



Operation and Management Plan

Connecticut Solid Waste System Resource Recovery Facility Hartford, CT

PREPARED BY:



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1 INTRODUCTION

This Operation and Management Plan (O&M Plan) is provided to the State of Connecticut Department of Energy & Environmental Protection (CT DEEP) by the Connecticut Resources Recovery Authority (CRRA) pursuant to Section 22a-208a of the Connecticut General Statutes (CGS) and Section 22a-209-4 of the Regulations of Connecticut State Agencies (RCSA). This O&M Plan has been developed in accordance with CT DEEP's Bureau of Waste Management DEEP-WEED-GUID-102 "Guidelines for Completing the Facility Plan for a permit to Construct and Operate a Resource Recovery Facility", Section D (Revision June 2002) to summarize information for environmentally safe operation and adequate facility management of the Connecticut Solid Waste System Resource Recovery Facility ("the Facility"). The Facility is owned by the Connecticut Resources Recovery Authority (CRRA) and operated by a third party contracted operator NAES Corporation.

The Facility, which is located in the South Meadow area of Hartford, is comprised of three components: a Waste Processing Facility (WPF), Power Block Facility (PBF) and Electric Generating Facility (EGF). Refer to the Location Plan, **Figure 1**. The WPF receives municipal solid waste (MSW), which is processed into refuse derived fuel (RDF), after non-processables, ferrous (and other trace metals), and small fraction residue (including glass and other small grit) are removed. The PBF combusts RDF in the three (3) municipal waste combustors to produce steam. The steam is then utilized in the EGF which contains two (2) turbine/generators, condensers and associated equipment to generate electric power. The facility historically had the ability to supplement the RDF with coal, although no coal has been processed since 2006.

Terms used in this O&M Plan¹ are as defined in CRRA's "Connecticut Solid Waste System Permitting, Disposal and Billing Procedures." A current copy of these procedures can be found in **Exhibit A**, which is attached to and made a part of this O&M Plan. The Procedures may be amended from time to time. The information contained in this plan regarding design of the facilities is considered proprietary to Combustion Engineering Resource Recovery Systems (CE), its successors and assigns, and is to be treated as such unless permission is received in writing to allow dissemination of said information.

1.1 The Waste Resource

Municipal Solid Waste is received on the tipping floor from CRRA's transfer stations and/or town haulers, coming from approximately 70 towns in Connecticut.

Pursuant to the State Solid Waste Management Services Act (SSWMSA), the State has charged the Connecticut Resources Recovery Authority with the responsibility for implementing solid waste disposal and resource recovery systems, facilities and services where necessary and

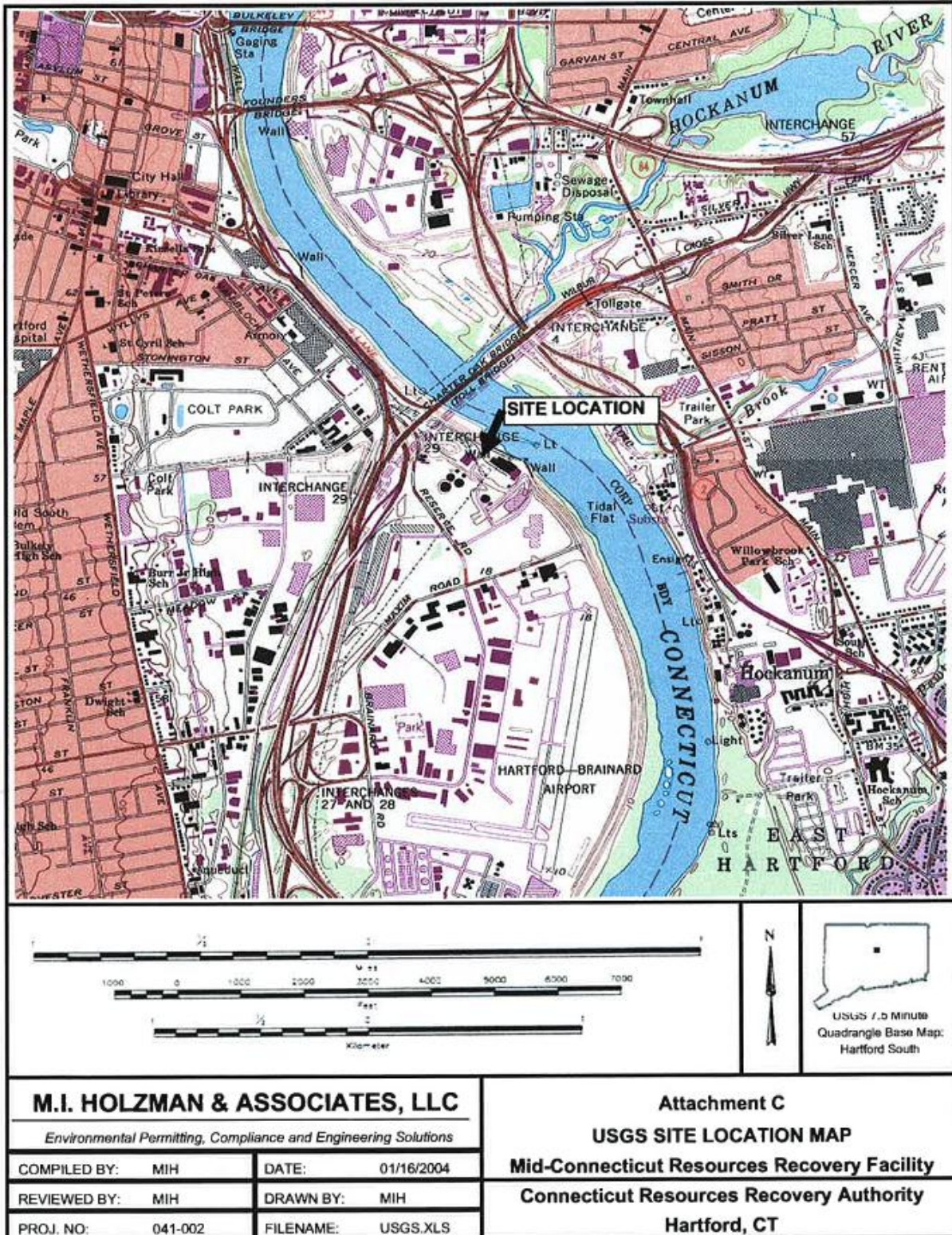
¹ An Operations and Maintenance Plan for the Connecticut Solid Waste System Resource Recovery Facility (dated November 5, 1987, rev. March 3, 1988) was submitted to CT DEEP as part of the Application Package for both the Permit to Construct and Operate a Regional Solid Waste Resource Recovery Plant—located on Reserve Road in the City of Hartford (dated April 4, 1985), No. 064-1WPM and a Temporary Permit to Operate (dated October 7, 1987) No. 064-6-RR. The Facility currently operates under a CT DEEP Bureau of Air Management Title V Operating Permit and three (3) NSR Permits.

desirable throughout the State and for producing revenues from its resource recovery operations sufficient to provide for the support of the CRRA and its operations on a self-sustaining basis.

The CRRA fulfills these responsibilities through coordination of projects with private industry to construct solid waste recycling, disposal and resource recovery facilities in conformance with the SSWSMA. The CRRA retains overall control and supervision of these projects in the following ways: by receiving funds or revenues from the sale of products, materials, fuels or energy in any form derived from the processing of solid wastes; by contracting with municipal and regional authorities to provide solid waste disposal services and charging and collecting fees for such service; and by providing for the transportation of solid waste and recovered resources anywhere within the State.

Figure 1

Facility Location Plan



2 FACILITY DESCRIPTION

The CRRA Connecticut Solid Waste System facility is located in the City of Hartford Connecticut. The site is located along the Connecticut River at 300 Maxim Road and 20 Reserve Road, Hartford, Connecticut. The site is comprised of approximately 70 acres of land and is bordered to the north and east by the Connecticut River, to the west by the Hartford Regional Market, and to the south by Maxim Road and Hartford-Brainard Airport.

The operation is comprised of two individual, yet interrelated process facilities. The Waste Processing Facility (WPF), occupies approximately 13 acres of the site, and the Power Block Facility (the PBF), occupying approximately 57 acres is located immediately north of the WPF. The Facility operates through membership and contractual arrangement from participating municipalities and private waste hauling companies to provide MSW, collected within the individual jurisdictions, which is then transported to the WPF portion of the facility for processing. Once processed, the final prepared RDF is transported through an interconnected conveyance system to the PBF for feed into the combustion process.

The RDF process differs from the mass-burn technology used at other trash-to-energy plants. To make RDF, MSW is processed two ways:

- First, recyclable metals and non-combustible materials such as grit, metal and glass are separated from the waste at the WPF. Recyclable commodities are shipped to processors.
- Second, remaining waste is shredded and conveyed to the PBF as fuel for combustion.

2.1 Waste Processing Facility (WPF) Description

The facility's objective is to reduce waste volumes by separating out metals and non-combustible materials suitable for recycling. The WPF receives approximately 880,000 tons of MSW per year from a population of greater than 1,000,000 people in 51 cities and towns throughout central and western Connecticut. This facility was designed and constructed in the late 1980s and has been in commercial operation since 1989.

The WPF system utilizes six key steps: manual picking from in-feeds, coarse shredding, magnetic separation, coarse screening, fine screening, and fine shredding. These steps are outlined in section 2.3 Process Description. 95 to 97%, by weight, of the MSW received is processed into RDF.

The RDF is then transported to the PBF via an 800-foot long conveyor gallery that connects the two facilities. The WPF typically receives between 2,000 and 3,500 tons of MSW per weekday and 200 to 1,000 tons on Saturday for processing. Facility operation and maintenance activities are conducted Monday through Saturday.

The Waste Processing Facility itself is divided into five contiguous buildings consisting of the: Truck Maneuvering Hall, Waste Receiving Building, Processing Building, Refuse Derived Fuel (RDF) Storage Building and Parts Storage Building.

Truck Maneuvering Hall – The Truck Maneuvering Hall is an unheated one-story metal frame structure supported on deep foundations and constructed adjacent to the existing Waste Receiving Building. This structure covers approximately 51,000 square feet and aids in containing odorous air from the WPF's Waste Receiving Building by controlling the odorous air from the door openings required to off-load MSW deliveries. Municipal and private collection vehicles enter the Truck Maneuvering Hall and subsequently back into the Waste Receiving Building to off-load MSW.

Waste Receiving Building – MSW is delivered to the Waste Receiving Building where it is stockpiled and temporarily stored on the enclosed tipping floor prior to processing. The Waste Receiving Building covers approximately 60,000 square feet of enclosed area. MSW deliveries are normally received Monday through Friday from 5:00 am until 5:00 pm and on Saturdays from 5:00 am until 2:00 pm. Front-end wheel loaders, and occasionally a compactor, operate in this area to stack and compact the MSW. The MSW is fed, via conveyors, to the processing lines, which are located on the east side of the building. Picking stations are operated on the conveyor lines, which remove of non-processable materials before the MSW enters the primary shredders.

Processing Building – The Processing Building covers approximately 27,000 square feet and contains two identical equipment lines used to process the as-received MSW into an RDF fluff material. The processing equipment consists of conveyors, shredders, magnets, trommels (now blanked off), and air handling systems. Processed MSW typically results in approximately 2% non-processables, 3% ferrous material, with 95 to 97% RDF conveyed into the RDF storage building. The processing lines typically operate two shifts per day, Monday through Friday, from 3:00 pm until 7:00 am. If additional processing is required, it would be scheduled on Saturday. Equipment maintenance is typically performed between 7:00 am and 3:00 pm Monday through Saturday, and Sunday on an as needed basis.

RDF Storage Building – The RDF Storage Building covers approximately 50,000 square feet and is used to temporarily store RDF material before it is loaded onto one of two conveyor trains and transported to the PBF for combustion. A front-end loader and occasionally a compactor operate in this area to stack the RDF material and to feed the conveyor belts.

Parts Storage Building – The Parts Storage Building covers approximately 2500 square feet.

2.2 Power Block Facility (PBF) Description

The facility consists of three (3) 675-ton per day RDF fired boilers, each capable of generating a maximum of 254,100² pounds of steam per hour. The steam powers two 45-megawatt capacity turbine-generators. The PBF also includes air pollution control systems (dry scrubbers), induced draft system (baghouses) and a chimney (stack).

The three (3) CE Power Systems VU-40 waterwall municipal waste combustors (MWC), with spreader stoker and traveling grates, combust RDF, and potentially coal, to produce steam. The steam, in turn, is used to produce electricity. The auxiliary burner system is natural gas fired. Each MWC is equipped with a spray dryer absorber (SDA) for acid gas control, a fabric filter for particulate matter control, and a selective non-catalytic reduction (SNCR) system for control of various oxides of nitrogen (NO_x).

The Connecticut Department of Environmental Protection (CT DEP) issued the facility air permits to construct in April 1985. Permits to operate were issued in August 1993. The permits were modified in April 2007 to add requirements for the addition of the Selective Non Catalytic Reduction (SNCR) system as well as to incorporate the rules of RCSA §22a-174-38. The permit for Boiler 11 was modified in April 2012 to incorporate the inclusion of a continuous emission monitor for ammonia. The plant operates under a Connecticut Department of Energy and Environmental Protection (CT DEEP) Bureau of Air Management facility wide Title V Operating Permit and individual New Source Review permits for each boiler. Additional operations information regarding this system can be found in the facility Operations Manual, System Description (SD)-204, Boilers.

Additionally, the PBF includes significant process operations including but not limited to the following:

Ash Handling System - The ash handling system takes the bottom ash from the municipal waste combustors and combines it with water and fly ash, lime and spent lime from the fabric filters. The combined ash is then discharged to an enclosed structure, where it remains until being loaded into trucks for disposal. Additional information regarding this system can be found in the facility Operations Manual, System Description (SD-501), Ash Handling.

Coal Processing System (Process currently out of service) - The coal processing system is as follows: Coal is delivered to the facility by barge or truck as needed. Coal delivered by barge is lifted by crane and dumped in the coal hopper and onto Coal Conveyor 1, which conveys it to the coal pile. Coal delivered by truck is dumped directly onto the coal pile. A bulldozer moves the coal around the pile and onto the conveyors, which transport the coal to the municipal waste combustors.

RDF Conveyance System - The RDF conveyance system consists of a series of conveyors, which transport RDF from the processed waste floor to the municipal waste combustors. All conveyors are fully enclosed. Additional information regarding this

² Maximum value established by the Facility's Title V and NSR permits

system can be found in the facility Operations Manual, System Description (SD)-202, RDF Handling.

Natural Gas Fired Heaters and Boilers – Six (6) small natural gas fired heaters and boilers are operated at the Waste Processing Facility. GEU-4 is comprised of two (2) Aerovent 5 MMBTU/hr Make-up Air Heaters, two (2) Weil-McLain 2.1 MMBTU/hr boilers, an Aerovent 0.6 MMBTU/hr Make-up Air Heater, and a Rezner 0.3 MMBTU/hr Make-up Air Heater.

2.3 Process Description

2.3.1 WPF Process

The WPF layout includes two (2) conveyor feed lines (Line #100 and #200) to carry MSW from the receiving floor through a dual processing system, to produce the RDF fuel output. Each piece of equipment at the facility used to process the waste stream, as designed by CE, is designated by number and has a nominal and maximum processing capacity value assigned to it based on equipment parameters and speed of the conveyor line. In general, these lines are rated with a nominal capacity of 100 tons/hour and a maximum rated capacity of 150 tons/hour each. During the hours the WPF is staffed for processing, there is an expected downtime for short term fixes, such as relieving jams in the system, or repairing minor breaks. Planned maintenance and repair outages are scheduled for non-processing times to minimize disruptions to the system when processing. Refer to **Figure 2**, Simplified WPF Diagram.

Each of the two processing lines carries the MSW through the waste process facility as the following functions are performed as outlined in SD-101 General Plant Description.

2.3.1.1 Primary Shredder

The primary shredder is a specialized piece of equipment designed to reduce the size of the incoming MSW feed in preparation for further inspection. The shredder will reduce 90% of the solid waste feed to a size less than 6", and glass to 2" or less. Design capacity of the shredder is 100 tons per hour (tph), while maximum capacity is 130 tph. Average bulk density of the feed is 280 pounds per cubic yard. Speed of the shredder is approximately 1,100 rpm through a vee belt dodge drive from a 300 hp, 1,800 rpm, 4,160 volt squirrel cage motor.

2.3.1.2 Load/Feed Conveyors

The load/feed conveyors, which are provided at the Facility, are of the steel pan or apron pan type. These conveyors consist of a horizontal conveyor and inclined conveyor which loads an inclined conveyor which loads the Primary Shredder feed conveyor.

2.3.1.3 Picking Station/Gantry Crane

Three (3) articulating, hydraulic pickers provided for removal of non-processable waste (NPW) from the two drag conveyors. One picker is dedicated to each conveyor, while a third picker is a backup positioned to remove NPW from either conveyor. The pickers are controlled remotely from totally enclosed and ventilated operating booths. Provisions are made for the operators to access either conveyor or hand-remove awkward materials. Stop/start stations for both drag and apron conveyors are included in the controls package.

2.3.1.4 Feed Conveyors

The feed conveyors are designed to transfer trash in a continuous duty at an approximate rate of 100 tph with surges to 150 tph and discharge it into the primary shredder.

2.3.1.5 Primary Shredding Containment and Baghouse

Due to the flow of the MSW, some items may make it through the sorting and picking stations. These items may include explosive compounds such as propane tanks. Therefore, the primary shredder room is an explosive-proof containment room that is locked during shredder operations. This is for personnel safety and to also limit the extent of any blast into the WPF. The containment room has frangible explosive blowoff panels/tents located on the roof area to release the force of the blast into the air and not into the building.

2.3.1.6 Ferrous Recovery/Removal

Part of the overall ferrous recovery system is an integrated subsystem consisting of magnetic pick-up and take-away drums. This drum system works in tandem to remove metals from the MSW stream. The removed metals are then conveyed to a ferrous waste truck for offsite transportation and metals recovery.

2.3.1.7 Secondary Shredder

This shredder takes the items that are still too large to be used as RDF and will perform an additional processing to make the MSW of the desired size to be used as RDF.

The Williams Model 680 Reversible Secondary Shredder is a hammer mill designed to reduce 98% of the MSW feed to approximately 4" to 6" in size. The unit consists of a rugged vertical housing containing the horizontal rotor and cage. There are four hammer pins equally spaced around the shredder rotor. There are 6-7 free swinging hammers installed on each of the hammer pins (26 hammers total).

Breaker plates are mounted on both sides of the housing above the cage. These breaker plates are installed on pins which allow them to be moved towards or away from the rotor by adjusting breaker plate eye bolts. The processed MSW then exits the shredder onto the conveyor that moves it to the RDF process hopper.

2.3.1.8 Mobile Shredder

Operations at the WPF are conducted such that NPW is removed from incoming waste either by the payloader operator on the tipping floor or by the picking station grapple operator at the in-feed conveyor lines. The NPW materials consist primarily of oversized municipal solid waste items such as household furniture, chairs, tables, sofas, mattresses, and rugs. The NPW may also contain limited quantities of “White Metals” (i.e., large appliances and machinery) and pieces of scrap/light metals.

In an effort to enhance the recovery of heat energy and ferrous metals from the NPW, as well as minimize the off-site transportation and landfill disposal of resources, CRRA petitioned CT DEP, and subsequently received approval, to purchase, install and operate a slow-speed, high-torque mobile shredder for operation on the WPF tipping floor. The mobile shredder is used to reduce the size of the NPW components to 5-1/4” inch or less. This coarsely-shredded NPW will then be fed into the processing lines with other municipal solid waste for further shredding and processing into RDF.

As requested in the CT DEP approval letter, CRRA notified CT DEP of the installation and start-up on the mobile shredder on December 30, 2008.

2.3.1.9 Refuse Derived Fuel Stationary Packer and Conveyor

The purpose of the two 11-cubic yard stationary packers, one per processing line, is to provide a means for orderly introduction of slightly densified RDF onto the storage area floor for handling and subsequent loading into the metal pan conveyor bins or to be stored in the RDF hall. By using these stationary packers, less attention has to be paid to area of entry for RDF material into the RDF handling area, thus allowing equipment operators to pay more attention to the actual RDF loadout operation.

