82.4	48.5	10.7
Background Concentration	43.2	30.5	8.6
Total Concentration	125.6	79.0	19.3
NAAQS	1,300.0	365.0	80.0
% NAAQS	9.7	21.6	24.1

The spark ignition reciprocating internal combustion engines associated with the proposed project have the potential to emit formaldehyde above a threshold that is considered significant under ch. NR 445, Wis. Adm. Code. Formaldehyde is both a federal and a state hazardous air pollutant. The formaldehyde is a by-product of the spark ignition combustion reaction and occurs with any fuel, including natural gas or propane. Under ch. NR 445, Wis. Adm. Code, any facility that emits formaldehyde above a given emission threshold must apply Best Available Control Technology (BACT). BACT is determined via a top down process, examining all potential control techniques and technologies for technical and economic feasibility. In this case, the facility has proposed the use of an oxidation catalyst as BACT for formaldehyde.

The potential emissions of greenhouse gas (GHGs) resulting from this project were calculated to be 36,672 tons per year on a carbon dioxide equivalent basis, excluding the flare. Because the facility is a new source, the significance threshold under ch. NR 405, Wis. Adm. Code, for GHGs is 100,000 TPY on a carbon dioxide equivalent basis. Thus, the proposed project is not considered a major source for GHGs under ch. NR 405, Wis. Adm. Code.

Other Issues

During processing inside the facility, dust would be controlled with the ventilation system and create a negative pressure. In the event the HVAC system fails to control dust, a misting system over the shredder would be employed.

Odor would be controlled by keeping the building doors closed at all times and dumping the materials indoors. Once the materials were processed and shredded the materials would be moved by closed tube conveyors and stored prior to gasification in a sealed silo. The material would be continually processed and would not remain on the tipping floor for more than 48 hours. This would insure the least amount of odor development (and pest control). Trench drains would be cleaned and washed on a regular basis to control odor. In the event of an unscheduled shut down, the materials would be diverted to the landfill. Odor neutralizers would be used in situations where nuisance odor may occur.

Flying debris due to wind would be controlled by dumping the MSW on the indoor tipping floor. MSW blowing off the property would be controlled by having the property fenced with a 6 foot chain link fence and by workers collecting any litter on the site on a daily basis. MSW trucks would be required to have waste fully contained in the trucks to prevent waste from escaping prior to entering the facility.

All MSW would be tipped and processed inside the building. No waste would be left outside the facility at any times. Cleaning daily, weekly and monthly schedules would be established, posted, and enforced by Floor Plant Manager and supervisors. A pest/rodent control plan would be implemented.

Waste containing free liquids, sludge or asbestos, MSW that are flammable or explosive and infectious waste would be defined by the plant as hazardous waste and would not be accepted. Such materials would be disposed of in accordance with state and federal laws.

8. Other Changes

No processing or storage would occur outside of the building. Vehicles would be restricted to paved roads and parking lots. The bituminous surface would be constructed to support heavy equipment, resist frost action, and resist wear. Runoff would be handled with a storm water management pond. The exterior would be graded so that runoff is directed to the storm water management area.

Approximately twenty-four 13-ton trucks would be received daily to tip material onto the processing floor. The route for truck traffic to the site is Highway 172 east to Highway 43 north to Atkinson Drive to Hurlbut Street. Currently, Atkinson Drive and Hurlbut Street have primarily heavy trucks and tankers utilizing this route because of the heavy industry located in this area. The trucks would enter the facility using the south driveway and travel, one-way, to the receiving area. After tipping, the trucks would exit the facility using the north driveway.

There would be approximately three 13-ton trucks hauling rejects and char to a landfill and one truck hauling recyclables to end users on a daily basis.

9. Identify the maps, plans and other descriptive material attached

Attachment 1 County map showing the general area of the project
Attachment 2 USGS topographic map
Attachment 3 Land use map
Attachment 4 DNR county wetlands map

Attachment 5 Existing site map
Attachment 6 Site plan map
Attachment 7 Storm water control map

AFFECTED ENVIRONMENT (describe existing features that may be affected by proposal)

10. Information Based On (check all that apply):

☒ Literature/correspondence (specify major sources)

Initial Site Inspection, Proposed Solid Waste Processing Facility, Oneida Recycling Solutions Waste to Energy Facility, City of Green Bay, Brown County, Wisconsin conducted on April 11, 2011.

Initial Site Inspection Report, Proposed Solid Waste Processing Facility, Oneida Recycling Solutions Waste to Energy Facility, City of Green Bay, Brown County, Wisconsin dated April 29, 2011.

