# Preliminary Assessment

Central Hudson Gas and Electric
Danskammer Point Generating Station
Newburgh, New York
EPA I.D. #NYD980592612

April 1986

# Danskammer

## I. Introduction

Central Hudson Gas and Electric (CHGE) operates a generating station at Danskammer Point, New York. CHGE plans on closing their hazardous waste units and therefore will not need a Resource Conservation and Recovery Act (RCRA) Permit. Their closure plan has been approved by the Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC), public noticed, and a public hearing will be held on May 6, 1986.

## II. Unit conditions

### A. RCRA Units

#### 1. Acid (A) Basin

- The acid holding basin is located on the north side of the Danskammer Point property between the wastewater treatment facility operations building on its south side and Danskammer Cove, a tidal embayment of the Hudson River on the north side. The A basin is rectangular, with the long axis directed north-south; surface dimensions are 67.5 x 105.0 x 7.0 ft side wall depth (SWD). The side wall slopes at a ratio of 3:1. The A basin construction consists of a 3.0 in. base asphalt layer, a vinyl (Hypalon) liner, and an asphalt bituminous covering applied cold. Waste material flows into the pond through a 6.0-in. pipe approximately 18.0 in. above the bottom and enters the lagoon on the south side. Following treatment, A basin waste material is pumped to the T basin (washwater) sump. The operating capacity of the A basin with a 2-ft freeboard is approximately 126,000 gal.

#### 2. Equalization (E) Basin

- The E Basin is the northernmost of the three primary treatment lagoons. The basin is rectangular, with the long axis oriented east-west. Surface dimensions of the E basin are 241.0 x 54.5 x 6.5 ft SWD. The side wall slope is 3:1. The E basin is constructed of an 18.0 in. layer of recompacted backfill (clay, sand) covered with a vinyl (Hypalon) liner anchored at the top of the forming berm by 3.0 in. of asphaltic concrete and bituminous cold patch. Operating capacity of the E basin with a 2-ft. free-board is 226,000 gal.

  Wastewater material enters at the eastern end of the E basin through a concrete mixing chamber (6.0 x 6.0 x 5.0 ft) containing a fiberglass tank 5.9 ft in diameter and 5 ft deep. Influent mixing is achieved by use of an electrically driven shaft-mounted propeller. Operating capacity of the mixing chamber tank is 1000 gallons.

The E basin (wastewater) sump is constructed of concrete and measures 20.5 x 17.3 ft; it has a 4.0-ft operating liquid depth. Recirculation between the sump and E basin is done using one or two 400-gpm electric pumps. Waste capacity of the E basin sump is approximately 10,000 gal.

3. Final (F) Basin

- The F basin is in the center of the three primary treatment lagoons. It has an east-west axis and surface dimensions of 241.0 x 54.5 x 6.5 ft SWD. The side wall slope is 3:1. With a 2.0 ft freeboard the operating capacity of the lagoon is 226,000 gal. The lagoon is constructed of recompacted backfill (clay, sand, coal ash), an 18.0-in. base of impervious clay (plasticity index less than 15%), Fibretex grade 400 geotextile fabric, and a 36-mil reinforced Hypalon liner anchored at the top of the berm by a 3.0 in. asphaltic concrete and bituminous cold patch.

  Waste material enters the lagoon at the east end through 6.0-in. pipes. The pipe flow impact as it enters the lagoon is mitigated by a double Hypalon liner mat measuring 12.0 x 12.0 ft. Flow exits through an over-under weir at the western end of the basin. Final basin discharge flow by gravity to an open weir on the northern side of the waste treatment facility where discharge flow is monitored.

4. Elementary Neutralization Unit

- The waste material produced by the demineralizer resin regeneration is discharged to an 1100-gal (approximate capacity) fiberglass tank located near the ion exchangers in the power generation building. A 150-gpm electric pump is used to pump wastewater from the tank through a 4.0 in. pipe to the totally enclosed ENU. The ENU consists of a 30,000-gal tank that has chemical and process controls necessary for pH adjustment to a range of 6.0-9.0. Following pH adjustment, the wastewater is discharged to the E basin wastewater sump.

