Exhibit L

SECTION III

Exhibit "B"
Engineering Report

SPOKANE REGIONAL
WASTE TO ENERGY FACILITY

SOLID WASTE DISPOSAL SITE PERMIT

EXHIBIT "B"

ENGINEERING REPORT

August, 1987

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PREFACE

This Engineering Report is being submitted as a part of the Solid Waste Disposal Site Permit. It is being developed, along with other requirements of the permit, before the waste to energy facility's final design is completed. The Solid Waste Disposal Site Permit is renewed yearly and this Engineering Report will be subsequently updated to reflect any changes in procedures prior to the start of plant operations.

Other regulations, which may affect plant operations and permit requirements, are under development. Subsequent permit applications/renewals will reflect those new laws when they become effective.

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PART 1. REGULATION COMPLIANCE

1.1 Solid Waste Comprehensive Plan

The Waste to Energy Facility is in compliance with the adopted Spokane County Comprehensive Solid Waste Management Plan Update, 1984, (Parametrix, Inc., July 1984). The City and County of Spokane decided to develop a regional solid waste management and disposal system to transfer municipal solid waste to a waste to energy combustion facility.

The Spokane Waste to Energy Project objectives are based on the management of solid waste in an environmentally and economically acceptable manner. Specific objectives are:

- To develop solid waste management practices that protect the natural environment of Spokane County.
- To encourage materials recovery and other waste reduction methods as a means of reducing the amount of solid waste at the source.
- To promote economically responsible means of solid waste management that serves the needs of the County and minimizes the amount of land required for future disposal.
- To implement a waste to energy combustion facility that will recover energy in the form of steam and/or electricity for industrial use.
- To ensure the protection of groundwater resources.
- To select a site for the waste to energy facility (and recycling/transfer stations) that considers cost, public concerns, accessibility to waste generators and to energy markets, and environmental protection.

1.2 Zoning Ordinance

The existing zone designation for the Waste to Energy Facility site is RI-Restricted Industrial. The existing Zoning Ordinance does not allow "incinerators" in any zone within the County.

Even though the Zoning Ordinance does not allow "incinerators" in the county, the project is considered to be in compliance with the Zoning Ordinance. This is due to the eminant domain rights which enables the City of Spokane to own, construct, and operate the Facility without being subject to their own zoning requirements or those of other governmental jurisdictions.

In Appendix A, Zoning Consideration, is a copy of a letter by the Waste to Energy project's attorneys. This letter indicates the City's rights to construct the Facility without meeting the zoning restrictions.

1.3 SEPA

The Waste to Energy Facility is in compliance with the State Environmental Policy Act (SEPA). The SEPA process for the entire project, including the Facility, began in 1985 and was completed in 1987 with the issuance of the addendum to the final environmental impact statement. The following is a list of documents, circulated for public review, which fulfilled SEPA requirements:

Spokane Regional Waste to Energy Project, Draft Environmental Impact Statement; March, 1986.

Spokane Regional Waste to Energy Project, Supplemental Draft Environmental Impact Statement on the Railroad Site; April, 1986.

Spokane Regional Waste to Energy Project, Final Environmental Impact Statement; June 1986.

Addendum to the Final Environmental Impact Statement for Spokane Regional Waste to Energy Project; April 6, 1987.

PART 2. PROJECT BACKGROUND

2.1 Existing Documents

The Spokane Regional Waste to Energy Project's environmental documents describe the project's background extensively. By this reference, the documents listed below are hereby made a part of this Engineering Report. Along with the document list is a list itemizing the requirements for this Engineering Report and which documents provide that information:

Final Environmental Impact Statement; June, 1986

- Meteorological conditions
- Initial environmental findings for the project.

Addendum to the Final Environmental Impact Statement; April, 1987

- Transportation routes to and from the site.
- Effects upon existing transportation systems.
- Water source.
- Method of obtaining water.
- Sanitary sewer facilities.

Technical Report No. 9 Solid Waste; January, 1986

- Population and area to be served.
- Anticipated type, quantity, and source of solid waste.
- Determination and evaluation of the present types of collection, storage, transportation, processing, utilization, and disposal in the area and the effect the facility will have on them.

Technical Report No. 11 Transportation; January, 1986

- Transportation routes to and from the site.
- Effects upon existing transportation systems.

Technical Report No. 12 Utilities; January, 1986

- Water sources.
- Method of obtaining water.
- Sanitary sewer facilities.

PART 3. FACILITY DESIGN & OPERATION

3.1 Site Layout

Figure 1, plot plan, shows the basic layout of the Facility. The plan shows that the Facility, including roadways, employee parking area, and cooling tower structure, will only require approximately 30 acres of the 75 acre site. The minimum use of site area by the Facility permits sufficient development of buffer areas around the Facility.

Access to the Facility is provided by a single entrance roadway. Traffic enters the site and travels to the scales prior to entering the reception area. Once the vehicles have been weighed, they proceed via a raised roadway section into the reception area and unload.

After unloading, the vehicles exit the building and proceed down a ramp and exit from the site. When a vehicle requires that a tare weight be taken, it travels through the scale after unloading and is weighed once again. Then the vehicle exits the Facility site.

As shown on Figure 1, and further represented in Figures 2,3, and 4, Floor Plans of the Facility, a number of process elements are contained in a unified building structure. The refuse reception area, storage pit, water treatment, turbine and generator, switch gear, boilers, and air pollution control equipment are all linked architecturally in one basic structure. Only the cooling tower, administration offices, and ash handling and truck loading equipment are separate structures. This aspect of the design not only enhances the appearance of the Facility, but also the Facility's daily operations by permitting access to critical equipment within one building.

3.2 Overview of Facility Design

3.2.1 Process Description

The Facility is designed with a nominal capacity at maximum continuous rating (MCR) of 800 tons of municipal solid waste (MSW) per day. The facility's annual throughput capacity is 248,200 tons. Annual throughput is based upon allowances for scheduled and unscheduled facility outages and the County's annual guaranteed quantities of acceptable waste.

Two weigh stations, each containing two weight scales, are provided. The location of the weigh stations allows for separation of incoming and exiting traffic.

Self-unloading trucks will normally unload directly into the refuse storage pit. Hand unloading vehicles will discharge into the receiving pit. Refuse will be pushed from the receiving pit to the storage pit by the Facility's front-end loader. A refuse loadout hopper is provided in one end of the refuse storage pit to allow loading refuse trailers in the event of a Facility shutdown.

Storage is provided for approximately four days of MSW throughput at 1,200 tons per day. This will be adequate to ensure continuous operation of the Facility and acceptance of refuse with minimal use of backup landfill during Facility outages.

The Company will utilize state-of-the-art technology based on the most recent advances in the operations of its design in the United States. These advances are based on over 11 years of operating experience by Signal Environmental Systems under demanding commercial and industrial conditions at its facilities in the United States.

The refuse will be burned in two specially designed Signal Environmental Systems/Von Roll/Babcock & Wilcox furnaces with membrane waterwalls and pendant superheater platens.

Superheated steam will be produced and delivered to the turbine generators for electric power production and distribution to the utility's transmission network. Exhaust steam from the turbine generator will be condensed in a water-cooled condenser and the condensate returned to the boiler feed water system.

Refuse receiving and storage areas are maintained under a negative pressure with the air from the receiving floor and pit serving as the source of combustion air for the furnace. In this way plant dust and odors are drawn into the furnaces and destroyed through exposure to temperatures exceeding 1,800 degrees Fahrenheit.

Flue gases from each boiler will be cooled, treated for acid gas and particulate removal by passing through the spray dryer/absorbers and baghouses and then discharged to the atmosphere through a 170-foot high chimney.

An ash handling system consisting of water-sealed ram type ash expellers and mechanical conveyors will be provided. Ash and inerts from the furnace, together with siftings from the grate system, will be quenched in the ash expellers, then discharged onto a vibrating conveyor. Fly ash from spray dryers and the baghouses will be conveyed to the ash conditioners and then discharged onto the bottom ash conveyor system.

Moistened fly ash and bottom ash will be conveyed to the ash load out and storage building. Ferrous metals will be recovered from the ash prior to transporting the remaining ash to the landfill.