DNR applications
- Oneida Energy, Inc. Air Permit (chs. NR 406 & 407, Wis. Adm. Code) Application and subsequent submittals
- Plan of Operations (s. NR 502.08, Wis. Adm. Code) approval request
- Storm water Discharge Construction Site Permit (ch. NR 216, Wis. Adm. Code)

Friends of the Earth Briefing on Pyrolysis, Gasification and Plasma Dated September 2009
Provided in an e-mail dated 3/5/2011 to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR

Article in Waste Management World by Ed Dodge
Plasma gasification: Clean renewable fuel through vaporization of waste
Provided in an e-mail dated 3/5/2011 to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR

April 21, 2011 County of Los Angles Department of Public Works document entitled: Board Motion of April 20, 2010, Item No. 44 Conversion Technologies in Los Angeles County Six Month Status Update: October 2010 Through April 2011 Update

June 14, 2010 Minnesota Pollution Control Agency (MPCA) - Program Management Decision Memo

Websites
- City of Green Bay
- Brown County (Comprehensive Planning)
- Incineration Free Brown County
- American Combustion Technologies, Inc.
- Alliance Construction & Design
- EPA's Municipal Solid Waste - Electricity from Municipal Solid Waste
- Department of Energy (DOE) National Renewable Energy Laboratory (NREL)
- Public Service Commission (PSC)
- Multiple Internet searches regarding:
    - MSW boilers/incinerators
    - Single stream/biomass boilers/incinerators
    - Gasification/pyrolysis technology

☒ Personal Contacts (list in item 26)

Field Analysis By: ☒ Author ☐ Other (list in item 26)

Past Experience With Site By: ☐ Other (list in item 26)

11. Physical Environment (topography, soils, water, air)

The site is characterized as vacant, industrial land. The properties within a quarter mile of the site are zoned and used as industrial properties. The Bay of Green Bay is located to the north of the site and there are wetlands located to the south on the other side of Highway 43 and to the north. There is no waterway located onsite. The area is flat and has been filled in to rise above groundwater and designated Federal Emergency Management Agency (FEMA) flood mapping elevations.

The proposed site is located in the Bayport Industrial Tract, which is a large area west of the Fox River that has been filled over a period of many years. The proposed site is located in an area that was once wetland and floodplain, but has been filled and used as an area of several construction debris landfills and disposal of fly ash and dredged material from the Fox River and Green Bay. The area is considered highly disturbed.

Brown County is considered in attainment for all National Ambient Air Quality Standards. The Brown County PSD baselines for PM_{10}, SO_2, and NO_2 were set in 1988, 1983, and 1988 respectively. Any sources installed or modified since these dates consumes air quality increment. All air emission sources at the proposed facility will consume increment.

12. Biological Environment (dominant aquatic and terrestrial plant and animal species and habitats including threatened/endangered resources; wetland amounts, types and hydraulic value)

According to the City of Green Bay's comprehensive plan, all but 3 percent of Green Bay's original wetlands have been lost, including 465 acres along the bay. The Bayport Industrial Tract is a large area west of the Fox River that has been filled over a period of many years. The proposed site is located in an area which was once wetland and floodplain, an essential part of the Bay's ecology and once home to many species of birds, mammals, reptiles and insects. It is considered mildly contaminated with fly ash and potentially impacted dredged sediment.

This site is dominated by invasive vegetation such as *Pragmites australis*. Due to the highly disturbed nature of the site, it is anticipated that no wildlife consistently inhabits the site. It is anticipated that red-winged blackbirds and other common songbirds may use the site periodically, due to the proximity to wetlands in the area. Other songbirds, small mammals, common furbearers, and deer may use this area.

An endangered resource review using the Natural Heritage Inventory was conducted for this document and there were no recent records for federal or state endangered, threatened, or special concern species found at the project site. There was a historic record for the purple false oats (*Trisetum melicoides*) however considering the disturbed nature and the current land use of the area the probability of finding this plant on site is very low. There are listed species in the general area however considering the disturbed nature and current land use of the site the potential impact to these species is low.

13. Cultural Environment

a. Land use (dominant features and uses including zoning if applicable)

Legal Description

All of Lot 5 of the recorded plat Bayport Industrial Center No. 1 Re-Plat-A County Plat, Volume 1, Co. Plats, Page 207, Document No. 1842675, Brown County Records, said plat being: part of Lots 21, 22, 23, 24, 25, 41, 42, and 43 of the Fort Howard Military Reserve, and all of the recorded plat of Bayport Industrial Center No. 1 and vacated Great Lakes Drive and Portview Street, said plat being part of Lots 21, 22, 23, 43, 44, and 45, FHMR, all being in T24N, R20E, City of Green Bay Brown County, Wisconsin.

Land Use

The site is characterized as vacant, industrial land. The properties within a quarter mile of the site are zoned and used as industrial properties. These industrial properties include Peters Concrete Company, Northeast Asphalt Company, and Martell Construction. Nearby, but outside of the quarter mile distance, are the City of Green Bay residential yard waste disposal/recycling drop-off area, the Brown County Bay Port confined disposal facility used for contaminated dredged material, an Exxon oil storage facility, and the Wisconsin Public Service Pulliam coal-fired power plant. The nearest park or green space area (Ken Euers Nature Area) is 0.80 miles to the north of the site at the end of Hurlbut Street. The nearest nursing home (Oaks Family Care Center) is more than ½ mile west of the site on Lark Street. The nearest hospital is St. Mary's Hospital on Shawano Avenue.

The Brown County solid waste transfer station on Mason Street is part of a 3-county waste disposal plan. The Brown County waste disposal plan incorporates waste reduction, material re-use, recycling, composting, landfilling, and WTE (Brown County Solid Waste Department, 2010). This proposed facility appears to be consistent with the waste disposal plan to incorporate WTE projects.