5. Drum Storage

- Waste solvents were stored in drums at a designated area just north of the Danskammer Point waste treatment facility operations building. The waste drums were stored on pallets placed on bare ground or ground covered with lose gravel. The storage area measured 7.5 x 25 feet.

B. Non RCRA Units

1. Landfill - Coal ash was deposited as fill material into a landfill from 1959 to 1963. This landfill, of unknown capacity and dimensions, is located west of the railroad tracks.

2. Coal Ash Basin - Coal ash was deposited in a diked embayment of the adjacent Hudson River from 1951 to 1959. The capacity of this 695 foot by 361 foot area is unknown. This area lies below the regulated surface impoundments

3. Treatment (T) Basin

- The treatment basin is rectangular in shape with surface dimensions of 86.0 x 241.0 x 6.5 ft SWD. The side slope ratio is 3:1. With a 2.0-ft freeboard, the operating capacity is 514,000 gal. The bottom of the lagoon is irregular; a ramp along the southeastern side permits heavy equipment access for sludge removal. A wall located 50.0 ft from the western end of the basin separates the lagoon into the larger eastern end (primarily for settling of solids) and a smaller western clear well. A 4.0-ft-wide weir in the wall that separates the clear well from the treatment area is used to regulate water height.

  The lagoon is constructed of recompacted backfill (clay, sand, coal ash) covered with an 18.0 in. layer of impervious clay fill. A Fibretex grade 400 geotextile fabric liner and a 36-mil reinforced Hypalon liner covers the clay fill. The Hypalon liner on the bottom of the lagoon in the settling portion of the basin is covered with a 1.0-ft sand base course and then 3.0 in. of asphalt. The Hypalon liner is anchored along the top of the berm by a 3.0-in. asphaltic concrete and bituminous cold patch.

  Waste material enters the T basin from the eastern end through a concrete mixing chamber (6.0 x 6.0 x 5 ft deep). Mixing is achieved in the chamber by a shaft-mounted propeller and electric motor. The capacity of the mixing chamber is 1,400 gal.

- The T basin (washwater) sump measures 20.5 x 17.3 ft and has a 4.0 ft operating water depth. Water entering the sump is from the clear well and is recirculated between the sump and basin by one or two 400-gpm pumps. Capacity of the T basin washwater sump is approximately 10,000 gal.

4. Sludge Drying Bed - Wastewater treatment sludges composed primarily of oil ash residue are deposited for drying and storage within an asphalt lined, bermed structure. This 1,200 cubic yard area is located just south of the T basin. Sludge derived from the combustion of fuel oil is high in vanadium in the form vanadium pentoxide. Although vanadium pentoxide is a listed waste, these wastes are exempt under 261.4 b (4).

5. Fuel Oil Storage Tanks - are located in the southern end of the property. There capacity is unknown.

6. Temporary Wastewater Treatment Lagoons

- Two lagoons were used as neutralization and settling basins for wastewaters generated by the plant from 1971 to 1974. These lagoons were approximately 100 x 200 feet and 4 feet deep. Plant wastewaters included demineralizer regenerant, boiler blowdown, boiler seal water, service water, floor drainage and metal cleaning wastes such as air heater and econimizer washes and boiler fireside washes. These wastes are hazardous due to corrosivity or high concentrations of metals.

C. Process Description

Wastes entering the Danskammer Point wastewater treatment facility are of two major types: (1) plant wastes associated with everyday operations, and (2) metal cleaning wastes. Daily plant wastes include boiler blowdown, boiler seal water, service water, floor drainage, and demineralizer regenerant wastes. Metal cleaning wastes include boiler fireside and chemical waterside washes. Fireside washes conducted using service water include air heater, induction fan, and boiler wall washes. Only wastes from the demineralizer resin regeneration operation and the acid phases of the boiler waterside washes have been characterized as hazardous.

The following is a brief discussion of each waste stream or group of similar waste streams.