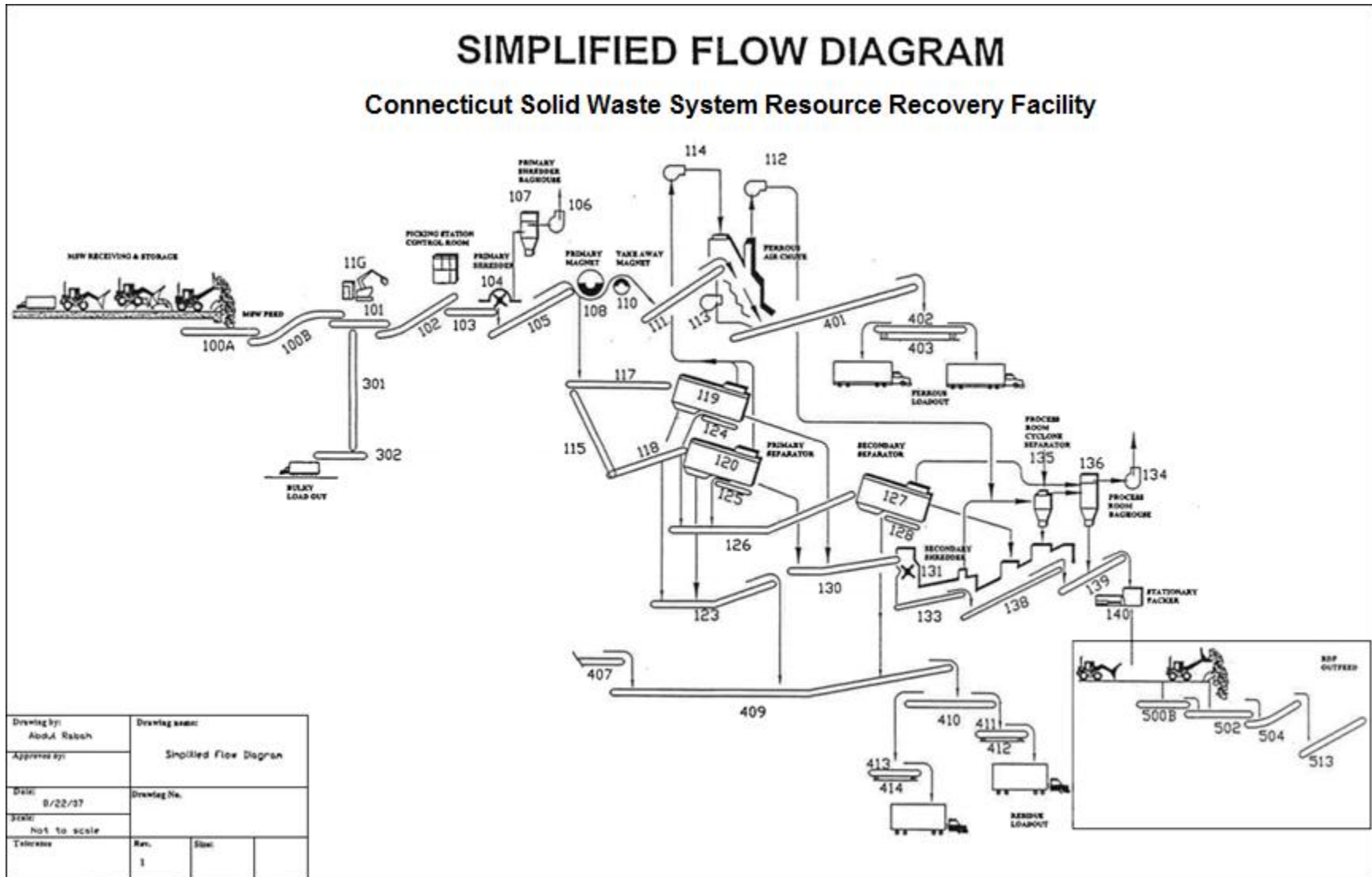
Front end loaders then move the new RDF from the compactor discharge area to a storage location. The front end loaders in the RDF Building monitor and maintain a supply of RDF on the conveyors that supply the PBF. The front end loaders in the RDF Building operate 24/7/365 to maintain feed to the PBF for boiler operations and properly store additional RDF when not feeding the PBF.

A system of horizontal and elevating apron pan type conveyors will discharge the RDF from the storage area to the transfer building on one of two transport systems. From here the RDF is conveyed, in controlled

quantities, to the RDF feed auger bins in the PBF. Control and responsibility for the RDF feed metering and transport systems will be from the PBF control room.

Figure 2

Waste Processing Facility Diagram



2.3.2 PBF Process

The PBF receives the RDF for firing in the boilers. The PBF was configured to supplement the RDF feed line with coal to meet steam generation rates when necessary, but no longer does so. The PBF is capable of operating solely, and reliably, on RDF as evidenced by operations since June 2006 which was the last time fuel supply to the PBF was augmented by coal.

The three PBF steam boilers (units 11, 12, & 13) are Water Tube Boilers equipped with CE Type "RC" Spreader Stokers. These stokers are designed specifically for firing RDF. A multi-section catenary style traveling grate supports a burning fuel bed and discharges the ash into the front ash hoppers.

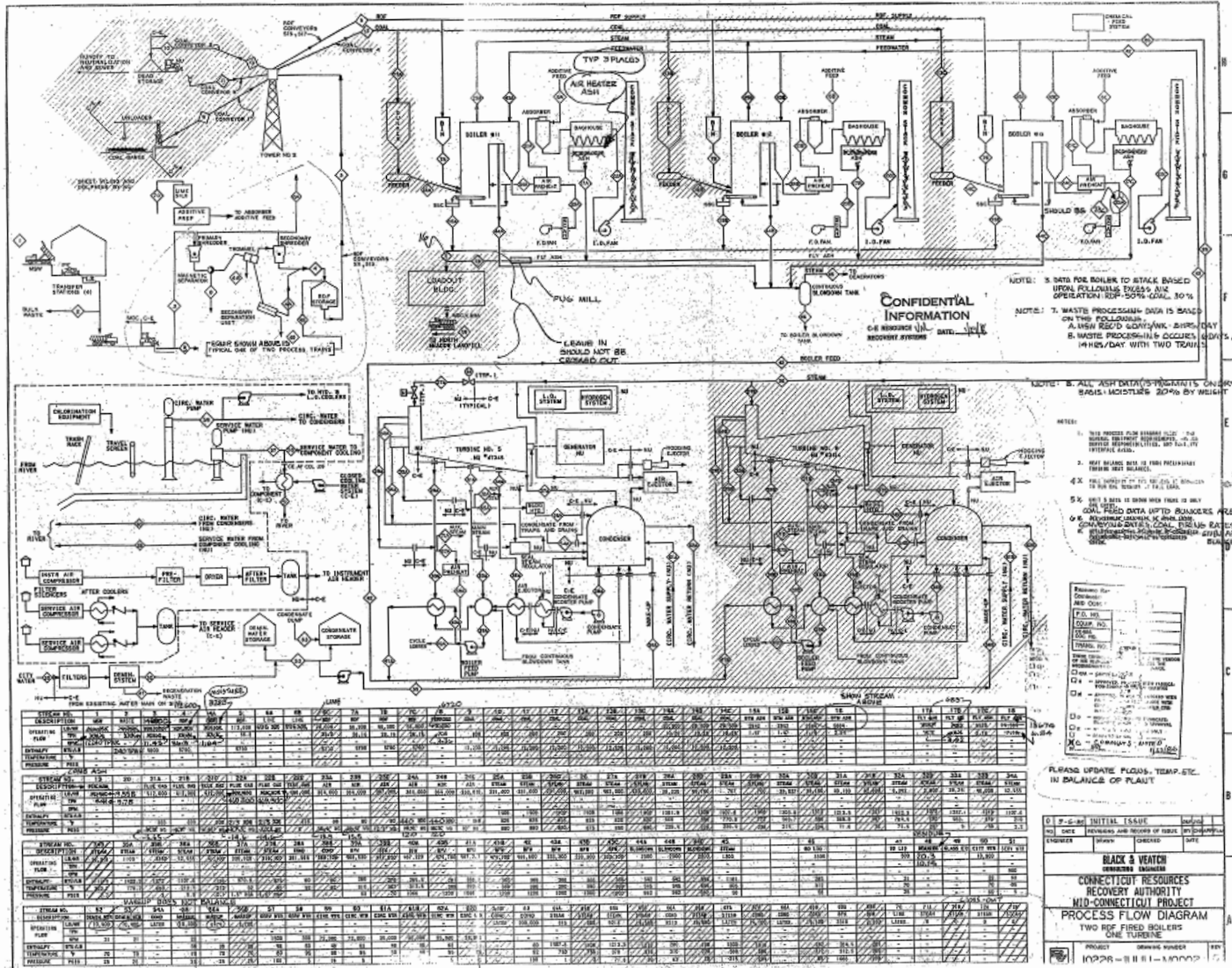
The energy released by the burning of RDF increases the temperature of the water in the water tube and some of it changes to steam. The steam/water combination flows to the boiler drum and then to one or more of the two Turbines (5 & 6) to rotate the turbine/generators. This produces a variable level of electricity that is transferred to the Transmission System.

The PBF's System Description Procedure SD-101 – Facility General System Description provides additional details regarding the PBF components and process descriptions.

The PBF is capable of operating 7 days per week, 24 hours a day, requiring staging of a larger RDF reserve on the floor on Saturday and days preceding holidays, to supply fuel through Sundays and holidays, when no waste processing is occurring at the WPF.

Figure 3

Power Block Facility Diagram



3 TRAFFIC

3.1 Traffic Flow

Traffic arriving at and leaving the WPF uses Maxim Road for access. All delivery vehicles are weighed on-route to the Facility, on either of the two 60-foot, 60-ton capacity scales, located adjacent to the central scale house. The gross vehicle weight, by truck registration number, is entered into the computer software system. Deliveries occur between 5:00 a.m. and 5:00 p.m. Delivery vehicles proceed along a drive path as shown in **Figure 4**.

The MSW trucks are routed from Scale House to an area outside the Truck Maneuvering Hall adjacent to the MSW Receiving and Storage Building. A wheel-loader spotter will then direct truck to an assigned position behind one of six bay openings to await unloading. When the wheel-loader operator signals the driver, the driver will back his vehicle into the assigned unloading bay, within the MSW Receiving Area. When inside the MSW Receiving Area several vehicles can be dumped simultaneously.

After unloading, the vehicles will drive forward and exit the MSW Receiving Building. The vehicle will follow the drive path to the exit. During normal operations, the waste is received, processed and disposed of on the same day. A day's collection of MSW can be held in storage. In the case of a prolonged plant outage, the system will be bypassed and MSW delivery trucks will be diverted. Solid waste deliveries average about 310 incoming vehicles per day to the WPF, but it is estimated that up to 400+ vehicles a day could be handled at the WPF at full capacity (3,500 ton/day).

3.2 Type and Size of Vehicles

The size and type of vehicles that deliver MSW to the WPF is not recorded, but the WPF is capable of receiving any configuration of solid waste vehicle (e.g., residential pick up vehicles, roll-off boxes, dump trailers, walking floor (or live floor) trailers, etc.). Vehicles can nominally range in size from 20 to 100 Cu. Yds.

3.3 Environmental Impact Survey

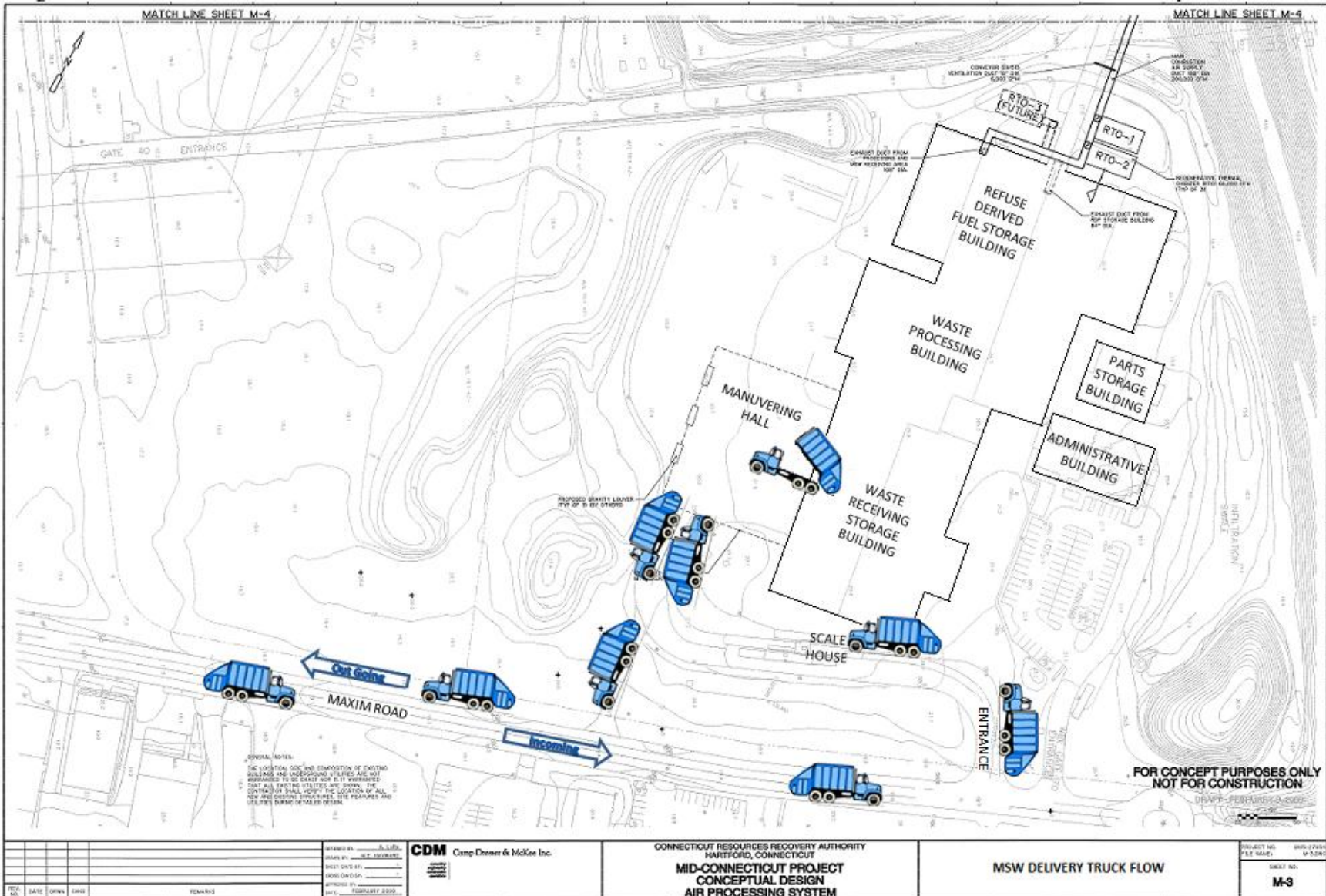
Due to the initial determination of delivery vehicle tare weights, an expeditious weight in process and the use of six waste receiving bays; MSW delivery vehicles has very short wait times and, therefore, have minimal environmental impact.

3.4 Dust Control and Cleaning

A mechanical sweeper is used for periodic road maintenance and dust control at the site.

Figure 4

MSW Delivery Truck Flow



4 MANAGEMENT

4.1 Connecticut Resources Recovery Authority

4.1.1 Organizational Chart

The organizational chart for CRRA as related to the operation of the Facility is **Exhibit F** to this Plan.

4.1.2 Duties and Responsibilities

The Chief Engineer of CRRA's Operations Department has primary responsibility for overseeing the operation of the Facility. CRRA is responsible for operating the scales and having a facility operator, certified by CTDEEP in accordance with RCSA Section 22a-209-6, on site at any time the plant is in operation.

Specific duties and responsibilities of CRRA employees as related to the operation and maintenance of the Facility are available in **Exhibit G**.

4.1.3 Qualifications and Experience of Operating Personnel

All facility operating personnel are employed by a third party contracted operations and maintenance company. CRRA has experienced personnel that are located on site at the facility to oversee the operations. Qualifications and experience are the responsibility of the contracted operator.

4.1.4 Certified Operators

Sections 22a-209-6 and 22a-231-1 of the Connecticut Solid Waste Management Regulations delineate the certification and training requirements for operators of all solid waste facilities, which are permitted by the Department of Energy and Environmental Protection (DEEP). Operators in Connecticut of resources recovery facilities and material resource recovery facilities attend training classes and take an examination to obtain DEEP certification. CRRA employees involved with facility appropriately retain the proper certification.

4.2 Connecticut Solid Waste System Operations (Power Block and Waste Processing Facility)

4.2.1 Organizational Chart

4.2.1.1 Waste Processing Facility

The Waste Processing Facility (WPF) is operated and maintained under contract through the use of a third party contracted operations and maintenance provider. The facility presently has a staff of fifty-four

employees which includes the Project's administration staff. Seventeen (17) of these staff are certified operators of material recovery facilities. Facility staffing covers two (2) processing and one (1) maintenance shift per day - five days per week. Processing of Municipal Solid Waste (MSW) is scheduled from 3:00 pm to 7:00 am Monday through Friday. Between the hours of 7:00 am to 3:00 pm, a maintenance shift provides scheduled preventive and repair maintenance prior to the start of the next processing shift.

The organizational chart for the WPF is **Exhibit E** to this Plan.

4.2.1.2 Power Block Facility

The Power Block Facility is operated and maintained under contract through the use of a third party contracted operations and maintenance provider. The total Power Block Facility (PBF) and Electric Generating Facility (EGF) staff numbers approximately fifty eight (58) personnel.

The organizational chart for the PBF is **Exhibit E** to this Plan.

4.2.2 **Duties, Responsibilities, Qualifications and Experience of Operating Personnel**

Operators at the facility are provided training by the State of CT Solid Waste trainers as well as receiving extensive in-house operations, maintenance and safety training.

All new employees are provided training on the NAES Safety Procedures Manual for the WPF and PBF respectively. See **Exhibit I** for the complete table of contents for this manual. The manual provides the employee with safe operating procedures and practices associated with working at the facility. Supervisory staff provides instructions to new employees on the various aspects of the operation and the proper use of the equipment. New employees are placed with experienced personnel to provide hands-on training within the facility and must successfully complete a probationary period during which the employees' ability to learn and perform the job safely are evaluated. Certifications are sought and/or renewed as necessary. A listing of both the WPF and PBF position titles in an organizational chart is shown on **Exhibit E**.

All operators currently obtain training through the use of a computer based generic training coupled with On-the-Job Training where operators complete written and practical tests. A series of detailed equipment procedures has been developed for the operators to use as not only an operational tool but also as a training aid. A copy of the table of contents for the control room operating procedures is included in **Exhibit J**. Key senior operations personnel have also obtained certification by the State of Connecticut Department of Energy & Environmental Protection as Resource Recovery Facility Operators.

Specific duties and responsibilities of CRRA employees as related to the operation and maintenance of the Facility are presented in **Exhibit G**.

4.2.3 Equipment Operating Manuals/Training

The Training and Qualification Program at the CRRA Connecticut Solid Waste System ensures that plant operating and maintenance employees will possess the knowledge and skills that are required to operate the plant safely and efficiently. The basis of the program consists of two major components: Training and Qualification. The Training Program is intended to ensure that all personnel are provided with full opportunities and assistance to acquire the necessary knowledge, skills, and experience. The Qualification Program is designed to certify that minimum requirements have been met and maintained to work in an assigned position. Personnel will take the knowledge they receive in training and apply that knowledge to achieve qualification.

The programs are designed to be flexible enough to allow for the qualification of personnel with a wide variety of backgrounds, skills, and knowledge. At the same time, all personnel must meet certain requirements to ensure that they can perform the job adequately and safely with a high degree of mutual confidence. The same basic qualification requirements must be applied to all personnel in a particular position to ensure the program is administered consistently and impartially. A variety of written and oral tests are used to ensure the provided training has been adequate and to assess the resulting knowledge level of each employee.

Training on operating procedures, maintenance activities, and equipment are addressed in the Facility Training Manual. Specifically, "TMP-1 Training Program Overview" has been developed to cover the specific needs of Connecticut Solid Waste System personnel that work in the Waste Processing Facility and/or the Power Block Facility. As described in "TMP-02 Initial Employee Qualifications" all personnel must meet Initial Qualifications. The remaining Training documents are tailored to the specific work site of the personnel.

Additionally, all equipment within the Connecticut Solid Waste System plant is supplied with specific vendor technical manuals specifying the recommended operating and maintenance practices. The manuals provided by the vendors for each system or major equipment item were used to prepare the overall Facility Operations Manuals for the WPF and PBF. These technical manuals are utilized as a principal source for the development of "Operating Procedures" for the equipment and systems within the Connecticut Solid Waste System plant.

The Operating Manuals are utilized for "Plant Specific Training" and as a technical reference source during start-up and for ongoing normal operations. Additionally, the manuals serve as a source for the development of preventive maintenance procedures used to maintain the equipment in a fully operational status. A copy of

the Table(s) of Contents for the Training, Operations, and Maintenance Program Manuals can be found in **Exhibit J**.