The project parcel is zoned for industrial use. The City of Green Bay's comprehensive plan states: "Although the bayfront west of the Fox River was once a thriving marsh supporting a wide variety of wildlife, much of it has been altered beyond restoration by industries and landfills. A narrow band of parkland will be extended east from Ken Euers Park to the vicinity of Bylsby Avenue." The area will remain zoned for industrial use.

Wisconsin offers residents clean energy options in wind and solar. NREL (National Renewable Energy Laboratory of the Department of Energy) maps show that the Wisconsin regions with the most wind potential are in a small area of the southwestern corner and southeastern corner and along the Niagara Escarpment. NREL classifies these areas with their lowest level of "fair" for wind power. Additionally, according to NREL, Wisconsin's solar resources are below the national average getting slightly less overall sunlight – between 4.0 kilowatt hours of sunlight per square meter and 4.5 kWh per square meter per day. The state offers residents and businesses incentives to convert to solar and renewable power and improve energy efficiency.

b. Social/Economic (including ethnic and cultural groups)

The facility will serve Brown County communities and businesses. The population of Brown County is 247,319 (US Census, 2010). There are 16,158 businesses in Brown County (US Census, 2010).

The site is located within the city limits of Green Bay. The City of Green Bay is a mixed cultural community. The community has mixed racial/ethnic, age/gender, religion, household/income, education/employment, and social interests. The City of Green Bay website states the following: pop. 104,020, elev. 604; The median income for a household in the city is $41,994 and the median income for a family is $50,046.

Green Bay is the 3rd largest city in the State of Wisconsin and holds the distinction of being the earliest settlement in Wisconsin by Europeans in 1634. The city covers 44.4 square miles on the bay of Green Bay/Lake Michigan. Major road systems connect to the major cities of Milwaukee, Chicago, and Minneapolis. Both the city's port and airport have an international status. The Port of Green Bay provides opportunities to new and existing businesses that cannot be found in many markets across the nation and helps give Green Bay a distinct advantage when competing for businesses that import raw materials or export large products to national and international markets. Because of its strategic location as the westernmost port of Lake Michigan, Green Bay offers the shortest, most direct route for shipments between the great Midwest and the world. Major railroads link the port with America's heartland. Truck lines provide overnight delivery within a 400-mile radius.

Green Bay has always been a community based on commerce. By the time the city of Green Bay was officially founded in 1854, the city boasted a lumber mill and steel foundry. Today Green Bay maintains its strong traditional manufacturing sector of timber products, food processing, and paper making coupled with more current industries in precision metal manufacturing, machine tool design, transportation/ logistics and a continually growing service sector of tourism, health services, finance, insurance, and education.

The city supports numerous religious practices. Green Bay offers a diverse selection of educational opportunities from the University of Wisconsin Green Bay to a number of technical colleges. Green Bay is home to the professional football team, Green Bay Packers, in the National Football League (NFL). The Packers are the third-oldest franchise in the NFL and the only non-profit, community-owned franchise in American professional sports major leagues.

According to the applicant the project would provide work for the local construction industry during the construction phase of the project and approximately 20 full-time jobs when the facility is complete. This project seems to support the social and economic goals of Brown County and the City of Green Bay.

c. Archaeological/Historical

<u>Historically</u>

In the 17th century, woodland Indians, French voyagers, fur trappers and Jesuit missionaries at one time or another traveled the historic water highway called the Fox River. A natural stopping place for them was where the Fox emptied into the bay. This stopping place became Wisconsin's first settlement.

The bay of Green Bay was shaped by a series of glaciers, which moved through the region thousands of years ago. Through time, a bay was formed which is presently 199 miles long and covers approximately 3,000 square miles.

Archaeological findings establish the region as a seat of primitively sophisticated culture many centuries before the white man's arrival. The area's inhabitants were the Winnebago's, a Sioux-speaking tribe. From the 1600's, the area was settled by primarily by

English and French, with other European (Belgian, German, Scandinavian, Irish and Dutch) immigrants settling in the 1800's. The current racial makeup of the city is mostly categorized as White, with other races including African American, Native American, Asian, Pacific Islander, and Hispanic or Latino.

Currently
The proposed site is located in the City of Green Bay's Bayport Industrial Tract, which is a large area west of the Fox River that has been filled over a period of many years. The proposed site is located in an area which was once wetland and floodplain, but is now mildly contaminated, because of it being filled and used as an area of several landfills, fly ash and contaminated dredged material disposal areas. The area is considered highly disturbed.

As part of the Endangered Resources Review, on March 31, 2011, the DNR reviewed the Department's Archaeological Inventory of Known Sites and determined that the proposed site is not a known archaeological site. In addition, the DNR reviewed the Department's Historical Inventory of Known Sites and determined that the proposed site is not a historical site. Therefore, the facility should not have any detrimental effect archaeological site.

14. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

This project is not expected to cause any significant negative effect on any State Natural Areas, prime agricultural lands, wetlands or other special resources. An endangered resources review was conducted using the Natural Heritage Inventory and adverse impacts to federal and state endangered, threatened, and special concern species are not anticipated.

ENVIRONMENTAL CONSEQUENCES (probable adverse and beneficial impacts including indirect and secondary impacts)

15. Physical (include visual if applicable)

The quantity of emissions from pyrolysis/gasification technology is reported to be less than that generated by incinerators and power plants. Knowledge of the contaminant concentrations in pyrolysis/gasification units is limited to the very small number of operating facilities.