Necessary auxiliaries for water treatment and wastewater treatment will be provided with sufficient redundancy in design to allow normal plant operation despite any individual unit being temporarily out of service.

3.3 Facility Scope

The Facility will meet all design and performance requirements including applicable codes, standards and regulations of the State of Washington.

The Facility will include:

- o Scale houses and scales, remote from building area
- o Receiving area, refuse pit and overhead cranes
- o Furnaces/boilers and auxiliary equipment
- o Stack
- o Air pollution control equipment; one (1) spray dryer/absorber and baghouse per furnace train
- o Pollution control monitoring equipment
- o Boiler feed water treatment system
- o Turbine generator
- o Water cooled condenser
- o Condenser cooling water system
- o Residue handling
- o Condensate system
- o Wastewater treatment system
- o Steam and condensate piping
- o Auxiliary fuel gas system
- o Monitoring, control, and security systems
- o Other appurtenances, equipment and system components as required for an efficient operation
- o Control room, offices, and equipment rooms
- o Storage facilities, shops and maintenance areas
- o Administration offices and public reception area

3.4 Site Development

3.4.1 Site Preparation

On-site materials will be utilized for embankments and for structural backfill under buildings and roadways where material is suitable. Off-site materials will be imported as required.

Embankment material will be compacted to a density of 95 percent of maximum density at optimum moisture content as determined by ASTM D1557. In areas that are to receive pavement or building slabs, the top 12 inches will be compacted to at least 98 percent of maximum density.

All site grading will be accomplished so as to ensure positive surface drainage at all times. During grading operations, temporary control measures will be used as necessary to control erosion and/or sediments. Diversion structures, silt fences, sediment barriers and/or temporary grassing will be installed, if required, as a means of control.

All disturbed areas, with the exception of building sites and paved areas, will receive a minimum of four inches of topsoil and will be seeded to reduce erosion.

3.4.2 Storm Drainage

Storm drainage run-off will be collected by a system of open ditches where possible. Culverts will be utilized under roadways or other obstructions. The storm drainage system will be designed on the basis of the run-off of a ten year storm of one-hour duration. The stormwater will be routed to an on-site storage pond (existing quarry area) for disposition by evaporation and infiltration.

Where culverts are required, reinforced concrete or bituminous coated corrugated metal pipe will be used. Yard areas will be graded to provide positive drainage.

3.4.3 Roadways and Paved Areas

Roadways will be provided for ingress and egress of refuse trucks, ash disposal trucks, the general public, and plant employees. Primary roads will be 24 feet wide and one-way roads will be 15 feet wide. Shoulder width will be four feet in both cases.

All roads and parking areas will be constructed of a crushed aggregate base course and a bituminous concrete binder and surface course.

Subbase, base course and surface course thickness will be determined by anticipated traffic requirements, from test data from appropriate soil borings and from recommendations from the Soils Geotechnical Engineer.

3.4.4 Sanitary Sewers

Sanitary sewer effluent will be collected by a gravity sewer system from the truck scale building, administrative building, warehouse building, and the refuse building. The effluent will be conveyed to the existing sanitary sewer system.

3.4.5 Security Fence

An eight (8) foot high galvanized chain link fence, topped with barbed wire, will be constructed to encompass the plant boundary area. An electrically operated slide type chain link gate will be provided at point of entry into the plant site. Chain link fences, with gates, will also be provided for the electrical substation and the switchyard.

3.4.6 Site Use

The planned operational use of the site is for a mass-burn Waste to Energy Facility. Site use will involve recycling activities, receiving and processing of wastes, removal of ash, and administration and support services. This planned use is expected to last 20 years. The Facility's life may be extended far beyond this 20 year life.

When closure of the Facility occurs, if at the end of the 20 year life or later on, the site could be utilized for many various uses. Demolition of the structure and ash and waste cleanup will be required for any future use. It is not expected that this facility will remove the land from future uses solely by the burning of mixed municipal waste.

3.5 Receiving and Unloading

Two independent refuse receiving areas are provided (see Figure 2.) One area is used primarily by self-unloading trucks. The other area is used primarily for hand unloading. Scales are located so that both types of incoming refuse may be weighed.

Refuse will be delivered directly to the storage pit by the self-unloading trucks. The delivery trucks will cross one of the platform scales. After leaving the scale, the trucks will proceed to the reception floor and tipping area. Refuse will be discharged for self-unloading trucks into the refuse storage pit. From the dumping area, the trucks will return down the ramp to grade level.

A separate receiving area is provided in order to keep self-unloading vehicles separate from the pickup trucks and automobiles expected in the manual unloading area. Refuse will be pushed from the manual receiving pit to the storage pit by the Facility's front-end loader. An emergency load-out chute is located at one end of the refuse storage pit to allow transfer trailer loading in the event that refuse must be bypassed to the landfill.

3.5.1 Reclaiming and Charging

Refuse will be reclaimed from the storage pit by two traveling, overhead, nine-ton capacity bridge cranes equipped with six-cubic yard orange peel grapples (see Figure 3). The cranes will transport the refuse to either of the boiler charging hoppers. The cranes will also be employed for pit management and blending the refuse into a more homogeneous fuel. Oversized objects will be staged on the charging floor. These objects will be periodically retrieved from the charging floor for direct loadout to transfer trailers by the cranes.

3.5.2 Design Criteria

The following criteria will be used in the design of the refuse receiving and handling area:

3.5.2.1 Density of Refuse

Type	Density (lb/cu yd)
o Packer refuse (at discharge)	350
o Packer refuse (in truck)	580
o Oversize bulk materials	300
o Refuse in storage, below tipping floor	600
o Refuse in storage, above tipping floor	500

3.5.2.2 Refuse Receiving Pit

o Width of pit (feet)	40
o Length of pit (feet)	240
o Height from tipping floor to pit bottom (feet)	Sloped from 6'9" @ Load Out Hopper to 16'-9" @ Storage Pit

3.5.2.3 Refuse Storage Pit

o Width of pit at bottom (feet)	50
o Length of pit storage area (feet)	142
o Height from tipping floor to pit bottom (feet)	40
o Height from charging floor to pit bottom (feet)	93
o Refuse storage reserve capacity	4,900 tons

3.5.3 Scale Operation

Four (4) electronic platform scales will be used to weigh incoming and outgoing trucks. Two scalehouses will be provided.

3.5.4 Refuse Receiving Area

The truck turning apron in the self-unloading area measure approximately 133 feet deep by 142 feet long and contains four dumping bays. The clearance from the roof truss to the tipping floor will be 30 feet. There will be eight dumping stations, each approximately 15.5 feet wide. The refuse receiving area for hand unloading measures approximately 40 feet deep by 240 feet long. The clearance from the roof truss to the tipping floor will be 30 feet.

3.5.5 Alternate Storage Plan

Self-unloading trucks will normally unload directly into the refuse storage pit. Hand unloading vehicles will discharge into the receiving pit. Refuse will be pushed from the receiving pit to the storage pit by the Facility's front-end loader. A refuse loadout hopper is provided in one end of the refuse storage pit to allow loading refuse trailers in the event of a Facility shutdown.

Storage is provided for approximately four days of Municipal Solid Waste throughput at 1,200 tons per day. This will be adequate to ensure continuous operation of the Facility and acceptance of refuse with minimal use of backup landfill during Facility outages. If for some reason the Facility was unable to process the required tonnage, or the additional storage pit was full, then the excess municipal solid waste would have to be landfilled.

3.5.6 Handling of Bulky and Liquid Wastes

The Facility will not handle, transfer, or store bulky or liquid wastes. All such wastes will be disposed of at the appropriate landfilling or landspreading permitted operations within the County of Spokane.

3.5.7 Crane Operation

Refuse will be reclaimed from the pit storage by two traveling, overhead, 9-ton capacity bridge cranes (see Figure 3). Each crane will be equipped with a 6-cubic yard orange peel grapple. Loads will be discharged into the furnace hoppers.

Motions of the refuse cranes will be individually governed by signals from a centrally located, remote operator's pulpit. Both cranes can feed the refuse hoppers, transfer oversize refuse, organize the storage pit and mix refuse to obtain more uniform composition. Cycle times will be structured such that one crane can maintain continuity of operation for a period of time in an emergency.