4.3 Operating Hours

To provide the operating flexibility to process the varying quantities of waste received daily at the WPF, processing staff is available for over 16 hours/day, through the scheduling of 2 x 8 hour/day shifts, 6 days/week. The facility is manned on two 8 hour/day shifts with 8 hours of each shift dedicated to operating the processing facility, from approximately 3:00 pm to 7:00 am (a 16 hour processing time), with the remainder of the time allocated for clean-up and maintenance, on a six-day work week, typically with no operations on Sunday. This schedule varies with the amount of MSW available, adjustments for down time and status of RDF floor volume, i.e.: operating only 5 days a week and/or less than 16 hours of processing time per day, and, on occasions, a longer than 16 hour processing shift and/or a partial Sunday. Adjustments are also made for holidays. When not processing, personnel participate in plant maintenance and cleaning. The responsibilities and duties of each position are as described in **Exhibit H**.

4.4 Communication Systems

The facilities use radio and Public Announcement systems for plant communications.

4.5 Evidence of Financial Capabilities

Records pertaining to the financial capability of the Connecticut Solid Waste System are on file with CTDEEP.

4.6 Security

The facility has a security program that includes a number of control mechanisms to control access to the site. These mechanisms include but are not limited to:

- Perimeter fencing with controlled access and intercom system,
- Trespassing signage,
- Facility lighting,
- Video camera surveillance,
- Designated Restricted Access Personnel,
- Designated Unrestricted Access Personnel, and
- Controlled access to various parts of the facility (i.e., control room, administration area, etc.).

Details relating to the specifics of the security program are included in the facility's Administrative Manual, Procedure AMP-110 Site Security.

5 OPERATIONS

5.1 Daily Operations

MSW is received on the tipping floor from CRRA's transfer stations and/or town haulers, coming from over 70 towns in Connecticut.

5.1.1 Receiving

Most of the municipal solid waste destined for processing in the Facility will arrive through direct delivery from local commercial and municipal haulers and transfer trailers. Typically it is expected that up to 300 MSW truck deliveries per day will be received. Waste must be superficially inspected and weighed on the automated scale before the trucks are directed to the discharge area on the tipping floor. Specific information, procedures and diagrams related to MSW Receiving can be located in the Operations Manual, System Description (SD) – 401 MSW Receiving and Storage.

Radioactive material detectors are located at the WPF scale house to check incoming loads. If a detector alarm sounds, the truck is instructed to pull off to the side and park. The CT DEEP is contacted in such an event and direction is received from the CT DEEP field inspector. The inspector may clear the material for processing, request that the material be isolated for decay or request that CRRA obtain a subcontractor to properly package and ship the material for offsite disposal. The load is typically monitored by the CT DEEP field inspector with a hand held detector to locate the source. In most instances it is found that the cause of the radioactive alarm was from the improper disposal of medical waste (e.g., chemotherapy waste) from residential locations. The item is ultimately handled accordingly, per CT DEEP direction and discretion.

Unannounced inspections of MSW deliveries are performed by CRRA Scale and Enforcement Specialists, pursuant to CGS 22a-220c(b). Inspections are performed for a minimum of five percent (5%) of the monthly truck load deliveries. The inspections and supporting documentation shall, at a minimum, consist of:

- Photographs of each load inspected,
- Origin of each load (i.e., municipality or private transfer facility, commercial or residential),
- Waste transporter company name,
- Identification of any and all designated recyclable components of the load and the estimated percentage of designated recyclable items, and
- Deliver an immediate written notification to the waste transporter, and subsequent notification to the origin, for any loads that contain greater than 10% of designated recyclable items.

CRRA's August 2013 request to exclude CRRA transfer station deliveries from normal inspection for recyclable materials and CT DEEP's subsequent approval is attached as **Exhibit K**.

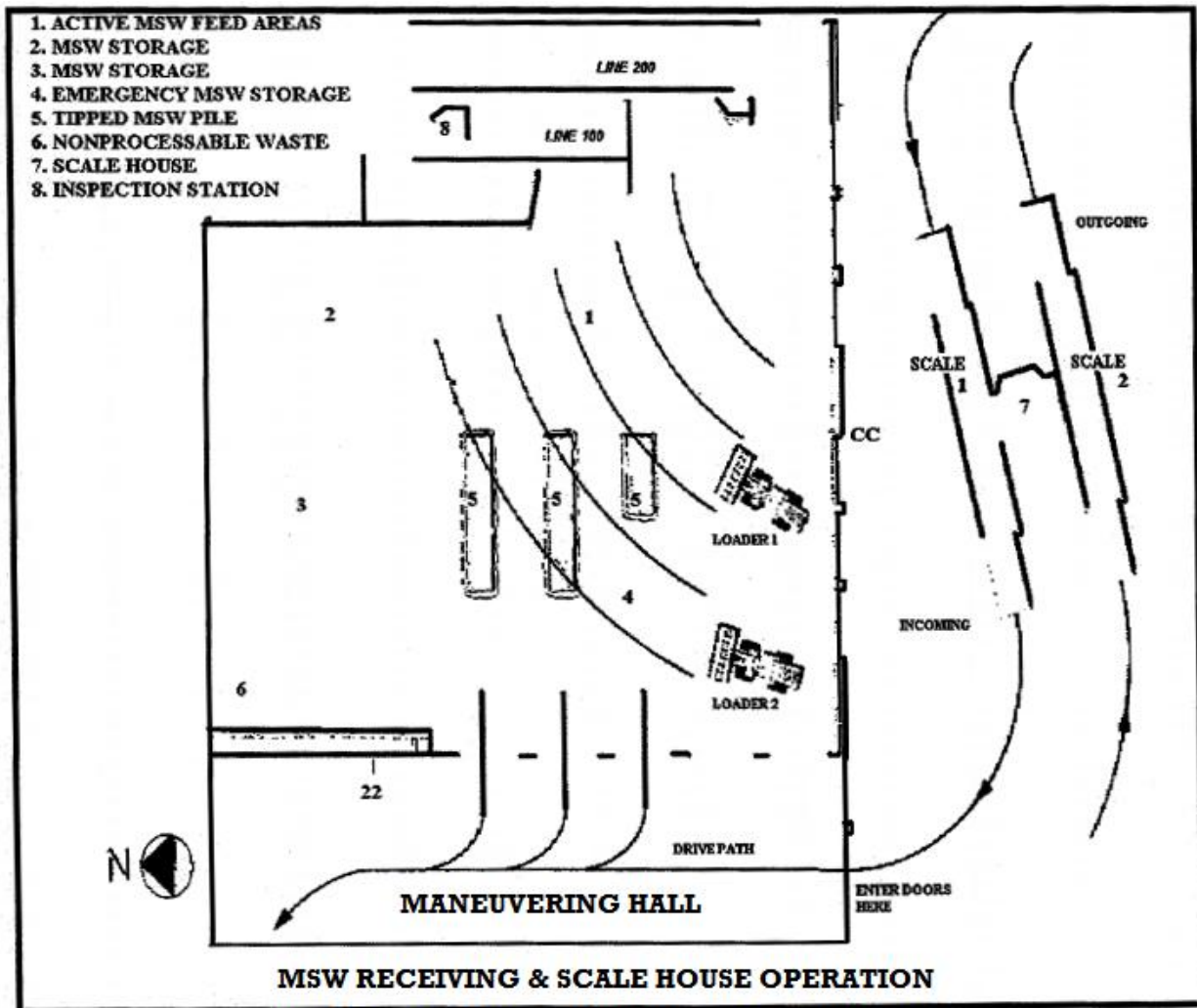
5.1.2 Weigh-In

The weighing equipment consists of two (2), 60 ton, above-grade truck scales. Each scale is 10 feet wide by 60 feet long and capable of handling long roll off trailers.

The MSW received is measured in tons at the scale house (scale 1) prior to reaching the MSW tip floor and the source of waste is recorded according to town or other facility. Delivery trucks are pre-permitted by the CRRA with registered sources, vehicle descriptions and tare (vehicle) weights. If a refuse truck does not have a tare weight on file or a tare weight check is required, the system is designed to allow manual weighing out of empty refuse trucks over either of the two truck scales. Typically, an inbound truck can be processed (weighed) in less than 15 seconds. The system will handle a maximum of 500 trucks per day. **Figure 5** is a schematic of the MSW receiving and scale house operation.

Figure 5

MSW Receiving & Scale House Operations



5.1.3 Unloading

The MSW trucks are routed from Scale House to an area outside the Truck Maneuvering Hall adjacent to the MSW Receiving and Storage Building. A wheel-loader operator will then direct trucks to an assigned position behind one of six bay openings to await unloading. When the wheel-loader operator signals the driver, the driver will back his vehicle into the assigned unloading bay, within the MSW Receiving Area. By using discrete unloading bays several vehicles can unload simultaneously.

After unloading, the vehicles will drive forward and exit the MSW Receiving Building. The vehicle will follow the drive path to the Maxim Road exit or proceed to scale #2 if an outgoing weight is necessary. During normal operations, the waste is received, processed and disposed of on the same day. A day's collection of MSW can be held in storage. In the case of a prolonged plant outage, the system will be bypassed and MSW delivery trucks will be diverted. Up to 500 vehicles a day can be handled at this facility at full capacity (3,500 ton/day).

5.1.4 Sorting

In the approach, delivery vehicles will generally back to a position along the column line inside the MSW Receiving and Storage Building and will unload in piles. MSW may be stored in certain areas depending on need for type of material delivered. The loaders work in unison in a sweeping motion to move and maneuver MSW for processing.

The objective is to push the incoming waste into an active storage pile. Most of the "push up" work will be done by one loader, while a second loader will "shave" material from this pile to feed the process lines.

There are three MSW storage areas (see **Figure 5**), each capable of holding greater than 1,000 tons of MSW. When area 1 is filled, excess material will be pushed into area 2 or area 3. Under normal operation, area 3 will probably not be needed except for possibly storing more difficult to handle waste for processing after peak traffic periods. Area 4 is expected to be used only during an emergency.

Non-Processable Waste (NPW) can be expected as a "fact of life" in the incoming MSW. The NPW should be removed ahead of the process line.

Primarily, the MSW received undergoes three types of material segregation off the incoming waste stream that is: NPW, small fraction residue and metals; with the remainder becoming "processed MSW."

The primary shredder is a rugged machine, but it is largely a bag breaker. Because of this, bulky material can contribute to jams at the primary shredder in-feed, inside the primary shredder or at downstream locations such as the magnetic separators.

For these reasons, it is important that good inspection and removal of bulky items be provided.

This inspection is accomplished in several steps. First, the unloaded pile of MSW is broken up or shaved by the loader operator. This is completed to expose as much of the MSW as possible for visual inspection. The loader operators can then identify NPW materials and remove them from the MSW. The sorted pile will then be moved to either the assigned MSW Storage Area or active MSW Feed Area. The NPW is placed into loadout trailers and are weighed when leaving the WPF on its way to off-site processing, recycling or disposal (e.g. landfill) as appropriate or processed by the mobile low-speed shredder.

The mobile, low-speed high-torque shredder makes it possible to process previously NPW such as furniture, sofas, mattresses and rugs.

NPW may include the following:

- Stoves, Refrigerators, Water Heaters
- Bulky Household Furniture
- Blocks of Concrete and Other Demolition Material
- Tree Stumps
- Truck Tires and Rims (Car and Truck)
- Spools of Wire
- Large Carpet
- Large Quantities of Combustible Fines
- Large Oversized Commercial Waste
- Containers of Combustible Liquid
- Anything that Looks Suspicious
- Gas Cylinders/Tanks (e.g., propane, acetylene, freon, etc.)
- Engine Blocks
- Pipe
- Large Cloth Objects
- Large Auto Tires or groups of tires
- Cable
- Parts of Machinery and Large Iron and Steel Objects
- Any Waste which Smells Like Fuel or Chemicals
- Oversize Corrugated

Some of the NPW will be removed on the tipping floors; however the picking station operator will also be able to remove the remaining NPW from the in-feed conveyor lines.

In addition to sorting the NPW, all personnel must be alert for materials which are considered to be classified unacceptable waste. They include but are not limited to the following:

- Hazardous and/or Regulated Waste of Any Kind
- Sludges, Liquids

The CRRA employs Enforcement Officers (EO) who fulfill a variety of duties including checking of the WPF tip floor for red bagged (implying bio-medical and otherwise hazardous) material. To minimize the number of these occurrences, hauling vehicles registered with CRRA are given criteria of what the loads can and cannot contain. Haulers must certify that hazardous and/or regulated materials are not knowingly contained in the load.

Besides waste confirmation, the EO will check for bulky material and/or recyclables mixed in with the MSW. Per state regulations, recyclables are not to be included, as they should have already been removed at the transfer stations. Per any means of identification that can be found, the EO will locate the source of non-conforming loads and write up Notices of Violation. These notices are maintained by CRRA.

Other duties of the EO are to discover:

- Other sources of MSW mixed with loads of member town MSW
- Incoming, unidentified out-of-project material

5.1.5 Load-Out

Materials that cannot be processed into RDF must be removed safely and efficiently from the WPF. This is completed through material “load outs” from the site.

5.1.5.1 Gas Cylinder/Tank Load-Out

Propane, butane, acetylene, etc. tanks that have been emptied, purged and had their valves removed are consolidated and properly stored with scrap metal. Tanks with valves intact are stored in a secure location. Such tanks are managed by a private contractor properly licensed to empty and purge the tanks, remove their valves, and transport the tank contents off-site. The empty tanks are added to the scrap metal inventory.

5.1.5.2 Non-Processable Waste Load-Out

NPW such as large furniture which cannot be handled by the mobile shredder is either pulled off the MSW floor after being set aside by the loader operator or picked from the in-feed lines by the mechanical grapple operated from a manned control booth above each line. After being placed in a loadout trailer, it is weighed on its way out from the WPF to the ultimate disposition site. By weight, NPW typically comprises 1.0 to 3.0% of the MSW received.

5.1.5.3 Transfer of MSW

From time-to-time CRRA may need to transfer (reload) MSW at the WPF for shipment off-site to another properly licensed solid waste facility. **Exhibit B** presents the operating procedure that CRRA shall follow to transfer MSW at the WPF.

5.2 Method of Measuring Waste

All collection vehicles are weighed on a vehicle truck scale upon entry to the WPF prior to discharging their loads. Currently, CRRA employees staff the scale house and are responsible for weighing vehicles (CRRA Scale/Enforcement Specialists). CRRA may utilize its own employees or retain a private contractor to staff the scale house.

Upon receiving a permit from CRRA, a vehicle's tare weight is determined the first time it uses a CRRA Connecticut Solid Waste System facility. The tare weight is stored in CRRA's centralized scale data base and is available to all CRRA Connecticut Solid Waste System facilities. The scales are connected to a computer in the scale house which automatically enters the tare weight of the vehicle into a scale computer software program. The CRRA Scale/Enforcement Specialist (or private contractor), based on information provided by the driver of the collection vehicle, enters other information about the shipment including the type of material (MSW, etc.) and the source/origin (town or city) of the material. Only vehicles with a valid CRRA Connecticut Solid Waste System permit are allowed to deliver MSW to the WPF. Therefore, the weight of the material delivered is calculated by the scale software program by subtracting the vehicle's tare weight (as stored in the scale software database) from the vehicle's gross weight (as determined by the scale). Vehicle tare weights are periodically checked.

5.3 Waste Storage Practices

The MSW receiving floor has a holding capacity of approximately 5,000 tons of non-compacted MSW. The MSW can be compacted if necessary to store up to 7,500 tons +/- . The floor space provides adequate room for inventory and allows for efficient and safe movement of delivery vehicles and MSW handling equipment. The MSW is pushed into either of the conveyors that feed the primary shredders to begin processing.

The WPF receiving floor has varying quantities of MSW left overnight after a day's processing. It is cleaned out fairly regularly, especially on Saturdays. It may also have significant quantities of MSW stockpiled if the RDF floor is full because of lack of full operations at the PBF or otherwise.

5.4 Operations and Maintenance Budget

CRRA develops an annual budget to pay for the operation and maintenance of the facility. CRRA uses a third-party contracted operator to provide operations and maintenance support necessary to operate the Connecticut Solid Waste System Resource

Recovery Facility. CRRA pays to the Operator an annual fee for the operation and maintenance of the Facility.

5.5 Towns Served by the Facility

The existing Connecticut Solid Waste System towns have signed Municipal Service Agreements (MSAs) with CRRA's Connecticut Solid Waste System effective November 2012. The list of these towns complete through May 2014 is available as **Exhibit C**.

The list is also available at CRRA's website:
http://www.crra.org/pages/MSA_signees.htm.

5.5.1 Waste Types by Town

The type of waste received at the WPF by each Town is determined by the Municipal Service Agreements signed by each Town and CRRA.

5.5.2 Waste Quantities and Volumes by Town

The collection, tracking and reporting of this data is discussed in section 8.1 of this plan.

5.6 The Power Block Facility (PBF)

The Power Block Facility consumption of RDF is limited by the CT DEEP "Permit to Construct and Operate" which defines a maximum steam production rate of 254,100 lbs/hour/boiler to control the firing rate and air emissions. Refer to a copy of the permit, which also refers to the Contract and all exhibits for design and construction between CE and the CRRA. The CE design was based on an RDF feed rate (28.15 tons/hour) times an RDF heating value (5,785 BTU/lb) when processing RDF at the PBF. The resulting heat design value of 326,000,000 BTU/hour for each of the three boilers is related to a maximum steam production rate of 254,100 lb/hr based on system component design performances. Ensuring compliance with the maximum steam production limit, a continuous real time measurement of steam produced, summed by the hour, is recorded electronically and is monitored not to exceed 254,100 lbs/hr/boiler over a 4 hour block averaged period.

The heating value of the RDF fuel is based on its composition, including percentage moisture and RDF residue. Using the Contract design RDF heating value of 5,785 BTU/lb, each of the three boilers can process 675.6 tons/day of RDF for a total of 2,027 tons/day (i.e.: 28.15 tons/hr x 3 boilers x 24 hours/day). If the heating value is lower than 5,785 BTU/lb, a greater RDF feed rate could be utilized up to the maximum design heat release rate in the form of steam, but collectively the three (3) units can combust no more than 739,855 tons of RDF in any one calendar year.

The PBF is capable of operating 7 days per week, 24 hours a day, requiring staging of a larger RDF reserve on the floor on Saturday and days preceding holidays, to supply fuel through Sundays and holidays, when no waste receiving or processing is occurring at the WPF.

It should be noted that coal has a standard average design heating value of 12,690 BTU/lb. The allowable heat input for coal in the permit is set just below the state's 250×10^6 BTU/hr limit for coal processing facilities, which prevents the boilers from being in a "Utility" category. With the small percentage of coal use (less than 12% by weight, maximum for any year since operation in 1988), these three boilers are not Utility Boilers or subject to regulation as such under the Clean Air Act (CAA).

Based on the 1988 Contract Settlement Agreement between CRRRA and CE, improvements as suggested early on the operation were funded and implemented by CRRRA. Most were minor change outs, but a few larger items were consolidated into the improvements project completed in 1992, which included the spare parts storage building, enlargement of the WPF and RDF floors, adding a grapple arm and increasing the motor's horsepower in the primary shredder. These improvements affected the safety and/or operating efficiency/downtime of the WPF, not the equipment capacities or facility guarantees.

5.7 Types and Quantities of Ash Disposed (Bottom Ash and Fly Ash)

The ash residue from the burning of RDF and coal to produce steam for power generation is currently taken to the Wheelabrator Putnam Ash Residue Landfill (Putnam landfill), but may be taken to other properly licensed disposal facilities. The 186-acre Putnam landfill is designed to accommodate ash from all of Connecticut's waste-to-energy facilities. The site includes six 10-acre ash disposal cells which allow the landfill to provide 400,000 tons of ash-disposal annually.

In FY 2013 the facility disposed of 168,000 tons of ash. In so doing, the facility achieved a 25.1% RDF to ash production ratio, which in turn accounts for a 74.9% RDF reduction factor on a weight to weight basis.

5.8 Maximum Quantities of Waste Processed

The WPF operates sixteen hours per day, six days per week. Although the quantity of MSW processed varies, the facility can process an average of about 2,750 tons of MSW per day, which represents about 2,650 tons of RDF.

The PBF operates 24 hours per day, seven days per week. Each boiler is capable of consuming 28.15 tons of RDF per hour, equivalent to 2,026.8 tons per day with all three boilers operating at the PBF, when the heating value of the RDF is 5,785 BTU/lb. The actual amount consumed depends on the heating value of the RDF and whether the boilers operate at full load.