The facility would be receiving MSW normally trucked to the local landfills. By directing MSW away from landfills there is the potential to reduce generation of landfill gas consisting primarily of methane and carbon dioxide, with lesser quantities of non-methane organic compounds (NMOCs). Landfill gas is generated within the waste mass by the bacterial decomposition of organic refuse in the absence of oxygen. Uncontrolled air emissions from a pyrolysis/gasification unit would contain methane and carbon dioxide, but also carbon monoxide and higher concentrations of hydrocarbon vapor compounds from the thermal decomposition of MSW.

In concept, WTE facilities may either encourage or discourage recycling and divert resources from efforts to reduce, reuse and recycle. Economic studies of the waste markets indicate that WTE projects have resulted in higher recycling rates. The communities contributing MSW to the facility are still obligated to comply with recycling statutes and the policies of local responsible units.

Pyrolysis gasification with energy production may result in emissions similar to incineration facilities. This generally results from gasification systems that do not adequately clean the gases and instead combust dirty syngas. Such systems are essentially two-stage burners and are not recommended for environmental reasons. There are many variations of combustion, pyrolysis and gasification – all used in different combinations. Proper engineering is required to achieve positive environmental performance.

The variation in the composition of MSW may affect the resulting emissions from this project. Appropriate air pollution control technologies would need to be installed to reduce toxic air pollutants generated by this facility. Similar to fossil fuel power plants, this proposed MSW pyrolytic gasification facility would generate and discharge wastewater. This facility would require pretreatment of the wastewater prior to discharge to the GBMSD sewer system.

The gasification of MSW reduces MSW waste streams directed to landfill, reducing the creation of new landfills. MSW degradation by gasification creates a solid waste called ash that contains elements that were originally present in the waste. MSW WTE facilities reduce the need for landfill capacity because disposal of MSW ash requires less land area than does unprocessed MSW. MSW combustor ash usually has concentrations of elements and compounds that are higher than corresponding concentrations in coal ash. There is no source of similar evaluations of elemental concentrations in char from waste to energy facilities, but it is reasonable to expect that the char would have concentrations more similar to incinerator ash than utility ash. Ash disposal in modern lined landfills

is generally considered adequate to prevent impacts of ash on groundwater or surface water. Under current regulations, MSW ash must be sampled and analyzed regularly to determine whether it is hazardous or not. Hazardous ash must be managed and disposed of as hazardous waste. Depending on state and local restrictions, non-hazardous ash may be disposed of in a MSW landfill or recycled for use in roads, parking lots, or daily covering for sanitary landfills.

While the potential air emissions of criteria pollutants are quantified with reasonable certainty, the potential emissions of state and federal hazardous air pollutants are not as well defined. As discussed in Section 22.a., the facility will be required to perform extensive emission testing to verify the emission rates as contained in the air construction permit application.

Due to the NOx emissions, adverse impacts on the visibility due to atmospheric discoloration or reduction of visual range due to increased haze may occur. However, these visible impacts are expected to be small and will occur near the facility. The facility is located more than 100 km from the nearest Class I areas (Rainbow Lake Wilderness and the Forest County Potawatomi), so visibility impacts on Class I areas are expected to be negligible. Under the Clean Air Act, a Class I area is one in which visibility is protected more stringently than under the National Ambient Air Quality Standards; includes national parks, wilderness areas, monuments, and other areas of special national and cultural significance. The visibility of the plume leaving the stacks is expected to be negligible.

During construction, there would be increased truck traffic and noise. There may be an increase in traffic on local roads due to employees and the trucks delivering MSW and removing recyclables and ash. Vehicles from employees would be spread throughout the shift schedule. Approximately twenty-four 13-ton MSW trucks would be received daily to tip material onto the processing floor. There would be three 13-ton trucks traveling to the landfill and one truck hauling the following recyclables: Aluminum, steel, plastic, and paper. The increase in air emissions due to increased traffic is expected to be insignificant.

No storage or processing would occur outside of the building. Vehicles will be restricted to paved roads and parking lots. The bituminous surface would be constructed to support heavy equipment, resist frost action, and resist wear. Runoff would be handled with a storm water management pond. The exterior would be graded so that runoff is directed to the storm water management area.

Odor would be controlled by keeping the building doors closed at all times and dumping the materials indoors. Once the materials were processed and shredded, the materials would be moved by closed tube conveyors and stored prior to gasification in a sealed silo. The material would be continually processed and would not sit on the tipping floor for more than 48 hours. This would ensure the least amount of odor development (and pest control). Trench drains would be cleaned and washed on a regular basis to control odor. In the event of an unscheduled shut down, the materials would be diverted to the landfill. Odor neutralizers would be used in situations where nuisance odor may occur.

Flying debris due to wind would be controlled by dumping the MSW on an indoors tipping floor. MSW blowing off the property would be controlled by a 6 foot high chain link fence and by workers to collecting any litter on the site on a daily basis. MSW trucks would be required to have waste fully contained in the truck to prevent waste from escaping prior to entering the facility.