The crane control room will contain a two-way communication system for direct contact with the main control room, reception area, and other locations where required.

Two crane operation stations will be located in a stationary, heated, air conditioned, glass paneled station on the charging floor side of the pit. This compartment will be centrally located with respect to feed hoppers and will provide line-of-site contact with boiler hoppers and all sections of the storage pit. From this vantage point, crane operators will readily be able to observe the discharge of refuse from the refuse trucks on the tipping floor. Television monitoring of each refuse hopper will be provided in the crane control room.

3.5.8 Overhead Cranes/Design

The overhead crane runway extends the full length of the refuse storage building to allow complete access by both cranes.

The extensive experience gained at the RESCO facilities has been utilized to develop cranes specifically designed for the rugged service encountered in refuse to energy facilities.

Some of the features which will be incorporated into cranes are: hoist motors with separately powered constant speed cooling fans; Class H motor insulation for high temperature operation; motor overtemperature warning system; and arm chair mounted operator joysticks.

An anti-collision system utilizes telemetric devices to sense crane spacing, and automatically slows the cranes when they enter into a proximity zone. Both cranes utilize this system, preventing collisions.

The cranes will utilize AC motors with static stepless controls. The hoists will utilize eddy current brakes which give proportional speed control. Mechanical brakes will be utilized as holding brakes.

The cranes will be designed to Class F, continuous service duty cycle classification, in accordance with the Crane Manufacturer's Association of America Specification No. 70.

The cranes will be equipped with 6-cubic yard capacity, 4 line, orange peel grapples. Maintenance stands will be provided at each end of the refuse pit to allow grapple maintenance to be done on the plant charging floor.

3.6 Refuse Fired Boilers

For the 800 tpd system, two Babcock & Wilcox mass-fired refuse burning steam generators with Von Roll grates will be provided with a rated capacity of 400 tpd each. Water-cooled refuse chutes, hydraulic ram feeders, grates and hydraulic systems, furnaces with water-cooled membrane walls, superheaters, boiler banks, economizers, forced draft fans, combustion air system, steam system, boiler blowdown system, superheater attemperator system, and associated controls will be included. Feed water equipment, such as the deaerator and feed water pumps, are also included.

3.6.1 Capacity

The boilers supplied are nominally rated at 400 tons per day throughput.

The boilers generate steam at 900 PSIG and 830 degrees Fahrenheit at the superheater outlet header with boiler feed water at 300 degrees Fahrenheit.

3.6.2 Refuse Feed

Each boiler will be equipped with a refuse feed hopper and feed chute.

Refuse will be transferred from the refuse storage pit by a traveling overhead crane and deposited in the furnace charging hopper. Each hopper will be maintained at a pre-established minimum level to seal the feed chute. This maintains furnace draft and minimizes flash back and burn back.

3.6.3 Feed Hopper and Chute

The refuse feed hopper will be a rugged, heavily reinforced unit incorporating a cut-off gate for boiler shutdown.

The refuse chute, located below the refuse feed hopper, will be a water-cooled, double walled design of carbon steel construction. The inside dimensions of the feed chute will allow large objects to pass without jamming.

3.6.4 Refuse Feeder

Each furnace will be equipped with a hydraulically-driven Von Roll ram feeder of the design currently used in Signal Environmental's U.S. and Von Roll's European installations. The feeder will be driven by a reciprocating mechanism powered by three hydraulic cylinders. The forward stroke will push the refuse onto the drying zone of the grate system. The speed of the forward stroke will be continuously regulated by the control system, based on steam demand. The speed of the return stroke will be constant.

3.6.5 Grate System

Each furnace will have a hydraulically-driven Von Roll R-Grate system of the latest design. The R-Grate is a transverse reciprocating type, inclined at an angle of 18 degrees from the horizontal, with alternating stationary and reciprocating transverse grate rows.

The grate will consist of two parallel sections. Each parallel row will be built up of four connected grate block modules, each driven by two hydraulic cylinders, for a total of eight modules per grate system.

The hollow grate block castings will be of special Von Roll chrome-steel material with cooling ribs which direct the flow of primary air through the casting for cooling, resulting in reduced wear and longer life for the grate blocks. The grate block design will be a high-pressure drop type to ensure uniform air distribution throughout the fuel bed.

The grate system will utilize eight primary air grate modules. Primary air flow and gate speed will be automatically controlled by steam demand.

One full-size access door on the furnace rear wall at grate level will provide access to the furnace.

The grate system includes a drying zone, a combustion zone and a burnout zone. Refuse will be fed into the drying zone by the hydraulic ram feeder. The refuse will begin to dry and combustion will be initiated at this point. The major portion of the combustion process will take place in the combustion zone, and final burnout of the remaining material will be accomplished in the burnout zone. After final burnout, ash and inerts will be discharged into a bifurcated residue chute.

3.6.6. Air System and Combustion

Primary combustion air for each unit will be supplied by a forced draft fan through ducts to the eight primary air zones on the underside of the grate system. The primary combustion air supply to each zone will be automatically controlled to obtain optimum air distribution to ensure good combustion and stable steam flow. Overfire air for each furnace will be supplied by a separate secondary air fan. This air will be introduced above the grates through a series of nozzles in the front and rear walls. The secondary air will promote turbulence and complete the combustion of the volatiles distilled from the drying and burning refuse.

Both the primary and secondary air supply will come from the refuse pit area, thereby maintaining that area under a negative pressure to prevent odors from escaping.

The hot products of combustion from the burning refuse will pass in sequence through the refractory-covered water-cooled membrane-wall furnace, the two stage parallel-flow/counter-flow superheater, the steam generating section, the economizer section, and then exit the unit. The two-stage superheater will be designed with an interstage of attemperation for superheat temperature control, where a controlled amount of boiler feed water will be sprayed into the superheated steam to maintain the final steam temperature at the design point.

3.6.7 Excess Steam

An automatic valve will be provided for each boiler to vent excess steam to the atmosphere. This valve will protect the boilers from excess pressure build-up in the event that the steam load is decreased suddenly when the furnaces are operating at a high burning rate. Steam vent valves will be sound attenuated for noise control.

In the event of a prolonged turbine generator outage, a bypass dump condenser is provided to condense the excess steam generated by the boiler while processing of refuse continues.

3.6.8 Auxiliary Burners

Each boiler will be furnished with two natural gas fired auxiliary burners. These burners will be designed to achieve and maintain a minimum furnace gas temperature of 1,800 degrees Fahreheit for at least a 1-second retention time during startup and shutdown.

Permanently installed thermocouples, located in the gas stream downstream of the superheater, will continuously monitor the furnace gas temperature during normal plant operation. These thermocouples are located outside of the slagging region of the furnace where the temperature readings are expected to be accurate and reliable.

During startup testing, a correlation will be developed to establish a one-to-one correspondence between the permanent thermocouple readings and the furnace temperature profile. It is expected that steam flow will also exhibit this one-to-one correspondence. This correlation will establish the minimum permanent thermocouple reading (or steam flow) at which the permit criteria are met.

During normal plant operation the thermocouples will be continuously monitored and a rolling average of the temperature will be calculated and compared to the minimum allowable temperature as determined by the correlation. When the rolling average falls below the minimum allowable, an alarm will start the auxiliary burner or take other appropirate action to re-establish minimum temperatures.

3.6.9 Feed Water Pumps and Deaerator

The boiler feed water system design will include two 50-percent and one 100-percent capacity boiler feed water pumps.

The deaerating feed water heater will be provided. The deaerator will provide a 10-minute storage capacity at the maximum continuous rating of the dedicated boilers.

Steam required for the deaerator is provided by uncontrolled extraction from the turbine generator, with make-up water being introduced to the condenser hot well from the demineralizer system.

3.6.10 Clinker and Corrosion Control

Provision for control of furnace side-wall clinkers will be included.

The furnace wall tubes will be studded and covered with 85 percent silicon carbide refractory to an elevation of 40 feet, 6 inches above the operating floor. Stud density will be approximately 160 studs per square foot of flat projected wall area.