1. Daily Plant Wastes

- Boiler operational wastes - Feedwater for the four boilers is produced by treatment of Town of Newburgh potable water within a demineralizer system. Boiler water is lost through seals and boiler and evaporator blowdown. Boiler operational wastes are collected in drain pits within the plant. Drain pit waste is pumped to the final basin through a 6-in. pipe. Wastewater entering the F basin is continously monitored for pH, and if any flow is detected below 6.0 or greater than 9.0 it is piped to the equalization basin for pH adjustment.

- Floor drains - Service water, which is screened intake water, is used in the plant to cool and lubricate equipment such as compressors and feed pump lubrication oil coolers. The wastewater flow is collected in the floor drain system and pumped to the F basin in the wastewater treatment facility through a 6-in. pipe. The F basin influent is continuously monitored for pH, and any flow outside the 6.0-9.0 range is automatically piped to the E basin for adjustment.

Waste characterization evaluation of the acid rinse wastes indicates that the HCL and citric acid rinses are hazardous due to low pH (<2.0) and concentrations of chromium and lead that exceed maximum allowable concentrations. The water rinse and caustic rinse phases have not been determined to be hazardous. Rinse phases have not been determined to be hazardous. Rinse phases characterized as hazardous are neutralized in tank trucks or railroad cars on-site and then manifested to permitted off-site treatment facilities. Rinse phases not characterized as hazardous are discharged to the A basin. The A basin is not used for any other purpose.

3. Waste Solvents - Waste halogentated solvents result from metal cleaning and degreasing operations throughout the plant site. Following accumulation, drums of waste solvents are transported under manifest to a licensed storage and disposal facility.

III. Known and Suspected Releases

A. RCRA Units

1. Acid (A) Basin - On March 22, 1985, a site inspection of Danskammer was performed by EPA and NYSDEC engineers. NYSDEC took groundwater samples at wells M-1 - M-5. Analyses of these samples revealed elevated concentrations for chloroform (up to 50ppb), 1,1 dichloroethane (up to 16ppb), toluene (up to 4ppb), benzene (up to 4ppb) and trichloroethylene (up to 3ppb). Most of the highest concentrations for these parameters were found in well M-5, which is upgradient of the regulated surface impoundments. Further groundwater monitoring (GWM) will be conducted under the closure plan. There have been no known releases from this unit.

2. Equalization (E) Basin - see III.A.1.

3. Final (F) Basin - see III.A.1.

4. Elementary Neutralization Unit - there have been no known or suspected releases from this unit.

5. Drum Storage - although there are no known or suspected releases from the drum storage area, soil samples will be taken in this area as part of the closure plan.

B. Non RCRA Units

1. Landfill - according to Danskammer, only coal ash has been placed in the upland ash fill area. Although coal ash is exempt from hazardous waste regulation, studies indicate that arsenic, barium, boron, aluminum and strontium are leached at naturally elevated concentrations from the ash. No groundwater data exists for the upland fill area. It is questionable if a liner existed in this unit when it was active. In the absence of a liner, one would have to assume that all of the above-mentioned elements are probably in the groundwater.

2. Coal Ash Basin - again, Danskammer claims that only coal ash has been placed in this unit which lies beneath the present surface impoundments. Due to the fact that the regulated surface impoundments are built on the coal ash basin, Danskammer contends that all of the arsenic concentration highs obtained during the interim status groundwater monitoring are the result of coal ash leaching. Because of this spatial relationship between the SMWU and the regulated units, the groundwater data already generated applies equally to both.

3. Treatment (T) Basin - see III.A.1.

4. Sludge Drying Bed - the sludge deposited in the sludge drying bed has been described as consisting mainly of oil ash residue, which is exempt from hazardous waste regulation. However, several metals are leached naturally from the ash. Therefore, more work is needed in this area. During a site visit the soil about the sludge drying bed was discolored (pink and green). The management and appearance or the sludge drying bed was messy.