16. Biological (including impacts to threatened/endangered resources)

Pyrolysis facilities are likely to produce emissions, consisting of:

- Air emissions including water vapor, methane, carbon dioxide, carbon monoxide, vapor-form hydrocarbons, acid gases, nitrogen oxides, sulfur dioxide, particulates, cadmium, mercury, lead and hydrogen sulfide - information is not available for compounds such as dioxins and furans and PAHs;
- Solid residues including inert mineral ash, inorganic compounds, and any remaining carbon – these can be between 8 and 15 per cent of the original volume of waste;
- Other emissions include wastewater.

The quantity of air emissions from pyrolysis/gasification technology are reported to be less than those generated by incinerators and power plants. Knowledge of the contaminant concentrations in pyrolysis/gasification units is limited to the very small number of operating facilities.

Phytotoxic air pollutants have the potential to cause injury to vegetation. Phytotoxic pollutants include sulfur dioxide, nitrogen oxides, and ozone. This project has the potential to emit or contribute to the formation of all of these pollutants. However, the facility is not expected to emit or form these pollutants in such concentrations or quantities to have a significant or measurable impact on wildlife, vegetation or soils.

Since the proposed site is considered highly disturbed and dominated by invasives such as *Pragmites australis*, and does not contain wetlands or waterways adverse impact potential to fish or wildlife habitats is considered low.

Wastewater will be treated by GBMSD and is expected to have negligible biological impact.

An endangered resource review using the Natural Heritage Inventory was conducted for this document and there were no recent records for federal or state endangered, threatened, or special concern species found at the project site. There was a historic record for the purple false oats (*Trisetum melicoides*) however considering the disturbed nature and the current land use of the area the probability of finding this plant on site is very low. There are listed species in the general area however considering the disturbed nature and current land use of the site the potential impact to these species is low.

17. Cultural

a. Land Use (including indirect and secondary impacts)

The proposed facility would be built on highly disturbed filled land that is zoned for industrial use, dominated by invasive vegetation and not consistently inhabited by wildlife. No additional significant impact is anticipated.

b. Social/Economic (including ethnic and cultural groups, and zoning if applicable)

The site is characterized as vacant, industrial land. The properties within quarter mile of the site are zoned and used as industrial properties. These industrial properties include Peters Concrete Company, Northeast Asphalt Company, and Martell Construction. Nearby, but outside of the quarter mile distance, are the City of Green Bay residential yard waste disposal/recycling drop-off area, the Brown County Bay Port confined disposal facility used for contaminated sediment, an Exxon oil storage facility, and the Wisconsin Public Service Pulliam coal-fired power plant.

If approved, the proposed facility would add an additional industrial facility to this area resulting in additional truck traffic on Hurlbut Street. No scenic or recreational resources would be affected by the proposed waste processing facility and no land would be removed from public use.

It is not expected that land values for the businesses located near the waste processing facility would be negatively affected by proposed waste processing facility.

The electricity generated by burning the syngas produced at the facility would be sold to a nearby electric utility and used to supply electrical power to the grid. The proposed facility has a capacity of 5 megawatts of electricity.

c. Archaeological/Historical

The DNR reviewed the Department's Archaeological and Historic Inventories of Known Sites and determined that the proposed site is not a known archaeological or historic site. The facility should not have any detrimental effect archaeological sites.

18. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

This project would not impact State Natural Areas, prime agricultural lands, wetlands or other special resources. An endangered resources review was conducted using the Natural Heritage Inventory and adverse impacts to federal and state endangered, threatened, and special concern species are not anticipated.

19. Summary of Adverse Impacts That Cannot Be Avoided (more fully discussed in 15 through 18)

The proposed actions will result in a change of stack-vented air emissions. Most of the stack-vented emissions are controlled and the impact of these emissions cannot be avoided.

The increase in noise will be a temporary condition that cannot be avoided during the construction activities. In addition, traffic will also increase temporarily during construction.

Storm water runoff will increase with this project however the BMPs described in the NR 216 Storm water Discharge Construction Permit should minimize the potential for adverse impacts.

Wastewater is planned to be treated onsite to meet all standards and limits of set by the GBMSD so there should be no impacts to surface water or groundwater.

20. Environmental Effects and Their Significance

a. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are long-term or short-term.

Short Term Effects:
Operation of the construction equipment will result in noise pollution and exhaust emissions. The increased noise and exhaust may be irritating to nearby businesses. Noise and disruption from the equipment is expected to further disturb any wildlife activities in the vicinity of the operation for the duration of the project. Since construction activities disturb one or more acres, the operation has obtained coverage under the storm water construction site general permit (WI-0067831-03), which requires the operation to implement BMPs to address impacts from storm water runoff.

Construction activities may likely lead to short-term increases in employment and purchase of goods and services near the project location.

Maintenance will be needed periodically to remove the accumulated sediments in the pond, which will increase the short term impacts from erosion and disturbance to wildlife and the aquatic plants.

Long Term Effects:
The potential air emissions from the facility would increase the criteria and state hazardous air pollutant loading into the environment. Although no problems are anticipated from this project, several expansions of this type may cause a cumulative increase in criteria pollutant levels in Brown County. Since the National Ambient Air Quality Standards and increments would be maintained, no adverse impact (short or long term) on the local population or biological communities is anticipated.