In general, the WPF processes all of the MSW by the end of the week and does not store MSW from week to week. The RDF produced during the day is stored to be fed to the boilers at night and on Sunday when the WPF is not operating. The goal is to have approximately 800 tons of RDF remaining in storage when the WPF begins operation on Monday morning, in the event there is a problem in processing MSW at the WPF, so the boilers may continue to operate uninterrupted. Please refer to a copy of the CRRA Connecticut Solid Waste System Waste Processing Facility Description of First-In / First Out Handling of MSW and RDF, included as **Exhibit D**, for more information.

Data from CY 2013 indicated an average processing rate of 2,200 tons/day which includes about 20% downtime during staffed processing hours. Based on Acceptance Test and actual performances it is reasonable to assume a yearly maximum processing production capacity of 890,000 tons per year, with an average of 684,000 tons, and a maximum peak daily processing capacity of 3,700 tons/day with 2,200 tons/day on average.

5.8.1 RDF Storage Area

The floor size of the RDF storage area has a storage capacity of 21,670 cubic yards (approximately 7,000 tons).

Please refer to a copy of the CRRA Connecticut Solid Waste System Waste Processing Facility Description of First-In/First Out Handling of MSW and RDF, included as **Exhibit D**, for more information on how the RDF Storage Area is currently utilized for operation.

Although CRRA has authority to store Clean Wood, a storage quantity has never been stated in the permit. In the event that Clean Wood is received at the facility, it may be stored in the RDF storage area if the particle size is similar to that of RDF (the wood does not require further processing), or it will be stored in the MSW storage area if the wood requires further processing in the WPF. In either case, the quantity of wood, together with either MSW or RDF, will not exceed the storage limits allowed for MSW and RDF. "Clean Wood" is defined in RCSA Section 22a-208a-1(11).

5.9 Acceptable Solid Waste

Acceptable Solid Waste or "ASW" received at the Facility, as defined in **Exhibit A** the "Connecticut Solid Waste System Permitting, Disposal and Billing Procedures" document.

5.10 Unacceptable Wastes

In addition to sorting the non-processable items, personnel must be alert for materials which are considered to be classified unacceptable waste. They include the following:

- Hazardous waste of any kind

- Sludges, liquids

Under ideal conditions the scale house operator will reject these materials but because they may be hidden or unexposed it is possible for such materials to be unloaded on the tipping floor.

5.11 Incompatible Waste Steams

As of May 2014 there were no unique waste streams shipped to the Facility that were deemed incompatible with the acceptable solid waste that would require special handling.

5.12 Mass, Energy, and Water Balance

The PBF is limited by a maximum steam production rate of 254,100 lb/hour to control the RDF firing rate and potential air emissions. The original CE performance design was based on an RDF feed rate of 28.15 tons/hour times the average RDF heating value of 5,785 BTU/lb. The resulting heat design value of 326,000,000 BTU/hour for each of the three boilers relates to a maximum steam production rate of 231,000 lb/hour. To ensure compliance a continuous real time measurement of steam produced, summed by the hour, is recorded electronically and is monitored so as to not exceed 254,100 lbs/hour in any 4 hour block average period.

The heating value of the RDF fuel is based on its composition, including percentage moisture and RDF residue. Using the Contract design RDF heating value of 5,785 BTU/lb, each of the three boilers can process 675.6 tons/day of RDF for a total of 2,027 tons/day (i.e.: 28.15 tons/hr x 3 boilers x 24 hours/day). If the heating value is lower than 5,785 BTU/lb, a greater RDF feed rate could be utilized up to the maximum design heat release rate in the form of steam.

5.13 Recyclable Materials

Recyclables are segregated and collected and transported to appropriate market facilities for processing and distribution.

5.14 Landfill

The ash residue from burning RDF to produce steam for power generation is taken to the Wheelabrator Putnam Ash Residue Landfill. The Putnam Landfill is a nine million cubic yard landfill designed to accommodate ash from all of Connecticut's waste-to-energy facilities. The 186-acre site is designed to have six 10-acre ash disposal cells, built sequentially throughout its 25-year life. The remainder of the site is comprised of natural buffers, an administration building, a private access roadway and other supporting facilities.

5.14.1 Landfill Capacity and Expected Life

According to CT DEEP's Solid Waste Management Plan, Wheelabrator Putnam Facility is expected to reach capacity and close by the end of 2018. However, in 2009 it was estimated that the Putnam landfill has enough capacity for another 15 to 17 years, or until 2024 or 2026. ([*Determination of Need Process for Proposed Ash Landfill, Paul Frisman*](#))

5.14.2 Ash Disposal Practices

Taken from facility operating procedures, System Description, CRRRA-PBF_SD-501
Ash Handling:

Baghouse fly-ash is discharged from the hoppers into a closed drag flight type conveyor system which discharges into the fly-ash conditioning system. Fly-ash is mixed with water to control dusting, and is then discharged onto the bottom ash conveyor. Fly-ash and bottom ash are thereby comingled and dusting is eliminated.

The main ash stream proceeds into the Residue Enclosure where it is deposited in piles in any of the ash compartments. Here it is stored for loading into transport vehicles for shipment to a properly licensed facility.

Ancillary equipment, such as front-end loaders, loads the trucks for final disposal in landfill. The disposal trucks have tarps to prohibit dusting. The residue arrives at the landfill in a semi-wetted state; consequently very little airborne material is released.

The storage area is fully enclosed on four sides, provides for multiple truck loading bays, and has sufficient storage for two days of residue during normal operation.

6 FIRE PROTECTION

6.1 Fire Protection Water (Includes Source and Quantity of Water)

The water supply for the firefighting systems is taken from the municipal fire main located just outside of the plant boundary, and as a backup, from the municipal potable water supply through a backflow preventer. The flow rate from either source is adequate for all demands. The pressure is sufficient to satisfy the requirements of all of the firefighting needs except for some of the RDF handling fire suppression systems located at the higher plant elevations.

To meet the needs of these fire systems located at the higher elevations, a booster fire pump has been provided. It is located at Elevation 80 Boiler and is rated at 1,500 gpm and 50 psi. The pump only operates when required for those systems needing the higher pressure. The pump is started automatically from a pressure switch located on the upper area system.

6.2 Fire Protection Systems

The Site Fire Protection System provides manual firefighting capability with hose streams at site facilities. The system also provides a flow path for water supplies to fire protection systems in buildings and structures and to the designated fire protection systems as follows.

- Generation Building Fire Protection (FPA).
- Air Quality Support Structures and Control Building Fire Protection (FPB).
- Control and Laboratory Area Fire Protection (FPC).

The Site Fire Protection System consists of underground yard piping and valves, accessories, and hydrant houses. Twelve (12) fire hydrants surround the WPF and eleven (11) fire hydrants surround the PBF.

Hand Portable Extinguishers

Hand portable firefighting equipment is generally considered to be the first line of defense. Most fires start small, and if discovered in time, can usually be extinguished with either fire extinguishers or fire hose. Further, wet pipe sprinkler systems have been installed in various areas of the plant do not always extinguish a fire, but rather control it, may require the use of hand-held hose lines to effect complete extinguishment.

Fire extinguishers are located throughout the entire power plant and the various auxiliary buildings. The extinguishers are class ABC All Purpose Mono-ammonium Phosphate dry chemical extinguishers.

Fire Hose and Accessories

Fire hose mounted on hose racks are strategically located throughout the power plant in accordance with the National Fire Codes. In the power plant areas where there is the danger of hose streams hitting energized electrical equipment, the hose is equipped with electrically safe nozzles designed in such a way that there is no solid straight stream pattern, but adjustable rough various spray patterns. This type nozzle is safe for use on energized electrical equipment but extreme care is still required when fighting an electrical fire with water – De-energize the area as much as possible first to put out the fire.

Wet Pipe Sprinkler System

An underground yard distribution system supplies fire protection water throughout the main plant area. The yard distribution piping includes a loop around the central plant complex to supply water to fire hydrants, hose stations, and fixed water suppression systems installed in buildings and other plant structures. Additional fire protection yard piping is installed to outlying areas and structures.

The wet pipe sprinkler system consists of an alarm check valve, a water distribution piping system, and closed fusible link sprinkler heads.

The Wet pipe system is used for protection of the following plant areas:

- Turbine Building under the operating floor.
- Lube Oil Room
- Machine Shop
- Fuel Oil Heater Set Area
- Weld Shop
- Warehouse

The preaction sprinkler system is a dry-pipe type sprinkler system in which the alarm check valve has been replaced with a deluge valve and a detection system. The system is used when a high degree of assurance against false operation is required. The dry-pipe system uses the same type of sprinkler head as the wet-pipe and the same hydraulic design applies. Preaction systems have been provided to protect the following systems:

- Turbine Bearings – Unit 5
- Turbine Bearings – Unit 6

Deluge Water Spray Systems

Deluge type water spray systems are used for those hazards requiring rapid response and application of fire suppression, and complete impingement of water over the entire area or equipment being protected. The deluge valve is the same as that described for the Preaction system and is arranged in exactly the same manner. The primary difference between the sprinkler type systems and the deluge systems is that open type water spray nozzles are used for the deluge system in order that water may be applied over the entire

hazard simultaneously instead of one head at a time as occurs with the sprinkler systems. The following equipment is protected with deluge type fire suppression systems:

- Main Transformer
- Auxiliary Transformer
- Hydrogen Seal Oil and Turbine Lube Oil Pumps – Unit 5
- Hydrogen Seal Oil and Turbine Lube Oil Pumps – Unit 6

Fire Pump

The fire pump is manufactured by Peerless Pump. This pump is a single-stage, horizontally split-case, 1765 rpm, rated at 1000 gpm at a Delta P of 40 psi. The pump motor is a 30 horsepower, 460 volt unit. The pump is located in the auxiliary boiler room (near #9 deaerator) on elevation 80.

Fire Detection System

A fire detection system is installed throughout various areas of the plant. Portions of the system are designed for general area detection while other portions are designed to function in conjunction with fire suppression systems. The system is comprised of three major components:

- Fire Detectors
- Local Control Panels
- Main Control Panel

There are two types of detectors used at the plant. One of these is the photoelectric type smoke detector. The second type is the fixed temperature heat detector.

The areas of equipment protected by photoelectric detectors are:

- Exciter Cabinet – Unit 5
- Exciter Cabinet – Unit 6
- Instrument Repair Shop and Electric Shop
- MCC, Battery and Switchgear Rooms

Fixed temperature detectors are provided for:

- Hydrogen Seal Oil Unit and Lube Oil Pumps – Unit 5
- Hydrogen Seal Oil Unit and Lube Oil Pumps – Unit 6
- Turbine Bearings – Unit 5
- Turbine Bearings – Unit 6
- Boiler No. 9 Burner Front
- Main Transformer
- Auxiliary Transformer

The Hartford Fire Department is automatically notified if the fire detection system is triggered.

Manual Alarm Stations

If a fire occurs in an area protected by an automatic fire detection or suppression system, an alarm will automatically sound in the control room. There are many other areas of the plant, however, in which fire can occur which are not so protected. In order to permit prompt reporting of such a fire once it is discovered, manual break glass type alarm stations are strategically located throughout the plant and outlying buildings. Manual Stations are located as follows:

- Employees' Building near the building entrances and exits.
- Administration Building near the building entrances and exits.
- Turbine Building – There are three (3) locations in the Turbine Building. They are at all building entrances and exits.
- Warehouse near the building entrances and exits.

This information was taken from the Fire Protection System Description, SD-804.

6.3 Emergency Planning

In accordance with the requirements of this Plan, and other regulatory requirements for emergency planning, the Facility has made arrangements with local fire, police, medical and other emergency service providers in the event of a fire, explosion or chemical release.

7 EQUIPMENT

7.1 Description of Principal Equipment

This section gives descriptions of the primary equipment employed at the Facility.

7.1.1 Municipal Waste Combustors

Three CE Power Systems VU-40 waterwall municipal waste combustors, with spreader stoker and traveling grates, combust RDF and coal to produce steam, which is in turn used to produce electricity. The auxiliary burner system is natural gas fired. Each municipal waste combustor (MWC) is equipped with a spray dryer absorber (SDA) for acid gas control, a fabric filter for particulate matter control, and a selective non-catalytic reduction (SNCR) system for nitrogen oxide control. Each municipal waste combustor is also equipped with continuous emission monitors (CEM) to monitor opacity, SO₂, NO_x and CO. Permits to construct 075-0044, 075-0045 and 075-0046 were issued on April 18, 1985; permits to operate were issued August 27, 1993. These three permits were modified on April 27, 2007 to add requirements for the addition of the SNCR system as well as to incorporate the rules of RCSA §22a-174-38, and 075-0044 was modified April 30, 2012 to incorporate the addition of an ammonia continuous emission monitor. The facility operates under Title V Operating Permit 075-0245-TV.

7.1.2 Ash Handling System

The ash handling system takes the bottom ash from the municipal waste combustors and combines it with water and fly ash, lime and spent lime from the fabric filters. The combined ash is then discharged to an enclosed structure, where it remains until being loaded into truck for disposal. This unit does not require a registration or permit.

7.1.3 Dolomitic Lime Silo

A silo stores the dolomitic lime used in the ash amendment system. It is equipped with a fabric filter for particulate matter control during deliveries.

7.1.4 Pebble Lime Silo

A silo stores the pebble lime used in the spray dryer absorbers. It is equipped with a fabric filter for particulate matter control.

7.1.5 Coal Processing System

The coal processing system is as follows. Coal is delivered to the facility by barge or truck as needed. Coal delivered by barge is lifted by crane and dumped in the coal hopper (EU-8) and onto Coal Conveyor 1, which conveys it to the coal pile.

Coal delivered by truck is dumped directly onto the coal pile (EU-7). A bulldozer moves the coal around the pile and onto the conveyors (EU-10, 11 and 12), which transport the coal to the municipal waste combustors. These units do not require a registration or permit. The applicable requirements for this grouped emission unit are listed in Section III.C – Premises-Wide Requirements of this Title V Permit.

7.1.6 Waste Processing Facility

Municipal solid waste (MSW) is received at the Waste Processing Facility's tipping floor, where it is processed by two RDF processing lines to remove ferrous metal, large bulky waste, sand/dirt and glass and to produce a uniform size material, approximately 3 to 4 inch nominal size. Each processing line consists of a primary and secondary shredder. RDF is stored on the RDF floor. RDF is loaded onto the RDF Conveyance System as needed. These units do not require a registration or permit.

7.1.7 RDF Conveyance System

The RDF conveyance system consists of a series of conveyors, which transport RDF from the processed waste floor to the municipal waste combustors. All conveyors are fully enclosed. These units do not require a registration or permit.

7.1.8 Natural Gas-Fired Heaters and Boilers

Six small natural gas fired heaters and boilers are operated at the Waste Processing Facility. These include two Aerovent 5 MMBTU/hr Make-up Air Heaters, two Weil-McLain 2.1 MMBTU/hr boilers, an Aerovent 0.6 MMBTU/hr Make-up Air Heater, and a Rezner 0.3 MMBTU/hr Make-up Air Heater.

7.2 Specifications and Processing Capabilities

The fixed equipment and rolling stock equipment must meet the specifications listed in this plan and outlined in plant equipment lists, or equivalent.

8 RECORDKEEPING

Recordkeeping of various aspects of the Facility are tracked for various purposes including:

- Weights of MSW received and its components after separation
- Environmental Compliance Monitoring
- Operating and Processing Rates

This section describes those items that are measured and recorded during the various processing steps at the WPF and PBF.

8.1 Daily Tonnage Data

Daily data is available in the Daily Tonnage Report. The Report contains data recorded by the scale software/computer at the Facility on a daily basis including:

- Beginning/Ending MSW Inventory
- Total Received
- From Member
- Contract & Spot
- Ferrous Residue
- Non-Processable Waste Received
- Total Waste Amount Processed
- Total Ash
- Beginning/Ending RDF Inventory
- RDF Produced
- RDF Consumed

The Report includes a section for WPF Notes which lists run hours, hours down, hours available, and tons processed for each of the two WPF lines. The Report also contains a PBF Overview, which includes data on boiler steam, header hours, and net/gross electricity.

8.1.1 Waste Received

Estimates are made at the beginning of each day of the volume of MSW (and RDF) on the floors. The amount of MSW processed per day is determined by subtracting the MSW floor volume at the beginning of the processing day from the MSW received the previous day. The MSW floor zeroes out often at the end of processing on Saturdays as well as on some weekdays, meaning that all MSW received was processed that week, or even that day i.e.; since the last time the MSW floor was emptied.

Information is maintained by the contracted-operator regarding the running time of each of the two conveyor lines. Downtime during available staffed processing hours is noted individually by reason, (such as equipment jams, electronic or mechanical failures, picking from in-feeds, zero MSW inventory and RDF storage full) and

time associated with the down event for each conveyor line on a daily basis. Note that “miscellaneous” downtime is that time during the designated 16 hour processing span that the lines are not operating because the MSW inventory is completely processed for the day (especially on Saturdays), there is a holiday or the line personnel take a break. There are also separate downtime summaries for overtime on days where the processing lines were manned for greater than 16 hours. The overtime summaries are also compiled into monthly reports.

8.1.1.1 RDF Available to PBF

The RDF floor receives wastes directly from other sources besides the WPF. These sources include:

- Returned Ferrous Residue
- RDF From Out-of-State Sources
- Miscellaneous Other Residue (namely woodchips and Safeway end-products by specific contract terms).

8.1.2 **Waste Burned**

The amount of waste burned is recorded as RDF Consumed in the Production Summary Report.

The ratio of these other sources to the RDF volume of processed MSW on the floor is not consistent in quantity, but over the long run make-up only between 2% to 6% of the total RDF volume. Of the three miscellaneous RDF sources, the one with the greatest variability is out-of-state RDF, whose incoming quantity depends on its availability, as well as the available space/need on the RDF floor.

Steam Production Rate is monitored on a continuous basis and summed to hourly averages. The hourly summaries are presented on a per day basis, along with pressure, temperature and RDF/coal use for each boiler.

8.1.2.1 RDF Analysis

Three (3) times each month an RDF sample is analyzed to determine the moisture content of the material incoming to the PBF. The material is also tested for percentage ash, heating value (BTU/lb) and percentage sulfur for both the as-is RDF and dried RDF per Standard ASTM procedures. Refer to **Figure 6** for a sample testing report.

Figure 6

Sample RDF Analysis Report



Hazen Research, Inc.

4601 Indiana Street
 Golden, CO 80403 USA
 Tel: (303) 279-4501
 Fax: (303) 278-1528

Date March 12 2014
 HRI Project 002-GIV
 HRI Series No. B10/14-1
 Date Rec'd. 02/04/14
 Cust. P.O.#

Connecticut Resources Recovery Authority
 John Romano
 100 Constitution Plaza, 6th Floor
 Hartford, CT 06103-1722

Sample Identification
 Trash and Waste

Reporting Basis >	As Rec'd	Dry	Air Dry
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Proximate (%)

Moisture	39.07	0.00	3.74
Ash	9.35	15.34	14.77
Volatile	46.16	75.75	72.92
Fixed C	5.42	8.91	8.57
Total	100.00	100.00	100.00

Sulfur	0.210	0.344	0.331
Btu/lb (HHV)	5189	8517	8198
Btu/lb (LHV)	4433	7935	
MMF Btu/lb	5768	10211	
MAF Btu/lb		10060	

Ultimate (%)

Moisture	39.07	0.00	3.74
Carbon	29.80	48.91	47.08
Hydrogen	3.82	6.28	6.04
Nitrogen	0.52	0.85	0.82
Sulfur	0.21	0.34	0.33
Ash	9.35	15.34	14.77
Oxygen*	17.23	28.28	27.22
Total	100.00	100.00	100.00

Chlorine**	0.617	1.012	0.974
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Air Dry Loss (%)	36.70
Forms of Sulfur, as S, (%)	

Sulfate		
Pyritic		
Organic		
Total	0.21	0.34

Water Soluble Alkalies (%)

Na2O	0.254	0.418
K2O	0.213	0.350

Lb. Alkali Oxide/MM Btu= 1.36
 Lb. Ash/MM Btu= 18.02
 Lb. SO2/MM Btu= 0.81
 Lb. Cl/MM Btu= 1.19
 As Rec'd. Sp.Gr.=
 Free Swelling Index=
 F-Factor(dry), DSCF/MM Btu= 9,979

Report Prepared By:

Gerard H. Cunningham
 Fuels Laboratory Supervisor

* Oxygen by Difference.

** Not usually reported as part of the ultimate analysis.

An Employee-Owned Company



Hazen Research, Inc.