3.6.11 Tube Cleaning

Cleaning of the superheater section will be accomplished by mechanical rapping. The steam generating and economizer sections will have independent rapping systems. This arrangement will permit cleaning each section as required.

3.7 Spray Dryer Absorber/Baghouse

3.7.1 Sources of Pollutants and Method of Control

3.7.1.1 Odor from Refuse Storage Pit and Tipping Floor

Air from this area, including any odor that may be present, will be ducted to the boiler and used as combustion air. The odors will be destroyed by incineration in the furnace.

3.7.1.2 Fugitive Dust from Ash Handling System

Bottom ash from the boiler will be handled in a moist condition eliminating a potential fugitive dust problem. Fly ash will be transported in closed conveyors to the ash conditioners where it will be wetted and added to the boiler bottom ash. The boiler bottom ash is conveyed to a "grizzly", which is a coarse vibrating screen. The damp ash falls through the grizzly onto a conveyor where a magnet removes ferrous metal. The non-magnetic ash can be loaded directly into a truck, or placed in storage by the front-end loader. The larger objects, usually metallic, that go over the grizzly are stored in the ash building with the ferrous metal. A manual wet down system is provided to dampen the metal and ash prior to loadout.

3.7.1.3 Boiler Flue Gas

Flue gases exiting the boilers contain the following major pollutants:

- o Particulate matter
- o Sulfur oxides (SO_2 and SO_3)
- o Nitrogen oxides (NO_x)
- o Acid halides (CHl and HF)
- o Carbon monoxide

Nitrogen oxides and carbon monoxide are controlled to minimum values by efficient management of combustion in the boiler.

Acid halide gases and sulfur oxide gases will be controlled by a spray dryer/absorber (SDA) (dry scrubber) using lime slurry as the scrubbing media.

Particulate matter exiting the furnace and particulate generated in the SDA will be removed from the flue gas by a baghouse.

Clean flue gas will be discharged to the atmosphere through a separate flue for each boiler in a concrete stack. Each flue will be 5.5 feet in diameter. The stack will be 170 feet high. A spare flue will be provided for the future boiler.

An induced draft fan will move the flue gases through the gas cleaning system.

3.7.2 Air Pollution Control System Components

The boiler flue gas air pollution control system battery limits begin at the economizer outlet of each boiler and end at the stack discharge (see Figure 5). The major components of the system are:

- Two SDA's
- Two baghouses
- Two induced draft fans
- One stack with three flues
- Two sets of ductwork
- Two environmental test stations located at the induced draft fan inlet
- One continuous emission monitoring system (CEMS) with sample points located at each induced draft fan inlet and at the SDA inlet. Two sets of analyzers will be provided (one set for each boiler) to transmit data to a single environmental-report-generating computer and to the slurry control system for each SDA.

3.7.3 Procurement and Installation of Equipment

The flue gas cleaning systems will be supplied and erected by Wheelabrator Air Pollution Control (WAPC), an affiliate of RUST International Corporation, with the exception of the induced draft fans, fly ash removal system, the CEMS and instrumentation located in the control room.

3.7.4 Design Criteria

The air pollution control systems and equipment will be designed to achieve the following emission limitations:

- Total suspended particulate (TSP) shall not exceed .0184 grains per dry standard cubic foot (DSCF) when the gas volume is adjusted to 12 percent CO_2.
- Opacity shall not exceed 10 percent as measured by a transmisometer.
- Sulfur dioxide (SO_2) shall not exceed 50 PPM dry volume at 7% O_2.

- Hydrogen chloride (HCl) shall not exceed 50 PPM dry volume at 7% O[2].

The maximum flue gas flow rate from each boiler will be 130,000 ACFM at 475 degrees Fahrenheit. These gases will be cooled to 250-280 degrees Fahrenheit in the spray dryer and will exit the stack at 230-260 degrees Fahrenheit having decreased to a volume of 115,000 ACFM. Approach to water dew point is 100 degrees Fahrenheit.

Each SDA will be a steel vessel 20 feet in diameter by 84 feet high from the gas inlet at the top to dust outlet at the bottom. Flue gas residence time is 10 seconds. Lime slurry will be sprayed into the hot flue gas through multiple two-fluid nozzles using compressed air for atomization.

Each fabric filter will be the shake-deflate type with two rows of filtering compartments, each row containing 3 compartments (6 compartments per boiler). The gross air-to-cloth ratio will be 3.31:1. With one module off, the ratio is 3.97:1. Filter bags will be constructed of fiberglass fabric treated with acid resistent finish. The fabric filter hoppers will be heated over their bottom one-third and will be provided with:

- Hopper door with key interlock
- Hopper ash level probe
- Vibrator/Thumper
- Insulation

Fly ash rapped from each field will fall into a trough type hopper serving that field for removal via screw conveyors and double dump valves.

A lime slurry preparation system with pumps, tanks, and slakers capable of supplying both spray dryers will be provided.

The slurry preparation system will be fed from a 80 ton capacity pebble lime storage bin. Two lime slakers each with a capacity of 2,500 pound per hour will be supplied. The second slaker is an installed spare. An agitated 7-hour capacity lime slurry storage tank will be provided. One 2-hour capacity dilution water tank will be included. All pumps in the lime slurry system will have installed spares to ensure continuity of slurry flow to the spray dryers.

3.7.4 Concept of Operation

Hot flue gases exit each boiler economizer and are ducted to the SDA (see Figure 5). The flue gases enter the vertical cylindrical SDA chamber through a top gas flow distributor. Aqueous slaked lime slurry is sprayed into the SDA's using compressed air atomizing nozzles located downstream of the gas distributor. Water in the droplets evaporates quickly cooling the gases. The acid gases react with the reagent to form a collectible dry power, a portion of which falls to the bottom of the SDA where it is removed. Treated cooled flue gas containing a substantial fraction of entering fly ash and dried acid gas reaction products (powder) flows to the baghouse where the fly ash and powder mixture is collected and removed from the flue gas.

From the baghouse, the flue gases flow past an environmental test station and the CEMS sample probe to the induced draft fan. A 170 foot high stack discharges the cleaned flue gases to the atmosphere.

The lime storage and slurry preparation facility will receive pebble lime (calcium oxide) via pneumatic-self-unloading truck and store it in a vertical cylindrical silo with a conical bottom. Lime from the silo will be metered to a slaker, where it will be mixed with water to form aqueous lime slurry. The slurry will be screened for grit removal, stored in an agitated tank, diluted with water and pumped to the SDA's for atomization and reaction with acid gases.

3.7.6 Continuous Emission Monitoring System (CEMS)

A CEMS with sample points located at the SDA inlet and the baghouse outlet will be provided. The system will consist of field mounted analyzers, one set per boiler, and one emission report generating system. The report generating system will consist of a computer, printer, alarms, and a cathode ray tube (CRT) readout. The CEMS will measure the concentration of controlled pollutants and prepare an excess emissions report for the Washington State Air Pollution Control Board. The excess emissions report will include:

- Excess emissions, duration and magnitude
- Reason for the excess emissions
- Calibration events (the CEMS checks its own calibration on a daily basis)
- Quality of operation (in operation off line, how long, etc.)

Excess emissions will be reported from each boiler for CO measured at the SDA inlet. CO_2 and/or O_2 will also be measured at the SDA inlet. Opacity and SO_2 will be measured at the baghouse outlet. The SO_2 analyzer will generate a signal that will be used to control the lime absorbent flow to the SDA.

3.7.7 Buildings and Structures

The spray dryer, baghouse, induced draft fan and stack will be located outside on the east side of the boiler building. Platforms, walkways, stairways and other accessways will be provided.

The lime slurry preparation system will be located in a building southeast of the boiler building. Access for lime hauling trucks will be provided.

The CEMS analyzers for the boilers will be located in a building near the stack base. The CEMS computer, panel, alarms, and printer will be located in the main control room.

3.8 Water Treatment

This area includes potable water distribution, boiler feed water treatment, boiler water chemical feed systems, and cooling water system.

3.8.1 Design Criteria

3.8.1.1 **Potable Water:** A potable water distribution system is provided for drinking and sanitary purposes. Water fountains and sanitary facilities are included.