5. Fuel Oil Storage Tanks - there are no known or suspected releases from these units.

6. Temporary Wastewater Treatment Lagoons - Very little information on these units has been provided by Danskammer. In particular, no data is available on lagoon construction (i.e., presence/absence of liners, berms, compacted clay, etc.). If the lagoons were not lined, the free liquids that were contained in them would have easily migrated to the shallow water table. Given such a condition, releases to the GW would have been continuous over the four year operational period. Contaminated GW samples (see III.A.1.) suggest that the wastewater treatment lagoons may in fact be a source of contamination. More study is needed before any conclusions can be reached.

## IV. Target Populations and Environments and Release Pathways

The groundwater at the Danskammer facility all flows towards the Hudson River.

## V. Recommendations

Based on the above observations, a site investigation is recommended for the Danskammer facility. This investigation should involve soil and groundwater sampling at all of the known and suspected SWMU's. Soil and groundwater sampling at Danskammer are required in their closure plan for the RCRA regulated units. Further sampling of the sludge drying bed area is suggested to determine if the soil about the area is indeed contaminated. During the investigation, the structural integrity of each unit should be evaluated. Specifically, the presence/absence of liners and/or berms should be noted. Finally, the visual appearance and extent of the waste materials should be fully documented.

Visual Site Inspection Report
Central Hudson Gas and Electric
Danskammer Point

Inspected By

| | |
|---|---|
| Sitansu Ghosh | Project Engineer, DEC Albany |
| Luanne Whitbeck | Project Geologist, DEC Albany |
| Jeffrey Clock | Environmental Affairs, Central Hudson Gas and Electric |

Date of Inspection — December 15, 1986

A visual site inspection was conducted to enhance the PR and the SV workplan. All the SWMU's listed in the PR were inspected. The observations are described below for each of the units.

A. RCRA Units

1. Acid (A) Basin

This impoundment was about 1/3 full with rainwater, and the fence broken in one place on the northern end. This impoundment will be closed as a part of the closure plan approved by DEC.

2. Equalization (E) Basin:

All liquid and solid have been removed from this impoundment. The liner is broken at many places. The berm was damaged in many areas. This impoundment will be closed as part of the closure plan approved by DEC.

3. Drum Storage

The drums have all been removed. Soil will be sampled from this storage area. This unit will be closed as a part of the closure plan approved by DEC.

B. Non-RCRA Units

1. Final (F) Basin

This basin was in operation and was observed to be maintained properly. The liner and the berm were structually sound. There was no discoloration or odor.

2. Elementary Neutralization Unit

This unit was structually sound and properly maintained. There was no sign of release, discoloration or odor.

3. Landfill

The landfill has been converted to a reserved coal storage. The area has been excavated and compacted with clay, and crushed stone placed over it. Groundwater monitoring wells have been installed up and down gradient of this unit.

4. Coal Ash Basin

The RCRA Units Acid Basin, Drum Storage, Equalization Basin and non-RCRA Units Final Basin and Treatment Basin are occuping the coal ash basin. There are groundwater monitoring wells up and down gradient to these units. As a part of the closure of the RCRA units soil samples and groundwater samples have been taken.

5. Treatment (T) Basin

This unit is in operation and was properly maintained. The liners and the berms were structually sound. No discoloration or odor was observed. No sign of release was observed.

6. Sludge Drying Bed

This area is being used for storing construction equipments. No discoloration or odor observed. There is no intended use of this area.

7. Fuel Oil Storage Tanks

These tanks was structually sound there was no sign of release, discoloration or any odor. The tanks are in operation and properly maintained.

8. Temporary Waste Water Treatment Lagoons

This area has been converted to live coal storage. The area has been excavated, compacted with clay, and crushed stone put in place. Groundwater monitoring wells have been installed up and down gradient to this unit.

Summary of Observation

Groundwater monitoring wells have been installed upgradient and downgradient to the RCRA and non-RCRA units. About a year's worth of sampling data have been collected by the facility. Soil samples have been collected and analyzed from the equalization basin area. Soil samples will be collected from the acid basin and drum storage area.

For RCRA units the facility is in 3 years post-closure groundwater monitoring phase. The groundwater and soil sampling data for RCRA and non-RCRA units will be made available to NYSDEC in an engineering report in the month of January 1987.