4601 Indiana Street
 Golden, CO 80403 USA
 Tel: (303) 279-4501
 Fax: (303) 278-1528

Date March 12 2014
 HRI Project 002-GIV
 HRI Series No. B10/14-1
 Date Rec'd. 02/04/14
 Cust. P.O.#

Connecticut Resources Recovery Authority
 John Romano
 100 Constitution Plaza, 6th Floor
 Hartford, CT 06103-1722

Sample Identification:
 Trash and Waste

Elemental Analysis of Ash (%)

SI02	37.00
AL203	9.71
TI02	2.27
FE203	3.14
CA0	24.60
MG0	2.84
NA20	3.97
K20	3.60
P205	1.61
S03	4.78
CL	4.02
C02	0.66
Total	98.20

Ash Fusion Temperatures (Deg F)

	Oxidizing Atmosphere	Reducing Atmosphere
Initial	2100	2064
Softening	2103	2067
Hemispherical	2105	2071
Fluid	2107	2076

Report Prepared By:

Gerard H. Cunningham
 Fuels Laboratory Supervisor

Note: The ash was calcined @ 1110 deg F (600 C) prior to analysis

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8.1.2.2 Use of Coal (Process is out of service)

Coal may be used to supplement the RDF volume to the boilers when RDF is not available, to keep the boilers operating as close to 24 hours a day, 7 days a week as possible to meet required steam production rates by Contract to the EGF. The Facility has not utilized coal to meet demand since 2001. The facility is part of the base load electrical supply for the state and must operate accordingly.

8.1.3 **Unprocessable Waste**

Non-processable waste, such as propane tanks or large furniture that cannot be shredded, is either pulled off the MSW floor after being set aside by the loader operator or picked from the in-feed lines by the mechanical grapple operated from a manned control booth above each line. After being placed in a loadout trailer, it is weighed on its way out from the WPF to the landfill. Non-processable waste typically comprises 1.0 to 3.0% of the MSW received by weight. The remaining waste proceeds along a conveyor to the primary shredder, which opens bags and breaks the waste into large pieces.

After going through the primary shredder, ferrous metals are separated by drum magnets off the conveyor lines and dropped into trailers to be taken to a metals processing company. It should be noted that the separated metals have miscellaneous debris associated with them and that this “ferrous residue” is shipped back, to be placed directly on the RDF floor. The ferrous metals (and residue) loaded out typically accounts for 3.3% to 3.7% of the MSW stream by weight.

The material now goes through a secondary shredding process and is conveyed to the RDF storage area floor.

8.1.4 **Ash**

Ash residue from the PBF is transported in vehicles which are closed and covered, to the Wheelabrator Putnam Ash Residue Landfill in Putnam, Connecticut, or other properly licensed disposal facilities.

8.2 **Weekly Reports**

The Facility compiles weekly performance and management reports for WPF and PBF. These weekly reports include much of the same updates and data as the monthly reports (not including the financial information), but are updated on a weekly basis.

8.3 **Monthly Report**

The Facility compiles monthly reports for WPF and PBF/Jets. These monthly reports include the following information:

- Plant Performance Data
- Safety Updates
- Environmental Updates and Data
- Regulatory Updates
- Administrative Updates
- Operations Data
- Maintenance Updates
- Financial Updates
- Tonnage

Attached in **Exhibit L** is the 1st Quarter 2014 Solid Waste Tonnage Report for the WPF.

8.4 Quarterly and Annual CT DEEP Reports

Consistent with the requirements of Connecticut General Statutes Section 221 Sections 22a-1 through 22a-123 and Section 22a-263, (Formerly Sec. 19-524v), Meetings, Records, Reports, Audits CRRA prepares and submits quarterly and annual reports of operations. These reports include but are not limited to the following data points:

- A listing of the number and type of waste management service contracts entered into with local government units and persons, and the charges therefor;
- A map showing the location of all facilities owned or leased by the authority;
- A schedule of the amounts of waste received and processed in such facilities;
- A listing of the outstanding issues of notes and bonds of the authority and the payment status thereof;
- A budget showing the administrative expenses;
- A report of revenues from all sources and redistribution of any surplus revenues.

Attached in **Exhibit M** is the quarterly report for period ending September 30, 2013 and the annual report for Fiscal Year 2013.

8.5 Sources of Waste Input

The Authority has Municipal Service Agreements (“MSAs”) with approximately 50 municipalities for use of the Connecticut Solid Waste System facilities. The new MSA, through the Authority’s Connecticut Solid Waste System (“CSWS”), went into effect November 16, 2012, following expiration of the CRRA Mid-Connecticut Project on November 15, 2012. The majority of the new MSAs are Tier 1 agreements expiring on June 30, 2017 (short term agreements) or June 30, 2027 (long term agreements).
(source: Annual report of operations, 10/23/2012)

Updated based on: List on web site: http://www.crra.org/pages/MSA_signees.htm

8.6 Maintenance and Operations Costs

CRRA's Connecticut Solid Waste System facility operator bills CRRA the annual contractual operation and maintenance costs for the PBF and WPF in 12 monthly installments. CRRA records and tracks these payments using generally accepted accounting principles.

9 MAINTENANCE

9.1 Daily Clean Up Procedures

The tipping floor of the Waste Processing Facility Building must be cleaned each day. In the event that MSW is staged on the tipping floor overnight in accordance with Section 3.3 above, only those areas of the tipping floor that are clear of MSW must be cleaned. Cleaning shall consist of pushing MSW off the tipping floor, or off those sections of the floor that are not intended to be used for overnight storage, using the bucket of the Payloader.

Provisions for washdown of the tipping floor (e.g., floor drains, trench drains) are incorporated in the Transfer Building design. Floor drains and trench drains must be cleared of MSW on a daily basis, or more frequently if necessary. The floor drains and trench drains discharge to a 5,000 gallon holding tank.

Any refuse that has spilled from waste vehicles must be cleaned up at the end of each day, or more often if necessary. Rodents are controlled by proper tipping floor housekeeping measures as well as by use of a contracted rodent control service.

9.2 Control of Dust

A sweeper is used for periodic road maintenance and dust control at the site.

9.3 Control of Odor and Litter

CRRA has also installed a \$15 million-dollar odor control system for the WPF. The system was designed to draw in an average of 240,000 cubic feet per minute (cfm) of air from the Connecticut Solid Waste System WPF and thermally destroy the odors in the PBF boilers. Since the typical total air demand for the boilers is 180,000 cubic feet per minute, two regenerative thermal oxidizers more than make up the difference at a full capacity of 120,000 cubic feet per minute.

(CRRA website http://www.crra.org/pages/proj_midconn_facilities.htm#rdf).

Additionally, CRRA implements a First In / First Out (FIFO) handling process to mitigate odors from materials, a copy of this process is contained in **Exhibit D**.

On a daily basis, all blowing litter (MSW) that is within or visible must be removed within 2,500 feet of the WPF entrance in either direction. In addition, on a weekly basis, all MSW must be removed from within 100 feet of the property boundary of the WPF building, unless CRRA has verified to the satisfaction of DEEP that despite its best efforts, CRRA was unable to obtain the permission of the property owners to remove the MSW from the properties.

The chain link fence around the perimeter of the site contains windblown materials and facilitates custodial duties at the site.

9.4 Contracts/ Agreements for Maintenance

The current agreements necessary to continue ongoing maintenance activities at the Facilities are in place.

9.5 Equipment Maintenance and Preventative Shutdown Program

The facility implements a program of Predictive, Preventative and Correction Maintenance on systems and equipment.

9.5.1 Predictive Maintenance

Predictive Maintenance is performed on critical equipment. This Maintenance Manual Policy 1 (MMP-1) provides guidelines and recommendations for the use of Predictive Maintenance best practices in support of overall plant operability and reduced maintenance costs. Critical equipment is defined as a single piece of equipment that jeopardizes plant availability or capacity if unavailable.

The Predictive Maintenance program includes the following elements:

- Review of Operating Logs
- Oil Analysis
- Vibration Analysis
- Electrical Trends
- Thermography

9.5.2 Inspection and Preventative Maintenance

Preventive Maintenance is scheduled for each piece of equipment and its components. The Metropolitan District also uses other checklists for equipment maintenance and area safety monitoring including: The Preventative Maintenance program is outlined in Maintenance Manual Policy 2 (MMP-2).

The Preventative Maintenance program includes the following elements:

- Routine Preventive Maintenance
- Fixed Interval Preventive Maintenance
- On-Condition Preventive Maintenance

9.5.2.1 Preventative Maintenance: On-Line Inspections

WPF On-Line Inspections

The waste processing facility operations are under constant visual inspection by the facility operators. The facility is divided into routine areas of

responsibility for the operations staff, thus insuring that all systems and components are checked during normal operator rounds. When indications are present of a component or system not functioning in an efficient/effective manner the Shift Supervisor is notified and corrective actions taken.

PBF On-Line Inspections

A significant reduction in unplanned failures of plant steam production and air quality control equipment is obtained by performing detailed on-line inspection and monitoring procedures on a routine basis. These procedures consist of defined equipment monitoring responsibilities among Operations Department personnel and are the major source of equipment problem identification in the facility on a day to day basis.

The facility is divided into routine areas of responsibility for the operations staff, thus insuring that all systems and components are checked during normal operator rounds. When indications are present of a component or system not functioning in an efficient/effective manner the Shift Supervisor is notified and corrective action taken.

The following list is typical of routine operator actions associated with major equipment to preclude problems from progressing to the point at which a forced outage is required to correct the problem.

- Furnace Checks
 - Bed depth check
 - Burn out rate
 - Proper combustion zone
 - Carry over
 - Furnace exit gas temperature
- Stoker Checks
 - Grate speed
 - Mechanical cleaning of grates
 - Temperature
 - Seal condition
- Ash System Checks
 - Proper water levels
 - Proper alignment of chains
 - Chains and paddle wear
- Back Pass Checks
 - Carry over and ash buildup
 - Boiler exit gas temperature
 - Economizer inlet and outlet temperature
 - Air heater inlet temperature
- Scrubber Checks
 - Proper mixing of lime slurry

- Proper atomization
- Low end gas temperature
- Baghouse Checks
 - Proper position of inlet and outlet damper
 - Frequency of cleaning
 - Inlet and outlet temperature
 - Hopper levels
- CEM System Checks
 - Proper operational levels
 - Correct frequency of automatic calibration cycles

9.5.2.2 Preventative Maintenance: Scheduled Outages

Waste Processing Facility (WPF) Scheduled Outages

In order to minimize unplanned failure of RDF production, a coordinated plan consisting of scheduled shutdowns, inspections and preventative maintenance actions is implemented based on equipment manufacturer's recommendations, actual equipment performance and on-line performance data analysis. The waste processing facility is shut down each day for maintenance and inspection of both processing lines between processing shifts.

Detailed below are key waste processing components and the major inspection and maintenance tasks performed:

Refuse shredders:

- Check hammer wear and replace hammers if necessary.

Primary and Secondary Baghouses:

- Inspect for broken bags, look for and remove, if necessary, buildup of material in hopper.

Secondary Shredder:

- Check hammer wear, grate wear, and liners. Replace if necessary.

Power Block Facility (PBF) Scheduled Outages

In an effort to minimize unplanned failure of plant steam production and air quality control equipment, a coordinated plan consisting of scheduled shutdowns, inspections and preventative maintenance actions is completed based on equipment manufacturer's recommendations, actual equipment performance and on-line performance data analysis. The plan will provide for shutdown of individual boilers and their related systems at routine intervals thus minimizing the effect on plant availability while ensuring that plant equipment functions efficiently and effectively within design parameters.

Detailed below are the key steam generating and air quality control components, the frequency of inspection and the major tasks performed during the inspection. The basic design of the facility allows the utilization of the “unit concept” when developing the overall maintenance plan. This allows one unit to be taken off line with the related support systems and inspected with minimal impact on the facility. Maintenance activities may be expanded or reduced in scope and the frequency of inspection may vary to accommodate operations/needs. Since the facility consists of three identical boiler/emission control train combinations, only one is discussed. Scheduled outages, frequencies and outage lengths discussed for one boiler/emission control train are representative of the other two boilers, but outages are staggered based on operational requirements. Electrical generating equipment maintenance is scheduled to coincide with steam generating equipment outages to minimize the loss of electric generation capability.

A unit shutdown will consist of shutdown of one boiler and the associated emission control system. Over a one year period there are planned quarterly maintenance shutdowns of varying duration and one planned annual overhaul of a lengthier (2 weeks) duration. During the maintenance shutdowns the boiler is cleaned of deposits. Internal inspection of the stoker, furnace, superheater, economizer, tubular air heater, breaching, scrubber, baghouse and CEM system is performed. Any maintenance that can be accomplished during the planned period is performed and any necessary inspections, measurements or samples are obtained for planning purposes in preparation for the annual outage. Preventative maintenance activities in conjunction with original equipment manufacturer’s recommendations are performed by plant personnel and or subcontractors.

During the annual overhaul, detailed inspections are performed on all major equipment. Additionally, major maintenance activities are performed and extensive nondestructive testing performed on various components. Some of the major tasks performed are discussed below.

Boiler:

- Furnace, superheater area and back pass are cleared of slag.
- Routine burner front and sootblower maintenance are done as well as thickness testing of various tube areas in the boiler.
- The tubular air heaters are cleaned to maximize heat transfer and major auxiliary equipment associated with the boiler is inspected.

Scrubber:

- The scrubber is inspected and the atomizers disassembled and inspected.
- Tanks and lines are flushed clean and necessary controls are calibrated to insure efficient/effective operation of the system.

Baghouse:

- The baghouse is inspected internally and cleaned.

- Any necessary bag replacement is done, ash removal systems inspected and repaired as necessary.

CEM System:

- All normal preventative maintenance is performed on the system and a complete calibration done on all measurement devices.

The facility is divided into routine areas of responsibility for the operations staff, thus insuring that all systems and components are checked during normal operator rounds. When indications are present of a component or system not functioning in an efficient/effective manner the Shift Supervisor is notified and corrective action taken.

9.5.3 Corrective Maintenance

Corrective maintenance is managed and performed consistent with Maintenance Manual Policy 3 (MMP-3). MMP-3 provides guidelines on the use of the plant CMMS work order request, work order and work control practices.

9.5.3.1 WPF Unscheduled Outages

When equipment problems exist to the extent that further operation of the WPF equipment will cause probable damage, environmental hazards, or hazards to personnel, corrective action is determined and carried out, including but not limited to processing reductions or equipment shutdown. In all cases of partial or total forced outages, maximum efforts are made to correct the problem and restore the equipment or systems to full operational status.

9.5.3.2 PBF Unscheduled Outages

Through the use of planned outages and extensive on-line inspections as detailed in the previous sections, unplanned- or “forced outages” are reduced to a minimum. Additionally, the overall design of the steam and electric generating facility lends itself to improved flexibility and reliability through the use of a three boiler/two turbine common header system. The dual fuel boilers also allow fuel burning flexibility with coal as a secondary fuel. Key auxiliary system flexibility such as boiler feed pump redundancy and individual emission control trains on each boiler minimize the possibility of an unnecessary load reduction or forced outages. The fuel delivery systems offer operational flexibility with two RDF delivery conveyor systems and the ability to send coal to the bunkers by reclaim from the storage pile or directly from the barge unloader.

When equipment problems exist to the extent that further operation of the equipment will cause probable damage, environmental hazards, or hazards to personnel, corrective action is determined and carried out, including but

not limited to processing reductions or equipment shutdown. In all cases of partial or total forced outages, maximum efforts are made to correct the problem and restore the equipment or systems to full operational status.

9.5.4 WPF and PBF Spare Parts

Spare parts for the Facility equipment are purchased in accordance with the following considerations:

- Impact on plant operation critically of failed component
- Anticipated component life (wear)
- System/component redundancy
- Availability of replacement components

The spare parts inventory for the waste processing facility systems is available at the facility in a storage room which was constructed in 1992.

10 EMERGENCIES

10.1 Emergency Waste Handling Procedures

The facility has implemented a waste management plan to capture and document all waste related details and procedures for the proper characterization, storage and ultimate disposal of all wastes generated from plant operations including emergencies. All waste generated as part of a plant emergency will be properly containerized, stored, labeled and disposed in accordance with all local, state and federal waste regulations.

10.2 Emergency Control and Response Procedures

10.2.1 Emergency Contacts

The following are the telephone numbers of the emergency contacts for the Facility:

Emergency – Medical, Fire and Police	911
CT DEEP – Emergency Spill Reporting	(860) 424-3338 (866) 337-7745
Abdul Rabah, WPF Plant Manager	(860) 247-8887 W (860) 558-3912 C
John O’Rourke, PBF Plant Manager	(860) 240-7101 W (860) 377-3432 C
Richard Quelle, CRRA Owners Representative	(860) 757-7707 W (860) 305-8219 C
CRRA After Hours	(860) 729-0081 (860) 250-1463
NAES (Facility Operator)	(425) 961-4700
Hank Green, NAES Project Manager	(856) 351-6337
Routine Calls:	
Hartford Police Department	(860) 757-4000
Hartford Fire Department	(860) 757-4500

10.2.2 Fire

A. In the event of any fire, immediately report the fire to the Shift Supervisor via plant radio, cell phone, or other means. The report to the Shift Supervisor shall include the following:

- Your name
- Nature of event – “Fire”
- Location of the fire
- Severity of the fire
- Your planned action (e.g., evacuate or use fire extinguisher)

- B. Incipient stage fire means a fire which is in the initial or beginning stage and which can be controlled or extinguished by one person with one portable fire extinguisher. If the fire is in the incipient stage and you have been properly trained, respond using the appropriate fire response equipment.
- C. In the event that the fire is beyond the incipient stage and requires outside emergency response the Shift Supervisor will contact 911 and sound the plant evacuation alarm.
- D. To facilitate a quick response, the plant will designate a liaison to meet the Fire Response Service at the main entrance gate.
- E. Upon hearing the fire evacuation alarm, all personnel shall evacuate to their primary evacuation area.
- F. If necessary, a secondary evacuation area will be determined based upon site conditions and wind direction (as determined by the wind sock).
- G. The Visitor Log Book from the Administration Building should be utilized to aid in accounting for all personnel.
- H. Fire Evacuation Drills shall be conducted annually. At a minimum, the plant evacuation alarm shall be tested monthly. A written record of all drills shall be maintained. Any deficiencies observed shall be corrected.

10.2.3 Explosion

Fires and explosions are closely related. One can easily be the cause or the result of the other. Explosions are most likely to occur in enclosed areas.

In the event of explosion the Shift Supervisor, or designee, must do the following:

- Administer first aid if required;
- Call the Fire Department, CRRA and the Insurance Company;
- Alert Plant personnel;
- Locate and shut down possible sources of combustion (e.g. fuel and gas lines, flammable materials, etc.);
- Assess damage to property and mechanical equipment and file a report in written form.

Plant personnel must make every effort to minimize the possibility of explosion. Precautions are taken to prevent potentially explosive materials from entering the plant processing lines. Plant waste review and processing procedures minimize the likelihood of an explosion by segregating explosive materials from further processing.

Additionally, the following practices are in place to minimize the possibility of explosion:

- Strictly enforce no-smoking rules;
- Post signs indicating potential explosion hazard areas;
- Use positive mechanical ventilation prior to entering or when working in a potentially explosive or suspected oxygen deficient area.

10.2.4 Incident Reporting Requirement Pursuant to Solid Waste Operating Permit

Condition No. C.4.e. of Permit to Operate 06401021-PO for the Resource Recovery Facility (this includes both the Waste Processing Facility and the Power Block Facility) obligates CRR/NAES to report emergency incidents. The language in this condition is stated below:

Provide expeditious notification regarding any emergency incident (explosion, accident, fire, release, or other significant disruptive occurrence) which:

- (i) significantly damaged equipment or structures;
- (ii) interrupts the operation of the Facility for greater than twenty-four (24) hours;
- (iii) results in an unscheduled Facility shutdown or forced diversion of solid waste to other solid waste facilities;
- (iv) could reasonably create a source of pollution to the waters of the state; or
- (v) otherwise threatens public health.

Such notification shall be:

- (i) immediately conveyed to the Commissioner using the 24-hour emergency response number (860) 424-3338 or the alternate number (860) 424-3333 and in no event later than twenty-four (24) hours after the emergency incident;
- (ii) verified to the Solid Waste Program in the Waste Engineering and Enforcement Division of the Bureau of Materials Management and Compliance Assurance by phone at (860) 424-3366, or at another current publicly published number for the Solid Waste Program, or by facsimile at (860) 424-4059;
- (iii) followed by a written report no later than the fifth business day after the emergency incident detailing the cause and effect of the incident, remedial steps taken and emergency backup used or proposed to be implemented; and
- (iv) recorded in a log of emergency incidents. In addition to the notification requirements above, the Permittee shall comply with all other applicable reporting or notification requirements regarding the emergency incident including but not limited to, reporting required by CGS Section 22a-450.