3.8.1.2 **Boiler Feed Water Treatment:** A boiler feed water treatment system (two trains) is provided to treat water for the boilers. All condensate is returned except for miscellaneous uses. No condensate polishing equipment is included.

3.8.1.3 **Boiler Water Chemical Feed Systems:** Three skid-mounted chemical feed systems are included for treatment of boiler water. Two of the systems include one tank for each feed system and one pump for each boiler plus an installed pump for the future boiler. The third system includes one tank and two pumps which feed the deaerator.

3.8.1.4 **Cooling Water System:** A cooling water system is included for condensing the steam in the turbine condensers and for cooling the auxiliary equipment.

The city water supply is used as a make-up to the cooling tower. This water is also used as the primary fire water source and as a back-up source of dilution water for the spray dryer absorber.

3.8.2 Concept of Operation

3.8.2.1 **Boiler Feed Water Treatment:** The concept of operation for the boiler feed water treatment system includes demineralization and storage.

A two-train demineralizer system with carbon filter is provided to remove minerals chlorine and organics from the water supply. The system includes acid and caustic storage tanks and pumps for regenerating the anion and cation resins. The waste regenerated is stored in the neutralization tank until both anion and cation resins are regenerated. After mixing the two wastes, the mixture is neutralized and metered to the wastewater system for reuse.

Demineralized water is stored in a tank sized for one boiler fill. Normal make-up to the boilers is to the hot well of the surface condenser. Demineralized water pumps provide boiler fill water, make-up water to the deaerators as required, and water for other miscellaneous uses. The pumps are sized to quickly fill the boiler to minimize fill time and to provide water for boiler upset conditions.

3.8.2.2 **Boiler Chemical Feed Systems:** Either dry or liquid chemicals are diluted with demineralized water in a mix-and-use tank for each chemical feed system. The diluted mixture is then pumped to separate injection points for each boiler or deaerator. The capacity of each pump is manually adjustable to vary the chemical supply as determined by boiler water analyses.

3.8.2.3 **Cooling Water System:** A wet/dry evaporative cooling tower is included in the system to reject heat from the main condenser and dump condenser as well as miscellaneous heat exchangers. A two speed fan motor for each cell is manually controlled. The cooling tower will be the plume abatement type. The tower will be expandable for additional cells in order to increase capacity. Additives to the cooling water system include acid, chlorine, corrosion inhibitor, non-oxidizing biocide, and dispersants. City water is used for cooling tower make-up.

Cooling water pumps circulate cooling water through the turbine condensers, the bypass condenser, and back to the cooling tower. Cooling water booster pumps increase a side stream pressure for cooling the auxiliary equipment heat exchangers.

An alternate has been included for an air cooled condenser in place of the surface condenser and cooling tower. The alternate includes a small wet type cooling tower for auxiliary cooling.

3.8.3 Instrumentation and Controls

3.8.3.1 **Potable Water:** All potable water including that used for process, except fire water, is metered. Detection check valves are provided for potable water fire lines.

3.8.3.2 **Boiler Feed Water Treatment:** The flow rate of potable water through the demineralizer is controlled by the water level in the demineralized water storage tank. The set point level normally keeps the storage tank at a predetermined level. The demineralized water pumps are started on system demand.

3.8.3.3 **Boiler Chemical Feed Systems:** All boiler chemical feed pump capacities are manually adjustable. Pressure indicators are provided for pump discharges.

3.8.3.4 **Cooling Water System:** Make-up water cooling tower blowdown, and cooling water acid addition are all automatically controlled. Make-up water is level controlled, blowdown is conductivity controlled, and acid addition is pH controlled. Temperature indicators are located before and after the condenser and in the cooling tower hot water return.

3.8.4 Buildings

The potable water distribution system, the boiler feed water treatment system, the boiler water chemical feed systems, and the cooling water chemical additives, except chlorine, are all located within the main building. The cooling tower basin, the cooling water pumps, and the chlorination building are located outside the main building.

3.9 Electric Power Generation

The Facility will be constructed with a turbine-driven electric power generator. The turbine will be designed to operate as a straight condensing unit with uncontrolled extractions. All electric power not used by the plant will be sold. The turbine generator will be controlled to maximize the power supplied to the transmission system.

In the event of a turbine shutdown or partial shutdown of the exhaust steam surface condenser, the steam from the boilers will be directed to a bypass condenser which will condense it for return to the boiler feed water system.

The area will also include the required auxiliary equipment and systems to make a complete operating system. These will include:

- Lubricating oil system
- Electrohydraulic turbine control system
- Exhaust steam condensing system
- Condensate system
- Bypass condenser
- Maintenance provisions
- Building heating and ventilation systems
- Generator excitation systems
- Generator control systems
- Generator and plant switchgear
- Plant switchgear

- Metering of gross power generated
- Metering of power delivered to Washinton Water Power Company
- Metering of station service power
- Station battery
- Capacitors for power factor generation
- Voltage regulator

3.9.1 Turbine Generator Design

The turbine generator and auxiliaries will be designed for continuous operation, 24 hours a day, 365 days a year. The turbine generator will be designed to operate with throttle steam of 850 PSIG/825 degrees Fahrenheit under normal conditions, with the capability of operating at a 5% overpressure with valves wide open (VWO).

Steam from the refuse-fired boilers will be combined and piped to the inlet trip valve of the turbine. The turbine will have one uncontrolled extraction. The uncontrolled extraction will supply steam for the deaerator heater.

3.9.1.1 Exhaust Steam Condensing System: The exhaust steam from each turbine will be connected to a shell-and-tube surface condenser. A steam jet air ejector and hogging ejector system will be supplied to remove the noncondensibles. The condensed steam from the steam jet air ejector system will be discharged to the condenser hotwell.

3.9.1.2 Cooling Water System: The exhaust condenser will utilize a cooling tower system for heat removal. The cooling tower will be designed for the following operation:

o Flow (GPM)	17,500
o Inlet water temperature (Fahrenheit)	96
o Outlet water temperature (Fahrenheit)	76
o Wet bulb temperature (Fahrenheit)	64
o Plume abatement	No plume with temperatures as low as 0 degrees F WB/0 F DB

A chlorine solution will be added to the cooling water system to minimize biological incrustations. The chlorination system will include a vacuum operated chlorinator to meter gaseous chlorine from 1-ton containers through a water eductor and into the cooling water supply line. The system is capable of feeding approximately 1,500 pounds a day of chlorine at maximum flow rate. The chlorine solution can be fed either continuously or on a shock basis.

Sulfuric acid will be added for pH control. Addition of the acid will be automatically controlled. An inhibitor/dispersant will be added automatically. Control of the feed rate will be based on cooling tower blowdown, which in turn is controlled by conductivity of the blowdown.

3.9.1.3 Condensate System: The condensate system is designed with two full-capacity hotwell pumps for condensed steam from each surface condenser. The condensate will circulate through the inter-condenser and after-condenser of the steam jet air ejector, and will be pumped to the deaerating heater and feed water storage tank.

3.9.1.4 Miscellaneous Cooling: Miscellaneous cooling loads will be taken from the cooling tower-condenser loop. Two pumps will be provided to boost water pressure through the various components and return the water to the cooling water.

3.9.1.5 Turbine Lubricating Oil: A turbine lubrication oil system will furnish bearing lubrication for each turbine generator unit by means of a central oil system with redundant features and emergency capabilities. Each system will include two full capacity AC motor-driven pumps and a DC motor-driven emergency oil pump. The DC-powered pump will permit the turbine to be brought to a safe stop in the event of the loss of AC power. The DC motor will be powered from the 125-volt station battery.

The turbine lube oil will be continuously filtered and polished in a recirculating turbine oil conditioner designed to treat the entire oil charge five times a day.

3.9.1.6 Electrohydraulic Controls: A separate high-pressure non-flammable oil system with redundant features will be supplied to actuate the turbine control.

3.9.2 By-Pass Condenser

In the event of a shutdown of either turbine or partial shutdown of either surface condenser for maintenance, refuse burning and boiler operation will be continued. Steam generated in the boilers will be bypassed to steam dump condensers and condensed for use as boiler feed water.