## Recommendations

The likely candidates for soil sampling under the SV are the landfill area, temporary wastewater treatment lagoon area and the sludge drying bed area.

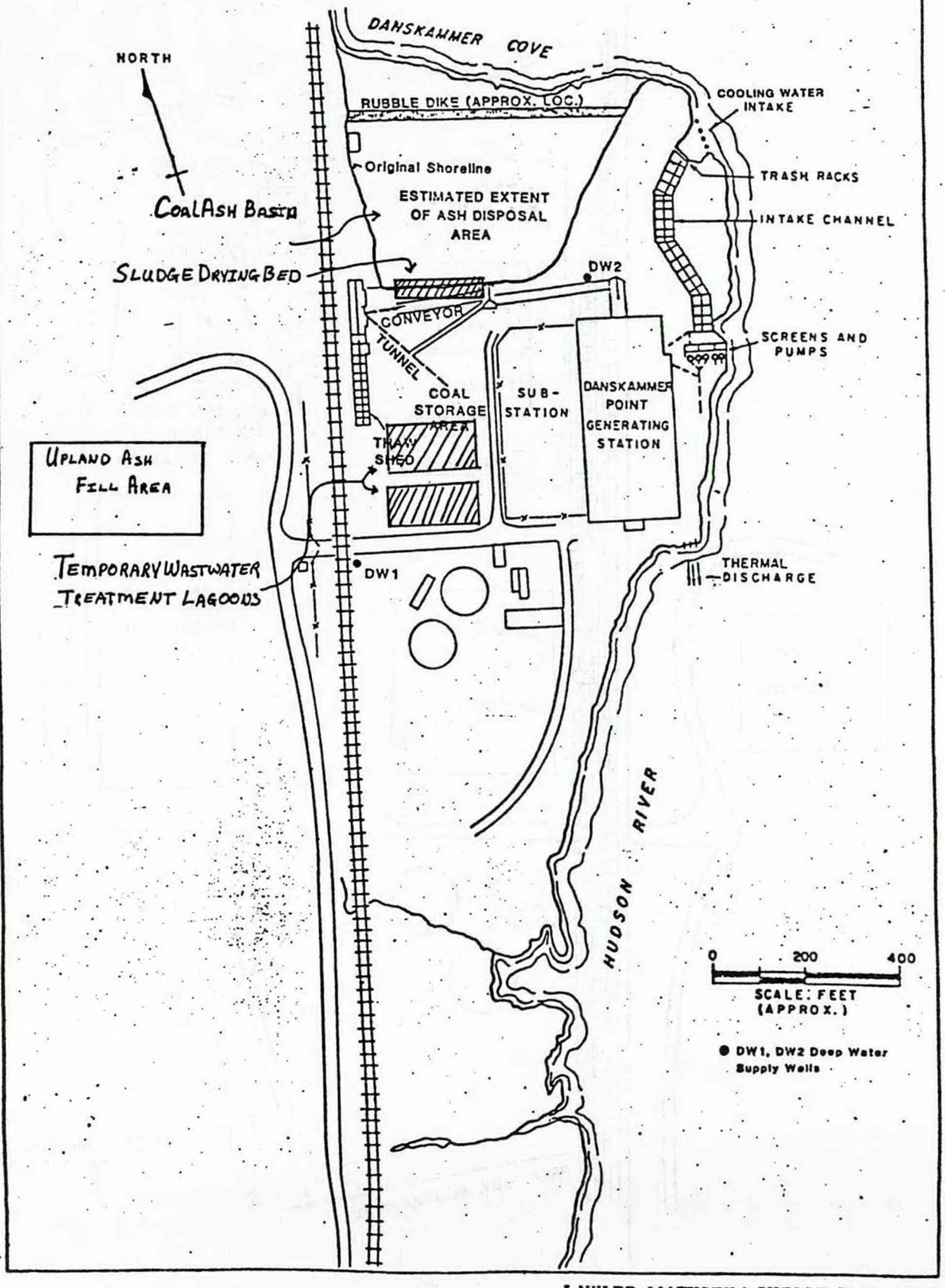
It is recommended that the engineering report to be submitted in January 1987 be reviewed along with the groundwater analysis data and sludge analysis data already available with NYSDEC for determination of requirement for additional groundwater and soil sampling.

