

## Power Data Calculations 6-150TPD THW & MSW (06-20-03)

Product Processed	Pounds/Hour	Tons/Day	Mix/lb	BTU's/lb	Total BTU's	Avg BTU's/lb	Net BTU/lb	Net %
Industrial Oil	45,833.33	550	61%	16,000	8,800,000	9,760	8,784	90.00
Municipal Waste	29,166.67	350	39%	7,000	2,485,000	2,730	2,457	90.00
Hospital	none							
Tires	none							
<b>Totals</b>	<b>75,000.00</b>	<b>900</b>	<b>100%</b>	<b>N/A</b>	<b>N/A</b>	<b>12,500</b>	<b>11,241</b>	<b>90.00</b>
<b>BTUs retained in char</b>								<b>10.00</b>
<b>Total BTU</b>								<b>100.00%</b>

- One Boiler Horse Power (HP) = 33,520 BTU
- One Boiler Horse Power will generate 34.5 pounds of steam per hour
- Thermal Oxidizer operates at 1,600 degrees F
- Flue Gas Temperature is 500 degrees F (use economizer)
- Boiler Pressure is 650 PSI
- Density of air is 0.075 pounds per cubic foot.
- Specific heat of air is 0.25 BTU per pound.

\*Efficiency Factor per size of turbine generator -13

### ENERGY RECOVERED:

BTU Available	75,000lbs/hr x 12,500 BTU/lb/hr	=	937,500,000 BTU/hr
BTU to Thermal Oxidizer	937,500,000 90%	=	843,750,000 BTU/hr
Air Flow to Thermal Oxidizer	$\frac{843,750,000 \text{ BTU/h}}{(60)(1600)(0.075)(0.25)}$	=	468,750 SCFM
BTU transferred to boiler	468,750 SCFM x (60)(1,375 F)(0.075)(0.25)	=	725,097,656 BTU/hr
Boiler HR generated	$\frac{725,097,656 \text{ BTU/hr}}{33,520 \text{ BTU/HP}}$	=	21,632 BHP
Steam generated	21,632BHP x 34.5 lbs stream	=	746,297 lbs Steam/hr
mWh and kWh	$\frac{746,297}{13^*}$	=	57.41 mWh or 57,407 kWh
Less Parasitic Consumption (16.38%)	83.62% -Net	=	48.00 mWh or 48,000 kWh