The bypass condenser will be of a shell and tube design, with steam on the shell side, and cooling water on the tube side.

3.9.3 Switchgear

The 15 kV metal-clad switchgear will be constructed for indoor service and suitable for use on a 13.8 kV, three-phase, three-wire, 60 Hz system with a basic insulation level of 95 kV. Breakers will be metal enclosed, drawout vacuum type, operated by an electrically charged, mechanically and electrically trip-free, stored-energy-operated mechanism. The breaker control voltage will be 125 volts DC, supplied by storage batteries located in the turbine generator building. Breakers will be rated at 15 kV maximum RMS voltage, with short circuit and continuous current ratings to match system requirements.

The 5 kV switchgear will be the general attributes of the 15 kV equipment, will be suitable for use on a 4.16 kV, three-phase, three-wire system, and will have a basic insulation level of 60 kV with maximum operating voltage of 4.76 kV.

One metering system will meter the energy supplied by the generator.

A second metering system will measure the energy flow in the utility tie.

A third metering system will be used to measure the plant load.

3.10 <u>Wastewater Treatment</u>

The wastewater treatment system includes collection and to the maximum extent possible, reuse of all wastewater with the exception of sanitary waste. Sanitary wastewater is collected separately and flows to the City sanitary sewer. Any excess process wastewater is discharged to the sewer.

All process areas are under roof; therefore, stormwater run-off from the plant site is uncontaminated and does not require containment or treatment.

3.10.1 Concept of Operation

The concept of operation for wastewater treatment is to collect both contact and non-contact wastewaters separately and reuse all water in cooling and wetting the bottom ash, and as dilution water for the spray dryer absorber. Contact wastewater, specifically, is water which has either been in contact with ash, scrubber chemicals, or used to clean the fire side of the boiler tubes, and is high in solids content. Non-contact wastewater is all other wastewater from the Facility except storm and sanitary.

The non-contact wastewater includes backwash from the activated carbon filters, neutralized demineralizer regenerate, cooling tower blowdown, condensate, boiler blowdown and drainage, and floor drains from non-contact areas.

The contact wastewater is collected from the various areas of the facility and conveyed to a sump where solids settle. Overflow from the sump is them pumped to a large storage tank where it is neutralized and used as a make-up water to the ash expeller units and spray dryer absorber.

Solids which settle in the contact wastewater sump are periodically removed and landfilled with the bottom and fly ash.

When contact wastewater is not available as make-up, non-contact wastewater or raw water is used.

The non-contact wastewaters are collected in a sump and are normally pumped to the contact wastewater holding tank. If the non-contact wastewater is not needed, the wastewater is pumped to the sanitary sewer.

3.10.2 Instrumentation

3.10.2.1 Contact Wastewater: Wastewater which overflows the weir in the settling area of the contact water sump is automatically pumped to the wastewater holding tank. The pumps are controlled with a level switch and the wastewater is neutralized with caustic and lime before storage in the wastewater holding tank.

3.10.2.2 Non-Contact Wastewater: The non-contact water sump is basically a sump with minimum water storage. The non-contact water is automatically pumped to the contact sump for use when the water level allows.

3.11 Ash Handling

The ash handling system includes the facilities, equipment and operational concepts required for the collection and handling of grate riddlings and bottom ash residue, as well as for recovery of fly ash from boiler convection sections and air pollution control equipment. Methods for storage and transport of ash from the plant are described.

3.11.1 Design Criteria

The following design data are based on recovery of ash in a wet state. Ash quantities will result from the firing of two boilers at a combined initial rate of 800 tons of refuse per day with capacity to handle three boilers at a combined rate of 1,200 tons per day. Moisture content of the bottom ash will be about 18 percent by weight. Fly ash will be mixed with water to control dusting and be combined with the bottom ash on the bottom ash vibrating conveyor.

3.11.2 Design Considerations

A system of 8 hoppers for each furnace, plus 2 for the ram feeders, will receive the gravity flow of grate riddlings. Primary air for combustion will be ducted to each riddlings hopper. Each hopper will be fitted with a hinged inspection door.

The hopper discharge outlets will be fitted with single, air-operated, flapper valves. Opening the gates in sequence will permit the riddlings to flow through the gate to a drag conveyor for conveying to the bottom ash vibratory conveyor.

3.11.2.1 **Boiler Fly Ash System:** There will be one boiler fly ash collecting hopper for each boiler.

An air-operated, double-flapper, air seal valve will be located at the discharge outlet of the hopper. Fly ash will be fed into one boiler ash expeller through the boiler ash chute.

3.11.2.2 **Ash Handling System:** At each of the two baghouses, collecting screw conveyors will receive fly ash from each collecting field. The screw conveyors will discharge through seal valves to a common transfer drag conveyor which will convey the baghouse fly ash and the SDA fly ash to the fly ash conditioners (see Figure 5).

A seal valve and a drag conveyor will be located below each of the two SDA's. The SDA conveyors will discharge to their respective boiler's fly ash transfer drag conveyor.

3.11.2.3 **Bottom Ash Removal System:** Bottom ash from the grates of each furnace will be quenched and combined with the boiler fly ash in ram type ash expellers. Each water-filled ash expeller will push bottom ash up an inclined section to be dewatered. Ash will exit the dischargers at a moisture content of approximately 18 percent.

3.11.2.4 **Bottom Ash Conveying System:** Bottom ash from the ash expellers which will include the grate riddlings will be discharged onto the bottom ash vibrating conveyor.

The bottom ash vibrating conveyor will feed an inclinded belt conveyor which transports the ash to a grizzly scalper. The grizzly scalper will remove the ± 10 inch material (mostly metal) from the bottom ash. The -10 inch material (mostly ash) will pass through the grizzly deck onto a vibrating conveyor. A drum magnetic separator located above the vibrating conveyor will remove magnetic ferrous metal from the -20 inch ash. Magnetic ferrous metal and grizzly overs will be discharged into the storage area. The remaining material will be loaded directly into the ash truck, or discharged onto the floor in the storage area. Ash and metal will be moved into storage or loaded into trucks by front-end loader. Three days storage (at the expanded facility site) are provided.

3.11.2.5 **Ash Conditioning System:** The fly ash from the transfer drag conveyors will discharge into the ash conditioners.

In the ash conditioners, the dry fly ash will be dampened to eliminate dust, then will discharge by gravity onto the bottom ash vibrating conveyor.

3.12 Buildings

A main process building will house the refuse receiving and handling area, refuse boilers, turbine generator, boiler feed water system, air pollution control system, ash handling systems, warehouse, personnel, maintenance, and control systems.

The Administration Building shall house all administrative and accounting offices, conference rooms, clerical areas and restrooms. The building will be approximately 75 feet by 45 feet by 15 feet high. The Administration Building will be a pre-engineered steel structure with metal siding and roofing. Walls and roof will be insulated with batt insulation. Interior positions will be drywall on metal studs. The ceiling will be acoustical lay-in tiles. Flooring will be carpet, resilient tile and ceramic tile.

Other structures will be the fire pump house, valve house, chlorine storage building, scale houses and ash storage, and reclamation building.

3.12.1 Main Plant Building

The main plant building is divided into six areas: the refuse receiving and handling area, boiler area, air pollution control area, ash handling area, water treatment area, and the turbine generator area. These areas are totally consoled with metal siding and metal roofing, except where noted otherwise. The building will generally be uninsulated, although insulation will be used as required where building space is heated and cooled.

Access stairs, ladders, and platforms will be provided to all equipment requiring service and to test locations. All stairs, ladders and platforms will be in accordance with the applicable OSHA regulations.

3.12.1.1 Refuse Receiving and Handling Area: The refuse receiving and handling area consists of two refuse receiving areas (one for hand unloading and one for self-unloading), a receiving pit for hand unloading vehicles and the main storage pit which also serves as the receiving pit for the self-unloading vehicles. Skylights will be provided to allow daylighting of the receiving areas. The self-unloading area is approximately 142 feet by 133 feet by 30 feet high. The hand unloading receiving area is approximately 50 feet by 240 feet by 28 feet high. The receiving pit area is approximately 40 feet by 240 feet by 30 feet high. These areas will be completely enclosed with precast concrete panels and uninsulated standing seam roof.