Note: Past

FIGURE 2.0-1

PLOT PLAN

Danskammer Point Generating Station



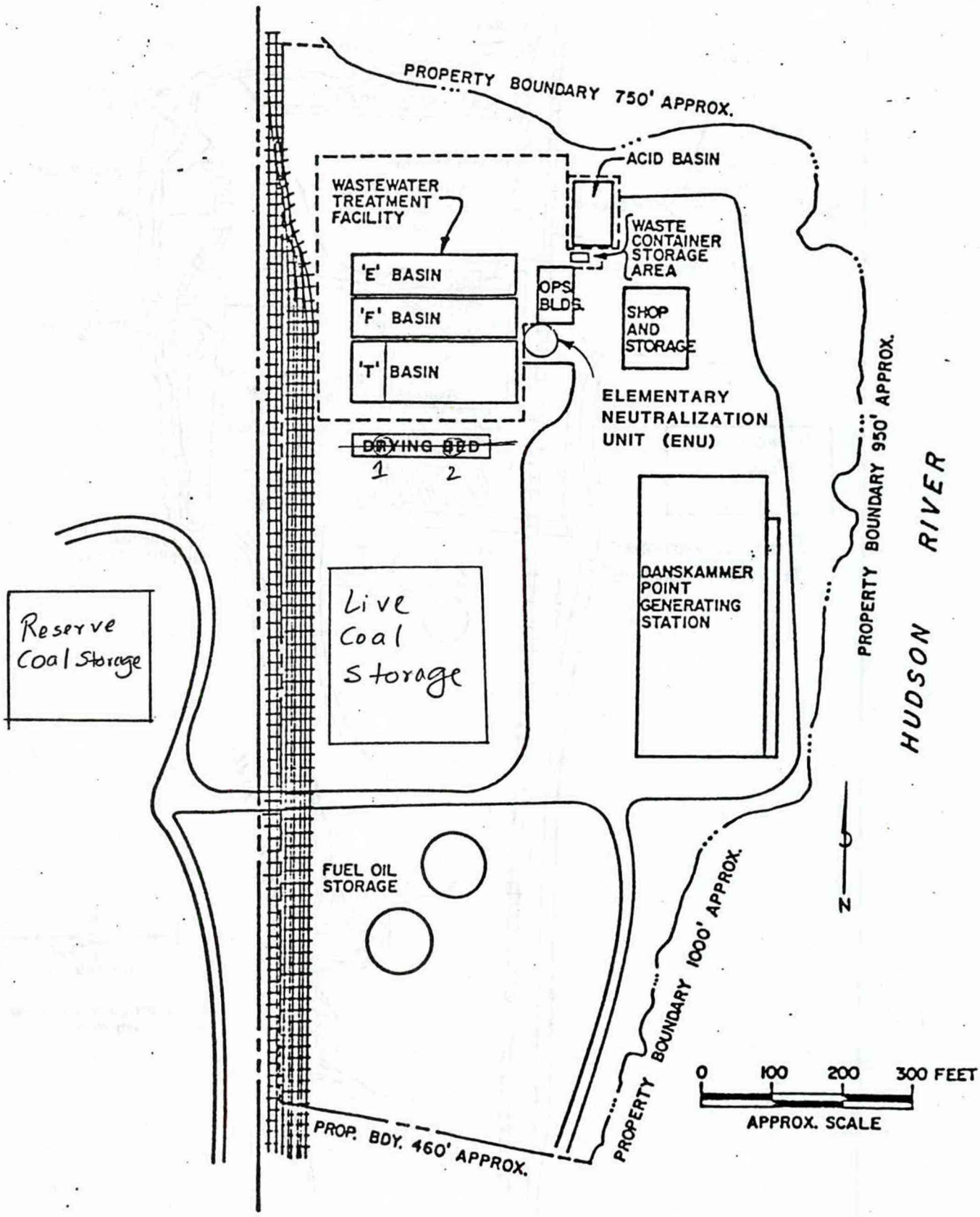

LAWLER, MATUSKY & SKELLY ENGINEERS

Note · Present

FIGURE 1

# PLOT PLAN

## Danskammer Point Generating Station



## Corrective Action Program

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) added Section 3004(u) which requires corrective action for all releases of hazardous waste or constituents from any solid waste management unit (SWMU) at a treatment, storage, or disposal facility seeking a permit regardless of the time at which waste was placed in such unit. This corrective action requirement is also stipulated in New York State final status hazardous waste regulation 6 NYCRR 373-2.6(1). The primary objective of the Corrective Action Program is the protection of human health and the environment from all releases of hazardous waste or constituents.

A SWMU is any discernible unit at which solid or hazardous wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous wastes. Such units include any area at a facility at which hazardous waste or constituents have been routinely and systematically released (e.g. a spill area contaminated by routine and systematic discharges from product or process units.) A SWMU does not include accidental spills from production areas and units in which wastes have not been managed (e.g. product storage areas).

The RCRA corrective action program consists of three phases:

1. The RCRA Facility Assessment (RFA) to identify releases or potential releases requiring further investigation.

2. The RCRA Facility Investigation (RFI) to fully characterize the extent of releases.

3. Corrective Measures (CM) to determine the need for and extent of remedial measures. This step includes the selection and implementation of appropriate remedies for all problems identified.

The RFA is a three stage process that includes the Preliminary Review (PR), the Visual Site Inspection (VSI) and the Sampling Visit (SV). The RFA is conducted to:

- Identify and gather information on releases at RCRA facilities;

- Evaluate SWMUs and other areas of concern for releases to all media (soil, surface water, groundwater, air, etc.) and regulated units for releases to media other than groundwater;

- Make preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility; and

- Screen from further investigation those SWMUs which do not pose a threat to human health or the environment.

The PR is a desk-top review of all of the available information on the individual SWMUs. During the PR and in subsequent phases of the RFA, all of the media that could potentially be affected by hazardous waste releases are examined. Based on this review, the SWMUs are characterized as to their release potentials.