DEEP Contacts for reporting emergency incidents per Condition of Permit to Operate

1. The Emergency Response Unit
Immediately call the DEEP 24 Hour emergency response number: 860-424-3338 (This is required even if there is no release to the environment).

2. The Waste Engineering & Enforcement Division

Call one of the following individuals:

Eugene McGillis: 860-424-3561

Frank Gagliardo: 860-424-3130

Calin Tanovici: 860-424-3315

Otherwise, type a brief summary of the incident (time, nature of event, etc., including your name and phone number) and fax it to 860-424-3366.

10.2.5 Major Injury—Outside Medical Attention Required

If someone is seriously hurt, notify the Shift Supervisor of the location of the injured person, nature of the injury, and any other important information related to the incident scene (ex. Down power line next to injured person, chemical drum spill, etc.).

The Shift Supervisor will contact 911 to alert emergency crews. An individual will be designated to meet emergency crews at the main entrance gate.

The Shift Supervisor will make an announcement for all available First Aid/CPR trained personnel to report to the incident site. The First Aid/CPR-trained personnel will administer first aid and any other measures within their training until the emergency crews arrive at the scene.

If the situation warrants the rescue of an unconscious or immobile person from a confined space or an elevated surface, or in a personal fall arrest system the Shift Supervisor will be instructed to dial 911 and shall explain to emergency personnel the type, location, and hazards of the area.

10.2.6 Minor Injury—On-Site Medical Attention Necessary

All injuries must be reported to the supervisor, no matter how small. First Aid/CPR trained personnel will be called to respond to minor first aid injuries.

10.2.7 Accident Reports

Accident reports will be completed within the facility incident tracking system and forwarded to CRRA Organization in a timely manner.

10.2.8 Hazardous Waste Management

The following steps will be done immediately upon observation of a hazardous material spill. This procedure is intended to be a concise list of the basic

emergency response steps and must be used in conjunction with Hazardous Material Spill Training and Follow-up.

- A. Ensure that all personnel are evacuated from the spill area. Attend to any injured personnel.
- B. Evacuate the entire plant if it becomes necessary. Primary evacuation routes are shown in **Exhibit N**. The Plant Manager or his designee may designate different evacuation routes at the time of the accident based on the information known at the time. Personnel may also be directed to go to a particular area of the plant to evacuate the area of the emergency if evacuation of the site is undesirable.
- C. Additionally, if the emergency involves a toxic airborne release, the Plant Manager or his designee will evaluate the release and wind conditions and determine whether or not to evacuate plant personnel or “shelter-in-place”. The shelter-in-place concept is preferable in the situation where a high concentration cloud of toxic gas passes a building containing people.
- D. If the gas cloud is moving in the direction of the control room, shut down all air conditioning and ventilation systems. All personnel in the building should enter the control room area and all doors leading to this area should be closed.
- E. Take the necessary steps to mitigate the spill or release (e.g., shut off pumps, close valves, discontinue loading/unloading operations, etc.) if it safe to do so. If at all possible, stop the spill at its source.
- F. Immediately notify (Control Room Operator (or equivalent)) all personnel on-site of the spill/release.
- G. The Plant Manager (or a designee) will instruct plant personnel for further spill response measures. At any time the Plant Manager determines that the spill or any measure needed to prevent, contain, control, or clean up the spill is beyond the ability or training of the facility manpower and/or equipment, he shall immediately contact outside hazardous materials emergency responders and remediation contractors to help control/clean up the spill.
- H. If the spill or release is of a nature that may place the public at risk, initiate public warnings through the local emergency agencies listed on the Emergency Response Contact List.
- I. The Plant Manager or his designee will maintain plant security and communications. In no case shall members of the press be admitted without the approval of Owner Representative. The Owner Representative

or his designee will handle all public relations, press releases, and outside inquiries.

- J. Make every reasonable effort to keep the spill on the plant property. In the event that the material has been released from the containment system, all necessary steps shall be taken to prevent it from entering storm sewers, public waters, or from escaping the facility property as long as it is safe to do so.
- K. Refer to the Material Safety Data Sheet further known in this procedure as MSDS sheets for proper use of personnel protective equipment.
- L. Build berms, place absorbent materials, plug storm drain inlets, culverts, and ditches to stop the flow of the spill. If necessary, PLUG culverts of streams and drainage ditches leaving the plant to stop the flow of the spill.
- M. Document all events in detail as soon as possible.
- N. Follow up with all emergency response organizations, NAES headquarters, and the Owner Representative to ensure all reporting requirements have been met. Report all injuries in accordance with SMP-14, Accident, and Injury Reporting.

11 ENVIRONMENTAL CONTROLS

11.1 Odor, Dust, and Vibration Control

Odors are generally not a problem at the facility. Odor control is based on processing all material on the day it is received if possible. If not possible, the goal then is to move out the oldest material first. See **Exhibit D**, First In/ First Out (FIFO) Handling for additional information. In addition, all dry areas, tipping floor and refuse storage areas and wall areas are to be swept at the end of each processing day. Spillages and accumulations are to be cleaned up. Waste is to be kept out of sunlight, which is feasibly accomplished in the enclosed and enlarged tipping floor area.

There is a comprehensive dust collection system in the shredders and processors of the WPF. The cyclone-bag houses release the collected material to the line, which is then fed to the RDF floor. Dust collection systems are also in place at the PBF. Roadways are street-swept by MDC on an as-needed basis.

11.2 Noise Control and Background Testing

The WPF equipment is contained within a building with primary shredders installed in isolated rooms. Noise has not been considered a problem in the commercial/ industrial (non-residential) area of both the WPF and PBF.

11.3 Screening

Solid waste transfer stations are required to comply with screening of materials from view of residential areas. There are no residences within 500 feet of the facility so screening from view pursuant to RCSA Section 22a-209-9I is not required.

11.4 Rodents

Rodents are controlled by proper tipping floor housekeeping measures, as well as by use of a contracted rodent control service. There is a constant effort to pick up litter in the vicinity of the facility by operating personnel.

11.5 Vectors

As of May 2014 CRRA contracts with the United States Department of Agriculture, Wildlife Services to control nuisance birds, etc.

11.6 Air Pollution Parameters and Monitoring System Control

11.6.1 Air Monitoring

The objective of air monitoring is to show official compliance with the CRRA's contract performance requirements as well as CT DEEP and EPA air emission

permit limitations. Monitoring of air emissions from the PBF operation are conducted as required by the CT DEEP Permit to Operate. Continuous emission monitoring at the PBF is conducted for opacity, sulfur dioxide, nitrogen oxides as nitrogen dioxide, oxygen, carbon monoxide, ammonia (unit 11 only), and carbon dioxide.

In addition, various process data and information is gathered on a continuous basis. The system is recertified each year as required by regulations.

11.6.1.1 Air Pollution Control System

The Air Pollution Control System removes fly ash, oxides of nitrogen (NO_x), and acid gases such as sulfur dioxide and hydrogen chloride from the combustion flue gas to comply with federal and state regulatory requirements.

The Air Pollution Control System for each boiler includes a dry scrubber/fabric filter train, scrubber module, Selective Non Catalytic Reduction (SNCR) NO_x-Out module, and other associated auxiliary equipment.

In the process the reactive sorbent, in this case calcium hydroxide, is prepared by slaking burnt lime, calcium oxide, with water which reacts to form the desired slurry material. Concentration of the calcium hydroxide slurry is maintained by dilution with process water flow proportioned to the concentration setting desired. Grit, or unreacted oversized material, is removed from the final slurry by screening prior to depositing the additive in the additive storage tank.

In the spray dryer, the feed slurry is finely atomized and mixed with flue gas. Rotary atomizers provide fine sprays, can handle a wide range of flows, and operate at low feed pressures. The feed rate to the atomizer can be adjusted to control the spray dryer outlet temperature. Evaporation of water and SO₂ absorption occur concurrently, yielding a dry mixture of calcium sulfite/calcium sulfate, some unreacted lime, and fly ash. The solid product is collected in a fabric filter downstream. The fabric filter can also provide for a small amount of additional SO₂ removal due to unreacted sorbent coating the bags.

The absorber outlet temperature is maintained at the desired set point by controlling the flow of slurry to the rotary atomizer with the slurry control valve.

Inlet and outlet temperatures of the absorber are indicated and controlled from the control console. High and low temperature alarms and interlocks are provided. If the outlet temperature drops below a preset level, slurry

flow to the absorber will cease and the atomizer wheel will be flushed. Flow resumes when temperature rises into the control range. This action is taken to prevent wetting and pluggage of the absorber, and blinding of the baghouse fabric.

The additive feed tank at each absorber has a minimum capacity at design load to provide adequate system responsiveness. Hydrated lime is added to the feed tank in slurry form and water is added to maintain a constant tank level. The lime concentration in the slurry is determined by inlet SO₂ load and stoichiometric ratio. In controlling the slurry solids concentration, the operator can input inlet SO₂ load, then adjust stoichiometric ratio to optimize use of recycle solids to achieve the desire SO₂ removal. The balance of liquid added to the tank is water.

The Selective Non Catalytic Reduction (SNCR), NO_x-Out, injects a urea mixture, post combustion, to provide NO_x emission control. Flue gas temperature and reagent distribution are monitored in order to optimize NO_x removal of the system.

Control is provided on the control console to allow the operator to set lime stoichiometry and additive feed tank level. High and low level alarms, low level and high level interlocks are also provided.

The additive slurry is conveyed to the spray dryer rotary atomizer by the additive feed pumps. Two pumps are furnished, with one being a dedicated operational spare per unit, for a total of six additive pumps (two per unit). Each fabric filter is composed of 12 compartments. Inlet and outlet temperature is monitored and controlled to ensure proper operations. Hopper heaters and two-point nuclear hopper level transmitters are provided for each compartment with alarms for higher hopper level and Kirk-key interlocks. Each fabric filter compartment has a differential pressure monitor to determine in- service status for bag maintenance.

The initial configuration is four compartments are placed in service. Once started, the inlet temperature into the fabric filter is maintained at approximately 400 degrees Fahrenheit. The compartments are cleaned on a timed sequence basis, based on boiler load and the rate of differential pressure buildup, or based on differential pressure control only. In addition, when the pressure drop measured exceeds a predetermined value, the cleaning sequence automatically becomes continuous. Should this fail to resolve the high differential pressure buildup, appropriate panel alarms alert the operator of abnormal operation, and corrective action is taken. A wide variety of continuous emission monitors, are located upstream and downstream of the baghouse to monitor key pollutant releases to the chimney.

Induced Draft System

The Induced Draft System provides the negative pressure required to induce the flow of combustion gases from the furnace to the chimney and to maintain furnace draft.

The Induced Draft System for each boiler includes one double width, radial induced draft fan with a drive motor, fan inlet vanes and an outlet damper, and fan and motor foundations.

Each induced draft (ID) fan for each steam generator is located between the fabric filter and the chimney. Combustion flue gas flows from the outlet ductwork of the fabric filter into the inlet ducts of the ID fan.

Chimney

The Chimney System or stack, which is 218 feet above grade, provides for the discharge of combustion gases to the atmosphere at a sufficiently high elevation to meet air quality limitations and regulations associated with dispersion of pollutants. The stack helps to further reduce ground level concentrations of any pollutants not removed by the control equipment to acceptable safe levels.

The Chimney System includes a wind shell, single liners, foundation, ductwork, breeching entrances, platforms, ladders, and aviation obstruction lighting.

The brick liner is located within the concrete shell to convey combustion gas from each steam generator to the atmosphere. The annular space between the liner and the shell is pressurized to prevent gas leakage from the liner.

Aviation obstruction lighting is mounted on the chimney shell in accordance with FAA obstruction marking regulations. A high-intensity, white aviation obstruction lighting system is installed on the chimney.

11.7 Ash Testing

Per the requirements of CT DEEP's Permit to Operate a Solid Waste Facility, ash samples are collected on a periodic basis and analyzed using EPA's Toxicity Characteristics Leaching Procedure (TCLP).

11.8 Coal and RDF Monthly Mass and BTU Analysis

11.8.1 Method of Calculating the Mass of RDF Produced and Fired

The individual weights of the Municipal Solid Waste (MSW), non-processables, small fraction residue and ferrous are totaled each month. The mass or weight of RDF is calculated to be equal to the weight of MSW received less the weight of non-processables, small fraction residue, and ferrous recovered. The Waste Processing Facility receives MSW on the incoming vehicles. The MSW is presorted on the tipping floor to remove oversized and non-processable wastes.

A large drum type magnet removes the ferrous metal. The ferrous metal is recovered in separate containers and sold to a firm under contract to recycle the metal

The separate roll out containers of non-processables, small fraction residue and ferrous are placed on outgoing trucks and weighed on the 60 ton capacity scale as they leave the facility. The weight of these materials as it is determined over a month is subtracted from the total weight of MSW received for the month to determine the mass of RDF produced for the month.

11.8.2 Method of Sampling for Average RDF BTU Analysis

The BTU value of the RDF is determined via sampling and analysis pursuant to ASTM method D5865. The sampling is conducted as the RDF discharges from the auger bin through a chute to the vibrating pans. The chute has a door which allows for easy access to the RDF at this point. A tray can be placed under the stream of falling RDF and the RDF sample placed in a marked, sealed plastic bag. For a sampling event, a sample is obtained every hour over a 24 hour period. These samples are composited and thoroughly mixed. The cone and quarter method is used to generate a sample for analysis. A copy of the RDF Sampling protocol is attached as **Exhibit O**.

Such composite samples are obtained three (3) times each month and are sent out for analysis. All samples are analyzed for the BTU value, which is then used to generate an average value for that sampling period. Analysis is also conducted to determine, among other things, percent moisture, percent ash and percent sulfur.

11.8.3 Method of Calculating the Mass of the Coal Fired

The coal is conveyed to the Power Block Facility (PBF) and introduced into the boiler through Stock Batch Feeders. The Stock Batch Feeders weigh the coal. Each month the weight of the coal is tallied and the tally used as the mass of the coal fired for the month.

11.8.4 Method of Calculating the Average BTU of the Coal

Coal that is to be combusted in the PBF is transported to the Facilities dock on the Connecticut River in barges. The barge unloader moves the coal with a clam shell

unloading system into a receiving hopper in the barge unloading structure. Via conveyor the coal is moved to the PBF or to the coal storage area.

The coal is sampled and analyzed pursuant to ASTM-27, prior to shipment and a detailed report is furnished for each delivery.

11.9 Water Process Monitoring and Control of Discharges

The WPF was registered to the CT DEEP General Permit for Miscellaneous Discharges of Sewer Compatible (MISC) Wastewater. Although the volume of this wastewater has receded and registration to the general permit is no longer necessary, compliance with the wastewater quality standards is still required.

The PBF has two discharge permits which include a National Pollutant Discharge Elimination System (NPDES) Permit to discharge non-contact cooling water to the Connecticut River and a permit to discharge treated wastewater to the Metropolitan District Commission sanitary sewer system. Copies of the Permits are available upon request.

11.9.1 Stormwater Management

Both WPF and PBF operations are registered to the CT DEEP General Permit for the Discharge of Stormwater Associated with Industrial Activity. The registration number is: GIS000118. See **Figure 7** for a copy of the Stormwater General Permit registration.

11.10 Industrial Hygiene Monitoring

On a periodic basis the facility will be monitored to ensure compliance with occupational safety and health regulations. Monitoring includes tests conducted via noise dosimetry, sound level meter readings, total dust analysis, respirable dust analysis and heavy metal analysis.

Figure 7

Stormwater General Permit Registration

CT DEEP Industrial Stormwater Registration Status										Report Includes all Registrations received by 4/16/2014
Permit coverage expires 9/30/2016 - Status (Updated Daily)										
Site Town	Site Name & Street Address	Client Name	Application #	Received Date	Status	Pollution Prevention Plan	Registration Posting Date	Request or Comment Period End Date	Permit Number	Authorization Date
HARTFORD	Name: HARTFORD MAINTENANCE FACILITY Address: 49 JENNINGS RD	TRANSPORTATION, STATE OF CONNECTICUT DEPARTMENT OF	201104098	05/26/2011	Issued	Review and/or Comment Period Closed	6/2/2011	6/17/2011	GSI000956	10/1/2011
HARTFORD	Name: HERITAGE-CRYSTAL CLEAN LLC, HARTFORD BRANCH Address: 94 MURPHY RD	HERITAGE-CRYSTAL CLEAN, LLC	201105250	06/03/2011	Issued	Review and/or Comment Period Closed	6/10/2011	6/25/2011	GSI002117	10/1/2011
HARTFORD	Name: MDC-VEHICLE MAINTENANCE FACILITY Address: 50 MURPHY RD	METROPOLITAN DISTRICT, THE	201104547	05/27/2011	Issued	Review and/or Comment Period Closed	6/3/2011	6/18/2011	GSI000490	10/1/2011
HARTFORD	Name: Metal Management Aerospace, Inc Address: 239 West Service Road	METAL MANAGEMENT AEROSPACE, INC.	201104345	05/31/2011	Issued	Review and/or Comment Period Closed	6/7/2011	6/22/2011	GSI002206	10/1/2011
HARTFORD	Name: METROPOLITAN DISTRICT Address: 240 BRAINARD RD	METROPOLITAN DISTRICT, THE	201104572	05/27/2011	Issued	Review and/or Comment Period Closed	6/3/2011	6/18/2011	GSI000597	10/1/2011
HARTFORD	Name: MID-CT RESOURCE RECOVERY FACILITY Address: 300 MAXIM RD	CONNECTICUT RESOURCES RECOVERY AUTHORITY,	201104645	06/01/2011	Issued	Review and/or Comment Period Closed	6/8/2011	6/23/2011	GSI000118	10/1/2011

12 SAFETY

12.1 Safety Policy

It is the policy of CRRA and the Facility Operator to assure to the highest degree possible a safe and healthful working environment for all employees.

In order to achieve the goal of a hazard-free working environment, employees and non-employees who use the Facility are required to obey the rules set forth in CRRA's and the Facility Operator's safety program or be subject to disciplinary action.

CRRA and the Facility Operator must meet or exceed the standards established by any applicable local and/or federal laws and regulations including regulations promulgated by the Occupational Safety and Health Administration (OSHA) pertaining to general industry (29 CFR Part 1910) and the construction industry (29 CFR Part 1926).

12.2 Safety Standards and Rules

Comprehensive safety procedures are maintained on site in the Safety Management Plan (SMP). Procedures include, but are not limited to:

- SMP-1A Job Hazard Analysis
- SMP-2 Emergency Response
- SMP-5 General Safety Practices
- SMP-11 First Aid

The complete Safety Manual Table of Contents is available in **Exhibit I**.

12.2.1 General Safety Standards for Employees

- A. Any employee who discovers an unsafe or hazardous condition will attempt to rectify the condition if possible. If not possible, the condition shall be reported immediately to the Shift Supervisor.
- B. The company encourages self-reporting of all near miss, unsafe conditions, and other safety learning incidents so that all employees can benefit from lessons learned. Reporting of such an event will not result in disciplinary action.
- C. It is expected that all employees will comply with safety rules and guidelines. Only the proper equipment and tools are to be used for each job.
- D. Smoking will not be allowed in NO SMOKING areas.

- E. Employees are not allowed to bring handguns or other weapons, concealed or otherwise, onto the plant property or carry handguns or other weapons while engaged in conducting business on behalf of this facility. This rule also applies to contractors and vendors and their employees as discussed in the vendor/contractor training requirements in SMP-1.

12.2.2 Basic Facility Rules and Regulations

- A. Employees shall maintain work areas in a clean and orderly condition.
- B. Walks, aisles, stairways, fire escapes, and all other passageways shall be kept clear of all obstructions.
- C. Work areas shall be cleaned up as soon as the job is completed and when necessary to maintain safe conditions while work is in progress.
- D. Tools and materials should not be placed where they will cause tripping or stumbling hazards.
- E. Spills or accumulation of oil or water on floors shall be cleaned up promptly. Post signs to inform other employees of condition.