The refuse storage pit building is approximately 78 feet by 244 feet by 120 feet high and will house the reinforced concrete storage pit and crane lay-down areas. The pit will be 50 feet by 142 feet by 40 feet deep. The control room, water treatment facilities, laboratory, offices, toilets, MCC room, electrical equipment, HVAC equipment, and storage rooms will be located below the charging floor on the south side. The maintenance shop, warehouse, men and women's lockers, lunch room, E & I shop, MCC room, electrical equipment, HVAC equipment and storage room will be located below the charging floor on the north side.

Enclosed stairways will be located in the refuse receiving and handling area on the north and south side of the pit.

The refuse pit building will be enclosed with the uninsulated metal wall panels and will have an uninsulated standing seam metal roof.

3.12.1.2 **Boiler Area:** The boiler area will house the two refuse-fired boilers, complete with associated equipment. The boiler building is approximately 97' x 67' x 150'. Generally, the building exterior walls will be uninsulated metal siding, and the roof will be insulated standing seam type.

Interior walls and partitions will be masonry construction or drywall with view windows where required. These spaces will be insulated where heating and air conditioning are required.

Enclosed stairways will be located in the boiler building in the north and south sides.

3.12.1.3 **Ash Handling Building:** The ash handling area will house the conveyors, truck loadout station and truck lanes for ash removal. The building is approximately 80 feet by 90 feet by 55 feet high with uninsulated metal siding and will have an uninsulated standing seam roof.

3.12.1.4 **Water Treatment Area:** The water treatment equipment, except the chlorination equipment, will be located in the main building in the area below the charging floor in the pit building. Water distribution and treatment equipment, located outside of the main building, include the fire pumps and chlorination equipment. The fire pumphouse, valve house, and chlorine storage building will be constructed of load-bearing masonry with open web joists and insulated standing seam metal roof.

3.12.1.5 **Turbine Generator Area:** The turbine generator area will be adjacent to the boiler area. The building is approximately 60 feet by 55 feet by 65 feet high and will house the turbine generator switchgear, battery and UPS rooms, and auxiliaries. The building will be closed with uninsulated metal siding and insulated standing seam roofing.

3.12.1.6 Air Pollution Control Area: The air pollution control equipment will be enclosed by a building approximately 125 feet by 67 feet by 125 feet high. The building will house the spray dryer absorbers, baghouses, and induced draft fans. The building will have uninsulated metal wall panels and uninsulated standing seam roofing.

3.12.2 Scale House

The scale house will be a building approximately 22 feet by 10 feet by 12 feet high, and will consist of a scale operator room, operator's toilet and driver's toilet. The building will be constructed of light gage metal framing enclosed with metal siding and standing seam roof. Batt insulation will be provided in the walls and roof.

3.12.3 Construction Materials

Building construction materials will conform to the requirements of all applicable local, state, and federal codes and standards and all applicable trade specifications.

3.13 Environmental Controls

3.13.1 Noise Control

The primary noise sources for a combustion facility are the waste-delivery and combustion-byproduct trucks. Other primary noise sources are the induced draft (ID) fans, ID fan housing, ID fan motors, and the cooling towers. It is not expected that any of this equipment would contribute, alone or in combination, to noise levels in excess of applicable noise standards.

Construction noise impacts would be minimized by using mitigation measures described in the U.S. Environmental Protection Agency Region X noise guidelines (USEPA Region X, 1975). Some of these measures include the use of electrically-powered equipment rather than pneumatic, ensuring that all vehicle mufflers are in good working order, avoid prolonged idling of pumps and compressors, and utilizing portable barriers for shielding specific equipment items.

Several mitigation strategies will be incorporated in the design of the proposed waste to energy facility to further reduce noise impacts. The cooling towers will be located to take optimum advantage of site attenuation, and fans will be silenced to a practicable extent. Design of the facility will minimize the need for packer trucks to queue for excessive periods. Acoustic material will be applied to stationary equipment which might produce noise such as ID, induced draft, fans, fan motors, etc. In addition, reduction of cooling tower noise at night may be implemented. This could involve a slower cooling tower fan speed used at night, or a reduction in the number of fans used. Additional noise control techniques which may be included in the facility design are:

- Silencers on all steam and air vents
- Air intake filter/mufflers for compressors
- Wrap stack breechings and induced draft fans
- Locate all steam system equipment with buildings

Earthen berms will also be placed where needed to minimize noise dispersed at ground level. Consideration of noise impact would be given at all stages of facility design to assure negligible noise impact with respect to existing ambient noise levels and Washington State noise regulations.

3.13.2 Vermin Control

The Facility will contract out with a local exterminator to provide pest control. This system has worked well at other facilities as the exterminator will make scheduled inspections and correct any problems.

Another control is that the refuse is being stored in the pit and the lowering of the refuse level in the pit every week (ie: Monday a.m. after the weekend).

3.14 Facility Equipment

3.14.1 Types and Numbers of Equipment

Appendix B, Detailed Facility and Equipment Data, lists the types and numbers of equipment to be used at the facility. The Appendix also provides operating ranges and/or specifications for each type of equipment or assembled unit.

3.14.2 Source of Reserve or Emergency Equipment

In Part E, Miscellaneous Information, of Appendix B, Detailed Facility and Equipment Data, a spare parts and tools list will be developed with the cooperation of suppliers once purchase of the original parts have been made.

PART 4. SUPERVISION/SAFETY

4.1 Facility Staffing

The Facility will be operated by approximately 37 employees. The employees can be categorized according to three major functional groups: 4 administrative personnel, 24 operating personnel, and 9 maintenance personnel. The following table shows an organizational chart of the Facility staffing:

PLANT STAFFING

Administration	
*General Manager/Operation Manager	1
*Controller	1
Bookkeeper/Records Clerk	1
Secretary/Receptionist	1
SUBTOTAL	4
General Operations	
*Operations Supervisor	1
Purchasing Agent	1
Laborers	4
SUBTOTAL	6
Shift Operations	
#Lead Plant Operators	4
Assistant Plant Operators	4
Furnace Feeders	4
Utility Operators	6
SUBTOTAL	18
Maintenance	
*Superintendent	1
Maintenance Personnel	8
SUBTOTAL	9
TOTAL PLANT PERSONNEL	**37**

*Indicates Operating Plant Management
#Performs Shift Supervision Function

New employees will be trained at other Signal waste to energy facilities prior to completion of construction. Some positions will be filled by transferring experienced operators from other Signal facilities on a full-time basis.

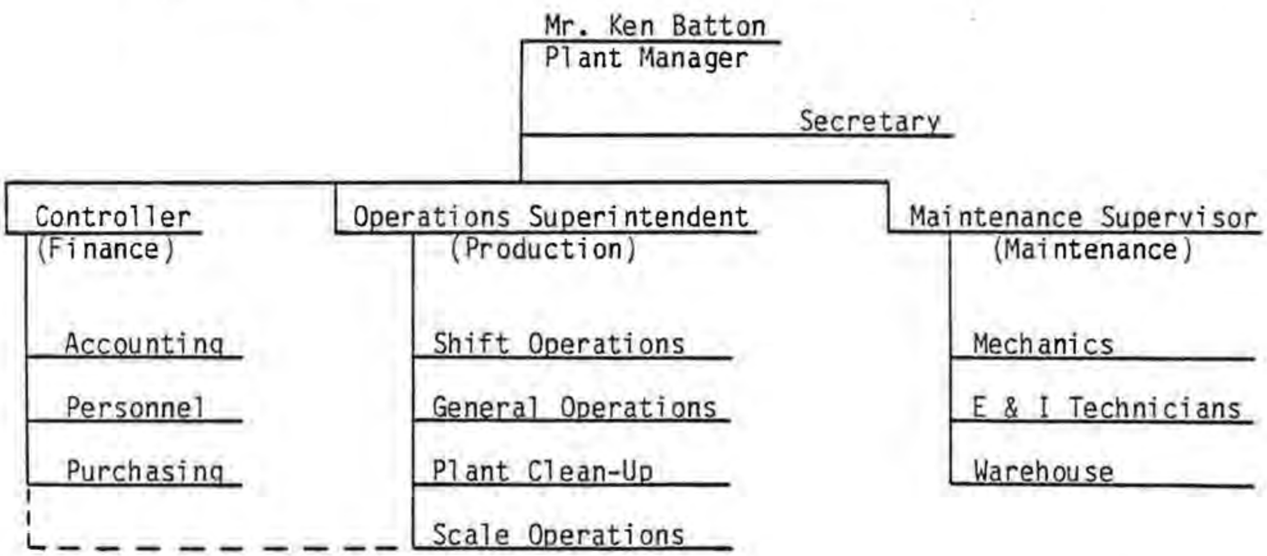
4.2 Hours of Operation

The Facility will be operated 365 days per year, 24 hours per day. Continuous operations will be maintained by establishing four working teams of personnel. On any one day there will be three working shifts, so that over the course of a year, each team will work 13 weeks at 6 days per week and 39 weeks at 5 days per week.