The most commonly noted form of air pollution associated with MSW operations is odor. Standardized methodologies for odor measurement have not been adopted in the United States. The Department has not adopted a methodology to predict the potential odor impact of MSW operations. Thus a quantification of predicted odor impact of the proposed project is not included in this assessment. Wisconsin's odor rule is established in s. NR 429.03**,** Wis. Adm. Code. This rule establishes general limitations on objectionable odor, defines the tests for what constitutes objectionable odor, and sets abatement or control requirements.

Long-term physical impacts include visual impacts. The construction of the building will result in visual changes at the site as a result of the new building. There will be noise and dust associated increased traffic in the area associated with the transportation of MSW. Noise from waste transport can only be controlled by vehicle operational practices. Dust will be controlled by confining traffic to paved surfaces. Given that the area is zoned industrial and is relatively sparsely populated, increased traffic and visual impacts are not considered to be significant. In addition, while the physical appearance of the site will be substantially changed, the use of the site will remain industrial.

No waterways or aquatic resources will be re-routed or altered as a result of this project.

The proposed facility construction and operation will have indirect effects. The area's economy will change through jobs associated with the construction and operation and an increase in the area's tax base. It is anticipated that the operation will employ about 20 local residents in full time jobs once it is in full operation.

The proposed operations could reduce the use of fossil fuels through:
- MSW trucks reducing travel distances to distant landfills
- Production of syngas used in generators to produce electricity

No long term impact is expected from the facility in regards to climate change because the facility is not considered a major source of greenhouse gases. On a per-ton of waste basis, WTE and landfill gas-to-energy facilities are largely indistinguishable in terms of greenhouse-gas emissions. In Wisconsin, landfills are not required to monitor continuous fugitive emissions from the surface of the landfill, only from the landfill-gas collection system. Most MSW landfills are required to perform periodic surface emissions monitoring to identify major fugitive air emissions discharges to the environment. A WTE facility is required to quantify air emissions through record keeping and emissions testing. WTE facilities have advantages in that MSW as feedstock is not likely to

change or decrease, whereas MSW landfill gas production tapers off after cessation of filling. WTE facilities conduct their operations inside enclosed vessels which very nearly completely capture all produced syngas, whereas gas capture by MSW landfills is compromised by lack of containment in active filling areas and areas without final cover.

The proposed operations include the additional source separation of recyclable materials. This may result in benefits, such as:

- Material separation promotes the removal of additional designated recyclable materials from the waste stream and, therefore, may help in achieving higher recycling rates.
- Material separation enables the recycler to receive revenue by the sale of the recyclable material.

b. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are effects on geographically scarce resources (e.g. historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered resources or ecologically sensitive areas).

The proposed project is not anticipated to have significant short-term, long term or secondary effects on geographically scarce resources, scenic and recreational areas, primer agricultural lands, threatened or endangered species or ecologically sensitive areas.

c. Discuss the extent to which the primary and secondary environmental effects listed in the environmental consequences section are reversible.

The use of additional air resources may preclude other expansions or new additional sources in the immediate vicinity of the facility, depending on the natural, size, and types of pollutants emitted for the foreseeable future. The air environmental impacts from this project are reversible and should contribute minimal impact to the environment.

The altering of the site would not be easily reversible, once construction and operation of the facility is complete. The building could be dismantled, but is more likely that it would be utilized by another business entity.

Brown County Port and Solid Waste Department has a goal to meet the solid waste disposal needs of local communities and businesses through methods which are environmentally sound and economical. These methods incorporate waste reduction, material reuse, recycling, composting, landfilling and WTE to the extent that they are technically feasible, economically appropriate and desired by the public.

If the proposed facility is unable to meet its objectives, the MSW would be directed back to landfill disposal. Any recyclables discarded by residents in their garbage would not be separated and would be discarded in the landfill.

21. Significance of Cumulative Effects

Discuss the significance of reasonably anticipated cumulative effects on the environment (and energy usage, if applicable). Consider cumulative effects from repeated projects of the same type. Would the cumulative effects be more severe or substantially change the quality of the environment? Include other activities planned or proposed in the area that would compound effects on the environment.

The area surrounding the facility is currently considered "attainment" for all criteria pollutants. It would be expected that if a large number of new sources (having emissions equivalent or greater than the potential emissions associated with the proposed project) were to locate in the immediate surrounding area, air quality in the area would eventually decline. However, the required air quality analysis for this project or other facilities in the area would serve to prevent the degradation of air quality to levels below applicable air quality standards.

Any future projects will be examined at the appropriate time. With each new operation or expansion proposed, cumulative effects are considered. Unless these facilities are poorly sited or concentrated in a small area, the cumulative impacts to the environment should not be significant.

The Wisconsin Renewable Portfolio Standard (RPS), Wisconsin Statute 196.378, requires all Wisconsin electric providers to provide their retail electricity customers with a certain percentage of electricity from renewable resources. The RPS creates an overall statewide goal of 10 percent renewable electricity by 2015. Each Wisconsin electric provider has a unique RPS requirement, known as their renewable “baseline,” based on how much renewable electricity the provider was providing in the years 2001-2003. Investor-owned utilities, municipal utilities and electric cooperatives are all obligated to comply with the RPS. Each electric provider must maintain their baseline renewable percentage for the years 2006-2009. In 2010, each electric provider must provide an additional 2 percent renewable electricity above their baseline percentage. From 2011-2014, electric providers must maintain their baseline

percentage plus 2 percent. In 2015, each electric provider must add an additional 4 percent renewable electricity, for a total of 6 percent above their baseline renewable percentage, and must maintain this level in subsequent years.