Following this review, a VSI is conducted during which all of the SWMUs are examined to determine obvious spills or leakage, stained soil, stressed vegetation, unit deterioration, or any other conditions that may be indicative of a release. By means of these observations and the findings of the PR, sampling is recommended at those units where releases are suspected, but not verified. A sampling workplan is then prepared and a SV is conducted.

The last aspect of the RFA involves the regulatory agency preparing the RFA report which includes recommendations for further action at those units with demonstrated releases of hazardous waste or constituents. In some cases, interim corrective measures may be required at a unit where an immediate threat to human health or the environment exists.

If the RFA concludes that there is a need for further investigative work, the owner/operator is required to perform a RFI as a RCRA Permit condition or as a condition of an Order on Consent. The purpose of the RFI is to determine the nature, extent and rate of migration of hazardous wastes or constituents in soils, groundwater, surface water, subsurface gas and/or air. Due to its very nature, the RFI usually involves a considerably greater level of effort than the RFA. Multi-media analyses should be used to determine the types of contaminants present, the boundaries of the contaminants (e.g., plumes), and the rate of contaminant movement. Once the chemical data is reviewed, a RFI report is prepared that provides a summation of the data and recommendations for any needed remediation.

The culmination of the Corrective Action Program is Corrective Measures (CM). The initial stage of the corrective measures phase is the preparation of a Corrective Measures Study (CMS). The CMS will address alternative remediation strategies that are technologically feasible and reliable, and which effectively mitigate and minimize damage to and provide adequate protection of human health and the environment. An exposure assessment coupled with a public health and environmental assessment will be mechanisms used to develop cleanup target levels. Library search, scale models, or treatability studies are tools that may be utilized, if necessary, to assess the technical feasibility of remedial alternatives. The CMS report should provide a discussion of the alternative remediation strategies studied addressing technical, institutional, public health, and environmental issues, and the conceptual engineering on the alternative action selected by the facility.