12.3 Safety Procedures and Responsibilities

All employees are responsible for:

- Adhering to plant safety procedures and rules
- Performing all functions in a safe manner
- Watching out for the safety of others
- Observing good housekeeping practices
- Using the appropriate safety equipment
- Immediately reporting all on-the-job injuries to their Shift Supervisor
- Correcting unsafe conditions or actions when possible
- Reporting unsafe conditions or actions to their Shift Supervisor
- Initiating a hazardous work permit when appropriate

All Shift Supervisors are responsible for:

- Reviewing work orders to ensure that adequate safety precautions are identified for each job
- Routinely review all assigned areas and jobs to verify that safe practices are being followed
- Follow up on the safety training program to ensure that all personnel maintain the appropriate level of safety awareness
- Ensure that routine workplace safety inspections, surveys, and audits are carried out and that all deficiencies are promptly corrected
- For any accident or near-miss, determine the root cause and implement the appropriate corrective actions

12.4 Safety Training

Employee safety training is provided in the following circumstances:

- Upon initial employee hiring as part of new employee orientation before assignment
- Employees are provided training when assigned to a new task for which training has not been received
- Shift Supervisors are trained on hazards and safe practices in their area of responsibility
- Training includes general area safety and specific assignment or job safety class training, the potential occupational safety and health hazards, and the Code of Safe Practices for the area
- Refresher training is provided as required or when events/activities necessitate re-training

Documentation of training is maintained on individual records for individual initial training. Group sessions will be documented on training accountability forms.

12.5 Personal Protective Equipment (PPE)

12.5.1 Head Protection

Employees must wear hard-hats and safety glasses on site except for designated areas such as inside the office areas and shops or when going between the buildings and private automobiles. Hard-hats shall be designed to reduce the hazard of shock due to contact with electrical equipment. Hard-hats must comply with ANSI Z89.1-2003.

Hard-hats will be properly cared for. The exterior of the hat will not be defaced by stamping, scratching, cutting, or painting. Hard-hats require replacement at least every 5 years. All hard-hats should be checked annually and replaced prior to their expiration date, which is stamped on their interior.

12.5.2 Eye Protection

Employees must wear safety glasses with side shields (Detachable side-shields are allowable) as a part of normal work; in addition, secondary eye and face protection may be needed when engaged in operations where there is additional exposure. Protective eye and face devices shall be in compliance with applicable ANSI standards, tinted lenses are not allowed inside buildings. The exception is specialized activities such as, welding/burning.

Functions recognized as having exposure for which additional face protection will be worn include:

- Chipping, grinding, boring, breaking, drilling, cleaning, scaling, etc.

- Opening or closing any energized fused cutout, jumper, tap and riser, or any switch which is not separated from the operator by an enclosure, barrier, or a remote operating mechanism
- Handling or using hot liquids and molten metals, including babbitting and soldering operations
- Testing or filling apparatus with liquids and gases under pressure
- Splicing or cutting energized low-voltage cable
- Using compressed air for cleaning off equipment or other housekeeping duties
- Working around rotating machinery
- Handling, mixing, and injection of chemicals
- Operating any machine shop power or impact equipment
- Working around a potentially hazardous source of steam such as when adjusting a packing leak on a steam valve
- Working with potentially injurious light radiation

Employees shall wear suitable protective equipment when engaged in welding or cutting operations, which has a filter lens with a shade number appropriate for the work being performed. Contacts lenses are allowed.

12.5.3 Foot Protection

Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards. All footwear shall be shoes with hard soles, substantial leather-type uppers and have a distinct heel. Shoes made of cloth, nylon, or fabric, and open heeled, open toed, or shoes with narrow heels that could catch in grating shall not be worn except when work is performed in the office.

Protective footwear must meet the current ASTM F2413-05 Standard Specification for Performance Requirements for Foot Protection for the type of hazards encountered. At minimum, protective footwear must meet the I/75 and C/75 rating for impact and compression as well as the ASTM F2413-05 puncture-resistant (PR) requirement.

The following is an example of an ASTM F2413-05 marking found on protective footwear:

ASTM F2413-05
M I/75/C/75
PR

Electricians must have boots that meet ASTM F2413 – 05 for electrical shock resistant (EH) footwear.

The following is an example of an ASTM F2413-05 marking found on protective footwear:

ASTM F2413-05
M I/75/C/75
PR EH

12.5.4 Hand Protection

Employees will be required to use appropriate hand protection to minimize exposure to hazards such as chemical absorption through the skin, severe lacerations or cuts, punctures, chemical or thermal burns, and harmful temperature extremes. Selection of hand protection shall be based on performance characteristics of the hand protection relative to the tasks to be performed, conditions, duration of use, hazards, and potential hazards.

12.5.5 Clothing

Employees will be required to wear proper clothing while working at the plant site, including full-length trousers and sleeved shirts. Tank tops, neckerchiefs, and cut off pants will not be allowed.

Loose sleeves, ties, cuffs, or other loose clothing should not be worn near rotating machinery.

Clothing saturated with chemicals must be removed immediately and not worn until laundered.

Polyester, acetate, nylon, rayon, or other synthetic fabrics that may increase the injury due to burns may not be worn if there is exposure to open flames, electric arcs, hot piping, or areas where it may be easily ignited.

12.5.6 Reflective Clothing

Employees will be required to wear Safety Yellow reflective outerwear including but not limited to a vest, jacket or coat.

12.5.7 PPE Requirements

Additional PPE may be required when performing certain job activities. A PPE Hazard Assessment (refer to **Exhibit P**) that contains the required PPE shall be completed for these activities.

PPE is not required in the following areas (unless necessary for unusual activities):

- Control Room
- Administration building
- Warehouse Office

- Temporary office trailers
- Office personnel, visitors, and others that are in plant process areas are required to, as a minimum, have the following PPE:
- Hard hat
- Safety glasses
- Sturdy work boots
- Hearing protection

The facility shall maintain an ample supply of hard hats, safety glasses, and hearing protection for visitors.

13 REVISIONS

Original Date	Description	
5/1994 Rev 0	Operations and Maintenance Plan	
Revision Date	Description	Sections Affected
9/2003 Rev 0	Reviewed, no changes	None
9/2004 Rev 0	Reviewed, no changes. Referenced in solid waste permit renewal application (5/12/2004).	None
9/2005 Rev 0	Reviewed, no changes.	None
9/2006 Rev 0	Reviewed, no changes.	None
9/2007 Rev 0	Reviewed, no changes.	None
8/2008 Rev 0	Reviewed, no changes.	None
9/2009 Rev 0	Reviewed, no changes.	None
9/2010 Rev 0	Reviewed, no changes.	None
8/2011 Rev 0	Reviewed, no changes.	None
10/2012 Rev 0	Changed to NAES as operator of both WPF and PBF.	References throughout
5/2013 Rev 1	Changed format of O & M Plan.	All
6/2014 Rev 2	Changed format of O & M Plan to follow CT DEEP guidance document DEP-WEED-GUID-102.	All

EXHIBIT A

Connecticut Solid Waste System Permitting, Disposal and Billing Procedures

EXHIBIT B

Transfer of MSW

CRRA Mid-Connecticut RRF

Procedure for Transfer of MSW at the Waste Processing Facility

The Resource Recovery Facility is comprised of two separate processing facilities: 1) a waste processing facility (“WPF”) where refuse derived fuel (“RDF”) is prepared from mixed municipal solid waste (“MSW”), and 2) a power block facility (“PBF”) where RDF is combusted to generate steam.

Shipments of MSW are delivered to the WPF on waste hauling vehicles, and the MSW is discharged from the vehicles onto the facility “tip floor.” Normally, the MSW is then pushed onto conveyors and transmitted through the WPF where it is processed into RDF.

From time-to-time CRRA may accept deliveries of MSW onto the tip floor, but instead of processing the MSW, CRRA may instead transload (reload) the MSW onto waste hauling vehicles that will in-turn deliver the MSW to an alternate, properly licensed waste management facility. CRRA anticipates that the need to transfer MSW will occur due to circumstances such as an unscheduled boiler outage, equipment malfunction, or other unanticipated situation that limits the amount of MSW that can be processed and combusted.

Such MSW transfer activities will be conducted as outlined below.

- Transfer of MSW will be performed by loading MSW into 100 yd³ transfer trailers, or similar waste hauling vehicles, for transport off site to other properly licensed disposal facilities.
- Transfer activities will be conducted only during those periods when MSW deliveries are not scheduled or occurring at the WPF. Accordingly, transfer activities may occur during the following periods:
 - Monday: 11:00 pm through 4:45 am the following day
 - Tuesday: 11:00 pm through 4:45 am the following day
 - Wednesday: 11:00 pm through 4:45 am the following day
 - Thursday: 11:00 pm through 4:45 am the following day

- Friday: 11:00 pm through 4:45 am the following day
- Saturday: 11:00 pm through 4:45 am the following day
- Sunday: All day (provided the WPF is not processing)

CRRA shall not conduct any MSW transloading activities during those times when deliveries of MSW are occurring at the WPF.

- After arriving on site, empty transfer trailers will back into the Maneuvering Hall of the WPF and then onto the tip floor. The waste hauling vehicles will be loaded using a front-end loader, which provides the most effective method for loading 100 yd³ transfer trailers on the tip floor. A Caterpillar 966, Caterpillar 980 front-end loader (or equivalent piece of equipment) will be used for this operation. These front-end loaders are “highlift” loaders; that is, they are equipped with extended load arms that can easily and safely accommodate loading over the side wall of a transfer trailer.
- There is adequate room on the tip floor to load two transfer trailers simultaneously; a transfer trailer can typically be loaded in approximately 20 minutes. Accordingly, the facility operator will be able to load thirty four (34) trailers during the 11:00 to 4:45 time period.

A Transfer Trailer has a capacity of 100 yards, or approximately 20 tons. The conversion factor between tons of MSW and cubic yards of MSW is 0.2 tons/cubic yard. Thirty four transfer trailers is equivalent to 680 tons, or 3,400 cubic yards. CRRA may transfer 680 tons, or 3,400 cubic yards per day.

- Each transfer trailer will be weighed prior to departing the site.
- The monthly reports stating waste receipts and waste shipments, submitted pursuant to RCSA 22a-209-10(13), will reflect this transfer activity, including quantity transferred and the facility to which the MSW is transferred.

EXHIBIT C

List of Towns with Municipal Service Agreements

List of Towns with Municipal Solids Agreements

TOWN/CITY	TOWN/CITY
Avon	Lyme
Barkhamsted	Manchester
Beacon Falls	Marlborough
Bethlehem	Middlebury
Bloomfield	Middlefield
Canaan	Naugatuck
Canton	New Hartford
Chester	Norfolk
Clinton	North Canaan
Colebrook	Old Lyme
Cornwall	Old Saybrook
Deep River	Oxford
Durham	Portland
East Granby	Rocky Hill
East Hampton	Roxbury
Ellington	Salisbury
Essex	Sharon
Farmington	Simsbury
Glastonbury	South Windsor
Goshen	Thomaston
Granby	Torrington
Haddam	Watertown
Hartford	Wethersfield
Harwinton	Winchester
Killingworth	Woodbury
Litchfield	

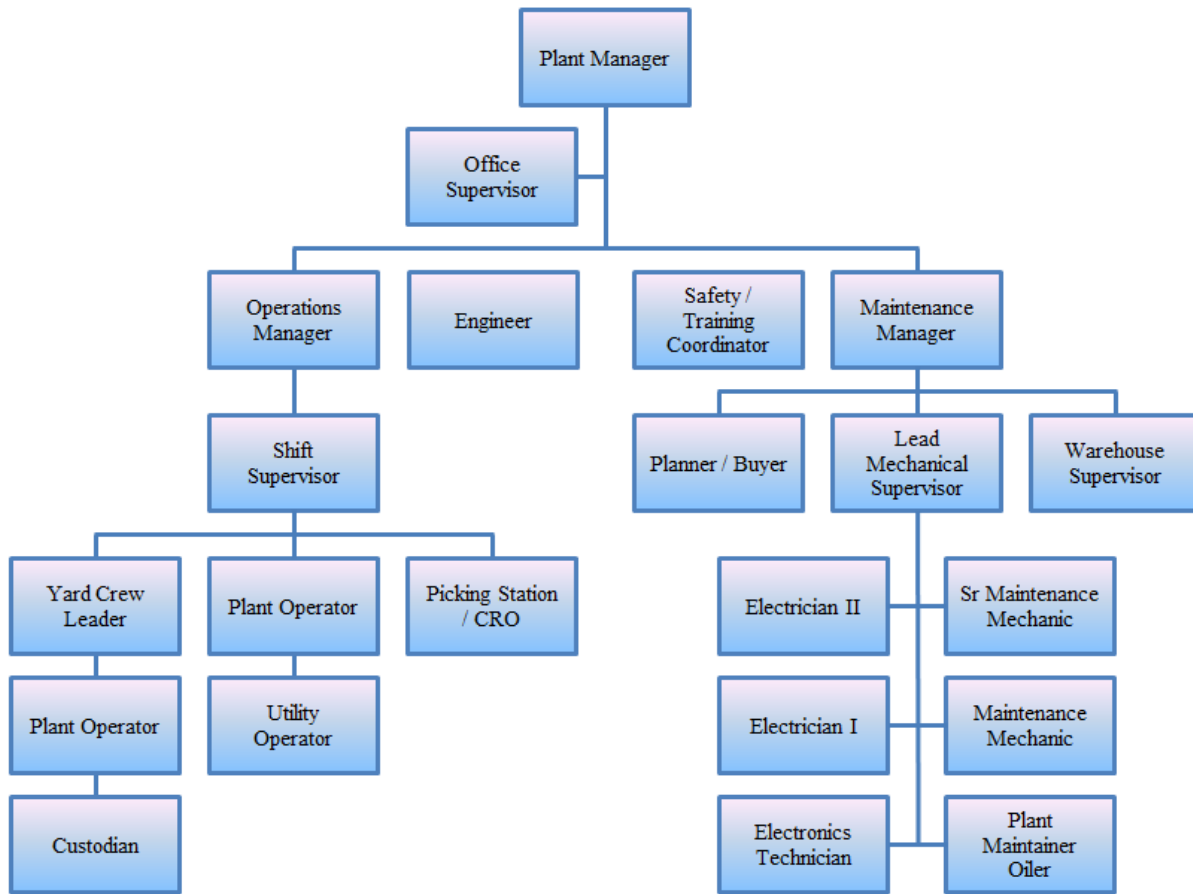
EXHIBIT D

Description of First In / First Out (FIFO) Policy

EXHIBIT E

WPF & PBF Tables of Organization

WPF Table of Organization



PBF Table of Organization

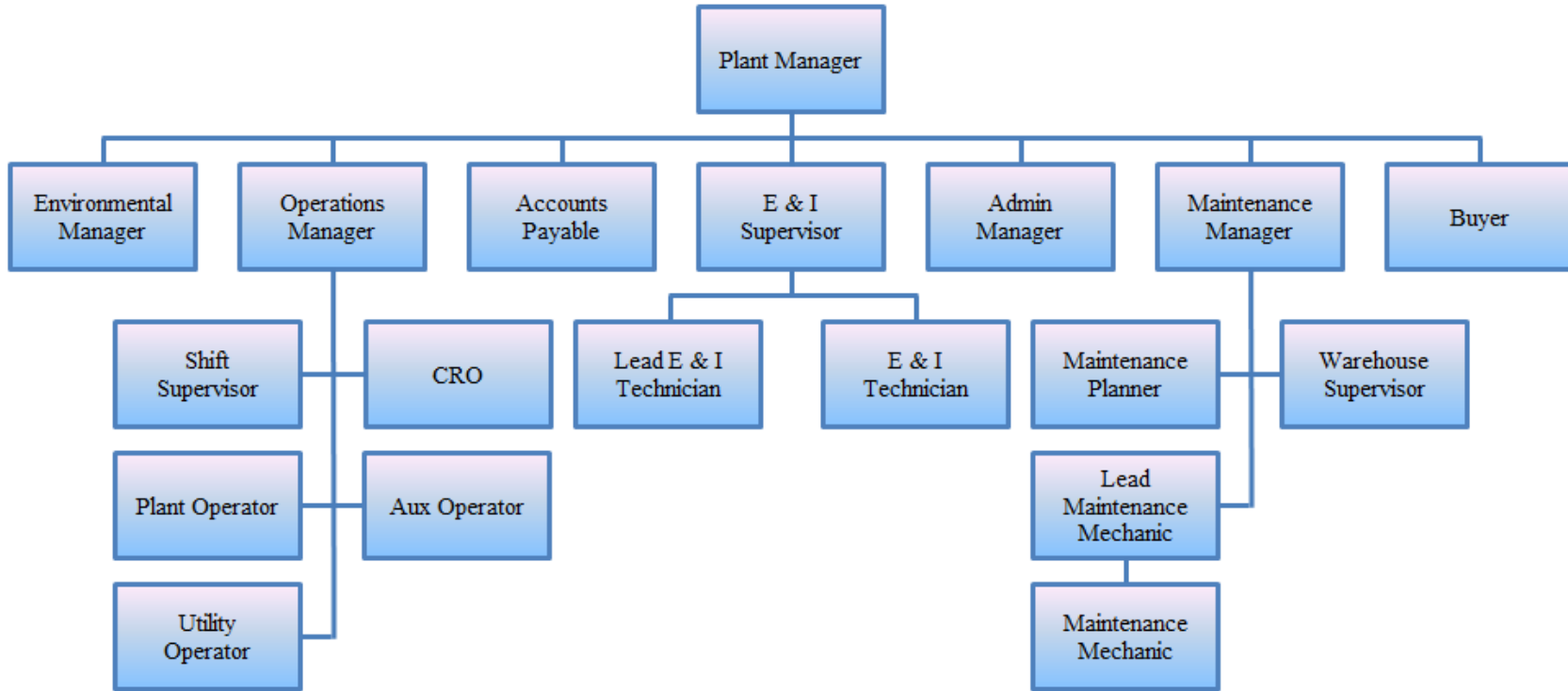


EXHIBIT F

CRRA Table of Organization

CRRA Table of Organization

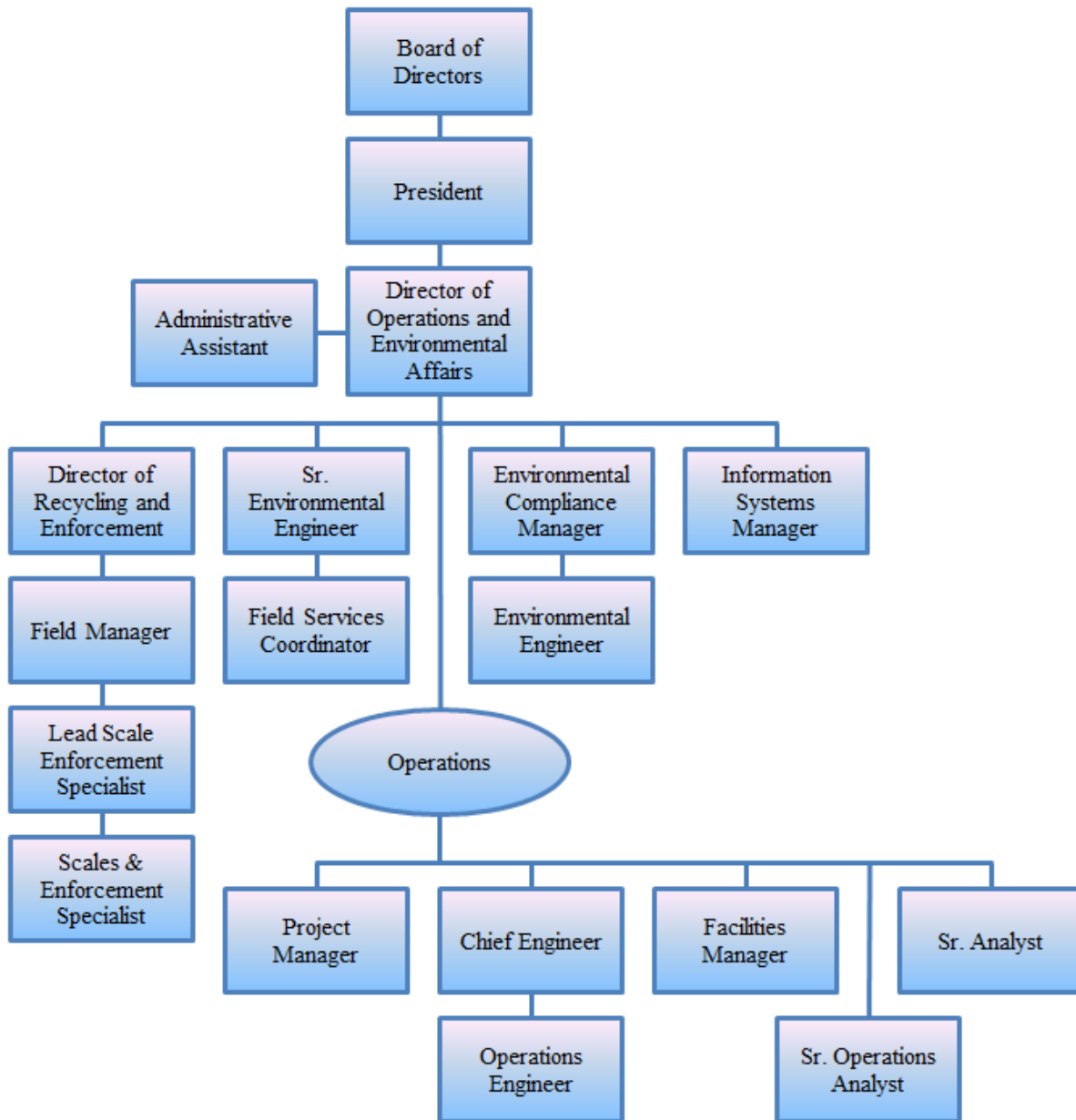


EXHIBIT G

CRRA Personnel Duties and Responsibilities

CRRA Personnel Duties and Responsibilities

Chief Engineer

- Develop and manage capital expenditures for the Facility.
- Meet with facility operator weekly to discuss facilities performance/issues.
- Review all daily, weekly, monthly reports generated by facility operator.
- Review facility operator's financial forecast reports.
- Review and finalize facility operator's O & M Budget.
- Review facility operator's monthly Invoices.
- Review of monthly RDF Fuel Analysis & HHV Reports.
- Review scope of repairs and cost estimates on major equipment.
- Perform daily physical inspection of facility.
- Perform internal boiler pressure parts inspections
- Review daily CRRA transfer station tonnage reports.
- Consult with CRRA environmental group on facility issues.