WPS is the electric provider that would purchase the electricity generated from this project and their baseline RPS percentage requirement is 3.74 percent with a 2010 RPS percentage requirement of 5.74 percent and a 2015 RPS percentage requirement of 9.74 percent. If this project is developed and repeated the electricity generated may be considered a renewable resource per the definition of a renewable resource in Wisconsin Statute 197.378(1)(h) and thus could reduce the need for additional sources of renewable energy.

22. Significance of Risk

a. Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analysis would eliminate or reduce these unknowns?

Pyrolytic/gasification technology using MSW as source material is not in large scale operation. Documentation of WTE operations, costs, and emissions are limited. Monitoring new facilities may provide useful information.

To verify emissions rates, the Department will require in the air permit that emissions testing be performed within 60 days after each emission unit reaches operational capacity, but no later than 180 days after initial startup of each emission unit. Emissions testing, as proposed, will be required for the following:

- Each retort oven and engine generator: dioxin/furans as TEQ (total equivalents); cadmium; lead; mercury; hydrogen chloride; carbon monoxide; opacity;
- An individual retort oven and an individual engine generator: nitrogen oxides; particulate matter
- Each engine generator: formaldehyde
- An individual engine generator: sulfur dioxide (to establish a correlation between hydrogen sulfide concentrations and sulfur dioxide emissions)
- Ash handling system: opacity
- Flare: opacity
- Syngas: full metals analysis, including cadmium, lead, and mercury; doxins/furans/PCBs as TEQ; total fluorine; total chlorine;

b. Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.

Department inspections based on complaints or general compliance efforts will help to serve to evaluate whether the operation is properly addressing minor "spills." In addition, the operation will be required to conduct inspections of storage facilities to ensure that more significant problems are addressed prior to any sort of massive facility failure.

The enclosed Hapman tube conveyors would minimize the dust and odor. The Hapman tube conveying system would be controlled by the gasifier monitoring system. This would ensure direct communication prevent over filling in the event of a shutdown or mechanical failure.

The operation of the system at slightly negative pressure would ensure the safety of the system due to the fact that pressure would be not allowed to increase to an unsafe level. In the event of a blower failure, the system would be equipped with pressure blow-off valves to release retort pressure until the process could be stopped.

In the event of an unscheduled shut down, the materials would be diverted to the landfill.

Fire danger would be reduced by controlling the process time of the material while within the facility. The building would be equipped with a fire sprinkler system.

Explosion hazards would be limited by locating the primary shredder on the tipping floor and surrounding it with a concrete push wall on two sides to limit the explosion effects in the main plant. Items with explosion potential that pass thru the primary shredder would be removed by hand from the MSW on the sorting line, avoiding any potential hazard at the final shredder.

All OSHA required programs would be implemented prior to the operation of this facility. These programs include:

- Hazard Communication (29 CFR 1910.1200)

- Personal Protective Equipment (29 CFR 1910.132)
- Control of Hazardous Energy (29 CFR 1910.147)
- Powered Industrial Trucks (29 CFR 1910.178)
- Respiratory Protection (29 CFR 1910.134)
- Emergency Action and Fire Prevention Plan (29 CFR 1910.38/39)

A qualified Certified Industrial Hygienist would provide facility staff training on these programs. Emergency contacts would be included in all equipment manuals and plant posters by entrances. Plant manager would be responsible for updating all manuals and ensuring maintenance schedules are followed.

23. Significance of Precedent

Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Describe any conflicts the proposal has with plans or policy of local, state or federal agencies. Explain the significance of each.

This project, if operational, would provide additional information regarding the unknowns with this technology and thus would provide for a better understanding to the associated environmental effects. This understanding would be considered during the review of any similar project proposals however new projects are reviewed on a case-by-case basis with each project having a unique set of circumstances that must be considered during the review process.

The technology has the capability of recovering recyclables, converting waste into a fuel product (i.e. syngas), efficiently using the fuel product on-site for power generation, and producing secondary material product (char). On-site power generation is currently the proposed alternative due to strong market demands for electricity, particularly from renewable energy sources.

MSW disposal in area landfills is not completely eliminated by development of this facility. Landfilling will still be needed as an essential function for controlling non-recycled solid wastes. Other types of recycling or processing facilities can be developed, and, if economic, may compete with this facility for the available MSW resources.

The Department primarily considered issues that fall under its regulatory authority as part of this analysis. The project is not known to conflict with plans or policy of local, state, or federal agencies. The operation will need to apply for and receive the appropriate approvals from all involved agencies prior to operating. Permitting this operation would not prevent the Department from taking necessary actions to protect the environment (i.e., revocation, modification of the permit).

24. Significance of Controversy over Environmental Effects

Discuss the effects on the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.

There has been public controversy generated as a result of the proposed large scale pyrolysis municipal solid WTE project. State and area citizens have expressed concerns about the project's technical claims, costs, and potential impacts to air and water quality and recycling rates.