Approval by the regulatory agency of the selected remedial alternative will initiate the final stage of corrective measures: Corrective Measures Implementation (CMI). CMI will address the final design, construction, and start-up of the selected corrective measures technology. Financial assurance under 6 NYCRR 373-2.6(1)(2) will be required of the owner or operator of the facility for corrective action.

# RCRA FACILITY ASSESSMENT REPORT
# PRELIMINARY REVIEW

Central Hudson Gas and Electric
Danskammer Point Generating Status
Newburgh, New York
EPA I.D. No. NYD980592612

April 1986
Revision April 1988

Recommendations

At Danskammer, coal ash was deposited in large quantities in the Coal Ash basin. This coal ash deposit may act as a source of contamination in the groundwater. Although the concentrations of arsenic, cadmium, mercury and lead were only slightly above the health based standard, it is recommended that in the RFI phase, a study carried-out to determine the extent and rate of contamination released from the coal ash basin. The probable environmental receptor of the contamination the surface water of Hudson River and air from uncovered soil. A sampling visit is recommended for the sludge drying bed. Table 1 shows the SWMUs and recommendations for future work.

Central Hudson Gas and Electric
Danskammer Point Generating Station

Table 1 - Solid Waste Management Units and Recommendations, April 1988

| SWMU's | Regulated | No Further Action | VSI | SV | RFI |
|---|---|---|---|---|---|
| Acid (A) Basin* | X | X | X | - | - |
| Equalization (E) Basin* | X | X | X | - | - |
| Final (F) Basin | - | X | X | - | - |
| Elementary Neutralization Unit | - | X | X | - | - |
| Drum Storage Area* | X | X | X | - | - |
| Landfill | - | X | X | - | - |
| Coal Ash Basin | - | - | X | - | X |
| Treatment (T) Basin | - | X | X | - | - |
| Sludge Drying Bed | - | - | X | X | - |
| Fuel Oil Storage | - | X | X | - | - |
| Temporary Wastewater Treatment Lagoon | - | X | X | - | - |

*These units have been closed under RCRA. Closure certification has been accepted.

Background

A Preliminary Assessment (PA) was prepared by USEPA Region II in April 1986 (Attachment 1). In that PA, twelve SWMU's were identified at Central Hudson Gas and Electric (Table 2). Further investigation was recommended at SWMUs with known or suspected releases.

During the Visual Site Inspection (VSI) in December 1986, it was observed that the landfill, the temporary wastewater treatment lagoon and the sludge drying bed were areas of concern and soil sampling was tentatively recommended for these three SWMU's. The Acid Basin, Equalization Basin, and the Drum Storage Area have been closed under RCRA interim status. Soil samples were taken and analyzed from these units during closure. The analysis results did not show any soil contamination at these SWMUs. Groundwater at these units is being monitored under a follow-up monitoring program. There was no evidence or potential for release from the Fuel Oil Storage Tanks, the Elementary Neutralization Unit and the T basin.

It was also observed during the VSI that the landfill and the temporary wastewater storage lagoon area have been converted to reserve coal storage and live coal storage respectively. The soil condition in these areas has also been altered during the construction. The facility has installed groundwater monitoring wells for these storage areas. A groundwater investigation report was submitted to the Department in January 1987. It was observed that concentrations of arsenic, lead and mercury in the groundwater have exceeded the EPA health-based standard for drinking water in some of the samples.

Attachment 1

Central Hudson Gas and Electric
Danskammer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

MAY 27 1986

Mr. Paul Couterman, P.E.
Chief, Bureau of Hazardous Waste
Technology
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

Dear Mr. Counterman:

Enclosed please find the preliminary assessment (PA) for Danskammer Point Generating Station and PVS Chemical.

Any questions regarding these PAs should be directed to Kathleen Tobin of my staff at (212) 264-0548.

Sincerely yours,

A. Bellina

Andrew Bellina, Chief
New York Permit Section
Solid Waste Branch

Enclosure