Operations Engineer

- Reviews plans and engineering information related to the operation of the Authority's waste-to-energy facilities.
- Works with Chief Engineer to develop plans for monitoring the adequacy of the facility operator's preventive maintenance and performance.
- Works closely with facility operators to maximize facility operations and performance.
- Oversees facility improvement projects.
- Manages operations data provided by the facility operator.
- Supervises consultants and contractors involved in various processing, mechanical and multi-disciplined projects.

- Oversees project operations, maintenance and repair to ensure assets are in accordance with good engineering practices and contractual requirements.

Field Manager

- Manage the activities of the scale/enforcement specialists,
- Ensure that at least one scale/enforcement specialist is at the scale house at any time that the Facility is in operation to perform scale weighing activities.

Lead Scale Enforcement Specialist

- Assist the Field Manager in performing his/her duties and responsibilities.

Scale & Enforcement Specialists

- Perform scale weighing of all CRRA permitted waste and recyclable haulers accessing the Facility and all other CRRA Connecticut Solid Waste System facilities;
- Monitor and report on the daily activities of the CRRA contracted operator of the Facility, to ensure that the operator is following through with contractual requirements;
- Perform routine checks of incoming waste and recyclables at the Facility and all other CRRA Connecticut Solid Waste System facilities to ensure that all wastes meet CRRA regulations and are delivered under a valid customer agreement, turn back vehicles and/or waste materials not meeting CRRA regulations;
- Periodically check origins of waste materials by surveillance of vehicles and examination of the waste and take appropriate action, including reporting all violations to CRRA management;
- Gather evidence of violations and prepare reports for CRRA management, and
- Maintain records of any hauler violations and vehicle tare weights and make recommendations regarding the restriction of repeat violators.

Senior Operations Analyst

- Prepare and submit to CT DEEP quarterly tonnage reports.

EXHIBIT H

Facility (WPF and PBF) Personnel Duties and Responsibilities

Facility (WPF and PBF) Personnel Duties and Responsibilities

Plant Manager

- Directs all Operations and Maintenance (O&M) activities at the plant.
- Assures that an adequate supply of manpower, tools, equipment and spare parts are available at all times to provide for the safe and efficient operation of the plant.

Operations Manager

- Manages the daily operations of the plant.
- Directs the implementation of the Operating Plant and identifies those areas which may need improvement or further development.
- Assures that plant operating conditions are always kept within optimum limits.

Maintenance Manager

- Oversees the maintenance and repair of plant facilities and equipment.
- Manages the implementation of the plant's Maintenance program and identifies those items which need improvement or additional work.

E&I Supervisor

- Responsible for the maintenance, repair and programming of all control systems and electrical equipment associated with the PBF/EGF and the DCS.

EXHIBIT I

Safety Manual Table of Contents

Safety Manual Table of Contents

TABLE OF CONTENTS

SECTION	TITLE	REV. NO.	REV. DATE
SMP-1	Safety Management Plan	Rev 0	16 Nov 12
SMP-1A	Job Hazard Analysis (JHA)	Rev. 1	16 Nov 12
SMP-2	Emergency Response	Rev. 1	16 Nov 12
SMP-3	Lockout and Tagout Procedures	Rev. 1	16 Nov 12
SMP-4	Fire Prevention Plan	Rev. 1	16 Nov 12
SMP-5	General Safety Practices	Rev. 1	16 Nov 12
SMP-5A	Fall Protection	Rev. 1	16 Nov 12
SMP-5B	Scaffolding	Rev. 1	16 Nov 12
SMP-6	Safety Inspections, Surveys, and Audits	Rev. 1	16 Nov 12
SMP-7	Confined Space and Enclosed Space Entry	Rev. 1	16 Nov 12
SMP-8	Hazardous Material Communication Program	Rev. 1	16 Nov 12
SMP-9	Electrical Safety	Rev. 1	16 Nov 12
SMP-10	Welding and Cutting	Rev. 1	16 Nov 12
SMP-11	First Aid	Rev. 1	16 Nov 12
SMP-12	Respiratory Protection Program	Rev. 1	16 Nov 12
SMP-13	Hearing Conservation Program	Rev. 1	16 Nov 12
SMP-14	Accident and Injury Reporting	Rev 0	16 Nov 12
SMP-15	Bloodborne Pathogens Exposure Control Plan	Rev. 1	16 Nov 12
SMP-16	Process Safety Management	Rev. 1	16 Nov 12
SMP-17	Work Permits	Rev. 1	16 Nov 12
SMP-18	Mobile Equipment	Rev. 1	16 Nov 12
SMP-19	Chemical Handling	Rev. 1	16 Nov 12
SMP-20	Influenza Pandemic Plan	Rev. 1	16 Nov 12

SMP-21	Combustible Dust	Rev. 1	16 Nov 12
SMP-22	Combustible Gas Venting, Purging, and Inerting	Rev. 1	16 Nov 12
SMP-23	Heat Stress	Rev. 1	16 Nov 12
SMP-24	Trenching and Excavation	Rev. 1	16 Nov 12
SMP-25	Radiation Protection (under development)	N/A	N/A
SMP-26	Contractor Safety	Rev. 1	16 Nov 12
SMP-27	Hot Work	Rev. 1	16 Nov 12

EXHIBIT J

Table of Contents for Training, Operations and Maintenance Manuals

Training Manual Table of Contents

SECTION	TITLE	REV. NO.	REV. DATE
TMP-1	Training Program Overview	Draft 1	05 Dec 11
TMP-2	Initial Employee Qualification	Draft 1	05 Dec 11
TMP-3	Auxiliary Plant Operator Qualification	Draft 1	DD Mmm YY
TMP-4	Control Room Operator Qualification	Draft 1	DD Mmm YY
TMP-5	Maintenance Mechanic Qualification	Draft 1	DD Mmm YY
TMP-6	I&E Technician Qualification	Draft 1	DD Mmm YY
TMP-7	Industrial Hygienist/Chemist Qualification	Draft 1	DD Mmm YY
TMP-8	Heavy Lifting Operator Qualification	Draft 1	DD Mmm YY
TMP-9	System/Component Expert Program	Draft 1	DD Mmm YY
TMP-10	Power Plant Test Questions	Draft 1	DD Mmm YY
TMP-11	WPF CRO and Picking Station	Draft 1	05 Dec 11
TMP-12	WPF Maintenance Mechanic	Draft 1	05 Dec 11
TMP-13	WPF Plant Operator	Draft 1	05 Dec 11
TMP-14	WPF ICE and Plant Electrician	Draft 1	05 Dec 11

WPF Operations Manual Table of Contents

<u>Section</u>	<u>Title</u>	<u>Rev. No.</u>	<u>Rev. Date</u>
100	GENERAL PLANT PROCEDURES		
OP-101	NAES Standard Operating Precautions	Draft 1	13 Apr 12
OP-102	Operating Procedures Users Guide	Draft 1	13 Apr 12
OP-103	NAES Standard Logs and Records	Draft 1	13 Apr 12
OP-104	NAES Management Standing Orders	Draft 1	13 Apr 12
OP-105	Startup Overview	Draft 1	13 Apr 12
200	PLANT ELECTRICAL SYSTEMS		
OP-201	Electrical Distribution System	Draft 1	13 Apr 12
300	SOLID WASTE DELIVERY AND WEIGH-IN		
OP-301	Scale House	Draft 1	13 Apr 12
400	MSW RECEIVING AND STORAGE		
OP-401	MSW Receiving and Storage	Draft 1	13 Apr 12
500	PRIMARY PROCESSING OF MSW		
OP-501	Primary Shredding	Draft 1	13 Apr 12
OP-502	Ferrous Recovery Systems	Draft 1	13 Apr 12
OP-503	Primary and Secondary Separation	Draft 1	13 Apr 12
600	SECONDARY PROCESSING OF MSW		
OP-601	Secondary Shredding	Draft 1	13 Apr 12
700	REFUSE DERIVED FUEL (RDF)		
OP-701	RDF Handling and Storage	Draft 1	13 Apr 12
800	FIRE PROTECTION SYSTEMS		
OP-801	Fire Protection	Draft 1	13 Apr 12
900	FACILITY SUPPORT & UTILITY SYSTEMS		
OP-901	Compressed Air Systems	Draft 1	13 Apr 12
OP-902	Video Systems	Draft 1	13 Apr 12
OP-903	Facility Support Equipment	Draft 1	13 Apr 12

EMERGENCY OPERATING PROCEDURES

EOP-1	Major Plant Fire	Rev 0	16 Nov 12
EOP-3	Steam Turbine Generator Trip	Rev 0	16 Nov 12
EOP-4	Lubrication Failure	Rev 0	16 Nov 12
EOP-5	Pneumatic Failure	Rev 0	16 Nov 12
EOP-6	Auxiliary AC Power Failure	Rev 0	16 Nov 12
EOP-7	Major Steam Leak	Rev 0	16 Nov 12
EOP-8	Major Feedwater Leak	Rev 0	16 Nov 12
EOP-10	Major UREA Leak	Rev 0	16 Nov 12
EOP-11	Hydrogen Gas Leak	Rev 0	16 Nov 12
EOP-12	Steam Turbine Generator Trip	Rev 0	16 Nov 12

PBF Operations Manual Table of Contents

<u>Section</u>	<u>Title</u>	<u>Rev. No.</u>	<u>Rev. Date</u>
100	GENERAL PLANT PROCEDURES		
OP-101	NAES Standard Operating Precautions	Rev 0	16 Nov 12
OP-102	Operating Procedure Users Guide	Rev 0	16 Nov 12
OP-103	NAES Standard Logs and Records	Rev 0	16 Nov 12
OP-104	Plant Manager's Standing Orders	Rev 0	16 Nov 12
OP-105	NAES Standard Incident Reporting	Rev 0	16 Nov 12
OP-106	Integrated Plant Startup	Rev 0	16 Nov 12
OP-107	Integrated Plant Shutdown	Rev 0	16 Nov 12
200	BOILER		
OP-201	Steam Generation	Rev 0	16 Nov 12
OP-202	RDF Handling	Rev 0	16 Nov 12
OP-203	Fuel Gas System	Rev 5	16 Nov 12
OP-204	Boilers	Rev 0	16 Nov 12
300	STEAM TURBINE GENERATORS		
OP-301-5	Unit 5 Steam Turbine/Generator Operation	Rev 0	16 Nov 12
OP-301-6	Unit 6 Steam Turbine/Generator Operation	Rev 0	16 Nov 12
OP-302	Turbine Lube Oil	Rev 0	16 Nov 12
OP-303	Hydrogen/CO2 System	Rev 2	16 Nov 12
400	STEAM CYCLE SYSTEMS		
OP-401	Main Steam	Rev 0	16 Nov 12
OP-402	Auxiliary Steam	Rev 0	16 Nov 12
OP-403	Make-Up Water Treatment System. (LATER)	Rev 0	16 Nov 12
OP-404	Boiler Feedwater System	Rev 0	16 Nov 12
OP-405	Condensate System	Rev 0	16 Nov 12
OP-406	Air Removal Unit 5	Rev 0	16 Nov 12
OP-407	Air Removal Unit 6	Rev 0	16 Nov 12
OP-408	Sampling and Analysis	Rev 0	16 Nov 12
500	FLUE GAS PROCESSING SYSTEM		
OP-501	Ash Handling System	Rev 0	16 Nov 12
OP-502	Flue Gas Desulfurization	Rev 0	16 Nov 12
OP-503	CEMS	Rev 0	16 Nov 12
600	BALANCE OF PLANT MECHANICAL SYSTEMS		
OP-601	Compressed Air	Rev 0	16 Nov 12

OP-604	Circulating Water Systems	Rev 0	16 Nov 12
OP-605	Closed Cooling Water	Rev 0	16 Nov 12
OP-606	Service Water Systems	Rev 0	16 Nov 12
700	BALANCE OF PLANT ELECTRICAL SYSTEMS		
OP-701	Electrical Distribution	Rev 0	16 Nov 12
OP-702	UPS and DC System	Rev 0	16 Nov 12
OP-703	Auxiliary Electrical Power	Rev 0	16 Nov 12
OP-704	Distribution Control System	Rev 0	16 Nov 12
800	FACILITY SUPPORT SYSTEMS		
OP-801	Waste Water Treatment	Rev 0	16 Nov 12
OP-802	Potable Water	Rev 0	16 Nov 12
OP-804	Fire Protection	Rev 0	16 Nov 12

Maintenance Manual Table of Contents

SECTION	TITLE	REV. NO.	REV. DATE
MMP-1	Predictive Maintenance	Rev. 0	21 Sep 12
MMP-2	Preventive Maintenance	Rev. 0	21 Sep 12
MMP-3	Corrective Maintenance	Rev. 0	21 Sep 12
MMP-4	Housekeeping	Rev. 0	21 Sep 12
MMP-5	Maintenance Practices	Rev. 0	21 Sep 12
MMP-6	Maintenance Support Programs	Rev. 0	21 Sep 12
MMP-7	Maintenance Procedures	Rev. 0	21 Sep 12
MMP-8	Cleanliness Control and Foreign Material Exclusion	Rev. 0	21 Sep 12
MMP-9	Jumper/Lifted Lead Requirements	Rev. 0	21 Sep 12
MMP-10	Computerized Maintenance Management System Overview	Rev. 0	21 Sep 12
MMP-11	Outage Planning	Rev. 0	21 Sep 12
MMP-12	Quality Assurance/Quality Control	Rev. 0	21 Sep 12
MMP-13	Facility Improvements, Plant Configuration, and Document Control	Rev. 0	21 Sep 12
MMP-14	Plant Upset/Incident Reporting (Superseded)	Rev. 0	21 Sep 12
MMP-15	Long Term Service Agreement	Rev. 0	21 Sep 12
MMP-16	Transformer Maintenance	Rev. 0	21 Sep 12
MMP-17	SCR Performance Monitoring	Rev. 0	21 Sep 12
MMP-18	Grade P91 Testing/Inspection	Rev. 0	21 Sep 12
MMP-19	HRSB Best Practices	N/A	N/A

EXHIBIT K

Inspections of MSW Receipts for Recyclable Materials

EXHIBIT L

1st Quarter 2014 Solid Waste Tonnage Report

EXHIBIT M

Quarterly and Annual Reports of Operations

EXHIBIT N

Evacuation Routes

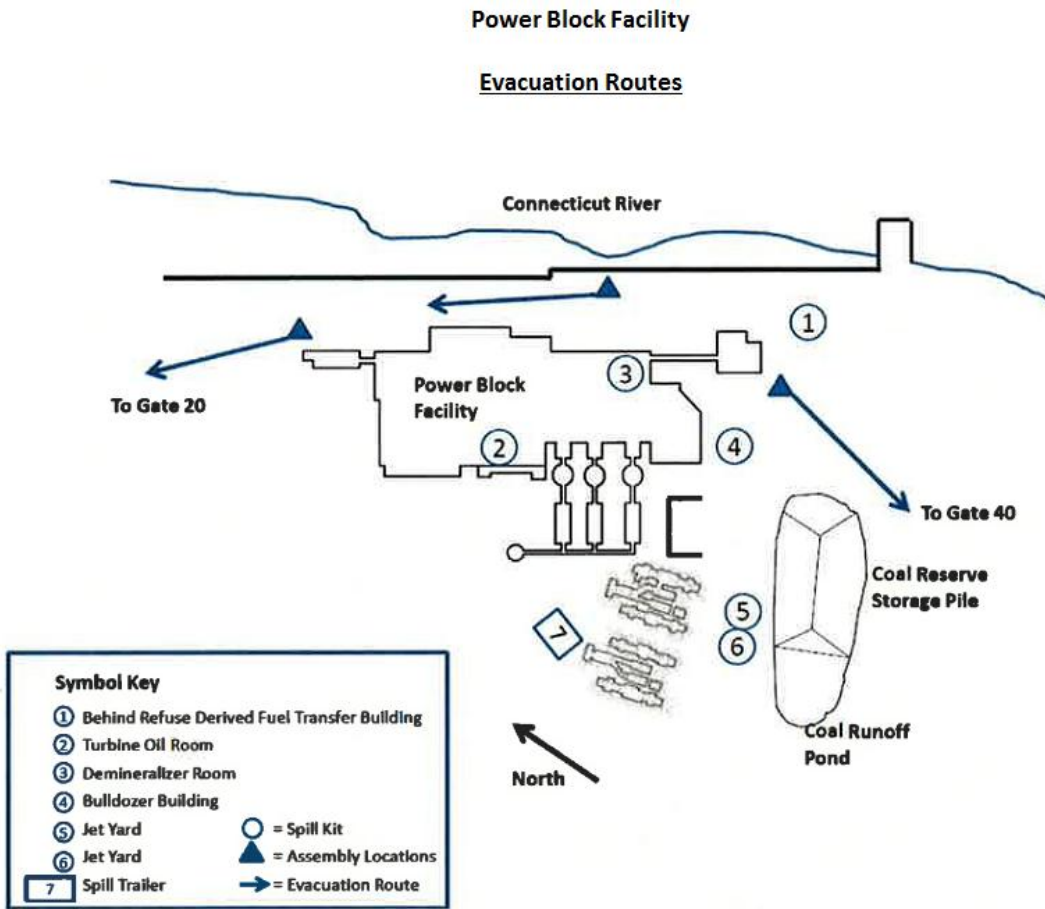


EXHIBIT O

RDF Sampling Protocol

EXHIBIT P

Personal Protective Equipment Hazard Assessment

Personal Protective Equipment (PPE) Hazard Assessment

Plant System: _____ Date: _____

Job Description: _____

Person(s) Completing Assessment: _____

Minimum PPE requirements	Hard Hat, safety glasses, sturdy work boot, hearing protection, work gloves, flame resistant clothing (e.g., heavy weight cotton, denim)
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Additional PPE or PPE that replaces the minimum requirements

HAZARD SOURCE	YES	NO	HAZARD SOURCE DESCRIPTION	PPE Required
Potential for lifting or moving of objects that may be dropped or rolled onto the feet (compression & penetration)			Objects falling onto the feet	Safety-toed work boots
Hand exposure to chemicals			Contact with: _____	Chemical protective gloves (circle): rubber nitrile neoprene
Hand exposure to electricity			Energized electrical equipment	Electrically rated gloves
Hand exposure to cuts, penetration, abrasions			Sharp objects, equipment or tools	Leather or cut resistant gloves
Hand exposure to heat or hot surfaces			Hot surfaces, open flames	Leather or heat resistant gloves
Eye & face exposure to chemical splashes			Contact with: _____	Splash goggles, face shield
Eye exposure to optical light radiation			Welding or cutting	Welding shield or burning goggles
Objects striking the eyes or face			Flying particles, sparks	Goggles, face shield
Body exposure to chemical splashes			Contact with: _____	Chemical protective clothing (circle): Apron suit slicker
Body exposure to electricity			Energized electrical equip, sparks	FR clothing (Nomex)
Body exposure to heat or hot surfaces			Hot surfaces, open flames	Heat resistant suit or shields
				Full-face air purifying respirator with the proper cartridges
				Half-face air purifying respirator and cartridge
				N-95 rated dust mask
Fall Potential			Unprotected elevated surface(s) > 4 ft, high reach	Personal fall arrest system (harness, lanyard, deceleration device)
Extreme Noise Potential			High noise areas, equipment, tools over 110 decibels	Double protection required (ear plugs and ear muffs)
Other:				
Other:				

Comments or Concerns: _____