4.3 Responsible Personnel/Supervision

At this time, Signal Environmental Systems, Inc. has only one employee in the region, Mr. Ken Batton. Mr. Batton will be the responsible official during construction and operation of the facility for Signal.

The following table reflects the organization chart for the facility and identifies, by work classifications, the chain of command and supervision.



4.4 Emergency Communications

The Facility will implement an Emergency Action Plan prior to operation. This plan is developed to be consistent with the emergency facilities available at the plant and within the region the plant is constructed. The plan will be developed in accordance with Signal Environmental Systems, Inc. guidelines and procedures as follows:

SESI
Procedure No. B-2, Issued: 1/22/87
EMERGENCY ACTION PLAN

1.0 SCOPE

1.1 This procedure contains the requirements for developing and documenting an Emergency Action Plan in Accordance with OSHA standards and insurance industry recommendations.

2.0 REFERENCES

2.1 U.S. Department of Labor
Occupational Safety and Health Administration
General Industry Standards
Part 1910 of the Code of Federal Regulations
Section 1910.38 (a), Emergency Action Plan

3.0 RESPONSIBILITIES

3.1 Responsibility for compliance with this procedure rests with the Operations Manager in regard to developing, documenting, and enforcing the Emergency Action Plan and with respect to handling emergencies in general.

3.2 Each employee is responsible for the specific emergency duties assigned to him/her by the supervisor or manager and for observing emergency action requirements in general.

4.0 DEVELOPING THE PLAN

4.1 All reasonably-expected emergencies shall be identified and addressed in the Emergency Action Plan. Emergencies should be categorized and/or grouped together according to their nature and how and by whom they are handled.

4.1.A Emergencies such as bomb threats, riots, demonstrations, work stoppages, etc. require management to take administrative action and, in some cases, perform operations-related activities. Matters involving public and media relations should be handled through proper corporate channels. All management and staff personnel involved in these types of emergencies should be informed of their duties and responsibilities, and these should be documented, as appropriate.

4.1.B For natural disasters, all precautions necessary to protect personnel and plant equipment should be documented and appropriately posted in the facility.

4.1.C Fire/explosion emergencies shall be handled in accordance with the fire response plan required by Prodecure No. D-1, Paragraph 5.1.D.

4.1.D. The plan should address emergency conditions related to the facility, equipment and operations such as utilities' outages, sprinkler leakage, release of hazardous materials, equipment malfunction, etc. These emergencies may arise by themselves or may result from emergencies discussed in the preceding paragraphs. Critical conditions requiring prompt action should be covered by documented procedures which are made available to all involved persons.

4.2. The Emergency Action Plan shall identify the means by which employees are made aware of emergency conditions and appropriate persons/organizations are summoned for assistance, as required.

4.2.A Emergency signals, whether activated automatically or manually, should be supplemented by a backup means of communication in the event of a power failure.

4.2.B The Emergency Action plan should state the proper response to emergency signals (evacuate, provide assistance, summon outside help, etc.) and the specific responsibility of each individual or group in this regard.

4.2.C The Emergency Action Plan should list the names and telephone numbers of persons/organizations to be summoned in an emergency and the employee(s) responsible for making such calls. Where an alarm is automatically transmitted to outside help (such as fire or police departments), confirmation of the notification should be made immediately.

4.3 The Emergency Action Plan shall include evacuation procedures and escape routes and a means of accounting for all employees.

4.3.A Evacuation procedures and escape routes should be posted at conspicuous locations within the facility. Special attention should be given to isolated or remote locations and enclosures or confined spaces where an occupant may require assistance.

4.3.B The Emergency Action Plan should establish a system for accounting for all employees at all times during an emergency.

4.4 The Emergency Action Plan should address, as appropriate, the operation and/or shutdown of critical equipment and processes during an emergency. The operation of fire suppression equipment shall be addressed in the fire response plan (Procedure No. D-1, Paragraph 5.1.D).

5.0 TRAINING and PRACTICE

5.1 All employees shall be properly trained in implementing the Emergency Action Plan, and practice exercises should be conducted at regular intervals not less than annually to assure that responses to emergencies are prompt and appropriate to the emergency condition.

6.0 DOCUMENTATION

6.1 The Emergency Action Plan shall be documented as described within this procedure with copies readily available for reference and use by employees and for review when requested by an OSHA representative.

6.2 Training classes and practice sessions should be documented with the records maintained on file.

4.5 Method of Fire Protection

Fire fighting at the Spokane facility shall conform to the following requirements.

All employees shall be trained in the use of fire extinguishers and Class II (1-1/2") standpipe and hose systems. Training shall be conducted at least once a year by the local fire department or other qualified organizations.

Upon discovery of a fire, the local fire department shall be summoned immediately. While the fire is in its initial or beginning stage, employees shall respond, as directed, to fight the fire using extinguishers, Class II standpipe, and hose systems. If the fire cannot be controlled by this equipment, or if fighting the fire requires protective clothing or breathing apparatus, all employees shall evacuate the facility. If the employees succeed in extinguishing the fire before the arrival of the fire department, the fire department shall be contacted so that it may recall its equipment.

For internal structural fires, the local fire department shall be summoned and all employees shall immediately evacuate the facility.

The Facility shall develop a fire response plan listing general procedures in the event of a fire and also identifying specific individuals and their responsibilities. Copies of the plan shall be posted at conspicuous locations throughout the Facility.

4.6 Safety Manual

The Facility will have a comprehensive safety program with the objective of providing a safe and healthful place of employment for the plant's employees.

A safety manual has been developed, and enclosed as Appendix A in Exhibit "A" General Plan of Operations, of the solid waste disposal site permit, incorporating experience gained at other Signal facilities. This document includes a comprehensive discussion of such matters as first aid, personnel protection, safety record requirements, fire protection and prevention, laboratory safety, chemical and gas precautions, and special safety procedures.

PART 5. CLOSURE PLAN

5.1 Estimate of Closure Year and Cost

The Facility is current being designed for a minimum of a 20 year operation life. It is expected that at the end of the initial design life, the Facility will undergo any necessary rehabilitation and remain in service. As per regulations, a cost estimate will be prepared for closure of the plant. At this time, however, the final design has not been completed in sufficient detail to accurately determine the extent of and costs associated with closure of the Facility.

5.2 Methods of Closure

At the time of closure, all refuse will be removed from the receiving pit, all tanks will be drained, and any remaining ash will be disposed of. All ash and cleanup wastes will be disposed of at the landfill. Following cleanup and final inspection by regulatory agencies, all entrances will be locked and/or barricaded.

5.3 Closure Timing and Notification Procedures

No later than 180 days prior to receipt of the final volume of waste, the Owner will notify the Spokane County Health District of its intent to implement the closure plan. Implementation of the closure plan will begin within 30 days following receipt of the final volume of waste.

5.4 Final Inspection by Regulatory Agencies

Upon completion of the closure procedures, the Owner will submit to the Spokane County Health District an affidavit signed by the Owner's authorized representative and a professional engineer, licensed in the State of Washington, stating that the site has been closed in accordance with the specifications of the closure plan. When the health district finds the Facility to be adequately closed, it will issue to the Owner a Certificate of Closure.