Pyrolysis is an established process for thermal degradation of waste materials, but it has not been widely used for the thermal treatment of MSW and there is limited information about commercial scale WTE projects. This lack of information contributes to uncertainty about projected air contaminant emissions, interpretation of research studies, and comparisons of resource utilization and lifecycle costs. WTE plants typically produce significantly more energy per ton of waste than landfills with energy recovery. However, WTE may have higher air pollution control equipment costs. Low fossil fuel prices affect implementation of innovative renewable energy technologies that have been proposed in the United States and around the world.

The socio-economic issues are difficult to quantify. Although the socio-economic issues are beyond the scope of the Department's overall regulatory authority, references to the County's and City's information has been included in this document. Beyond that, these issues would need to be addressed through local zoning and through implementation of comprehensive land use planning by the local units of government.

ALTERNATIVES

25. Briefly describe the impacts of no action and of alternatives that would decrease or eliminate adverse environmental effects. (Refer to any appropriate alternatives from the applicant or anyone else.)

No Action Alternative:
Under the no action alternative this site would not be developed thus the impacts described in this document would not occur. The property would be available for some other industrial use.

Alternatives
The facility could use alternative and less heterogeneous fuel streams such as shredded tires or auto fluff. However, the economic viability of the project may be jeopardized if the facility is unable to secure enough material.

The project could be reduced in size; however the applicant has stated that upfront costs require a facility to process at least 150 tons of MSW per day to be financially viable.

The facility could consider another location. Comparable sites would be located in industrial zoned areas with access to roadways and electrical substations. Larger sites could accommodate future expansion and higher ambient air quality standards for particulate matter smaller than 2.5 microns. OSGC proposed two other possible locations. The DNR inspected a proposed location on Bay Ridge Court, in the Village of Hobart, Brown County, Wisconsin. In a July 6, 2010 inspection report, the DNR determined that the site was environmentally suitable for the project. OSGC did not continue to pursue this site. OSGC also reviewed a site within the Industrial Park of the Oneida Nation on Packerland Drive in Green Bay, WI. Due to the Oneida Nation being sovereign, the DNR does not have jurisdiction to inspect sites or review projects within the Oneida Nation's territorial boundaries. OSGC did not continue to pursue this site.

SUMMARY OF ISSUE IDENTIFICATION ACTIVITIES

26. List agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed).

Date	Contact	Comment Summary
Various	Mark Verhaagh – Alliance Construction & Design	Project discussions with Sally Hronek (DNR)
Various	JaNelle Merry – Bay Environmental	Project discussions – Sally Hronek (DNR)
Various	Dan Guido - ERM	Project discussions with Jonathan Wright (DNR)
Various	Jonathan Wright, DNR Air Permit Engineer	Potential air pollution issues
Various	Sally Hronek, DNR Waste & Materials Management Engineer	Potential waste issues
Various	Jim Doperalski Jr., DNR Environmental Analysis and Review Specialist	Environmental Analysis review
Various	Bob Grefe, DNR Waste & Materials Management Engineer	Potential waste issues

Various	Jim Zellmer, DNR NER Waste & Materials Management Supervisor	Potential waste issues
Various	Crystal Schiefelbein, DNR Storm water Specialist	Potential storm water issues
Various	Nan Jameson, DNR Wastewater Pretreatment Coordinator	Potential wastewater issues

3/1/2011	MA Pfeifer	e-mails to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR; entitled: - fine particulates, filters...deaths from emissions to air - Incinerator Fire Hazard - Gasification A-Z presentation - Oneida Nation 7 Generations Pyrolysis Waste to Energy facility in Green Bay, WI - EPA letter to Seven Generations - Biomass Incineration and Health Risks - 10 Myths of Incineration
3/1/2011	John Filcher	e-mails to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR; entitled - letter to the air guys
3/5/2011	MA Pfeifer	e-mails to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR; entitled: - Pyrolysis, Gasification...Oneida WTE in Green Bay
3/9/2011	MA Pfeifer	e-mails to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR; entitled: - Particulate Matter Linked to Diabetes...Biomass Magazine
3/24/2011	MA Pfeifer	e-mails to Wright, Jonathan J - DNR; Zellmer, James A - DNR; Kincaid, Gary W – DNR; entitled: - Mecklenburg Board Votes to Not Recommend ReVenture Project - Scottish Facility Yet to Produce any Energy

Project Name: Pyrolysis/Gasification Based Waste-to-Energy Facility County: Brown

PRELIMINARY DECISION

In accordance with s. 1.11, Wis. Stats., and Ch. NR 150, Wis. Adm. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code.

The Department has made a preliminary determination that the Environmental Impact Statement process would not be required for this action/project. This recommendation does not represent approval from other DNR sections which may also require a review of the action/project.

Signature of Evaluator	Date Signed
/s/ Jonathan Wright	7/12/2011

FINAL DECISION

The public review process has been completed. The Department received and fully considered responses to the news release or other notice.

Pursuant to s. NR 150.22(2)a., Wis. Adm. Code , the attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action, and therefore the environmental impact statement process is not required prior to final action by the Department.

The Department has determined that it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code. This decision does not represent approval from other DNR sections which may also require a review of the action/project.

Signature of Environmental Analysis Program Staff	Date Signed

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.